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A Study of Financial Counselling and Estimation of Variance Between Estimated Bill and Actual Bill of Cardiac Cath Lab

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ABSTRACT

Cardiac cath lab is one of the major revenue generating department of the hospital, so it must be managed properly.

The present study is retrospective and data collection was done for 3 months. The study was analyzed using DMAIC methodology. Fish bone diagram and Gap analysis. Number of factors contribute to variances in estimated bill

- Preexisting conditions
- No of stents
- Surgeons charges
- Room charges
- ALOS

The variance calculated is 85% of actual bills are above estimated bills and 14 % are below estimated bills. Only 1% of actual and estimated bills are equivalent. It was recommended to control the variations by applying six sigma tools and following SOPs.

Keywords: Cardiac cath lab, Fishbone analysis, financial counselling,

INTRODUCTION

Cardiac catheterization is a non-surgical procedure often recommended for patients who suffer from chest pain, show signs of blocked arteries or have atypical stress test results. It enables doctors to more precisely pinpoint potential heart problems such as coronary artery, aortic or valve disease and provides critical answers needed to determine the best course of action and establish a treatment plan.

The staff in the cardiac cath lab can play a major role in achieving—or hindering the ability to achieve—the highest possible reimbursement for their hospital. Members of the cath lab team will need to heavily focus on improving quality, patient satisfaction, and outcomes. The combination of cost control and achievement of positive care and patient satisfaction measures can have a lasting impact on the financial performance. Constant, concentrated effort on patient-centered care by way of quality and satisfaction enhancement can have

downstream effects that will put your hospital in great position to be a provider of choice, and can help prepare for any other future programs. The cath lab can be the leading agent for hospital change by providing significant contributions. This study reviews the techniques used for financial analysis of billing in cath lab. Since cath lab is among the highest revenue generators for the hospital, it is necessary to be financial solvent.

Aim of the study: To calculate the variance between estimated bill and actual bill

Objectives of the study

1. Accuracy of estimation of billing
2. Transparency of cost in the billing procedure
3. Gap Analysis

REVIEW OF LITERATURE

Healthcare delivery costs continue to rise due to increased demand for patient services. Various hospital

departments, such as the emergency department (ED), radiology department, Cardiac cath lab and pharmacy represent a small sample of such departments facing high patient demand. On the other hand, there exist tremendous opportunities for cost reduction and quality improvement in the operation of these departments.¹

A team that cannot communicate effectively can compromise patient flow, procedure scheduling and patient outcomes, and negatively impact the program as a whole by fostering low morale, high turnover and so on, which can have a huge financial impact on the organization's bottom line. Overcoming communication challenges will allow for easier and more effective relationships to be established.²

Cost finding and cost analysis are the technique of allocating direct and indirect cost. They are also the process of manipulating or rearranging the data or information in existing accounts in order to obtain the costs of services rendered by the hospital. As financial management techniques, cost finding and analysis help to furnish the necessary data for making more informed decisions concerning operations and infrastructure investments. If structured accurately, cost data can provide information on operational performance by cost center. This information can be compared to budgeted performance expectations in order to identify problem areas that require immediate attention. These data give management the material to evaluate and modify operations if necessary. Moreover, knowledge of costs (both unit and total) can assist in planning for future budgets (as an indicator of efficiency) and to establish a schedule of charges for patient services. A hospital cannot set rates and charges which are realistically related to costs unless the cost finding system accurately allocates both direct and indirect costs to the appropriate cost center. Finally, cost finding and analysis are also of value to management in ensuring that costs do not exceed available revenues and subsidies.³

Two fundamental items of financial data needed by a hospital manager are allocated costs by cost center and the unit cost of hospital services. A unit of hospital services may be as small as one meal, or as broad as an entire inpatient stay. To perform these calculations precisely, the hospital needs an accurate and comprehensive financial accounting system. In many hospitals, however, existing accounting systems have gaps, such as excluding some costs or lacking the data

to relate the costs to specific cost centers. In these cases, estimates are needed. It is organized based on seven steps for computing unit costs.

The steps are:

1. Define the final product.
2. Define cost centers.
3. Identify the full cost for each input.
4. Assign inputs to cost centers.
5. Allocate all costs to final cost centers.
6. Compute total and unit cost for each final cost center.
7. Report results.⁴

3.1 Define the Final Product of the Cost Analysis:

What are the services or departments for which you are interested in computing unit costs? For example, do you want to know the unit cost for all inpatient services, or a separate unit cost figure for each ward or service? The decision will depend on two key questions:

Purpose of the Analysis: To do a comparison of costs of certain hospital departments by computing costs department wise & then predict the variation between projected cost & actual cost incurred by the patient

Type of Data Available: Our ability to compute unit costs will be constrained by how aggregate or disaggregate the available data are for both costs and utilization. For example, in order to compute unit costs by ward, you would need to have at minimum utilization data by ward (e.g actual total patient days for each ward for a particular budget year).

In some cases, it may be unclear whether to compute a separate unit cost for a certain activity, or allocate its costs to some other output. For example, some studies have computed separate unit costs for lab and radiology departments, thereby excluding those costs from the cost per inpatient day or discharge. Others have treated lab and radiology as intermediate outputs, and fully allocated their costs to the inpatient cost centers. Again, the desirability of each approach depends on the purpose of the analysis, but it is important to be consistent.

Define Cost Centers: The next step for computing unit costs is to determine the centers of activity in the hospital to which direct and/or indirect costs will be assigned. The

major direct cost categories of most departments include salaries, supplies, and other (purchased services such as dues, travel, and rents). Indirect cost categories include depreciation and allocated costs of other departments.

The rationale for choosing centers of activity that correspond with the hospital's organizational and/or accounting structure is managerial. Hospitals are organized into departments and, since we want to strengthen the management of these departments, it is useful to have cost centers that correspond to the existing organizational structure of the hospital. This provides: (1) the road map by which costs can be routed, through the process of cost finding, to final cost centers; and (2) a framework for costing the distinct functions of each center. Following this road map shows individual managers how they are using available resources in relation to what has been budgeted and the services that they are providing.

From an administrative standpoint, cost centers can be distinguished based on the nature of their work---patient care, intermediate clinical care and overhead centers. As explained below, some costs centers represent patient-centered activities (i.e., final or intermediate cost centers), while others are primarily for general services (i.e., overhead cost centers) such as housekeeping, laundry, maintenance, and the many other tasks necessary for the satisfactory operation of a complex organization like a hospital.

Identify the Full Cost for Each Input: An important part of computing unit costs is to make sure that you have cost data which are as complete as possible. Two issues are involved: (1) the conceptual issue of determining which expenditures should be counted as costs based on an economic sense of resources used up during production of health care, and (2) the actual measurement of true costs using available data (which may be incomplete or untrustworthy). Various studies have developed ways to impute or approximate cost when existing data are problematic.

Assignment of Inputs to Cost Centers: At this point, you have presumably gathered information about the hospital's total costs, whatever the source of payment. This information alone may provide useful insights even before you start computing unit costs: for example, in identifying which line items account for most of cost and whether this is changing over time. However, to compute

unit costs one must proceed to the next step: assigning costs from each line item to the relevant cost centers.

Allocation of All Costs to Final Cost Centers

The next step is to reallocate all indirect costs to the final cost centers. In this way, the unit cost will include overhead costs incurred in producing an admission, day or visit, not just direct costs. Indirect costs will include all costs which could not be allocated directly to final cost centers at an earlier stage. In some hospitals, this will only comprise services such as administration and laundry. In others, intermediate services such as pharmacy and radiology may also need allocating at this point, with little or no information about how much of their workload was generated by each of the medical departments.⁵

Computing Unit Cost for Each Cost Center: At this point you know the total costs that were incurred at each of the final cost centers. What is the output of each center, in days, discharges, lab tests etc.? This requires incorporating utilization data into the analysis.

In reality, you will have used the utilization data already by this point, for example in order to allocate laundry costs across wards in proportion to bed-days. However, this is the point at which any problems with the utilization data become particularly important, because they directly alter the unit costs.⁶

Several studies encountered problems with utilization data. In some cases, the number of admissions seemed accurate, but admission and discharge dates had not been carefully recorded, causing measurement of bed-days to be inaccurate. Correct measurement of bed-days requires that staff count how many beds are occupied in every ward, every 24 hours at the same time of day. Once you have obtained the utilization data, the unit cost can be computed.

REPORTING RESULTS

At this point it is important to remind yourself and any readers what items are and are not included in the unit costs you have calculated. For example, your unit cost does not include drugs and x-rays unless you specifically allocated the costs of those services to other final cost centers, during steps 5 and 6.

In today's economy, getting the most value from your Cath Lab—in terms of operational throughput,

human capital, and patient and physician satisfaction--is crucial to survival in the increasingly competitive market for cardiovascular services. In the case of a growing or expanding program, understanding the complex workings and inter-relationships within the Cath Lab setting is especially important to future success. The Cath Lab is unique with the staff working elbow-to-elbow with the cardiologist in a collaborative setting to provide care in an often intense clinical situation. Ensuring that a Cath Lab is operating efficiently and effectively, while also providing the highest quality care in this environment is not always easy.⁷

In order to maximize teamwork, performing a detailed, comprehensive operational assessment is necessary. This assessment can be an invaluable tool for creating a competitive edge in terms of clinical outcomes, operational efficiency, and/or financial performance.⁸

In any assessment process it is important to understand the base-line performance. Key steps must be taken to evaluate the program from start to finish in order to define areas of outstanding performance and also those that could use improvement. Despite the industry-wide focus on quality, and the endless quest for 'best practice' at all hospitals, making change can be difficult. (Sustaining change can be even more of a challenge!) Indeed, a thorough assessment of operations can be performed internally, though the process is best completed with a neutral third party. Often, an external consultant is needed to make those "tough" recommendations and bring fresh ideas to the table for improvement and/or change.⁹

An example of a simple problem that often involves strong recommendations is related to on-time case starts. Most Cath Labs struggle with this issue (first case of the day and on-time starts for those to-follow cases), and sustainable solutions can be elusive. A root cause analysis can bring hard data to what often becomes 'finger pointing' between staff and physicians, or between the Cath Lab and the patient care areas.¹⁰

Another important element to assess is how patients are scheduled and if it works efficiently for the cardiologists, patients, and Cath Lab staff. Is there a holding area for staging patients pre- and post-procedure? If so, does it cover the Cath Lab sufficiently with staffing and hours of operation?¹¹

Part of a thorough Operations Assessment includes a SWOT Analysis:

Strengths (S) support the positive aspects of the program. Examples include a facility design that is conducive to optimal patient flow or a leadership team that takes a crucial role in the program development.

Weaknesses (W) can be found in financial losses, staff competencies, or lack of physician champions. These are areas for improvement or sometimes can be unavoidable obstacles that will need addressed.

Opportunities (O) enable a focus on development and can lead to potentially increased revenue and better care delivery.

Threats (T) are the outside influences that can negatively impact a program's bottom-line, frequently from a competitive or regulatory standpoint.¹²

Although the investments to create a CCL are high, hospitals were historically been able to achieve their economic return of investment rapidly because of the relatively high contribution margins (CBMs) on many procedures performed within the department.¹³ During the last decade, realizing a return of this investment has become increasingly challenging.¹⁴ Hospital budget constraints, changes in DRG assignments, and a decreased level of public founding have put an enormous cost pressure on hospitals in many industrial countries.¹⁵ In response, healthcare providers developed marketing strategies to increase patient number and throughput.¹⁶ Furthermore, the importance of cost control instruments has increasingly been recognized.¹⁷

METHODOLOGY

The research methodology employed in this study to identify improvement areas and to make implementation recommendations for the overall Cardiac cath lab system is DMAIC. It includes the five stages of the six-sigma approach to identify potential areas of improvement and to suggest recommendations aiming at an overall process improvement, shown as follows:

1. Define: Study and understand the existing CCL system
2. Measure: Develop process maps and conduct time studies and collect all relevant system related data
3. Analyze: Analyze the collected data by bar diagrams and fish bone analysis
4. Improve: Make recommendations for continuous process improvements

5. Control: Ensure that the recommendations are implemented and followed methodically.

Duration of the study: This study was carried out for duration of 3 months.

Data Collection: The secondary data has been obtained from hospital information system. The study involved historical data collection of 3 months

OBSERVATIONS & DISCUSSION

The overall process map for the system is displayed in Figure 1, showing the flow through different processes along with their corresponding departments. In order to better understand the complex nature due to the differences in process flows among outpatients, inpatients, and emergency patients, individual process maps were developed for each type of patients

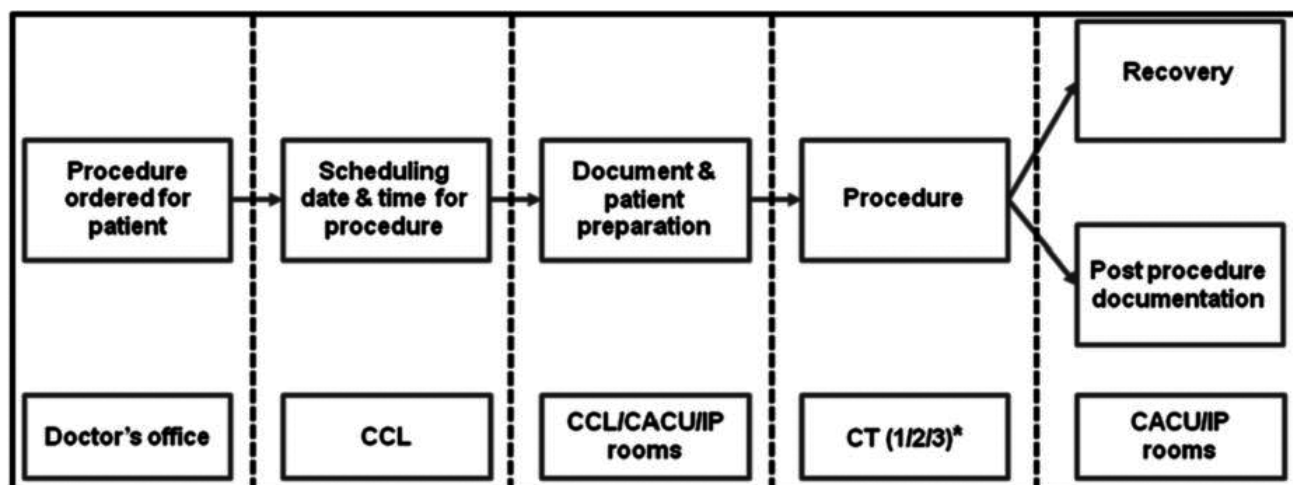


Figure 1: Process mapping

The following Table no 1 provides a summary of financial counselling done. The information of total number of procedures done is also provided. The total number of bills above the estimate is analyzed with percentage. Similarly, the total number of actual bills below and same as the estimated bills are analyzed with percentage.

Table 1: Variation between projected cost and actual cost

Series No.	Month	Percentage of Financial Counselling Given at NHHI	Total Number of Procedures Done	Total Number of Procedures Not done	Total Number of actual Bills above Estimate	Percentage of Total Number of actual Bills above Estimate	Total No. of Actual bills Below Estimate	Percentage of Total No. of Actual bills Below Estimate	Total Number of Actual Bills Same as Estimate	Percentage of Total Number of Actual Bills Same as Estimate
1.	Mar-16	93.75%	130	35	111	67.27%	18	10.91%	1	0.61%
2.	Apr-16	90.53%	112	41	103	67.32%	7	4.58%	2	1.31%
3.	May-16	97.60%	123	40	107	65.64%	11	6.57%	6	3.68%

Using the information from above table no 1, a pie chart can be plotted to get a better view of variance in the bills. The bills comprised of months from March 16 to May 16.

Variance Percentage

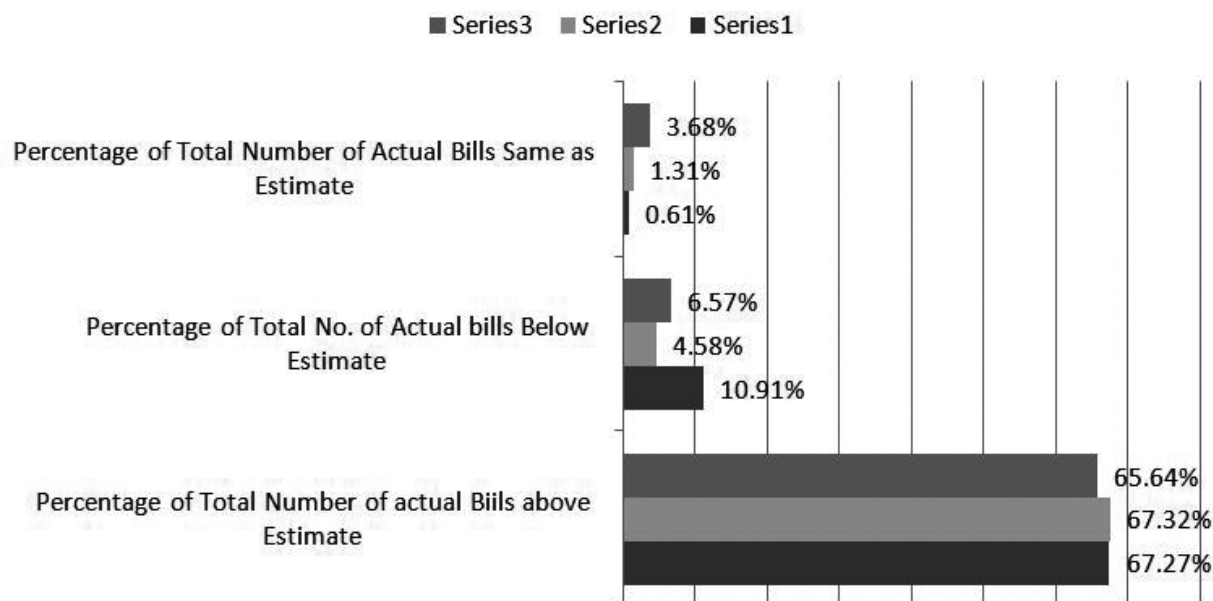


Figure 2: Total variance percentage of estimated and actual bills

The bar chart in figure 2 explains the percentage of actual bills above, below or same as that of estimated bills.

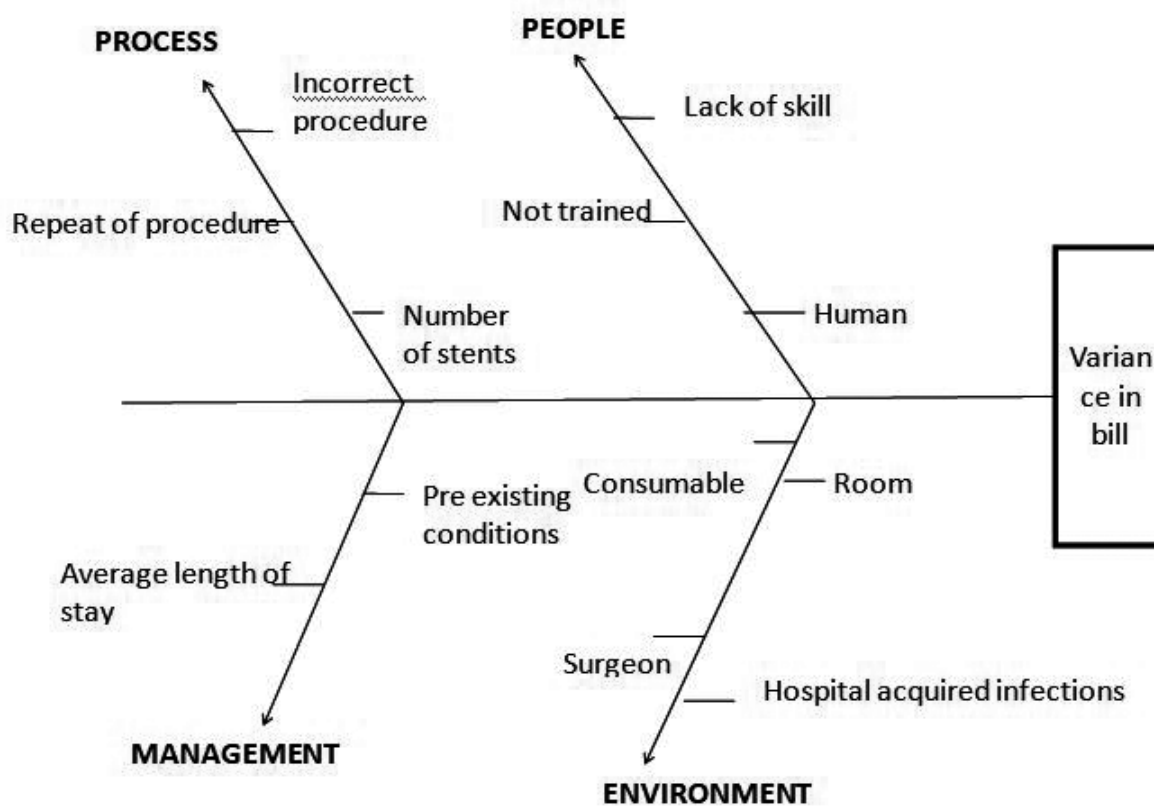


Figure 3: Fish bone analysis: cause and effect diagram

Gap Analysis

Table 2: GAP analysis between skill & errors

Sr. No.	Error	Justification
1.	Use of number of stents	The type and no of stents to be used is variable depending on the blockage in each patient
2.	Incorrect procedure	This can be controlled by following proper diagnostic procedures and SOPs
3.	Repeat of procedure	Can be controlled by following SOPs and use of skilled labour
4.	Human errors	Errors which occur during entering information cannot be controlled
5.	Lack of training and skill	Proper training should be imparted to personnel involved in giving estimates
6.	Hospital acquired infections	Can be controlled by following adequate measures as laid down by NABH/JCI or Quality Control Department of Hospital
7.	Room charges	Room can be upgraded if the patient requests. The room charges differ for that of deluxe, second class and general.
8.	Surgeon's charges	Can be controlled by standardizing the charges
9.	Consumables	The amount of consumables use is variable depending on each case
10.	Pre- existing conditions	Depending on medical history and pre- existing conditions, the procedural cost may vary for each patient
11.	Average length of stay	Can be controlled by providing quality care and following SOPs

RECOMMENDATIONS

As high amount of variance is seen between estimated and actual bill following measures can be adopted

- Proper medical management of patient. This would ensure that ALOS is maintained to the standard average.
- Financial counseling should be done by trained professionals who can clarify patient that procedure charges may vary with certain percentage.
- Repeat of procedures can be avoided by following SOPs and use of appropriate skilled force.
- Hospital acquired infections can be controlled by adopting measures laid down by Quality Control Department.
- Conduct trainings for staff at regular intervals.

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Alienation, Attachment Style, and Alcohol Addiction “A Study of Young Women Habitual Drinkers”

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ABSTRACT

Background: Alcohol addiction has been considered as a male phenomenon but, since past few years there has been a steep rise of habitual drinking among young women also. The researches on habitual Indian young women population are sparse. This paper tries to understand alcohol addiction only among college going young women students from the perspective of their attachment style that develops early in life and alienation.

Aim: To study the effect of attachment style on alcohol addiction among young Indian women. To study the association of alcohol addiction and alienation among young Indian women.

Methodology: Present study uses Ex-post facto desing and a sample of 100 college going young Indian women (50= addictive and 50=non addictive) in the age group of 18-24 years.

Result: The Insecure attachment is significantly associated with alcohol addiction as well as feeling of alienation whereas, secures women who are habitual drinker show low score on alienation. Present study refutes the old association of alcohol addiction and resultant feeling of alienation among young women. On the contract they form drinking group affiliations.

Conclusion: The results demonstrate that styles of attachment at an early age determines the pattern of association between alcohol addiction and alienation. Women with insecure attachment style are more likely to exhibit distrust and fear, and avoid closeness and intimacy in relationships with people around. Such circumstances could encourage alcohol addiction and “alienation” as the resultant feeling or cause of alcohol addiction among Indian women students. We need to systematcally study reasons like paradigm shift in value system, changed life style etc.

Keywords: *Young Indian women, Alienation, Attachment Style, Alcohol, Addiction, Habitual Drinkers.*

INTRODUCTION

Alcohol has been a part of social life with its ill effects from times immemorial, yet societies have always found it difficult to restrain their use¹. Comparing with women, it is more common among men². In western societies also, gender differences in drinking behavior are common⁵. In the past, alcohol consumption and its effects

has been as important ways to symbolize, and regulate gender roles for example, a symbol of masculinity³. But in past few decades there has been an increasing concern about drinking behavior among women. There has been a drastic change of trend seen in many substance abuse researches, articles, and reports indicating the rising graph of women substance abuse⁴. A general hypothesis about such change in drinking behaviors could be explained on the basis of increased opportunities for women to perform traditionally male roles. Particularly modern workplace have encouraged drinking among women and India is no exception⁶. Alcohol consumption, now is associated as a symbol of modernity, social status, power (in terms of equality), masculinity etc. apart from those all common socio-cultural indices³. We need to

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understand this steep rise of drinking behavior among women in light of their attachment style and feeling of alienation⁷ because attachment theory provides a foundation to examine emotion regulation strategies in relationships, including drinking -to-cope⁸. Individuals in relationships hold mental representations, or working models, of themselves and of their parents/partner as an attachment figure⁹. Cognitions and behaviors used to manage distress, closeness and felt security in relationships, constitute individuals attachment styles¹⁰. These styles are commonly thought of as dimensions of anxiety¹¹. Attachment anxiety is associated with hyperactivation of the attachment system, including strong desire for closeness and reassurance, whereas attachment avoidance is associated with hypoactivation of the attachment system, including a desire to maintain independence and emotional distance¹². On this basis, it may be hypothesized that drinking-to-cope with personal problems is one such -specific behavior that insecure young Indian women may use to manage distress and restore feelings of security in a relationship¹³. Hence, present study aims at investigating the effect of attachment style on alcohol addiction and its association with feeling of alienation among young Indian women Habitual drinkers.

MATERIAL AND METHOD

Study design: The present study used contrast group comparison design. This is not an intervention based research and no clinical trials on samples were conducted. It was an ex-post facto research design of only young women college students.

Participants: 100 young Indian women students based on purposive nonprobability sample of 50= addictive who were attending college regularly and were habitual drinker in the age group between 18-24 years (enrolled in college semester I to VI) and 50=non addictive (similar but random sample), comprised the sample of the present study. Informed consent of the participants was obtained before conducting this study and those consented to participate were included in the study. The study was conducted over a period of one year in 2016- 2017 from different universities and private colleges in Rajasthan.

Reason for choosing this sample for the present study: It is painful to accept that the universities and

the colleges (the educational institutions) are becoming common places for the availability, experimentation, peer pressure and succumbing to alcohol and drug consuming and trading. As youth is said to be the most vulnerable stage of struggle between urge of independence and lack of direction, because they are exposed to all kinds of temptations (risky behaviour, adventures, peer pressure etc.). Alcohol consuming was considered as a male phenomenon and a considerable stigma associated with female drinking specially in India, but during past decade drinking among female has witnessed a steep rise, though with its consequences. Therefore, it is pertinent to study Habitual drinking behaviour among young Indian women so college going women sample, becomes pertinent sample for this study.

Inclusion criteria: Young women students registered as regular students who were alcohol addict consuming alcohol regularly as a habit.

Exclusion criteria: Young women students who are registered as part-time/distance education and were occasional drinkers.

Procedure: The Adult Attachment Scale developed by Hazen and Shaver (1990) which is a Likert-type 18 items scale with a reliability by Cronbach's Alpha coefficients of .69 for secure, .75 for Depend, and .72 for Anxiety (Collins & Read, 1990) and test-retest correlation (for a 2-month period) of .68 for close, .71 for depend, and .52 for anxiety. It measures Secure, Anxious and Avoidant attachment style¹⁴.

The Alienation Scale by Hardeo Ojha which is a 20 statements scale that measures composite feeling of alienation by six factors—I. Powerlessness, II. Normlessness, III. Meaninglessness, IV. Social Isolation, V. Self-Estrangement, VI. Cultural Estrangement. Reliability and validity of the scale as reported was 0.83. and 0.77 respectively reported on the basis of kuder-Richardson formula-20 for internal consistency and test-retest reliability¹⁵.

Statistical Package for Social Sciences, Version 22 for Windows was used to analyze the quantitative data. ANOVA, t-test of significance and Chi-Square (equal probability) were computed. 0.05 level of confidence was used to interpret the results.

Findings of The Present Study:**Table 1: Mean comparison of alienation in relation to attachment style**

Attachment Style	Mean alienation score	Std. Error	df	t-value	Level of significance (p value)
Insecure	59.196	1.147	98	2.225	.029
Secure	54.508	1.023			

Table 2: Mean comparison of alienation in relation to addiction

Alcohol Addiction	Mean alienation score	Std. Error	df	t-value	Level of significance (p value)
Addictive Female	54.473	1.056	98	-2.474	.015
Non Addictive Female	59.232	1.117			

Table 3: Mean comparison of alienation in relation to attachment style and addiction

Attachment Style	Addiction	Mean alienation score	Std. Deviation
Insecure	Addictive female	58.52	4.154
	Non addictive female	59.88	3.631
	Total	59.00	3.989
Secure	Addictive female	50.43	13.876
	Non addictive female	58.59	4.540
	Total	55.47	9.996
Total	Addictive female	55.12	10.233
	Non addictive female	59.00	4.276
	Total	57.06	8.043

Table 4: ANOVA interaction of attachment style and addiction on alienation

Source	F	df	Level of significance (p value)
Corrected Model	7.313	3	.000
Intercept	5473.541	1	.000
Addiction	9.587	1	.003
Attachment Style	9.303	1	.003
Addiction * Attachment Style interaction	4.897	1	.029

Table 5: Frequency comparisons of alcohol addict young women on the basis of attachment style

	Attachment Style		
	Insecure	Secure	Total
Addictive Female	29	21	50
Non Addictive Female	16	34	50
Total	45	55	100

Table 6: Chi-square of Addiction and attachment style among Young Women

	Value	df	Level of Significance
Pearson Chi-Square	6.828	1	.009
Continuity Correction	5.818	1	.016
Likelihood Ratio	6.912	1	.009

DISCUSSION

Alcohol addiction is a major cause of many problems and concern in our society³. Attempting to know the underlying dynamics of the development of these problems is a pertinent route of investigation. We need to understand the steep rise of women drinking behavior. Since, attachment theory provides a foundation to examine emotion regulation strategies in relationships, attachment style and alienation seems to be the base understanding women drinking behavior⁸. The statistical analysis ($F=7.313$, $df=3$, $p=.000$) shows a significant trend association of attachment style, feeling of alienation and alcohol addictive behaviour.

In connection with the addiction and alienation, results, contrary to common belief and existing literature^{2,7} (alienation is positively associated with addiction as a cause as well as an effect) are found in the present study. Alienation mean score of addicted women was significantly lesser than non addicts ($F=9.587$, $df=1$, $p=.003$; $t=-2.225$, $df=98$, $p<.029$; table 4 and table 1). This shows that addiction does not have alienation as an underlying cause, but group affiliation may reduce the feeling of alienation among addict women students.

In connection with attachment style and alienation the difference in alienation scores among young women with secure and insecure attachment style ($F=9.303$, $df=1$, $p=.003$; $t=-2.474$, $df=98$, $p<.015$; table 2), shows a significant trend of insecure female students showing significantly higher feeling of alienation in comparison of secure females.

Conceding attachment style and addiction chi-square analysis (Table 5 and Table 6) revealed a significant association between attachment style and alcohol addiction among young female students ($\chi^2=6.828$, $df=1$, $p=.009$). Out of total 50 addictive female, 29 reported insecure attachment style in comparison to only 21 who reported secure attachment style. Whereas,

out of total 50 non-addictive female participants, only 16 reported insecure attachment style as compared to 34 with secure attachment style. These findings provide strength to the aforesaid association that insecure attachment style favours alcohol addiction.

Finally, the significant interaction effect of attachment style and alcohol addiction on feeling of alienation ($F=7.313$, $df=3$, $p=.000$) shows that attachment style mediates the feeling of alienation among alcohol addicted young women. Basically insecure habitual drinker young women feel more alienated and secure habitual drinker use drinking groups as means of affiliation. The above results could be further discussed in light of the following:

Firstly, alcohol consumption symbolizes enhanced masculine protest among women. Consuming alcohol in large quantity has been always a mark of male superiority, but with the paradigm shift in value system, social norms and drastic change in the life style of the Indian women, these old assumptions have been turned down in modern times³. Drinking in parties is becoming socially accepted and is an expression of equality and group affiliation rather than drifting away and feeling alienated among women. **Secondly**, increased autonomy is growing at a fast pace. Therefore, alcohol may seem to enhance an expression of power and freedom of risk behaviour inherently rewarding and exciting part of life style of young Indian women³. With the increasing career opportunities women are entering in the professional world similar to male counterpart and emulate the similar life style². In some instances, drinking is initiated as the job requirements drinking alcohol behaviour and is considered no more a taboo² which refutes association of alienation and drinking. On the contrary there seems a trend of lower scores of alienation among habitual alcohol drinking young women. Considering the attachment style and addiction, available literature reveal that insecure attachment leads to maladaptive behavior and use of alcohol as a coping strategy to manage distressing emotions^{16,17}. Specifically, avoidant and anxious attachment styles may promote frequent alcohol consumption as adaptive process to cope with the feeling of distress^{18,19}. Drinking may promote closeness and intimacy in the relationship by forming drinking groups²⁰. The feelings of lack closeness, love, and affection in relationships prevails among people with insecure attachment style⁸, secure attachment style

promotes higher levels of trust, intimacy, satisfaction, resilience in an individual. These positive characteristics help in coping with emotions and mental stressors by sharing love instead of using coping mechanism of drinking behaviour as rescue for their attachment deficit behaviour¹⁶.

Interaction effect of Attachment style and Addiction of Feeling of Alienation: The interaction effect of attachment style and alcohol addiction for alienation has also been found significant ($F= 4.897$, $df = 1$, $p=.029$; table 4). This shows that alcohol addiction and feeling of alienation among young women habitual drinkers need to be understood in the light of attachment style. Interestingly, the results of the present study reveal that in the category of insecure women, addict as well as non-addict women, feel equally high alienation whereas, secure but addictive women score significantly low on scale of alienation as compared to non-addict. Thus, attachment style mediates the addiction and alienation hypothesis. Attachment style is established early in life. Only insecure attachment style may favour alcohol consumption and alienation as symptomatic adaptive behaviour.

It is concluded that: Addiction leads to high alienation under insecure attachment style and low alienation under secure attachment style among young women college students. The old established association of high alienation among alcohol addicts is not proved in the present study. It needs further exploration, if low alienation of women with secure attachment is due to natural high social affiliation and support in general or due to addiction or addiction is probably giving further group affiliation these women.

Conflict of Interest: The authors declare no conflict of interests.

Ethical Clearance: This is not an intervention based research and no clinical trials on samples were conducted. Informed consent was taken from the participants.

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Challenging Issues in Health Economics

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ABSTRACT

The present study on health economics throw light on two major issues of scarcity of allocation, namely the Health and the Healthcare. Right from micro level to macro level the health issues are to be considered seriously in the economy. The current study expresses the role of State, role of doctor and role of individual etc., to improve the public health are discussed elaborately. There are seven chapters in this article. Chapter one initiate the basics of health economics. Chapter two continued with scope of health economics. Chapter three enlists the literature review. Chapter four highlights the issues in public health. Chapter five envisages the strategies to improve the public health. Chapter six analyses the determinants of public health. The final chapter concludes the challenging issues in Health Economics.

Keywords: Health, Healthcare, Public health, Productivity, Health economics

INTRODUCTION

Health economics is defined as a branch of economics concerned with the related to scarcity in the allocation of health and health care. These are the main components of health economics. These are the main components of health care. WHO, in 1948, defined the term health as a state of complete physical, mental and social well-being and to merely the absence of disease and infirmity? It is in fact, governed by the socio – economic, cultural and environmental factors. In medical terms the word health refers to an organism's ability to efficiently respond to challenges and effectively restore and sustain a state of balance. In the alternate medicine, the term health refers the overall state of well-being or wellness.

The second component, health care, refer to the prevention, treatment and management of illness and the preservation of mental and physical well-being through the services offered by medical, nursing and allied health professions. In the recent past the definition for health economics was modified to include the ability to lead economically and socially productive life. Recently, the term health economics is replaced by medical economics. Medical economics, of course, deals with the cost-benefit analysis of pharmaceutical products and cost effectiveness of various medical treatments.

Scope of Health Economics: The scope of health economics includes five distinct topics, viz

1. Factors determining health
2. Significance of health
3. Demand for healthcare
4. Micro economic evaluation at treatment level
5. Market equilibrium of public health can be achieved by integrating these five areas, namely, Health care financing market-Physician and nurses service market-Institutional services market-Input factor market-Professional education market

Therefore, an attempt made in this paper to discuss the issues related to the public health, approaches ad strategies of public health programme and also made an attempt to examine the relationship among the health expenditure and a few macroeconomic variables such as education expenditure, GNP, Productivity etc., Secondary date and the concept of Regressions were used to examine the importance and the relevance of health economics in the economic development of India.

Health is a state of total effective physiological and psychological aspects of the mankind. It is a relative and an absolute concept of an individual as well as group of people. Health is the outcome of combination of many forces: intrinsic and extrinsic and collective, private and public medical environment and it is conditioned by socio- economic cultural and legal status of the society.

REVIEW OF LITERATURE

Michel Grossman,¹ According to him, in production of health, medical care is one input but not the only one. He also rise a question that what factors might affect the efficiency of individuals and families in producing health? He proved that there is a high correlation between health and schooling. Grossman also shows both theoretically and empirically that higher income does not necessarily lead to higher levels of health.

Anuradha De, Tanuka Endow² (2008) in their working paper on the title “Public Expenditure on Education in India, Recent Trends and Outcomes” found that public expenditure on education in current prices has been growing at the compound annual growth rate (CAGR) of 13.4 per cent p.a. for the period 1990-91 to 2003-04 the rate of growth has slowed down in the present decade. Moreover their study indicates that expenditure in constant prices shows a much lower CAGR of only 6.5 percent for the same period. Though the expenditure has almost doubled between 1990-01 to 2000-01, it had stagnated and even decline since then. As a proportion of GDP the share of public expenditure on education has been less than 4 per cent. There have been major changes in the composition and modalities of expenditure on education.

Valentino Piana,³ in his study, expresses the significance, composition and determinants of public expenditure. According to him, “Public expenditure is the value of goods and services bought by the state and its articulations.... Public expenditure is characterized by a high degree of inertial and law-dependency which tempers the will of the current majority”.

Dr. Vathsala et al,⁴ (2001) in their study had rightly pointed out, “Review of the actual pattern of Budgetary provisions and public expenditure during the nineties indicate that the envisaged careful balancing of the rolls of the State and the Market did not materialise and permeate the planning process of the Centre and the State and the Budgetary constraints and fiscal deficit reduction objectives had led to compression of public investment and Government expenditure leading to a slowing down of the process of Economic Growth.”

Public Health: Health economics refers to the organized efforts or preventing diseases, enhancing life span and promoting efficiency of the people in the society. The

advancement of medical and scientific knowledge, social and political changes and expansion of public health work promote the health status of people. The available record of data proved that there is very strong association between the level of economic development and health status of people. In, the birth was per 1000 of population and death rate was 29 per 1000 population and the death rate was 9 per 1000 in the advanced countries. Whereas the birth rate was 29 per 1000 population and the death rate was 11 per 1000 population.

For the same period the infant mortality rate was in the advanced countries whereas it was 72 in the under develop countries. The birth rate, death rate, infant mortality rate and the life span depend upon the health status of the people which in turn is determined by the level of nutrition, Sanitation, literacy rate health expenditure and economic development.

Strategy to Promote Public Health: Role of the State:

Promoting public health can be advised only with the combined efforts of Central, State, private organisation, doctors and the people. State and the Central government should have integrated health policy to all. The policy should be focused more on rural people who are actually the victim of poor health. The availability of doctors' per 10,000 people must be increased. Incentives to the doctors who work in the rural areas. The registered medical practitioners should serve at least 10 years i rural villages. Service offered in rural villages must be the criteria for promotion i their profession. Rural health camp must be organised every month in each village in the State. Mobile dispensary service must be provided in the remote villages. Huge amount should be spent on health.

Role of Private People: Private hospitals must encouraged and established in the rural villages. Proper incentives like free land, loan at differential rate of interest for medical equipments and adequate infrastructure such as water, power and pleasant stay at villages must be provided to the doctors, by the entrepreneurs or the private limited companies.

Role of Doctors: There are many factors which promote health status of the people. But the role of doctor's in promoting public health is more important than other factors. There should be service bent of mind among the doctors. They should realise that serving the poorest of the poor is their religion and God. Unless they have courtesy, love and hundred percent involvements to

serve the rural people, achieving health for all, will be a dream for ever. They should have human touch in their treatment. Just the mechanical way of treatment will never benefit the patients.

People and Their Health Awareness: It is ultimately, the people to appreciate and avail the available medical facilities. This is possible with little bit of knowledge on the importance of health in their development. Therefore, the level of education, health education and health awareness are very important factors which promote public health. Creating health awareness among the people should be compulsory, extracurricular activity such as off the campus extension programmes are for the medical student. The final year medical student should have village visit project work on “health awareness” as part of their academic work. One month Village camp should be part of their medical studies in which they should get exposure to the village people on the basic health and its importance. The health insurance policy should reach the people in the village. They should realise the importance of health insurance. Due to their ignorance and lack of money i.e., due to poverty they are not able to take utmost care in their health conditions. Due to poor health, many people are spending more money on medicines and unable to concentrate on their profession more efficiently.

Determinants of Public Health: The public expenditure on health and education may be influencing the status of health directly and more prominently compare with other macroeconomic variables. Table-I shows the data on the percentage of health and education expenditure in the total public sector outlay since 1985-86.

Table 1: Percentage Of Education Expenditure in Total Public Sector Outlay In India

Year	% of education	% of health Expn	%of both Expn
1985-86	2.7	1.8	4.5
1986-87	3.1	1.6	4.7
1987-88	4.2	1.7	5.9
1988-89	4.5	1.7	6.2
1989-90	4.5	1.6	6.1
1990-91	3.9	1.9	5.8
1991-92	4.0	1.4	5.4
1992-93	3.9	1.7	5.6

Contd...

1993-94	3.9	1.5	5.4
1994-95	4.0	1.7	5.7
1995-96	4.9	1.8	6.7
1996-97	5.9	5.6	11.5
1997-98	5.9	7.5	13.4
1998-99	6.4	10.3	16.7
1999-00	6.2	8.5	14.7
2000-01	7.1	8.8	15.9
2001-02	6.0	7.5	13.5
2002-03	4.8	5.8	10.6
2003-04	9.7	4.4	14.1
2004-05	9.9	4.5	14.4
2005-06	10.2	5.7	15.9
2006-07	10.7	5.1	15.8

Sources: www.indiabudget.gov.in5

The above table shows that the percentage of education expenditure was ranging from 2 to 5 percent in the total outlay. The percentage of health expenditure in the total public sector outlay was just less than 1.8 per cent until 1995-96. It was on an average 6 per cent in the late 1990's but it was around 10% in the middle 2000. Percentage of both the health and education expenditure was, on an average, 15 per cent for the same period.

Indicators of Health: Birth rate in India was 36.9 per 1000 population in 1971 and it reduced to 25.8 in 2000. The reduction of both rates occurred in last. three decade was marginal. Similarly death rate was 14.9 per 1000 population in 1971 and it reduced to 8.5 in 2000. It shows sizable reduction in the death rate due to the improvement in the health status of the people.

Expectation of life at birth year was 19.4 for male and 20.9 for female. In 2000 they were 63.9 and 66.9 respectively for male and female. This is the achievement we made in the last ten decades. This lengthy process may be due to the poor allocation towards health and education expenditure in India.

Table 2: Birth rate and death rate of India since 1950

Year	Population (million)	Birth rate (per 1000)	Death rate (per 1000)
1950-51	359	39.9	27.4
1960-61	434	41.7	22.8

Conted...

1970-71	541	36.9	14.9
1980-81	679	33.9	12.5
1990-91	839	29.5	9.8
2000-01	1019	25.4	8.4
2002-03	1055	24.8	8.0
2003-04	1073	24.1	7.5
2004-05	1090	23.8	7.6
2005-06	1112	23.7	7.5
2006-07	-	23.1	7.4
2007-08	-	22.8	7.4
2008-09	-	22.5	7.3
2009-10	-	22.1	7.2
2010-11	1210	21.8	7.1
2011-12	1210	21.6	7.0

Sources: www.indiabudget.gov.in5

It is vivid from table-2 that birth rate (per thousand) reduced to 23.8 in 2004-05 from 27.4 in 1950-51. This shows the positive effect of the implementation of population policy in India. Table- 3 shows that infant mortality rated declined to 56 in 2005 from 129 in 1971. Table-4 shows that the life expectancy at birth increased to 62.9 in 2000-05 from 20.15 in 1911-20. These rates indicate the improvement in health status of people in India.

Table 3: Total infant mortality since 1971

Year	Rural	Urban	Combined
1971	138	82	129
1981	119	62	110
1990	86	50	80
1991	87	53	80
1992	85	53	79
1993	82	45	74
1994	80	52	74
1995	80	48	74
1996	78	46	72
1997	77	45	71
1998	77	45	72
1999	75	44	70
2000	74	44	68
2005	-	-	56
2007	-	-	55
2008	-	--	53

Conted...

2009	-	--	50
2010	-	-	47
2011	-	-	44
2012	-	-	42

Sources: www.indiabudget.gov.in5

Table 4: Total life expectancy

Year	Male	Female	Total
1911-20	19.4	20.9	20.15
1921-30	26.9	26.6	26.75
1931-40	32.1	31.4	31.75
1941-50	32.4	31.7	32.85
1951-60	41.9	40.6	41.25
1961-70	46.4	44.7	45.65
1971-80	50.9	50.0	50.45
1981-90	57.7	58.7	58.20
2000-01	63.9	66.9	65.40
2002-03	61.8	63.5	62.65
2000-05	-	-	62.90
2006-10			66.1
2010-12			66.0

Sources: www.indiabudget.gov.in5

GNP and Health Expenditure

$$\text{GNP} = f(\text{HE}); Y = a + Bx$$

$$Y = \text{GNP}; X = \text{Health expenditure}$$

$$R^2 = 0.84; t = 1.29; F = 105.5$$

The Estimated R^2 explains about 84 percent of the variations in the Gross National Product. As the estimated 'F' value is greater than its table value at 0.05 percent level, the overall regression models is statistically significant.

GNP and Health Education Expenditure

$$\text{GNP} = f(\text{HE} + \text{EE})$$

$$Y = a + b_1X_1 + b_2X_2$$

$$Y = \text{GNP};$$

$$X_1 = \text{Health expenditure}$$

$$X_2 = \text{Health expenditure}$$

$$R^2 = 0.81; t = 3.42; F = 71.68$$

The estimated R^2 explains about 81 percent of the variation in the GNP. The 'F' value is statically significant at 0, 05 percent level. The overall regression models are statically significant as the estimated 'F' Value is greater than its table value at 0.05 per cent level. The results reveal that the level of health expenditure influences GNP positively.

Productivity and Health Expenditure and Education Expenditure

$$Y = a_1 + b_1X_1 + b_2X_2$$

Y= productivity

X_1 = Health Expenditure

X_2 = Education Expenditure

$$R^2 = 0.83; t = 13.92; F = 82.06$$

The estimated R^2 reveals that the level of health and Education expenditure jointly explains 83 percent variation in the dependent variable. The influences of health and education expenditure on the level of productivity is statistically significant as the estimated 't' value is greater than the table value. The model is statistically significant as the estimated 'f' value is greater than the table value.

Productivity and Health Expenditure

$$Y = F(HE); Y = a + bX_1$$

Y productivity

X_1 = Health expenditure

$$R^2 = 0.89; t = 18.16; F = 162.9$$

The model reveals that the independent variable influences the level of productivity 89 percent. The association between the level of productivity and the level of health expenditure is statically significant as the estimated 't' value is greater than the table value. The whole model is statistically significant as the estimated 'f' value is greater than the table value.

GNP and Education Expenditure

$$GNP = f(EE)$$

$$Y = a + bX_1$$

Y = GNP

X_1 = Health Expenditure

$$R^2 = 0.91; t = 4.50; F = 216.54$$

The model reveals that the independent variable is responsible for 9.1 per cent verification in the dependent variable. The association between the level of GNP and the level of Education expenditure is statistically significant and the whole model is statistically significant as the estimated 'f' value is greater than the table value.

CONCLUSION

The study concludes that the level of health and education expenditure influences the level of GNP and the productivity positively. The government may enhance the percentage of expenditure on health and education in the total outlay. Proper and effective integrated policy must be evolved to provide adequate health facilities for all people by increasing the outlay on health programmes from the state and the private sector especially to the rural poor. Proper incentives must be introduced to private health investors and doctors who work to promote health services in the rural villages. Government should evolve suitable policy to create health awareness among the village people unless we make the people to understand that health is wealth, wealth cannot be accumulated and development shall not be achieved. Therefore, let us make wealth nation through healthy people.

Ethical Clearance: Completed. (Dept. level committee at VELs)

Source of Funding: Self

Conflict of Interest: NIL

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Examining the Impact of Development Projects' on the Project Affected People: A Study in Kalinganagar Industrial Estate, Odisha, India

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ABSTRACT

Purpose: The paper studies the impacts of development projects and their CSR activities on the Project Affected People (PAP) of Kalinganagar Industrial Estate of the state of Odisha.

Method: Primary data has been collected using Focused Group Discussion (FGDs) and secondary data from relevant literature. Data obtained have been processed through *sentiment analysis*.

Findings: It was found that the companies operating in the region have performed well in economic dimension where as underperformed in social and environmental dimensions.

Suggestion: The present research recommends that development projects should work on social and environmental dimensions of CSR and sustainability, instead of taking these as trade- off for economic development. Further research may be conducted on the social and environmental dimensions in the context, specific of tribal displacement.

Keywords: CSR, Development Projects, Project Affected People, sustainability, Triple Bottom Line

INTRODUCTION

The nation whose economic development is highly dependent on their natural resources, the contribution of development projects such as mines and minerals industries etc to the Gross Domestic Product (GDP) cannot be ignored. India like other developing countries has been adopting the western model of development by going for mega projects. Government of Odisha, after the liberal economic policy of the country, also welcomed many more mineral based industries. The country generally prefers thinly populated areas, close proximity of mineral resources, availability of more government land and also necessary strategic location to establish industries. These areas are generally the forest areas thinly populated by mostly the tribals and other vulnerable sections of the society. With general illiteracy, lack of awareness and least resistance, they become the victims of development after displacement from their habitat. Consequent upon displacement, as Cernea (1997)¹ stated “Like becoming a refugee, being forcibly ousted from one’s land and habitat by a dam,

reservoir or highway is not only immediately disruptive and painful, it is also fraught with serious long-term risks of becoming poorer than before displacement, more vulnerable economically and disintegrated socially.”

Development Projects, Tribal Displacement and CSR: The mining and mineral industry has been identified as a sector in which social responsibilities as well as sustainability are central issues in the debates that arises within responsible corporate citizens (Cowell et al., 1999²; Macintyre et al., 2008³). Industry output and benefits have a tremendous impact and influence on economic growth. This is particularly so in the country like India where natural resources are one of the principal economic sectors and their impacts are particularly emphasized in developing economies (Dorian and Humphreys, 1994⁴).

The Development project operation, however, brought about irreversible effects on landscape and potential long term damage to natural environment (Ali and O’ Faircheallaigh, 2007⁵). The most adverse impacts

are not only on the natural environment, but also the socio economic structure of the project affected families-PAFs (MMSD, 2002⁶). It is found that displacement in most cases results in landlessness, joblessness, homelessness, marginalization, food insecurity, loss of access to common property resources, loss of access to public services and social breakdown (Downing, T et al. 2001⁷; Cernea, 1997¹). Lifestyle and health problems are a few of the several chronic problems and sustainability of the PAFs becomes a matter of concern.

CSR of the development projects can address many of the problems experienced by the PAFs. CSR was defined by the World Business Council for Sustainable Development to be

“the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.”⁸

In this context, CSR is usually addressed using Triple Bottom Line (*TBL*) approach (Social Bottom Line- People, Environmental Bottom line-Planet and Economic Bottom Line- Profit. (Elkington, 1997⁹).

THE STUDY

Location: The study is conducted on PAFs of Kalinganagar Industrial Estate of Jajpur District of the state of Odisha, India. Kalinganagar is located near the chromite mines of Kaliapani, Kalarangi, Saruabila and Sukurangi and iron ore mines of Tamaka of Jajpur district. With the growing demand of steel at the international market, domestic and international players are vying to establish their plants in the region. Apart from being well connected with good railway infrastructure, two national highways passing through Kalinganagar also connect it

with Chennai and Kolkata. Over and above, the place is also blessed with the flow of the state's second largest river- *The Bramhani* to meet its water needs.

Industries: A good number of industries have established their operations in the region displacing a large number of people mostly from tribal and other backward communities. Table 1 presents the names of the plants and land acquired by them for establishment by displacing the local people.

Table 1: List of Plants and Land Allocated to Industries in Kalinganagar

Names of the Plants	Land in acres
Mideast (MESCO)	530
Orion	150
Maithan Ispat	100
Uttam Gala	370
NINL	2500
Maharashtra Seamless	500
TISCO	2400
Rohit Ferrotech	50
JINDAL	678
VISA Industries	390
Dinbandhu	100
K J Ispat	50

Source: ADM Office, Kalinganagar (as cited in Pandey, 2008¹⁰)

Affected People and their Life Styles: Kalinganagar was residentially populated by tribal and other backward people. *Ho* tribal community constitute nearly 80 per cent of the population and rest of them belong to *Munda* and *Santal* community. In the absence of irrigation, the area is largely rain- fed and productivity remains at a low level. Table 2 presents the socio economic profiles of the villages displaced by Tata Steel and Maharashtra Seamless Companies.

Table 2: Socio-economic profile of the three villages displaced by Tata and Maharashtra Seamless Companies

Name of the Village/ anchayat	No. of Households	% of ST Population	% of SC Population	Literacy Rate	% of Cultivator	% of Agricultural labourers
Chandia	331	85.9	.2	37.6	41.0	36.2
Gobaraghati	558	88.8	2.1	53.5	16.0	37.7
Gadapur	140	97.8	0	46.7	43.0	13.5

Source: Census 2001 (as cited in Pandey, 2008¹⁰)

Tribal economy was mainly subsistence oriented. They were engaged in food gathering, hunting, fishing and thus revolve around forests. They used to slash down trees and bushes and burn them into ashes which were used as manure for cultivation. They worship God for rain and good harvest.

Though tribal economy is shaky, their culture in its pristine state is rich and distinctive which they are proud to preserve. They used to manage the internal affairs very smoothly through the village council of elders. The council of elders meets on need basis to discuss matters concerning the welfare of the village.

They celebrate many festivals relating to marriage, birth or death within the family or a daughter attaining puberty and some others relate to sowing or harvest time. They celebrate the spirit of togetherness during festivals, consume *mahua* liquor, sacrifice animals to please deities and dance mirthfully.

Tribals are superstitious too and the 'ojha' (literally means doctor) occupies a honourable position. He not only prescribes herbs to recover from sickness but is also believed to exercise evil spirits.

Tribal Displacement in Kalinganagar: The Government of Odisha were trying to develop Kalinganagar Industrial area because of mineral reserves in the regions since early 1990's. The ongoing development programs of the State Government have negative fallout as far as the tribal people of the region are concerned. In fact, the root cause of their sufferings is these development projects which have led to destruction or loss of their ancestral territories, resources, values, political, economic and socio- cultural systems were not able to convince the displaced families with attractive resettlement and rehabilitation (RR) packages. The community and company confrontation reached extreme height when Tata started constructing its boundary wall for its steel project in the region in 2006. The situation went out of control and the police started firing at the tribal protesters which claimed 12 lives on spot and another later in hospital. The incidents made news headlines in national and international media as the innocent tribal people were made victims of development. Later, the Government of Odisha brought out the RR Act in 2006 for the displaced families.

CSR in Kalinganagar Area: Companies operating in the region are engaged in four thrust areas – Education,

Health, Livelihoods and Rural and Urban infrastructure. Besides, it will also undertake Interventions in the areas of sports, disaster relief, environment and ethnicity etc. The most remarkable RR and CSR initiative of Tata Steel is Tata Steel Parivar Rehabilitation Colony for the affected people. Besides, the companies such as Nilachal Ispat, Tata Steel, Jindal, and VISA are providing mobile medical services, scholarships or meritorious students, road construction, sponsorship for sports and tournament etc. However, though a period of one decade is over since the companies in the region started operation, no independent study has been conducted to measure the impact of these development projects on PAFs.

Research Questions

Based on the above stated research gap, the following research questions have been developed to fill the research gap:

1. What are positive aspects and impacts (CSR) of the mining project on PAFs?
2. What are negative aspects and impacts of the mining project on PAFs?

Objectives

1. To study the positive impact of the mining projects on the PAFs.
2. To study the negative impact of the mining projects on the PAFs.

METHOD

The present research work employs the qualitative approach based on analysis of data obtained through Focused Group Discussion (FGD) to capture affected community perception of project impact. TBL variables are adopted from Vivero (2014)¹¹ and are presented in Table 3.

Stratified sampling is aptly selected to measure the impact of company operation on different castes and community strata. The concept of a mining community has been taken from the *Mines and Mineral Sustainable Development Report 2002* (MMSD Report 2002)⁶ and moderated to suit the present research. As these three communities are not mutually exclusive, further classification has been made by the researcher to distinguish one from another. The basis for community strata is occupational shift. There are some *indigenous*

families who have been deriving their source of income through regular or contractual employment from the companies, and are considered to belong to *occupational communities*. Similarly, there are some families who have experienced a major occupational shift due to the development in the region, and they may have moved to being businessmen or drivers, laundry workers or shop keepers, among others. They are categorized under *residential communities*. The definition of indigenous families continues with their present occupation.

6 FGDs (2 from each community) have been conducted. The number of participants in each FGD was 10-20. The respondents have been informed about the purpose of the discussion and asked to feel free to express their opinions on what they perceive on the impact of the project. The discussions were made in local (Odia) language which was later translated into English for analysis. The findings of the study were processed through sentiment analysis.

FINDINGS

During FGDs, the participants identified development project impacts associated with three major TBL dimensions- *Social, Environmental and Economic*. In the social dimension, project impacts were perceived in respect to variables such as cost of living, demographic growth, education, family, health and indigenous issues.

In the social dimensions, project impacts have been perceived across the indigenous, occupational and residential communities as mainly negative except education and ethnicity. The participants across all the communities stated that demographic growth in the region has led to high cost of living which they are finding difficulties to cope with. The participants admired those educational initiatives undertaken by the companies in the region. Under Tata Steel scholarship scheme, some of the tribal children have the opportunity to pursue higher education in the prestigious institution like KISS University and have brought glory to the communities. However, participants from indigenous community apprehended that education disintegrates family as the educated members of the family leaves them for employment and there are some cases of inter caste marriage and separations among the educated members of the communities which pose threats to their cultural ethos. Monotony in family life has increased

affecting quality of life. Occupational participants admired health camps and mobile health services by Tata Steel. However, indigenous and residential community members stated that these health initiatives are quite inadequate since they have to depend on Cuttack SCB Medical College, 65 Km from the place for treatment of critical diseases. The affected families are looking for super speciality hospital in the region. The participants across all the communities are unanimous that the development in the region has not affected their indigenous character. They celebrate their festivals with spirit of pride and togetherness

In the environmental dimension, the project impacts are perceived by all the affected communities on the following topics: flora and fauna, pollution and water consumption. The affected communities have raised concern over the growing pollution due to industrialization and rapid disappearance of flora and fauna. There is massive uproot of trees because of the companies' operation and their plantation drives under CSR of companies are quite meagre. However, occupational community presented both positive and negative views justifying ecological degradation for economic development. Environmental pollution is impacting the social lives and villagers are vulnerable to several respiratory diseases. Electricity price has also gone up in last one decade. Water usage in the region has been increased. Electricity price has also gone up in last one decade. Tata Steel is serving the communities with portable water supply and they are happy for it. However, they apprehended deteriorating quality of water that would like to incur in future when the industrial estate ages and industry releases high quantity of wastes. They are also scared of pressure on water resources by the industry usages.

Table 3: Sentiment Analysis of the Discussion

	Indigenous	Occupational	Residential
SOCIAL			
Cost of Living	-	-	-
Demographic Growth	-	-	-
Education	+	+	+
Family	-	-	-
Health	-	+/-	-
Indigenous	+	+	+

Conted...

ENVIRONMENTAL			
Energy Consumption	-	-	-
Pollution	-	-	-
Flora and Fauna	-	-	-
Energy Consumption	-	-	-
ECONOMICAL			
Development	+	+	+
Economic Growth	+	+	+
Local Employment	+/-	+	+

Affected communities' perceptions on economic dimensions have been examined in terms of development, economic growth and local employment. All the participants acknowledged the direct and indirect contribution of development projects to rural economy. There have been occupational changes due to industrial operation in the region. The nominated members of the displaced families have been placed by the local companies on the basis of their education. However, there are a few cases of family disintegration after such rehabilitation. Development in the region has offered many PAF members jobs to work as labourers, drivers, shop owners, laundry workers etc. However, some of the members regretted that development has not reached out to the affected family members equitably. Though employment opportunity in the region has increased in the region in the last one decade, nevertheless, there are unemployment problems among the affected communities. The development projects have given employments to the nominated members of the displaced families whereas other adult members who were engaged in land and allied activities became unemployed after their lands were acquired by the project. Many of them are living as disguised labourers in the region.

CONCLUSION

Most of the development projects in India are doing well with economic dimension whereas their performance on environmental and social dimensions has invited criticism from the stakeholders. India plummeted 36 points from 141 in 2016 to 178 in 2018

in the Environmental Performance Index according to a biennial report put together by Yale and Columbia Universities along with the World Economic Forum. At the same time, development-induced displacement of tribal and other vulnerable families have not been able to provide impetus for social integration. In this connection, the present study recommends that TBL should be supported by technology and governance. Technology is important for a clean environment and governance should focus on policy implementation to deliver desired results. Input from the affected communities should be taken before deciding on any CSR project meant for them.

Ethical Clearance: Not Applicable

Source of Funding: Self

Conflict of Interest: Nil

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Effectiveness of Hand Muscle Strengthening Exercises on Dominant Hand Pinch Strength in Smartphone Addicted Collegiate

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ABSTRACT

Background: Smartphone Addiction is a dependence syndrome seen in certain mobile phone users. Smartphone gives us ability to connect with our friends and family, to news and entertainment, websites with just a tap of a touch screen. They have become a crucial part of everyday. The aim of the study was to find out the effectiveness of hand muscle strengthening exercises on dominant hand pinch strength in smartphone addicted collegiate.

Methodology: Study design was quasi experimental, pre test and post test type. 30 subjects of age 18-25 years with smartphone addiction score more than 40 in Smartphone Addiction Scale – Short version and using smartphone for more than one year were selected from SRM College of Physiotherapy, SRM Institute Of Science and Technology, Kattankulathur. Subjects with fracture or dislocation, soft tissue injuries, entrapment neuropathy, tumor or infections of upper limb were excluded. Dominant hand pinch strength was measured and hand muscle strengthening exercises were given to them for 4 weeks. Outcome measures were done by pinch meter.

Results: Smartphone addicted collegiate group has shown significant change in mean value from pre test to post test of pad to pad type of pinch (4.44 to 5.477), tip to tip type of pinch (3.59 to 4.52) and pad to side type of pinch (5.16 to 6.45) in dominant hand at $p < 0.01$.

Conclusion: The study concluded that hand muscle strengthening exercises have significant effect on dominant hand pinch strength in smartphone addicted collegiate.

Keywords: Smartphone addiction, hand muscle strengthening exercise, pinch strength, pinch meter.

INTRODUCTION

Smartphone Addiction is a dependence syndrome seen in certain mobile phone users. The term addiction has replaced by the term dependence syndrome by world health organization.¹ Emanuel, Richard stated that, we are addicted to information, enjoyment and connections that smartphone delivers but not to the smartphone itself.² Smartphone provide us access to connect with our friends and family and to news and entertainment, websites with just a tap of a touch screen. In short smartphones have become a crucial part of our day to day activity.

For college students mobile phones are important integral part of themselves, nowadays mobile phones are important in maintaining social relationship. Most of the younger people cannot think of being without mobile

phone and they never realize their level of addiction. Poor behavior control is a consequence of any addiction.³

Smartphone addiction begins as a simple behavior and gradually produces negative consequences. First the user uses the mobile for their need, such as texting, browsing and gradually the user involve in using mobile phone in dangerous situations like driving, crossing road. Smartphone user switch from liking the phone to wanting the phone.³

Approximately 72% of people reported that they are rarely more than five feet away from their smartphone at any time. This is known as nomophobia, the fear that being away from phone somehow disconnects them from world.⁴ As like other types of addiction smartphone addiction also a problem that can be arise from some depression or other mental stress.⁴

Smartphone overuse may be leads to various musculoskeletal problems such as neck pain, upper extremity pain and upper back ache due abnormal positions that maintained while using it.⁵ According to some studies smartphone overuse causes decrease in hand pinch strength and hand function.⁶

Hand grip strength and pinch strength are interferes with upper extremity function as hand strength reflects the hand function.⁷ There are three types of pinches as follows pad to pad type in which there is opposition of pad of thumb to pad of the distal phalanges of finger (in two jaw type index finger is involved, in three jaw chuck type index finger and middle finger are involved), in tip to tip type tip of the thumb and index finger is involved, in pad to side type pad of the thumb and lateral side of index finger is involved. All these type of pinches are produced by combined action of intrinsic and extrinsic hand muscles.⁸ strengthening exercise for these muscles may help to improve the pinch strength of smartphone addicted collegiate.

Normal pinch strength is important for college going students. Because pinch strength is indicator of upper limb strength as already mentioned. According to a study increased upper limb strength can improve the hand writing speed⁹ which subsequently improve their academic performance.¹⁰ No study was attempted to improve pinch strength in smartphone addicted people. Therefore there is a need for the study to find out the effectiveness of hand muscle strengthening exercise on dominant hand pinch strength in smartphone addicted collegiate.

The aim of the study was to find out the effectiveness of hand muscle strengthening exercises on dominant hand pinch strength in smartphone addicted collegiate.

METHODOLOGY

Study design was quasi experimental, pre test and post test type. 30 subjects of age 18-25 years with smartphone addiction score more than 40 in Smartphone

Addiction Scale –Short version and using smartphone for more than one year and having dominant hand pinch strength <6 for girls and <10 for boys were selected in SRM College of Physiotherapy, SRM Institute of Science and Technology, Kattankulathur. Subjects with fracture or dislocation, soft tissue injuries, entrapment neuropathy, tumor or infections of upper limb were excluded. Dominant hand pinch strength was measured and hand muscle strengthening exercises were given to them for 4 weeks. Outcome measures were done by pinch meter.

50 college students were selected according to inclusion and exclusion criteria, and given Smartphone Addiction Scale questioner.¹¹ Out of fifty, 30 students those who got smartphone addiction score more than 40 were included in this study. Participants were explained clearly about the procedure and informed consent was obtained. Institutional Ethical Committee approval also obtained. Pinch strength of the dominant hand was measured for them with pinch gauge before intervention. During measurement, therapist hold the pinch gauge, participants were sitting with shoulder adducted, elbow flexed to 90°, forearm and wrist in the neutral position.^{6,12} The participants were asked to do pad to pad pinch, tip to tip pinch and lateral pinch as hard as they can. Measurement of 3 trials with 30 seconds rest in between were taken and mean values of the these 3 trials were recorded.⁶ Then following hand muscle strengthening exercises were given to them, ball squeezing, elastic band exercises, closed fingers, closed fist, fingers apart, opposition of thumb with 2nd, 3rd, 4th, 5th digits, straighten fingers, knuckle bend, karate chop, clay exercises.⁹ Each exercise 20 repetitions on each day, weekly 5 continues days for 4 weeks. Post intervention measurement of the dominant hand pinch strengths were taken.

DATA ANALYSIS

Dominant hand pinch strengths measures were calculated, analyzed and tabulated. The data analysis was done by using IBM SPSS version 20.

Table 1: Comparison of Mean Values of Pre and Post Test of Dominant Hand Pinch Strength (Pad To Pad Type)

Dominant hand pinch strength		Mean	N	Std. Deviation	Std. Error Mean	t -value	Sig.(2-tailed) p value
Pad to pad	Pre test	4.44	30	1.00194	.18293	-7.517	.000
	Post test	5.47	30	1.22673	.22397		

Table 1 shows the pre-test and post-test Mean, Standard Deviation, t-test and p values of Dominant Hand Pinch Strength (Pad to pad type) of smartphone addicted collegiate

Mean values of pad to pad type of pinch strength significantly improved from pre test to post test which is 4.44 to 5.47 in smartphone addicted collegiate.

Table 2: Comparison of Mean Values of Pre and Post Test of Dominant Hand Pinch Strength (Tip To Tip Type)

Dominant hand pinch strength		Mean	N	Std. Deviation	Std. Error Mean	t-value	Sig.(2-tailed) p value
Tip to tip	Pre test	3.59	30	.99004	.18076	-12.158	.000
	Post test	4.52	30	.89622	.16363		

Table 2 shows the pre-test and post-test Mean, Standard Deviation, t-test and p values of Dominant Hand Pinch Strength (tip to tip type) of smartphone addicted collegiate.

Mean values of tip to tip type of pinch strength significantly improved from pre test to post test which is 3.59 to 4.52 in smartphone addicted collegiate.

Table 3: Comparison of Mean Values of Pre and Post Test of Dominant Hand Pinch Strength (Pad to Side Type)

Dominant hand pinch strength		Mean	N	Std. Deviation	Std. Error Mean	t-value	Sig.(2-tailed) P value
Pad to side	Pre test	5.16	30	1.87784	.34285	-8.181	.000
	Post test	6.45	30	1.61176	.29427		

Table 3 shows the pre-test and post-test Mean, Standard Deviation, t-test and p values of Dominant Hand Pinch Strength (Pad to side type) of smartphone addicted collegiate.

Mean values of pad to side type of pinch strength significantly improved from pre test to post test which is 5.16 to 6.45 in smartphone addicted collegiate.

Statistical analysis of this study showed that smartphone addicted collegiate group have significant change in mean value between pre-test and post-test in pad to pad type of pinch, tip to tip type of pinch and in pad to side type of pinch in dominant hand.

Jonsson et al., (2007) stated that thumb reaching its utmost ROM while texting in the smartphone as it adjusted to reach the small key board. Putting thumb in this constant position for longer duration causes unwanted load transmission on intrinsic and extrinsic muscles of thumb. It may causes pain and fatigue in hand.¹³

Most of users complaints about ache in carpometacarpal joint. They also insisted that distress in the upper extremity significantly correlated with total duration used up for mobiles and long duration of playing games in mobile device causes pain middle part of thumb and long duration of internet browsing causes pain in basal part of thumb.¹³

Jenkins et al., (2007) stated that 36% of college students who were doing their undergraduate program present with discomfort in hand.¹³

ESRA ERKOL INAL et al., (2015) stated that there was median nerve enlargement in smartphone addicts which might be depend on level of addiction not on

DISCUSSION

The objective of the study was to find out the effectiveness of hand muscle strengthening exercises such as ball squeezing, elastic band exercises, closed fingers, closed fist, fingers apart, opposition of thumb with 2nd, 3rd, 4th, 5th digits, straighten fingers, knuckle bend, karate chop, clay exercises on dominant hand pinch strength in smartphone addicted collegiate.⁹ Hand grip strength and pinch strength are interferes with upper extremity function as hand strength reflects the hand function.⁷

Smartphone overuse may be leads to various musculoskeletal problems such as neck pain, upper extremity pain and upper back ache due abnormal positions that maintained while using it.⁵ According to some studies smartphone overuse causes decrease in hand pinch strength and hand function.⁶

duration of smartphone use and there is a chance of development of carpal tunnel syndrome in smartphone addicts. Other than this smartphone addiction can also affect the pinch strength, causes the thumb pain. We could use the term hand smartphonopathy when above symptoms are present.⁶

Strength training improve the muscle force by improving acquisition, frequency and synchronization of motor units.¹⁴

Nikolaus Johannes Wachter et al.,(2017) concluded that the measurement of tip pinch, tripod pinch and key pinch can improve the follow up in hand rehabilitation of ulnar nerve lesion.¹⁵

Jose Manuel Perez-Marmol et al.,(2017) stated that exercise program for fine motor skills was effective to improve manual dexterity and also the active and passive range of motion. That is specific interventions of the hand are needed to prevent a worsening in range of finger motion in hand osteoarthritis.¹⁶

Strengthening exercise for hand muscles may help to improve the pinch strength of smartphone addicted collegiate. It may be due to some of the physiological and therapeutic effects of exercises such as increased requirements for oxygen and substrate in skeletal muscle removal of metabolites and carbon dioxide.¹⁷

Therefore this study revealed that hand muscle strengthening exercises has significant effect on dominant hand pinch strength in Smartphone addicted collegiate.

CONCLUSION

The study concluded that smartphone addicted collegiate who underwent hand muscle strengthening exercises have shown improvement in dominant hand pinch strength. Therefore hand muscle strengthening exercises have effect on dominant hand pinch strength in smartphone addicted collegiate.

Limitations of the study were small sample size, lesser study duration, exercises were performed only once in a day, only dominant hand pinch strength was measured, only hand muscles were focused in intervention. Recommendations for the further study are larger sample size can be used, study duration can be increased, exercises frequency for per day can be increased, non dominant hand measurement can also be considered, intervention can be given to whole upper limb.

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Effect of Traction Versus Counter Traction with Conservative Treatment on Adhesive Capsulitis

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ABSTRACT

Background: Adhesive capsulitis, pain and decrease in range of motion are correlated with each other. This study was undergone to see the effect of traction versus counter traction with conservative treatment in adhesive capsulitis subjects.

Objectives:

1. To determine the effect of traction on adhesive capsulitis.
2. To determine the effect of counter traction on adhesive capsulitis

Method: An Experimental study was conducted at Krishna College of Physiotherapy, Karad. 40 subjects with age group between 40-60 years were selected. A total of 40 subjects were equally divided into two groups. Both the groups received conservative treatment such as hot moist pack, Ultrasound, TENS, exercises. In addition, Group A received traction and Group B received Counter traction.

Results: On comparing both groups, counter traction (Group B) shown significant reduction in pain and improvement in range of motion for shoulder flexion and abduction.

Conclusion: Present study concluded that counter traction with conventional treatment shown to have significant improvement in pain and functional disability than traction with conventional treatment in adhesive capsulitis subjects.

Abbreviation: VAS: Visual Analogue Scale; ROM: Range of motion; SPADI: Shoulder Pain and Disability Index; GH: Glenohumeral; FLEX: Flexion; ABD: Abduction; TENS: Transcutaneous electrical nerve stimulation

Keywords: Adhesive capsulitis, traction, counter traction, conservative treatment.

INTRODUCTION

Adhesive capsulitis is characterized by the development of dense adhesions, capsular thickening and capsular adhesions in the dependent folds of the

capsule⁷. It is also known as frozen shoulder which is one of the most common problems of the arm and it may last for several weeks. Codman introduced the term "frozen shoulder" in 1934 to describe patients who had a painful loss of shoulder motion with normal radiographic studies. There are global restrictions of GH joint motion. Prevalence of adhesive capsulitis in normal population is 2% and 10%-15% in diabetic population.⁴ Adhesive capsulitis is caused by tightening of the joint capsule and results in stiffness and pain². The pain is usually more at night and during activity. In some cases, it radiates down the arm.¹¹

Counter traction is the resistance or back pull made to traction or pulling on a limb. The study of using counter

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traction was proved effective in shoulder dislocation and hence the attempt was made to study the effect of counter traction in the subjects with adhesive capsulitis.

Traction is usually applied to the arms, legs, spine or the pelvis. It is used to treat fractures, dislocations and long duration muscle spasms and to prevent or correct deformities.

Conservative treatment included hot moist pack, graded mobilization, free exercise, Strengthening exercise, TENS, ultrasound.^{12,9,13,14}

MATERIALS AND METHODOLOGY AND PROCEDURE

Goniometer, towels and data collection sheet were used for the purpose of counter traction.

The inclusion criteria were both male and female with right or left shoulder pain and restriction of movement. Subjects with the age of 40-60 years.⁵ Subjects with or without diabetes. Subjects complained of minor pain, intermittent pain at the time of activity. Subjects with the old history of micro trauma, minor shoulder injuries, etc.

1. VAS

Table 1: Comparison of pre and post VAS score within the group

	PRE		POST		P VALUE	T VALUE	INFERENCE
	R	A	R	A			
GROUP A	5.60 ± 1.52	7.8 ± 0.93	4.12 ± 1.56	6.26 ± 0.92	P < 0.0001	13.984	Extremely significant
					P < 0.0001	15.587	Extremely significant
GROUP B	5.66 ± 1.23	7.90 ± 0.92	1.84 ± 0.67	2.74 ± 0.74	P < 0.0001	13.674	Extremely significant
					P < 0.0001	12.110	Extremely significant

Pre treatment VAS on rest and on activity was extremely significant with (P<0.0001) respectively. Post treatment VAS on rest and on activity was also extremely significant with (P<0.0001) respectively.

2. ROM:

Table2: Comparison of pre and post ROM score within the group

	PRE		POST		P VALUE	T VALUE	INFERENCE
	FLEX	ABD	FLEX	ABD			
GROUP A	64.35 ± 18.25	65.25 ± 18.94	68.75 ± 18.30	70.55 ± 19.78	P < 0.0001	12.034	Extremely significant
					P < 0.0001	7.339	Extremely Significant

A total of 40 subjects were selected in this experimental study. These subjects were equally divided into two groups. Conventional treatment was common in both groups. In addition, group A received traction and group B received counter traction.

Conventional treatment included hot moist pack for 15 minutes, grade 1 and 2 mobilization (3 set of 30 repetitions).^{12,9} Free exercise such as wand exercise (10 repetitions), pendular exercise (10 repetitions), wall ladder exercise (10 repetitions), and shoulder wheel (10 repetitions). Strengthening exercise such as theraband exercise (10 repetitions)¹⁴. TENS on burst mode for 15 minutes around the shoulder joint¹³. Ultrasound for 7 min at the intensity of 1w/m² etc¹³. At the end of conventional treatment traction and counter traction was given respectively. Duration of treatment was 40 min for 5 days/week –for 2 weeks. The pre treatment and post treatment assessment was done by outcome measures like VAS, ROM and SPADI questioner.

Data analysis: The statistical analysis of VAS, ROM and SPADI scores was done by repeated paired t test and unpaired t test.

Conted...

GROUP B	61.15 ± 14.96	67.65 ± 13.51	69.6 ± 17.57	76.05 ± 15.27	P < 0.0002	4.505	Extremely significant
					P < 0.0001	4.857	Extremely significant

Pre treatment flexion and abduction was extremely significant with (P<0.0001) and (P<0.0001) respectively. Post treatment flexion and abduction was also extremely significant with the (P<0.0001) and (P<0.0002) respectively.

3. SPADI:

Table 3: Comparison of pre and post SPADI score within the group

	PRE INTERVENTION	POST INTERVENTION	P VALUE	T VALUE	INFERENCE
GROUP A	76.26 ± 7.13	65.43 ± 6.74	P < 0.0001	9.487	Extremely significant
GROUP B	71.53 ± 21.02	52.34 ± 18.93	P < 0.0001	10.188	Extremely significant

Pre intervention and post intervention SPADI was extremely significant with (P<0.00001) and (P<0.0001) respectively

RESULT

On comparing both groups, counter traction (Group B) shown significant reduction in pain and improvement in range of motion for shoulder flexion and abduction.

DISCUSSION

Counter traction is the resistance or back pull made to traction or pulling a limb. It may help in improving shoulder movements and reducing. The purpose of present study was to find out effect of traction versus counter traction with conservative treatment on adhesive capsulitis. The feasible training program aims to improve the activity of shoulder joint.

According to various studies it was analysed that counter traction may help in improving quality of life of subjects with shoulder pathology. This study aims to improve quality of life of subjects with adhesive capsulitis. In this study treatment protocol was given for two weeks.

Advantages of counter traction—

- It helps to stabilize scapula of affected side.
- It produces equal force on affected shoulder

In this study, 40 subjects had participated who were diagnosed with adhesive capsulitis out of which 26 were

male subjects and 14 were female subjects. The mean age of subjects included in Group A was 60.4 and in Group B was 59.3. Out of 40 subjects, 17 subjects have right side affected and 23 subjects have left side affected.

Subjects were analysed and were divided into two groups according to random sampling method. 20 subjects were included in Group A and were received traction with conventional treatment. An education and home exercise booklet was also provided for the reference. The treatment protocol was continued for 2 weeks.

Pre treatment outcome measures for pain, ROM and functional disability was done with VAS (both on rest and activity), ROM and SPADI. The specific treatment protocol was followed for 2 weeks.

Intra group comparison (within group) was analysed by paired t-test for VAS, ROM, SPADI score. This showed that there was extremely significant difference of Group A VAS score on rest with (P<0.0001). While there was extremely significant difference of Group A VAS score on activity with (P<0.0001). ROM scores were also extremely significant for both flexion and abduction with (P<0.0001). SPADI score shows extremely significant difference with (P<0.0001).

Similarly, In Group B, there was extremely significant difference of VAS both on rest and activity with (P<0.0001) respectively. ROM score was also extremely significant for both flexion and abduction with (P<0.0002) and (P<0.0001) respectively. SPADI score was also extremely significant with (P<0.0001).

Inter group comparison (between groups) was analysed statistically using unpaired t-test. This shows that pre intervention VAS on rest and activity was not statistically significant with ($P<0.8916$) and ($P<0.7226$). Pre intervention ROM was not statistically significant with ($P<0.5479$) and ($P<0.6473$), SPADI score with ($P<0.3467$) was not significant. While comparing the post intervention values of VAS on rest and on activity was extremely significant with ($P<0.0001$) and ($P<0.0001$) respectively. ROM of flexion and abduction was not statistically significant with ($P<0.8817$) and ($P<0.3312$). SPADI score was statistically very significant with ($P<0.0060$).

In this study, an attempt was made to improve range of motion and to reduce pain.

Improvement of subject on week 2 i.e. after the treatment program gets over.

- The subject could perform exercise independently
- There could be improvement in quality of life of subjects with adhesive capsulitis.
- There was reduction of symptoms in both the group but in group B there was marked reduction on symptoms were seen.

In conclusion, the result of current study shows that counter traction with conventional treatment is significant than traction with conventional treatment on adhesive capsulitis. Further studies can be done for longer duration of treatment protocol in order to determine the long term effect of this program.

Mohammad-Reza Ghane, Seyed-Hamed Hoseini, Hamid-Reza Javadzadeh, Sadroollah Mahmoudi, Amin Saburi* *Chinese Journal of Tromatology* 2014;17(2):93-93 conducted a study on comparison between traction-countertraction and modified scapular manipulation for reduction of shoulder dislocation concluded that final success rate shows that traction countertraction there was a significant effect on reduction in treatment duration.⁸

CONCLUSION

It was concluded that counter traction with conservative treatment shown significant effect on adhesive capsulitis than traction with conservative treatment.

Conflicts of Interest: This study can be carried out with various types of traction and counter traction methods and large number of sample size can be taken.

Ethical Clearance: Ethical clearance was taken from institutional committee of Krishna Institute of Medical Sciences Deemed to be University, Karad.

Source of Funding: Source of funding is Krishna Institute of Medical Sciences Deemed to be University, Karad.

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Efficacy of Probiotic Drink Containing *Lactobacillus Casei Shirota Strain* on Factors Affecting Dental Caries

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ABSTRACT

Objectives: To evaluate the effectiveness of probiotic drink on factors affecting dental caries.

Materials and Method: A three phase study where 12 volunteers were recruited with a DMFT score >3. The unstimulated saliva samples were collected prior to the start of intervention. The saliva samples were also collected after two weeks of consumption of the probiotic drink, Yakult (Yakult Honsha co., Ltd) and after wash out period of two weeks. These samples were cultured to detect the *Streptococcus mutans* level by colony count and to detect pH using pH strips. The volunteers were also asked to maintain a diet chart to determine sugar exposure.

Results: The mean of *Streptococcus mutans* colony count has significantly decreased from 27.17 (baseline count) to 2.50 (two weeks of intervention) respectively and has increased to 11.75 (washout period of two weeks). The mean of pH at baseline, after two weeks of intervention and after washout period were 6.08, 6.92 and 7.00 respectively. The correlation coefficient of dietary sugar exposure with *Streptococcus mutans* count for baseline and after two weeks of intervention were -.227 and -.007 respectively.

Conclusion: Probiotics when used as a regular drink reduces the *Streptococcus mutans* count in the oral cavity. People who have high sugar exposure can also control the oral microbiome with regular usage of probiotic with no significant variation in the salivary pH. It exhibits transient colonisation and lacks substantivity.

Keywords: Probiotics; *Lactobacillus casei shirota*; *Streptococcus mutans*; salivary pH; sugar exposure

INTRODUCTION

Changes in the homeostasis of the oral ecosystem can lead to proliferation of bacterial biofilm causing initiation and progression of demineralisation activity resulting in dental caries.¹ *Mutan streptococci* are considered are strongly associated with onset of caries and are gram positive bacteria which form insoluble glucan for adhesion, aggregation and caries biofilm formation.²

The caries treatment by the medical model include limitation of the substrate formation, modification of the oral microflora, plaque formation disruption, tooth surface modification, stimulation of salivary flow and restoration of the tooth surface.² The interest in modulation of the oral microbial dysbiosis by fortifying the body with beneficial bacteria for restoring and maintaining oral health have gained a lot attention over the use of probiotics.³ The concept of probiotic where live microorganisms are administered in adequate amounts to confer a health benefit have prompted the need for an alternative therapeutic and prevention strategy (FAO/WHO.2001).⁴

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Most of the probiotic bacteria belongs to the genera *Lactobacillus* and *Bifidobacterium spp.* which are the natural inhabitants of oral cavity and are

generally considered safe⁵. Studies done by *Caglar et al* have concluded that among the various species of lactobacillus, *L. reuteri* can reduce *S.mutans* count and can interfere the growth of oral bacteria which forms the biofilm. So *L. reuteri* can be a candidate probiotic for dental caries⁶. The advantage of incorporating probiotics into dairy products lies in their capacity to neutralise the acidic conditions.¹ Probiotics replace the pathogenic bacteria with non-pathogenic bacteria. This form of replacement therapy is achieved by their ability to secrete antimicrobial substances, compete with pathogens for adhesion sites on dental surfaces, alter environmental conditions of mouth and even reduce inflammatory response.¹ When probiotics are ingested, they are first exposed to the oral cavity and been contacted with the oral tissues. This adhesion could be the primary factor that facilitates the accomplishment of probiotic activity, its persistence and resistance to environmental factors in the oral cavity.⁸ Commercially available forms of probiotics are Yakult, probiotic juice, Choconat, sporolac, genetically modified bacillus mesentricus⁷. Studies done by *Sooke et al* has proved the antimicrobial activity of *Lactobacillus casei shirota*⁹ which is the main component of Yakult. Despite a low pH this drink has hardly caused demineralizing effect due to its high calcium and phosphate content. Milk proteins may also contribute to anti-carries effect.¹⁰ Hence Yakult was selected as the study material.

The present study aims to evaluate the effectiveness of probiotic drink (Yakult) on factors affecting dental caries.

The objectives of the study were to;

- evaluate the effectiveness of probiotic drink in reducing the colony count of *S.Mutans* in saliva
- detect the change in salivary pH for caries risk evaluation
- correlate dietary sugar exposure with *S.mutans* count

MATERIALS AND METHOD

This study was conducted in compliance with the protocol approved by the Institutional Ethics Committee. A total number of 12 adults with DMFT Score <3 based on WHO criteria and who were consented to participate in the study were included. Subjects who had lactose

intolerance, allergic to dairy products, habit of smoking and undergoing dental treatments were excluded from the study. The study was conducted for 4 weeks consisting of 2 weeks of intervention period and 2 weeks of followup period (T1-T2), Where (T1)-at baseline, (T2) -at the completion of consumption and 2nd week from T1 and (T3)-4th week from the base line and 2nd week from T2. Prior to the intervention period, the fermented milk, probiotic drink Yakult (Yakult Honsha co.,Ltd) containing a single probiotic strain of *Lactobacillus casei shirota* at a minimum concentration of 6.5×10^9 viable cells per 65 ml bottle was tested for viability of probiotic species (Figure 1). Probiotic drink was shaken vigorously, 10 ml of this drink was mixed with sterile saline to make 100 ml, and 1 ml of this mixture was serially diluted with 10 ml saline. Aliquots (100 μ l) of the diluted sample were inoculated into the Rogosa Agar medium and incubated at 35–37°C for 48 hrs. After incubation, colonies were counted with a colony counter and photographed under a light microscope.

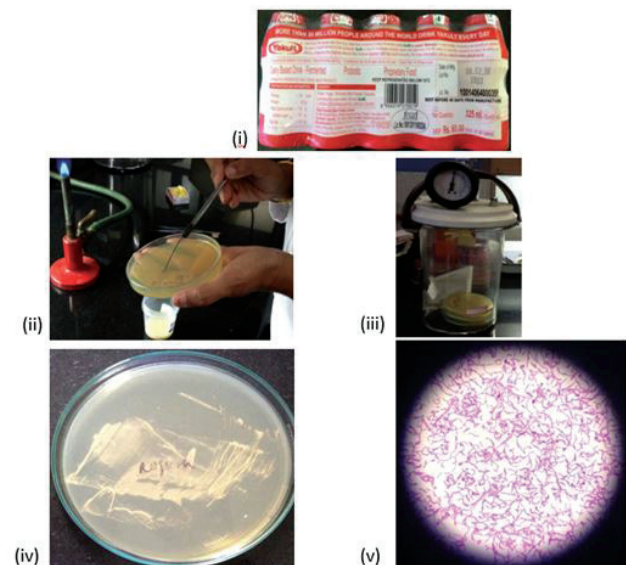


Figure 1: Microbial analysis to test the viability of probiotic species in Yakult

(i)The probiotic drink Yakult (ii)inoculation of the probiotic drink into Rogosa medium (iii)incubation procedure(iv)Viable *Lactobacillus* colonies (v) *Lactobacillus* colonies under light microscopic view

Oral examination of the subjects were conducted prior to the study using the mouth mirror and Community Periodontal Index probe and subjects were asked to maintain a diet chart¹¹ to evaluate sugar exposure during the intervention period.

Instructions were given to the participants to drink the study product after a meal (preferably at lunchtime and not right before bedtime). They were advised to drink one whole bottle of Yakult (65ml) each day. They are advised to hold the drink for 2-3 mins in the mouth before they swallow. Participants were advised to keep their probiotic drink refrigerated, in order to preserve the viability of the probiotic bacteria.

Normal oral hygiene procedures such as use of toothbrushes, fluoride tooth pastes and dental floss were allowed throughout the study. The use of other fluoride products, similar probiotic products, and other medical oral rinse were forbidden. The participants were told to brush their teeth twice a day.

Saliva samples were collected three times at 0, 2, and 4 weeks, around noon time (11:00 a.m.–1:00 p.m.). 1-2ml of unstimulated saliva samples were collected from subjects. The subjects were allowed to spit the saliva in a pre-sterilized bottles. The saliva samples were analysed for the presence of *Streptococcus mutans* using *Mitis salivarius* agar. 1:10 dilution of saliva were made in phosphate buffered saline. 10µl of saliva sample was inoculated onto agar plates using micropipettes and evenly spreaded using presterilised glass spreader. The plates were then incubated at 37°C for 24 hours and left at room temperature for further 24 hours. Using a colony counter, number of colonies of *Streptococci mutans* were counted.

Salivary pH was also determined by using pH strips (EKI universal pH strips) as a supplemental indicator. A

drop of unstimulated saliva was pipetted onto the pad, and the result is read after 5 min. The color of this test pad was compared with a standard color chart after 5 min to estimate the final pH. The method grades unstimulated saliva as low (pH ≤4), intermediate (pH 4.5–5.5), or high (pH ≥6) buffer capacity.

Data obtained from baseline, after two weeks and two weeks of washout period were arranged and tabulated and statistically analysed using the software SPSS version 21.0. The levels of statistical significance is set at $p \leq 0.05$. Repeated measures of ANOVA is used to investigate the effects of the probiotic consumption on *S. mutans* levels in saliva and salivary pH. Correlation was calculated between sugar exposure and *S. mutans* levels using Spearman correlation.

RESULTS

The study revealed that there was significant reduction of salivary *S. mutans* levels after intervention period (Figure 2), but after washout period there was no significant difference or decline in the *S. mutans* levels (Table I.).

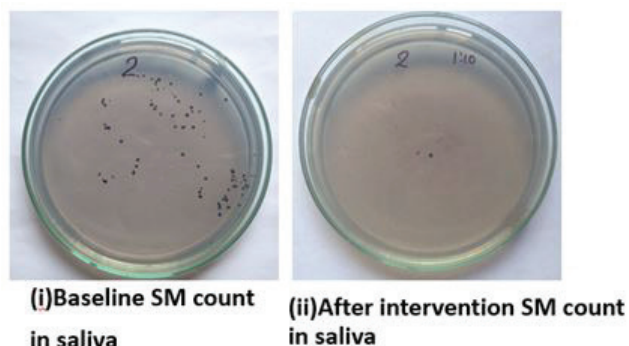


Figure 2: The culture plates reveals considerable decrease in *S. Mutans* levels after the intervention period

Table I: Comparison of *Streptococcus mutans* level among the three time frame

Group	N	Mean	Standard Deviation	F- value	p- value
SM-T1	12	27.17	21.595	11.8	.006*
SM-T2	12	2.50	1.508		
SM-T3	12	11.75	2.527		

*significant at the 0.05 level using Repeated measure ANOVA.

There was no significant change in pH at baseline, after intervention and during washout period (Table II).

Table II: Comparison of pH among the three time frame

Group	N	Mean	Std. Deviation	F- value	p- value
pH-T1	12	6.08	.515	27.13	.001*
pH-T2	12	6.92	.289		
pH-T3	12	7.00	.000		

Correlation coefficient suggest a negative relationship between mean sugar exposure and SM count(Table III).

Table III: Correlation of Streptococcus mutans and Sugar level

		S. Mutans (T1)	S. Mutans (T2)
Sugar Exposure	Correlation coefficient	-.227	-.007
	Sig. (2-tailed)	.502	.983
	N	12	12

DISCUSSION

Probiotics are earning wide acceptance in the field of oral health care. Some of the lactobacilli strains are considered to have omnipotent antimicrobial activity.⁹ Yakult the probiotic drink was selected in the study as it has 75 year's history of safe consumption, proven health benefits, extensive scientific research, reduction of functional and infectious gut diseases and immune-modulating effect.¹²⁻¹⁵ The study revealed that there was significant reduction of salivary *S. mutans* count after study period of two weeks. The mean of *Streptococcus mutans* count has significantly decreased from 27.17 to 2.50. The reason may be as the probiotics are exposed to oral cavity might undergo saliva mediated aggregation.¹⁶⁻¹⁹ They compete and intervene with bacterial attachments and produce antimicrobial compounds such as organic acids, hydrogen peroxide, carbon peroxide, diacetyl, low molecular weight antimicrobial substances, bacteriocins and adhesion inhibitors.^{20,21} Studies done by *Bezkorovainy* 2001²² had proved that a probiotic strain cannot anticipate a long term effect on the host after cessation of intake. In this study two weeks use of a *Lactobacillus casei* enriched Yakult drink showed a reduced *S. mutans* count in the oral cavity but after discontinuation for two weeks the *S. mutans* count increased. This showed transient colonization of probiotic species.

Dental caries is a diet related disease. Sweet consumption especially between meals may lead to

continuous decrease of pH and will not facilitate the pH to return to normal causing demineralization of teeth. Dental caries results from the interaction between pH, mineral flux and solubility at tooth surface.² According to Enamel Sieve Concept²³, after sugar consumption there will be an increase in hydrogen ions in dental plaque causing an increase in pressure gradients, leading to dissolution of hydroxyapatite crystals to their ionic components. These ions will diffuse towards dental plaque leaving behind microspaces. By the increase of pH due to the action of buffer system and termination of carbohydrate, a remineralization episode will be initiated, calcium, phosphorous ions and others will diffuse back to enamel from dental plaque. The precipitations of ions will be in form of a variety of complex salt crystals. In a succession of demineralization and remineralization cycle, if the sum of the demineralization is greater than the remineralization there will be a continuous loss of minerals thus porosity then cavitation finally causing dental caries.²³ In this study, diet chart was maintained to evaluate caries risk associated with sugar exposure. Correlation coefficient suggest a negative relationship between mean sugar exposure and *S. mutans* count. People who have high dietary sugar exposure can also control the oral microbiome with regular usage of probiotic with no significant variation in the salivary pH.

The pH of saliva found to be improved during the course of the study. The mean of pH at baseline, after two weeks of intervention and after washout period were 6.08, 6.92 and 7.00 respectively. In the present study no variation in salivary pH during the consumption of probiotic drink and washout period. The buffering capacity of saliva may get exhausted by the ongoing production of organic acids by cariogenic bacteria in the mouth. An improved pH results in the release of calcium and phosphate ions, which act to inhibit demineralisation due to the localised increased degree of saturation of milk proteins at the tooth surface and might promote remineralisation.²⁴ When probiotics are consumed as a milk product, buffer capacity of milk will decrease the production of acid. Calcium rich compounds in the

milk are anticariogenic and reduces the colonization of streptococcus mutans.¹⁰ The rise in the pH of saliva in the subjects at the two weeks and washout period could be due to patient awareness. As a result the microorganisms would produce less acid from dietary carbohydrates and the buffering capacity of saliva would have been improved. Future studies should be done with larger sample size for a longer duration to prove the results of the present study.

CONCLUSION

Within the limitations, the present study concluded

1. Probiotics when used as a regular drink reduces the *Streptococcus Mutans* count in the oral cavity and can be regarded as a caries control method.
2. It exhibits transient colonisation and therefore lacks substantivity. Sustainability of probiotic drink should be studied and justified.
3. People who have high sugar exposure can also control the oral microbiome with regular usage of probiotic with no significant variation in the salivary pH.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: From IEC, MCODS, Mangalore

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Health Expectancy Under Dynamic Set Up for India and its Selected States

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ABSTRACT

The quality of life is usually measured in terms of Health expectancy. It is vital to know that weather an increased in a life expectancy lead to a similar increase in years spent in reasonable health. Further, increases in life expectancy due to the gradual decline in mortality lead to the concept of dynamic life table. In this context, this paper proposes a new method to measure the healthy life expectancy under dynamic approach and consequently access the pattern of changing mortality scenario, resulting in a longer life with good health. In other words, the dynamic healthy life expectancy is the aggregate average number of years that a person lives in a healthy state with continuous changing mortality scenario. The usefulness of the proposed indicator is demonstrated for India and some of its major states for the year 2011. The result showed that, for both sexes, the health life expectancies at birth were more under dynamic consideration as compared to usual consideration.

Keywords: *Healthy expectancy, Dynamic, India.*

INTRODUCTION

The life expectancy is the most widely used measure of health, although it only takes into account the length of people's life and not their quality of life. In almost all the world, improvements in health care, development in medical technologies and also improvement in sanitation facilities are enabling people to live longer ^[1]. As people live longer and mortality rates have been declining, several health related questions arises about the quality of years lived. To answer these questions efforts have been made to develop a summary measure of population health that takes into account both current mortality and morbidity levels of a population. This concept is well known as health expectancy. More specifically, health expectancy is defined as the number of remaining years at a particular age that an individual can expect to live in a healthy state (howsoever way health may be defined) if current mortality and morbidity prevails ^{[2],[3]}. In most of the countries, today, health expectancy has been used as the central summary indicator of population health status^[4].

Further, in a period life table the assumption of a constant mortality rates prevails over the years and does not allow for the changes in mortality probabilities. However, the past records in both developed and developing countries showed a gradual decline in

mortality and a continuous increase in life expectancies ^[5]. In such case, an extension of the period life table has been proposed by Denton and Spencer (2011) which would explicitly allow for the possibility of further changes in mortality. This extension has been named as 'dynamic' extension of the period table that draws out the implications, for survivorship and life expectancy, of observed rates of change of death ^[6]. The concept of dynamic life table is also extensively used in the context of Indian data by Sharma et al., (2017) to demonstrate a more accurate picture of the mortality scenario.

Health expectancy is preferred to life expectancy as an indicator for population health status because it is based not just on mortality, but also on morbidity ^[8]. Moreover, the continuous changes in mortality, in a developing country like India, are largely the resultant of improved health care facilities and medical advances. Since the expected changes in mortality over time can be examined by using dynamic life table. Similarly, one might be of keen interest to calculate the health expectancy when both the mortality and morbidity are likely to change over time. Thus, in the present paper we try to develop an indicator, namely, dynamic health expectancy which would reflect the affects of improving morbidity on mortality.

As mortality rates have been gradually declining, one of the factors for this decline is the improvement of healthiness of the people. As such, if we compute dynamic health expectancy by considering simultaneous changes in mortality and morbidity then the resultant indicator would expect to give an absurd value, which might not be acceptable in real situation. So to compute dynamic health expectancy one can consider only the changing mortality scenario prevailing in a population and the current level of morbidity will prevail. An application of the said indicator is then illustrated for India and some of its major states for the years 2011 based on the previous ten years of change in mortality, which is 2001.

Development of Health Expectancy under Dynamic

Set up: The estimation of health expectancy or disability free life expectancy, developed by Sullivan (1971), combines both mortality and morbidity rates of a population into a single summary measure. Using Sullivan method, we further developed an indicator namely dynamic health expectancy, which requires combining the dynamic life table with the observed age specific proportions of persons without any disease or disability. As such to develop health expectancy under dynamic set up, we first construct the dynamic life table by the method as given by Denton and Spencer (2011). Here, two period life tables which are t years apart are taken and then the annual rate of change of probabilities of death for any age group x to $x + n$ is calculated by-

$${}_n r_x = \left(\frac{{}_n q_x / -}{{}_n q_x} \right)^{1/t} - 1$$

where, ${}_n q_x$ is the probability of death for the age group x to $x + n$ in the reference period table (in our context 2011 will be the reference period) and ${}_n \bar{q}_x$ is the corresponding probability in the earlier period table (2001).

The cohort of the reference period is given by l_{xx} and l_{xy} is the population of initial age group x to $x + n$ that survived to the age group y to $y + n$. The probability that a member of the l_{xx} cohort who has survived upto the exact age y will die in the interval y to $y + n$ is-

$${}_n q_{xy} = {}_n q_y (1 + {}_n r_y)^{y-x}$$

where, ${}_n q_y$ is the probability of death in the age group y to $y + n$ in the reference period, ${}_n r_y$ is the annual rate of change of that probability, and $y - x$ is the number of years between the subsequent age and initial age group, hence the number of years over which the age y probability has changed^[6]. After obtaining the dynamic probabilities of death, the rest of the columns of the life table are calculated in the same manner as a period life table.

Now, to derive the required expression of health expectancy under dynamic consideration (he_{xx}^0), we divide the sum of the products of L_{xy} and $(1 - \pi_x)$, where π_x is defined as the proportion of population with bad health at age x by l_{xx} . Thus, we get the following expression of dynamic health expectancy

$$he_{xx}^0 = \frac{\sum {}^y L_{xy} \cdot (1 - \pi_x)}{l_{xx}}$$

Application: As stated in earlier, here we shall try to construct dynamic healthy life expectancy for India and some of its major states. These will be done for the period 2011 taking 2001 as base. For constructing dynamic life tables, the Sample Registration System (SRS) based abridged life tables for the period 1999-2003 and 2009-2013 are taken, which are centered at 2001 and 2011 respectively. Now for the factor health we do not have age specific morbidity data for India, but Census of India published data on disability by their types, age groups and sex for all areas at India, state, district and city level. Different types of disability are 'in seeing', 'in hearing', 'in speech', 'in movement', 'mental retardness', 'mental illness', 'multiple disability' and 'any others'. For our present purpose we can take add up values, that is, total person with disability from 2001 and 2011 censuses. As the data are given for 10 year age group, mostly after age 9, we transform them to 5 year age group by using Karup King formula. Accordingly, the proportions of disability free persons are calculated for each census year under consideration. Then, we calculate the proportions of healthy (disability free) life expectancy under dynamic consideration for 2011 taking 2001 as base by the expression given earlier. A comparison can be made between the health expectancies under dynamic and usual consideration for India and its major states which are presented in table 1 for both males and females.

Table 1: Dynamic Health Expectancy at Birth with the Corresponding Health Expectancy for India and the Selected States, for both Males and Females, 2011

	Males		Females	
	DHE(at birth)	HE(at birth)	DHE(at birth)	HE(at birth)
India	68.2	63.2	72.9	66.2
Assam	63.6	60.2	69.0	62.5
Kerala	74.6	68.8	79.1	74.0
Maharashtra	73.5	66.1	75.8	70.1
Punjab	66.6	65.6	72.5	69.7
Rajasthan	63.5	62.3	68.4	65.3
Uttar Pradesh	59.3	60.3	67.7	62.8
West-Bengal	69.9	65.8	73.1	68.5

It is found from table 1 that an Indian male (female) lived on an average of 68.2 (72.9) years in a healthy state for the year 2011, when the mortality rates changes over the previous 10 years. The corresponding value under usual consideration for males was 63.2 years and that for females was 66.2 years, exhibiting a difference of almost 5.0 and 6.7 years respectively with the dynamic health expectancy. This clearly indicates that the health expectancies obtained under dynamic set up are relatively higher than those obtained under usual procedure, which could also be observed for all the selected states under consideration. Among the males of the selected states, the highest dynamic health expectancy at birth prevailed in the state Kerala with 74.6 years while Uttar Pradesh occupied the lowest position with 59.3 years. Also in the case of females, the state with highest dynamic health expectancy is Kerala (79.1 years) and the lowest is Uttar Pradesh (67.7 years). Similar situation is also observed under usual procedure, where Kerala's performance is better in terms of health expectancy at birth (68.8 years for males and 74.0 years for females) and the poorest value is exhibited in the state Uttar Pradesh with 60.3 years for males and 62.8 years for females. Although it is observed that the dynamic health expectancies were higher than the usual health expectancies for both sexes of the states, the exceptional case being the males of Uttar Pradesh where there the dynamic health expectancy is slightly lower than usual health expectancy. This may be attributable to the fact that there was an increase in mortality among older people in Uttar Pradesh over the past ten years. It is noteworthy to mention that after Kerala only the states Maharashtra (73.5 years for males and 75.8 years for females) and West Bengal (69.9 years for males and 73.1 years for females) had scored above the national level in terms of health expectancy under

dynamic approach. On the contrary, Assam, Punjab, Rajasthan and Uttar Pradesh are the states where the dynamic health expectancies at birth are more or less below the national average for both males and females.

In the above table, the variations among the males and females are clearly visible in health expectancies under both dynamic and usual consideration. The situation of females in terms of health was far better than their male counterpart in India and all the selected states. It is observed that the increase in health expectancy under dynamic scenario is higher for females than the corresponding increase in health expectancy for males. This also indicates that there has been a significant increase in life expectancy for females, where the improvements in overall mortality especially among adults have largely contributed to the increase in life expectancy at birth in females as compared to males^[7]. In addition to this, at all India level as well as disaggregated by various social groups, the proportion of disabled in the corresponding population is higher for males than females^[11], thus resulted in the higher values of dynamic health expectancies for females.

CONCLUSION

In the present paper, we try to propose an index of life expectancy incorporating mortality along with health status of a population under dynamic set up. When the proposed index was applied to the Indian data for both males and females for the year 2011 taking 2001 as base, a significant difference has been observed between the health expectancy at birth under usual and dynamic approach. The analysis showed that among the states under consideration, Kerala performs exceptionally well

in terms of health expectancy, followed by Maharashtra and West Bengal. These states have also higher differences between dynamic and usual health expectancy at birth as compared to other states. This reveals that the health situation of these states along with the life expectancy have remarkably improved over the past 10 years. Though there has been a gradual reduction in mortality in all the states of India together with an improvement of health status of the people, the states like Assam, Uttar Pradesh and Rajasthan were still lagging behind with respect to the health expectancy. Thus, we hope that the findings of the study will help the policy makers to take the necessary steps in improving the health scenario of the people to live a longer life with quality.

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IoT based E-Critical Care Unit for Patients In-Transit

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ABSTRACT

Quite often, we see patients dying due to non-availability of doctor on site or because the person on site is not authorized to administer any drug without the recommendation of a qualified doctor. Therefore, to get a doctor's prescription, either the doctor is called telephonically or the readings of the vital sign monitor, installed (if any) in ambulances, are described to the doctor by the person attending on the patient. The drawback of telephonic communication is that the doctor cannot actually see the monitor and he has to rely on the attendant for the information and further for administering the drug. In such cases, the patient may suffer due to communication errors between the doctor and the attendant. As such, there is a need for smart and secure technology which can enable quick and easy virtual access of doctor to the patient in real time. The present paper reports on the development of a fully integrated system, i.e. Smart and Portable Intensive Care Unit (SPICU) that would provide a REAL TIME ACCESS of the vital parameters of a patient to the concerned doctor at a remote location, in an easy and convenient manner i.e. on his Smart Phone. In turn, the doctor can easily monitor Vital Signs of the patient in real time and inject life-saving medicines at required time duration from a remote location. In this paper the working model of a low-cost multi-syringe infusion pump is described. The reported infusion pump would enable a doctor to deliver drug(s) from remote location. The obtained results pave a way towards the development of a low cost portable drug delivery system that can be installed in ambulances/ICU/CCU and to transfer the vital parameters of the patient to the doctor.

Keywords: Telemonitoring, cloud computing, remote health monitoring

INTRODUCTION

Remote monitoring of patients, including vital signs, audio and video is becoming necessary, especially when a patient is in transit. By transmitting the vital parameters of the patient to a doctor reduces the time for initiating treatment and allows the emergency crew to be better prepared⁽¹⁾. In recent years, there has been massive research in ICT (Information and Communication Technology), particularly in the area of Wireless Sensor Network (WSN). Low power microcontroller may create the backbone of a remote healthcare system, which enables delivering high-quality resource-optimal

care "anytime anywhere"⁽²⁾. Telecommunication system allows us to deliver audio, video, text data and both way communication at high speed data rate. In case of critical situation/emergency/road accidents emergency transportation, real time diagnosis provides precise decision making parameters during the critical minutes while transporting to the hospital. This can increase the possibilities of survival⁽³⁾. Thus, transmitting the vital parameter of the patient well on time may help out emergency staff in hospitals in a well prepared manner even before the patient gets shifted to the hospital through the ambulance. Such type of technology will help both the patient and healthcare professionals to interact as and when required. The scope of this study is to design a portable and smart drug delivery system that can transmit the vital parameters of the patient and provide the virtual presence of the doctor inside an ambulance in emergency cases.

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OVERVIEW OF EXISTING DRUG DELIVERY SYSTEM

Literature review has been conducted using the terms: Remote Drug Delivery, Telemonitoring, Distant Monitoring and Vital Sign Monitoring. Mobile phones are used to provide many facilities; therefore, multiple mobile applications are available today. Further development in this era allow mobile devices to fetch physiological and environmental parameters to enhance quality of life and remote monitoring⁽⁴⁾. It is possible now to collect, distribute and process bedside data of a patient in real time⁽⁵⁾. Immense research work has been done to transmit the patient data to a doctor in hospital or medical centre remotely. Where a doctor can monitor or analyse the patient data and take suitable action. An IoT (Internet of Things) based solution is proposed by⁽⁶⁾ using Wireless Body Area Network (WBAN) to store patient data to health care record database. Telemonitoring shows a great potential to improve the health of patients suffering from diabetes and chronic heart failure⁽⁷⁾The Health Buddy (HB). In telemonitoring cardiopulmonary diseases and chronic heart failure are the most common applications. Tele-monitoring is a remote monitoring system that includes the usage of audio, video and IoT technology to monitor the status of a patient⁽¹⁾. Apart from telemonitoring, Cloud Computing proves to be helpful for the development of Healthcare systems. It is the best solution with cheap cost, flexibility, better quality of service as well as scalability⁽⁸⁾. Moreover, advancement in the era of distributed computing, cloud computing and advanced processors allowed researchers to manage and process with unstructured data⁽⁹⁾. The key element of the present invention is bi-directional communication between doctor and patient. This study would allow a

doctor to prescribe the drug from remote location after viewing the physiological data of the patient. This is especially important for the monitoring of critically ill patients in transit or in hospitals.

MATERIALS AND METHODS

Healthcare support system is an important sector which needs to be handled carefully by the government for improving the health of the citizens. Cloud computing is found to be very effective through the continuous monitoring of the patients. Along with cloud computing architecture, wearable sensor technique as well as radio frequency identification device is also found to be efficient. Sometimes, the combination of cloud computing and wireless body area network is also efficient in monitoring of the patients⁽¹⁰⁾. The main objective of this paper is to enable health care professionals to assess vital parameters of the patient to facilitate drug delivery. The present invention provides a fully unified system to doctor with REAL TIME ACCESS to the vital parameters of a patient from a remote location. The doctor can view the selected vital parameters of the patient on his Smartphone in real time, and also can control the release of medicine to the patient from a remote location or during the transition in an easy manner. For our study, we have used a five parameter Vital Sign Monitor (VSM), which is connected with the patient, to store and display the vital signs. The working model of the proposed system is shown in the figure-1. Vital sign monitor transmits the vital parameters of the patient to the interface application hosted on Raspberry-pi microcontroller. This application further pushes the vital parameters to the cloud in JSON (Java Script Object Notation) format, which are further displayed on the mobile phone of the doctor using android application.

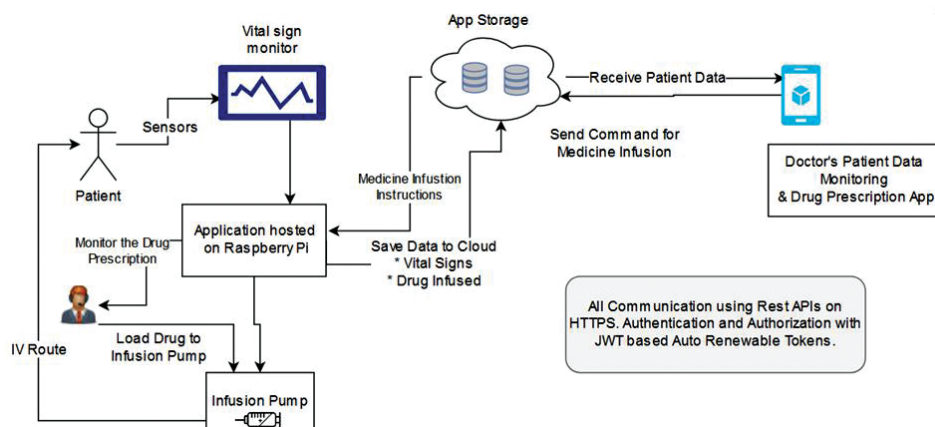


Figure 1: Working model

We have also designed an Android application which will enable doctors to receive the patient's physiological data after the successful authentications. In clinical practice it is necessary to secure the patient data to maintain the privacy. Therefore, It is essential to provide end to end security, confidentiality and integrity of patient data while the information is processed, stored and shared ⁽¹¹⁾⁽¹²⁾⁽ⁱⁱ⁾. The authentication and authorization are based upon JWT (JSON Web Token) auto renewable tokens. After seeing the vital parameters of the patient the doctor can suggest and prescribe the drug to the medical staff in the ambulance. Information like syringe number, the amount of the drug to be infused, syringe motion is sent in the form of a secure packet to the cloud as shown in figure-2. This packet is further received by the interface.

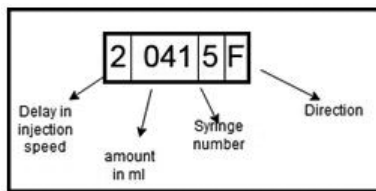


Figure 2: Packet information for cloud

The operator receives a signal and fills the syringe as per the drug prescribed by the doctor and the interface application sends a command to the infusion pump. The three layer architecture for the patient monitoring is shown in figure-3. The middle layer consists of two applications (user interface and android), which interacts with the hardware and cloud layer respectively. The user interface is hosted on the raspberry pi controller which acts as a middleware between top and bottom layer.

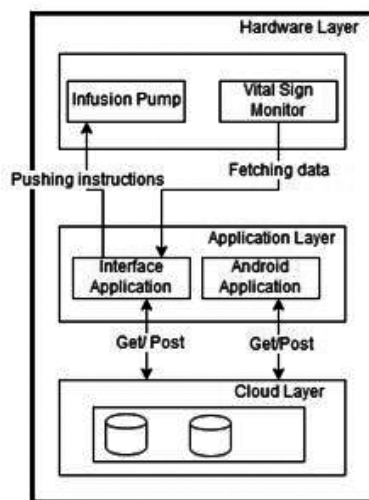


Figure 3: Three layer architecture model for patient monitoring

FINDINGS

Patient safety is one of the important challenges which is faced by healthcare professionals worldwide. The medication errors are increasing due to wrong infusion/drug, workload of the nursing staff, lack of mathematical skills/ pharmacological knowledge ⁽¹³⁾⁽¹⁴⁾⁽¹⁵⁾⁽¹⁶⁾. Therefore, with a computer controlled drug delivery system we can reduce the adverse effects due to drug. As shown if figure-3 user interacts with the application layer. At the application layer we have developed user interface in python programming language to fetch the vital parameters of the patients from the sensors connected with the vital sign monitor. For our study, we have used data set provided by ⁽¹⁷⁾, who provided vital sign data recorded from patients undergoing anaesthesia at the Royal Adelaide Hospital. We have also developed an android application which will help the doctors to fetch the patient data using an android phone. The sensors are installed in the infusion pump to detect the status of a syringe (installed, empty and filled). Figure-4 shows the mechanical control of infusion pump that uses a lead screw to position the plunger and to manage the liquid movement. This whole process is controlled by a stepper motor which moves the syringe plunger. Microcontroller attached with the stepper motor generates the pulses to control the direction of the motor. Formula to generate the pulses is derived to control the speed of motor.

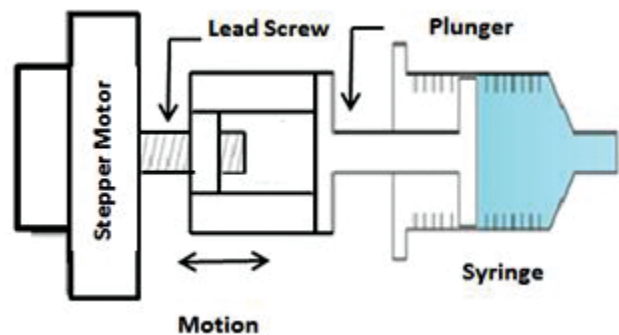


Figure 4: Mechanical Control of Infusion Pump

Pulse Generation Formula: To perform the whole experiment different parameters are taken into consideration. Supposing f is the frequency, T_d is the time delay for the generation of frequency, T_s is the time taken, q is the quantity of drug to be dispensed, x is taken as a constant. Since frequency cannot be controlled so we control T_d . As T_d is inversely proportional to frequency so $f \propto \frac{1}{T_d}$

Therefore, as T_d increased the speed decreases, this helps in maintaining the precision of the device.

$$T_d \propto T_s$$

$$T_d \propto \frac{1}{q}$$

$$T_d = \frac{T_s}{(q * x)}$$

$$x = \frac{T_s}{T_d * q}$$

Therefore, from the above calculation value of constant x can be determined, i.e. $x = .00324$

$$T_d = \frac{T_s}{q * 0.00324}$$

Thus, in order to make the device work properly the quantity of the drug to be delivered and the time for drug delivery should be provided to the system which will produce time delay and in turn provides pulses to the controller. The syringe sensors, which are installed with the pump help to detect the status of a syringe. The syringe sensor reads the status of syringe before the start of infusion e.g. if the syringe is not installed by the user, it will not start the infusion. The syringe sensor available at the pump can also detect if the syringe is empty and thus can immediately stop the infusion. A switch is also installed on the infusion pump which is to be pressed by the operator if command for the infusion is received at the pump.

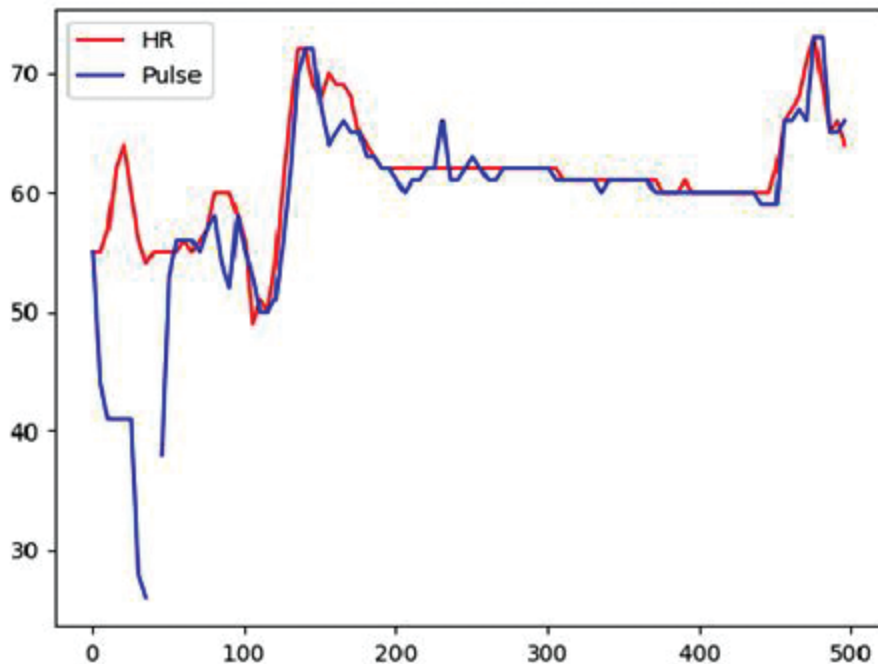


Figure 5: Vital sign transmission of the Smart Phone

CONCLUSION

The present invention discloses a cloud computing based interface that involves a remote access diagnostic unit to monitor the patient from a remote location. With respect to the remote monitoring of a patient from the remote location, many researchers have demonstrated the transmission of the physiological data of the patient in real time. The proposed model is not only helping a doctor to view the vital parameters, but also facilitates a doctor to prescribe name, rate and amount of the drug. Portability is one of the important features of the model which enables to install the system from one

place to another place. Therefore, it can be installed in ambulances so as to provide virtual presence of the doctor inside the ambulance.

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Conflict of Interest: There are no conflicts of interests.

Ethical Clearance: This project is sanctioned by Millenium Alliance, Govt. of India, USAID, UKAID, World Bank. Testing phase is undergoing.

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The Influence of Moderate Intensity Exercises on Fatigue and Quality of Life in Cancer Patients Undergoing Chemotherapy

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ABSTRACT

Background: Fatigue and decrease in quality of life are the common symptoms experienced by the patients going undergoing chemotherapy. The role of exercises and individuals adherence to exercise helps in reducing fatigue, improves quality of life and reduces exertion. So the following study was carried out.

Objectives:

1. To determine the effect of moderate intensity exercises on fatigue in cancer patients undergoing chemotherapy
2. To determine the effect of moderate intensity exercises on quality of life in cancer patients undergoing chemotherapy.
3. To determine the effect of moderate intensity exercise on perceived exertion in cancer patients undergoing chemotherapy.

Method: 60 subjects having cancer which were going under chemotherapy are selected. The pre and post assessment is taken by using by using VAFS, PFS, BORG SCALE and SF-36 score. They were divided into two groups i.e, Graoup A and Group B, group A was given moderate intensity exercises and other group i.e B group was control group.

Result: Moderate intensity exercises i.e, Group A showed significant improvement in level of fatigue and quality of life when compared to the control treatment.

Conclusion: Moderate intensity exercises shows significant effect on level of fatigue, quality of life and perceived exertion

Keywords: Cancer, Chemotherapy, moderate intensity exercises, fatigue, quality of life.

INTRODUCTION

Any treatment of cancer such as surgery, chemotherapy, radiotherapy, hormone replacement therapies and targeted therapies all of them have many adverse effects¹ such as pain, decreased appetite, ulcers in mouth, hair-loss, nausea and vomiting, shortness of

breath and fatigue² and it also leads to loss of sleep, altered hormonal level in breast cancer individual's depression anxiety ³. Fatigue is the first and most commonly experienced symptom by the individual⁵. Around 80%-100% of cancer individuals experiences fatigue symptom⁵. National Comprehensive Cancer Network defines cancer related fatigue as "a persistent, subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning"⁶. And treatment like radiotherapy and chemotherapy worsens the feeling of fatigue. And later this fatigue symptom may lead to exhaustion and complete loss of energy⁴.

Exercise is important in preventing cancer and also gives impact on individuals with cancer. Every

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individual consistently report improvement in quality of life with the help exercise. And the drugs which are used for fatigue in cancer patients have not given good results⁷ Li Tian et.al studied the effect of aerobic on cancer related fatigue, and aerobic exercises are the exercise of low to moderate intensity exercises which, results showed that aerobic exercises were effective in the patient with cancer related fatigue⁸. In cancer individuals there is loss of weight around 25% and 75% loss of skeletal mass⁹. It is also suggested that resistance training in cancer individuals help in improving muscle strength and it can be also used to overcome the other adverse effect of cancer treatment⁹. Exercise can also add beneficial effect on mental health. It is also suggested that exercises has marked effect in reducing depression and anxiety and to improve the mental health¹⁰ There are very few studies which had seen the effect of exercises on various types of cancer¹¹ So this study was carried out

MATERIALS AND METHODOLOGY AND PROCEDURE

The inclusion criteria was both male and female of 20-55 years of age group having cancer and which

1. VAFS

Table 1: Comparison of pre and post VAFS score within the group

	PRE	POST	P VALUE	T VALUE	INFERENCE
GROUP A	7.33 ± 1.32	3.40 ± 1.35	P < 0.0001	14.750	Extremely significant
GROUP B	7.73 ± 1.20	6.66 ± 1.64	P < 0.0001	4.750	Extremely significant

In the Group A, the P value by paired t-test (14.750) was found to be <0.0001 which was extremely significant. In Group B, the P value by paired t-test found to be <0.0001 and t value which was 4.750 extremely significant.

2. LEVEL OF FATIGUE BY PFS:

Table No.2: Comparison of pre and post PFS score within the group

	PRE	POST	P VALUE	T VALUE	INFERENCE
GROUP A	7.62 ± 0.72	4.18 ± 0.62	P < 0.0001	24.087	Extremely significant
GROUP B	7.81 ± 0.67	7.22 ± 0.74	P < 0.0003	4.169	Extremely significant

In the Group A, The P value by paired t-test was found to be <0.0001 and t value was 12.034 which was extremely significant. In Group B, the P value by paired t test was found to be <0.0003 and t value was 4.169 which was extremely significant. ±

3. BORG SCALE

Table No. 3: Comparison of pre and post BORG SCALE score within the group

	PRE INTERVENTION	POST INTERVENTION	P VALUE	T VALUE	INFERENCE
GROUP A	13.26 ± 1.87	6.76 ± 1.04	P < 0.0001	18.32	Extremely significant
GROUP B	12.2 ± 2.07	8.16 ± 0.98	P < 0.0001	5.352	Extremely significant

have gone under chemotherapy and who were willing to participate was taken. Patients with psychological illness, oral cancer and traumatic injuries were excluded.

The control sample of 30 subjects was studied in this experimental study. These subjects were divided into 2 groups. Group A was experimental group with the mean age of 41.93±8.50 while the group B was an control group with a mean age of 44.96±7.21. Group A had a moderate intensity exercises protocol like warm up exercises followed by moderate intensity exercises i.e, static cycle, brisk walking and stair climbing which was followed by cool down exercises. The group B was a control group. They were given treatment of breathing exercises, energy conservative techniques and slow walking.

The pre treatment and post treatment assessment was done by outcome measures like VAFS, PFS, Borg scale and SF-36 questioner.

Data analysis -The statistical analysis of VAFS, PFS, Borg scale and SF-36 scores was done by repeated paired t test and unpaired t test.

In Group A, the P value by paired t test was found to be <0.0001 and t value was 18.32 which was extremely significant. In Group B, the P value by paired t-test found to be <0.0001 and t value was 5.352 which is extremely significant.

4. SF-36

Table No. 4: Comparison of pre and post SF 36 score within the group

	PRE INTERVENTION	POST INTERVENTION	P VALUE	T VALUE	INFERENCE
GROUP A	23.18 ± 4.32	75.16 ± 7.16	P <0.0001	59.72	Extremely significant
GROUP B	23.07 ± 4.04	43.68 ± 6.15	P < 0.0001	17.13	Extremely significant

In Group A, the P value by paired t test was found to be <0.0001 and t value was 59.72 which was extremely significant. In Group B, the P value by paired t-test found to be <0.0001 and t value was 17.13 which is extremely significant.

RESULT

Moderate intensity exercises i.e, Group A showed significant improvement in level of fatigue and quality of life when compared to the control treatment.

DISCUSSION

Moderate intensity exercises has positive affect on the individual in all the aspects. The purpose of present study was to find out effect of Moderate intensity exercises on individuals with cancer. The feasible training program aims to decrease the fatigue and improve quality of life.

Cancer individuals have low physical endurance, which further reduces physical activity and thus this affects muscle and cardiovascular function and it further leads to fatigue. And this cycle of fatigue can only be broken down by continuous physical activity or adherence to physical activity. And it is also stated that high intensity exercises suppresses immunity and give high chance of infection. Their is no ideal mode of exercise available for cancer individual¹². It is also said that Supervised exercises improves muscle mass, function and quality of life in individuals with cancer, and their is no proper exercises protocol for cancer adults¹³.

So in this study low intensity and moderate intensity exercises was taken.

According to various studies it was analysed that moderate intensity exercises may help in improving quality of life and fatigue in various immunesuppressed patients. This study aims to reduce fatigue, reduce

exertion and improve quality of life of subjects with immunspression and cancer . In this study treatment protocol was given for 12 weeks.

Advantages of Moderate intensity exercises–

- It helps to improve cardio vascular function.
- It helps in improving physical as well as mental health
- It improve quality of life

In this study, 60 subjects had participated who were diagnosed with Cancer and underwent treatment (Chemotherapy or radiotherapy) out of which 30 were male subjects and 30 were female subjects. The mean age of subjects included in Group A was 41.93 and in Group B was 44.96 .

Subjects were analysed and were divided into two groups according to random sampling method. 30 subjects were included in Group A and were received warm up exercises with moderate intensity exercises and followed by cool down exercises. An education and home exercise booklet was also provided for the reference. The treatment protocol was continued for 12 weeks.

Pre treatment outcome measures for fatigue, quality of life and rate of perceived exertion was done with VAFS,PFS, SF-36 and Borg scale. The specific treatment protocol was followed for 12 weeks.

Intra group comparison (within group) was analysed by paired t-test for VAFS, PFS, BORG SCALE and SF-36 score. This showed that there was extremely significant difference of Group A VAFS score with (P<0.0001). PFS

scores was also extremely significant with ($P < 0.0001$). Borg scale and SF-36 score shows extremely significant difference with ($P < 0.0001$ and $P < 0.0001$ respectively).

Similarly, In Group B, there was extremely significant difference of VAFS with ($P < 0.0001$) respectively. PFS score was also extremely significant with ($P < 0.0003$). SF-36 score was also extremely significant with ($P < 0.0001$). Borg scale score was also extremely significant with ($P < 0.0001$).

Inter group comparison (between groups) was analysed statistically using unpaired t-test. This shows that pre intervention VAFS was not statistically significant with ($P = 0.2250$). Pre intervention PFS was not statistically significant with ($P = 0.2876$). Borg scale score with ($P > 0.9999$) was not significant and SF 36 Score was also not significant with ($P = 0.9249$). While comparing the post intervention values of VAFS on rest was extremely significant with ($P < 0.0001$). PFS was also statistically significant with ($P < 0.0001$). SF 36 score was statistically very significant with ($P < 0.0001$). and borg scale was also statistically significant with ($P < 0.0001$).

In this study, an attempt was made to reduce fatigue and exertion and improve quality of life.

Improvement of subject on week 12 i.e. after the treatment program gets over.

- The subject could perform exercise independently
- There could be improvement in quality of life of subjects with Cancer or who underwent chemotherapy/radiotherapy.
- There was reduction of symptoms in both the group but in group A there was marked reduction on symptoms were seen.

In conclusion, the result of current study shows that Moderate intensity exercises is significant. Further studies can be done for longer duration of treatment protocol in order to determine the long term effect of this program.

Moderate intensity is more help full in cancer individuals because people with cancer have reduced physical activity. But exercises helps in improving physiological functioning, it helps in maintain stress on musculoskeletal and cardiovascular function to perform

better. And thus this adherence to exercises adapt them to physical activity¹³.

CONCLUSION

Different approaches are used in treating fatigue in cancer individuals but this study concluded that the moderate intensity exercises was more effective reducing fatigue, perceived exertion and improves quality of life.

Conflicts of Interest: This study can be carried out with more various forms of exercises and large sample size can also be taken into consideration.

Ethical Clearance: Ethical clearance was taken from institutional committee of Krishna institute of medical science, deemed University, Karad.

Source of Funding: Source of funding is Krishna institute of medical sciences deemed University, Karad.

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The Effectiveness Planned Educational Intervention on Knowledge and Skills in Home Care Management among Care Givers of Patients with Spinal Cord Injury

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ABSTRACT

Introduction: The effects of Spinal Cord Injury are variable and may be permanent; there is currently no cure, emphasizing the need for effective management to prevent potential complications. A Pre experimental study was conducted on the effectiveness of planned educational intervention on knowledge and skills in home care management among care givers of patients with spinal cord injury in selected wards, AIMS, Kochi.

Purpose: The Objectives of the study were to 1) compare the knowledge of care givers of patients with spinal cord injury before and after the administration of a planned educational intervention, 2) assess the skill of care givers of patients with spinal cord injury after the administration of a planned educational intervention, 3) find the association between the knowledge and skills in home care management among care givers of patients with spinal cord injury and selected demographic variables.

Materials and Method: The research approach was quantitative research approach and the research design was pre experimental one group before-after design. The study was done on 30 caregivers of patients with Spinal Cord Injury in selected wards, AIMS, Kochi. The sampling technique used was convenience sampling.

Results: The mean pretest knowledge score of care givers of patients with spinal cord injury was 12.20, while mean post test knowledge score was 30. A significant improvement in the post test knowledge scores were noted at 0.001 % level of significance($t=34.61$). Post test skill score shows 90% of subjects achieved a grade of good in areas like mouth care, skin care, NG tube feeding, and ROM exercise. 93.3% of subjects achieved grade of good in area like catheter care.

Conclusion: The study concludes that the planned educational intervention on home care management were effective in improving knowledge and skills of caregivers of patients with spinal cord injury.

Keywords: *Spinal cord injury, Care givers, Planned educational Intervention*

INTRODUCTION

Spinal cord injury is a condition that affects the independence of an individual and makes him dependent on others. The world wide prevalence of spinal cord injury was 223-755 per million and world wide incidence

of spinal cord injury was 60-83 per million.² In India, approximately 15,00,000 people live with spinal cord injury. Every year, 10,000 new cases add to this group of individuals. In Kerala, around 18,000 persons suffer from spinal cord injury. Majority of them (82%) were males in the age group of 16-30 years.³ The causes of spinal cord injuries (SCI) include motor vehicle accidents (44%), acts of violence (24%), falls (22%), sports (two-thirds of these are from diving accidents) (8%), and others (2%).⁴

As a result of recent advances in medical technology, persons surviving a spinal cord injury (SCI) were living longer lives and often require varied degrees of assistance over their life span.⁵ In response,

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family members often become the primary sources of assistance for various activities of daily living, such as feeding, dressing, transfers, and bowel and elimination needs.⁶ However, caregivers enter into this new role without formal preparation or training.⁷

Considerable research has been conducted on the role of caregivers for older adults with chronic illness, for younger adults and children with brain injury, and for children with other chronic conditions. However, significantly less research is available on this role with regard to Spinal Cord Injury (SCI), which was the focus of this study. The cases of neurotrauma potentially involve the need for very long-term support provision.^{8,9} In many cases, spinal cord injuries require substantial physical therapy and rehabilitation, especially if the patient's injury interferes with activities of daily life¹⁴. Lower urinary tract symptoms in neurological disease may be at variance with the pattern expected based upon level of neurological lesion¹⁵.

MATERIALS AND METHOD

Research Design: The research design used for the study was pre experimental one group pretest- post test design (01 X 02). This design was adopted for the study in order to avoid contamination between groups and to overcome the sample scarcity.

Sample Size Estimation: Sample size was calculated by the formula 'Sample size for paired t test' at 95% confidence and 80% power. The minimum sample size obtained was 18 and for increasing the generalizability it was finalized as 30.

Study Population: Care givers of patients with spinal cord injury who are admitted in the selected wards of AIMS Hospital, Kochi from November 2012 were considered for the study.

Data Collection Instruments and Techniques

Development

Tool I

Section A: Sociodemographic data of the caregiver. It contains information related to caregivers such as age, religion, education, occupation, socioeconomic status, marital status and relationship to the client.

Section B: clinical data of the client which is filled by the researcher.

Section C: Structured questionnaire to assess the knowledge on home care management of care givers of patients with spinal cord injury under 6 dimensions includes general questions related to spinal cord injury and its self care needs, oral care, skin care, nasogastric tube feeding, catheter care and ROM exercises with a total of 35 items. The data was collected by self administered questionnaire.

Data Collection Procedures: With prior permission for conducting the study, investigator selected the sample based on sample selection criteria by convenience sampling technique. The investigator established a rapport with the caregivers and obtained informed consent. On Day 1, the demographic data and knowledge on home management of self care needs of the patients were assessed using a structured questionnaire. The tool consisted of 3 parts, part I - demographic data, part II - clinical data and part III - knowledge questionnaire. The caregivers were asked to put a tick mark against the correct answer and the questionnaire was collected back after 40 minutes. On Day 2 and 3, the care givers were subjected to individualized demonstration and return demonstration of procedures such as mouth care, skin care, Ryle's tube feeding, catheter care and ROM exercise for 1-2 hour daily. From Day 4 to 8, the care givers were doing the learned procedures, were assessed with the help of log book. On the 10th and 11th day post test assessment was done on skills and after that post test knowledge was assessed.

Data Analysis: Demographic data was analyzed using frequencies, percentage, mean, and standard deviation. Significance of the difference between pre test and post test scores was tested by Paired 't' test. Association between knowledge as well as skill score of care givers of patients with spinal cord injury and selected demographic variables was done using oneway ANOVA test.

FINDINGS

Table 1: Demographic characteristics of subjects n = 30

	Sample Characteristics	Frequency	Percentage
1.	Age in years		
	21-30	13	43.3
	31-40	6	20.0
	41-50	8	26.7
	51-60	3	10

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2.	Sex of the care giver		
	Male	3	10
	Female	27	90
3.	Educational status of the care giver		
	Primary	9	30
	Secondary	13	43.3
	Higher secondary	5	16.7
	Graduate	3	10.00

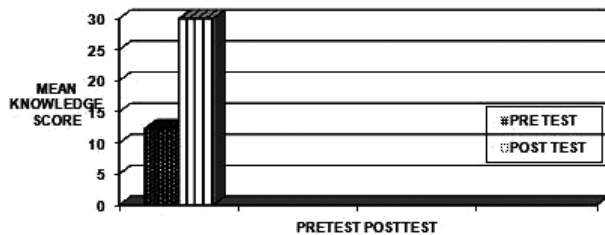


Figure 1: The mean knowledge score of subjects before and after the planned educational intervention

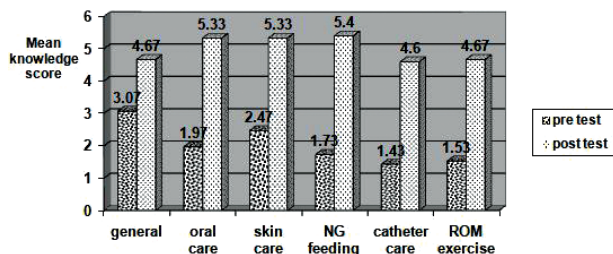


Figure 2: bar diagram showing frequency and percentage of subjects according to knowledge scores

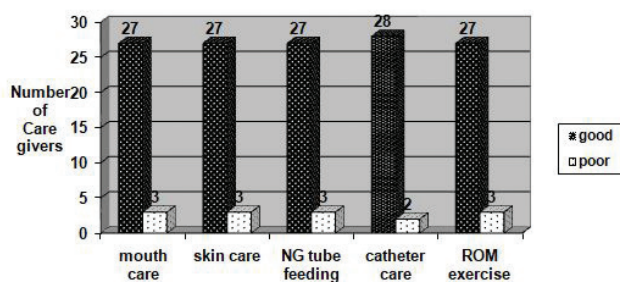


Figure 3: Bar diagram showing frequency of grades obtained by subjects in post skill assessment

The mean and standard deviation of knowledge scores was calculated before and after the administration of planned educational intervention and the mean difference was found. From the present study, it was evident that there was improvement in the knowledge of care givers of patients with spinal cord injury after the administration of a planned rehabilitation intervention

on home management of self care needs. The results suggested that the planned educational intervention on home management of self care needs was highly effective on improving the knowledge of care givers of patients with spinal cord injury.

Among the 30 subjects, it was statistically found that, in the pre test to assess knowledge, 24 (80%) subjects were with poor knowledge, 6 (20%) subjects were with good knowledge. In the post test all 30(100%) subjects were having excellent score.

A similar study conducted by Rundquist J¹⁰ et al (2011) on Nursing bedside education and care management time during inpatient spinal cord injury rehabilitation with the help of practice-based evidence (PBE) research methodology design. Six hundred patients with traumatic SCI were enrolled at six rehabilitation centers such as Craig Hospital, Englewood, CO; Shepherd Center, Atlanta, GA; Rehabilitation Institute of Chicago, Chicago, IL; Carolinas Rehabilitation, Charlotte, NC; The Mount Sinai Medical Center, New York, NY; and National Rehabilitation Hospital, Washington, DC. They depicted the importance of each educational topic. Bladder management was the education topic that comprised the largest proportion of time (17% of total time), next were bowel management and skin (14% each), and medication and pain education (13% each). About 50% of all care management time in all injury groups was spent on psychosocial support of the patient and/or family. In this study they didn't mention the outcome of teaching.

A comparative study was conducted by Chen HY¹¹ et al in 2004 for the purpose of investigating rehabilitation nurses' care for patients with spinal cord injury. 110 registered nurses selected from two hospitals of UK and two hospitals of Taiwan were the samples. Results show a high percentage of Taiwan nurses (88.9%) promote self care of patients with spinal cord injury through education whereas only 72.5% of UK nurses promote self care. They concentrated on enhancing self esteem.

It was observed that findings of the previous studies run parallel to the present study.

By analyzing mean and standard deviation of skill score computed after the planned educational intervention, it is clear that the score achieved by the subjects are not deviated too much. That is the subjects are able to do the procedures efficiently and they can render an effective home care management for their loved ones.

One group pre- and post-test design study conducted by Yuen HK¹² with the objectives to examine both the short- and long-term effects of an oral home telecare program on improving gingival health among 8 adults with tetraplegia. The oral home telecare program was given using personal computer-based videoconferencing between each participant and an occupational therapist. Training was conducted on an average of five 15-30 min sessions across 3 months. During these training sessions, supervised practice of oral hygiene, and provision of immediate corrective feedback and positive reinforcement in the use of adaptive oral hygiene devices was emphasized. Gingival health assessment using the Löe-Silness gingival index (LSGI) was conducted at baseline, 6 and 12 months. Results showed statistically significant differences (that is, improvement with less gingival inflammation) in their LSGI scores ($z=2.18$, $P=.03$). From baseline to 12 months, participants also showed a statistically significant difference (that is, improvement, $z=2.03$; $P=0.04$) in their LSGI scores.

It was observed that findings of the previous studies run parallel to the present study.

Influence of sex, age, education and occupation in attaining knowledge and skill after the administration of planned rehabilitation intervention were analyzed. The knowledge attained after the administration of planned rehabilitation intervention among the care givers based on age groups found to be non significant at $p<0.05$ levels which indicated that there was no significant difference in the knowledge attained by the different subjects based on the age.

A cross sectional study conducted by Naveen SR¹³ in 2007 for the purpose of assessing quality of life and burden of caregivers of patients with spinal cord injury. In this the caregiver's age distribution shows 10% of caregivers are in the age group 'up to 20', 18% are in the age group 21-30, 36% are in the age group 31-40, 28% are in the age group 41-50, 8% are in the age group 51-60. The caregiver's sex distribution shows 38% of the care givers were male and 62% of the care givers were females. The caregiver's educational status shows 30% were illiterate, 52% were having secondary education, 8% were having higher secondary education and 10% were having education status of degree and above. The caregiver's relationship with patient shows 42% of caregivers were wives, 14% were mothers, 2% were daughters. In the present study out of 30 subjects 13

(43.30 %) were in the age group of 21-30 years. Out of 30 subjects 13 (43.33%) were having educational status up to secondary classes. The relationship of care givers with the patients shows that 20 (66.67%) were wives. The remaining 2 (6.7%) were daughters, 5 (16.7%) were mothers, 3(10.00%) were others.

Conflict of Interest: No conflicts among authors

Source of Funding: Funding is by self.

Ethical Clearance: Ethical clearance was obtained from the institutional ethical committee.

CONCLUSION

In summary, the planned educational intervention on home care management was effective in improving the knowledge and skill of the care givers of patients with spinal cord injury. Hence this effective planned educational intervention can be implemented as a way of improving the knowledge, skill, and quality of life of the care givers of patients with spinal cord injury as well as patients with spinal cord injury after discharge.

This study will direct and encourage the staff nurses as well as the student nurses to concentrate more on care and education of care givers and patients with spinal cord injury. The study findings can be published in professional journal to assist in disseminating the findings for further testing as well as for possible implementation.

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Microbiological Evaluation of Polytetrafluoroethylene (Ptfе) Tape, Cellulose Sponge and Cotton as Spacer Materials Combined with Intracanal Medicament- An in Vitro Study

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ABSTRACT

Aim: The aim of this study was to evaluate the extent of microbial leakage of cotton, cellulose sponge and polytetrafluoroethylene tape (PTFE) tape used as spacers in an in vitro microbiologic model when impregnated with calcium hydroxide and iodoform based medicaments.

Materials and Method: The study consisted of three groups of spacers: Group I: Cotton, Group II: Cellulose sponge and Group III: PTFE tape. The groups were further subdivided into 3 groups where spacers were used alone, impregnated with calcium hydroxide medicament and impregnated with iodoform based medicament. Forty five intact mandibular human premolars were used to check the access cavity bacterial contamination. The teeth were disinfected, pulpal remnants removed, and access cavities were swabbed with sterile cotton. Spacers were placed and the teeth were inoculated with *Staphylococcus aureus* bacteria in nutrient broth till cemento-enamel junction. The access cavities were checked for contamination after 7 days by swabbing with sterile cotton and streaking the agar plates with the same. Bacterial colony formation was observed in all groups.

Results: 82% of samples in the cotton spacer group showed colonies $> 10^5$ CFU/ml, while those impregnated with medicament showed colonies $< 10^2$ CFU/ml.

Conclusion: According to the present study, the effectiveness of the three materials when used with medicament is best in case of cotton followed by cellulose sponge.

While in test groups where no medicament was used, PTFE tape was the most effective and cotton showed least potential against preventing bacterial uptake.

Clinical significance: Microbes cause periapical inflammation entering coronally during endodontic treatment. Hence an efficient provisional restoration and an interim spacer material is of paramount importance.

Keywords: cotton, PTFE, spacer, endodontics, microbial leakage, provisional restoration, medicaments

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INTRODUCTION

The success of endodontic therapy between the appointments is often compromised due to coronal leakage through the provisional restorations. Previous studies have demonstrated that the temporary restorative material thickness is a crucial factor in regulating the leakage from oral cavity. Webber et al demonstrated that a minimum thickness of 3.5 mm of Cavit is essential to ensure an adequate seal.¹ In addition to the restorative

material used, the type of spacer used beneath the restoration may also be responsible for the microbial leakage. Study by Vail and Steffel have found that no matter how meticulously the cotton spacers are placed, the fibers may still connect the access chambers with the oral cavity.² Traditionally, a layer of cotton in the access chamber is used before temporization by clinicians. It facilitates easy removal of the restoration without damaging the pulpal floor and helps in locating canal orifices.

Newcomb et al reported that the presence of cotton under a temporary restoration provides an opportunity for cotton fibers to be incorporated within the filling leading to bacterial ingress.³ The disadvantages due to the wicking nature of cotton have led to the use of other materials like foam pellets³ and PTFE tape⁴ as spacers by practitioners. Study by Paranjpe et al confirmed the better performance of PTFE tape than cotton when exposed to contamination.⁵ An ease of use, visibility, easy placement and removal, inorganic nature, inertness along with the cost effectiveness and availability are the ideal properties of a spacer.⁵ Polytetrafluoroethylene tape or Teflon or Plumber's tape meets these criteria. Its ribbon like, non spongy nature makes it easy to compress, thus reducing the potential for bacterial uptake.

Cellulose sponge made from cellulose wood fibers has also been advocated as spacer material. The use of intracanal medicaments like Calcium hydroxide aid in removal of bacteria, their by products and pulpal remnants from infected root canals.⁶ Addition of iodine gives them better reactivity by precipitating proteins and oxidizing essential enzymes.⁷ Therefore, the aim of this study was to evaluate the microbial contamination of cotton, PTFE tape and cellulose sponge as spacer materials combined with calcium hydroxide and iodoform based medicaments.

MATERIALS AND METHOD

Study Center: The study was conducted at the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences and Department of Microbiology, K.S. Hegde Medical Academy, Nitte, Mangaluru.

Inclusion and Exclusion Criteria: Forty five human mandibular premolars with intact crowns were used for this study. Previously restored teeth were excluded as

they could permit marginal contamination into the access chambers. Teeth with fracture lines were eliminated to prevent bacterial penetration through fracture margins.

Procedure: Tooth surfaces were disinfected with 3 % hydrogen peroxide. A new sterile Endo Access 2 bur (Dentsply Maillefer) was used and access cavity prepared under rubber dam isolation.⁸

After locating the canal orifices, thorough irrigation of the pulp chambers with 5.25% sodium hypochlorite was carried out followed by irrigation with saline to remove the debris and pulpal remnants. The teeth were autoclaved and pulp chambers swabbed with sterile cotton pellets to eliminate all signs of bacterial contamination that could potentially affect the microbial analysis. The spacer materials, with and without medicament impregnation were divided into groups. Three groups of spacers i.e. cotton, PTFE tape and sponge were formed which were further subdivided into spacers used alone, with calcium hydroxide medicament and with iodoform based medicament.

TABLE 1: Different Spacer groups

GROUPS	SPACER MATERIALS
Group I Cotton as spacer	
I A	Cotton
II B	Cotton impregnated with calcium hydroxide
III C	Cotton impregnated with iodoform based medicament
Group II Cellulose sponge as spacer	
II A	Sponge
II B	Sponge impregnated with calcium hydroxide
II C	Sponge impregnated with iodoform based medicament
Group III PTFE Tape as spacer	
III A	PTFE Tape
III B	PTFE Tape impregnated with calcium hydroxide
III C	PTFE Tape impregnated with iodoform based medicament

The spacer materials were sterilized prior to insertion and the length of the PTFE tape was standardized to approximately 2 inches. After placement of spacers, a periodontal probe was used to measure the depth of the access chamber. This was done to ensure that it

could accommodate a minimum provisional restorative material thickness of 3.5 – 4 mm (Cavit).⁹ Nutrient broth was autoclaved and transferred to 2 ml Eppendorf tubes. The tubes were then incubated at 37 degrees Celsius for 24 hours, followed by bacterial inoculation of broth containing specimens from all spacer groups. The bacterial inoculant used was *Staphylococcus aureus*, a commensal bacterium in the human oral flora¹⁰ which has been used previously in leakage studies.¹¹ Following the restoration, the tooth samples till the cemento-enamel junction were kept exposed in the broth for 7 days. After a week, the external tooth surfaces were disinfected with 70% ethanol, 5.25% sodium hypochlorite and sterile saline. The provisional restoration and spacers were removed. Access cavities were swabbed with sterile cotton pellets, which were then streaked on nutrient agar plates. The agar plates were incubated at 37 degrees Celsius for 48 hours and observed. The bacterial colony growth, measured as colony forming units, were counted and recorded by the microbiologist who was blinded to the study groups and procedures.

RESULTS

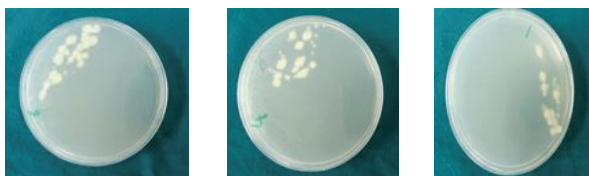
The data obtained were statistically analyzed using ANOVA test and Post hoc Tukey's and Post hoc Scheffe's test. 82% of samples in Group IA (Cotton) showed colonies $> 10^5$ CFU/ml, while those impregnated with calcium hydroxide and iodoform based medicament showed colonies $< 10^2$ CFU/ml. (Figure 1)



IA IB IC

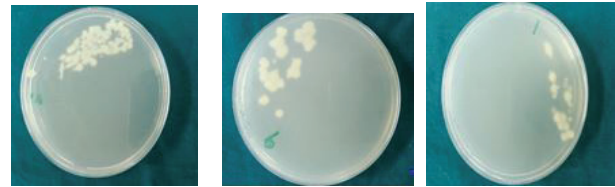
Figure 1: Total viable count seen when cotton used as spacer

Also samples in Group I (Cotton) and Group II (Sponge) showed significant difference in the bacterial colony load. (Figure 2) 60 % samples in the PTFE group showed bacterial colonies $> 10^4$ CFU/ml. (Figure 3)



IIA IIB IIC

Figure 2: Total viable count seen when Cellulose sponge used as spacer



IIIA IIIB IIIC

Figure 3: Total viable count seen when PTFE Tape used as spacer

PTFE spacers when impregnated with medicaments had a colony count in the range of 10^3 CFU/ml. (Table 2)

Table 2: Graph vs Colony Count cross tabulation

Colony Count (CFU/ml)				
	1-10 ³	10 ³	10 ⁴	> 10 ⁴
Group I (Cotton as spacer)				
Cotton	0	1	0	4
Cotton + Calcium Hydroxide	3	2	0	0
Cotton + Iodoform	4	1	0	0
Group II (Cellulose sponge as spacer)				
Sponge	0	1	1	3
Sponge + Calcium Hydroxide	1	3	1	0
Sponge+ Iodoform	0	4	1	0
Group III (PTFE tape as spacer)				
PTFE Tape	0	1	3	1
PTFE Tape + Calcium hydroxide	0	4	1	0
PTFE + Iodoform	1	3	1	0

DISCUSSION

Most endodontists use cotton pellets as spacers above the obturated canals and beneath the temporary restoration.² While this is clinically convenient, the fibrous nature of cotton promotes bacterial uptake in the access chamber.³

PTFE tape when compressed forms a firm platform which could support the overlying restoration and reduce microbial leakage. Although the use of cellulose sponge was effective in impregnating the medicament, it decreased the thickness of temporary filling as a result of more space consumption in access chamber. Similar results were found by Newcomb et al where the use of cotton as spacers resulted in thin restorations, thus

a poorer seal.³ The tooth samples were temporized by Cavit as it is used by endodontists routinely and previous studies have shown it to give better results than other materials.^{9,12,13} The microbial evaluation showed that spacers were positive for contamination after 7 days. The 7 day time point was selected based on previous *in vivo* and *in vitro* studies.^{1,14} The bacterial growth on agar plates showed positive microbial growth in the access chambers. The present study showed that cotton pellets when impregnated with medicament were less favorable to the growth of bacteria. PTFE tape, when impregnated, did not absorb the medicament as efficiently due to its polymeric, non fibrous nature. There was a significant difference between Group I (Cotton) and Group II (Sponge). When saturated with medicaments more adequately, sponge may serve as a better spacer material than PTFE. The use of cellulose sponge has been recommended by some clinicians. However, provisional restorative materials when placed over spongy spacer materials may be more prone to breakdown from masticatory forces. Also, the present study demonstrated that bacterial colony formation was less consistent with iodoform based medicament than with calcium hydroxide.

Another finding of this study is the easy handling characteristics of the PTFE tape and sponge compared to cotton. PTFE has a low static and kinetic coefficient of friction¹⁵, ensuring a 'non sticky' application and removal without leaving behind residues in access chamber. No simulation of occlusion forces and absence of thermocycling¹⁶ however, are the limitations for this study. Further *in vivo* studies may be required to affirm these results.

CONCLUSION

When impregnated with medicament, cotton absorbed the maximum and was highly efficient in preventing uptake of bacteria followed by cellulose sponge. PTFE tape due to its polymeric nature did not soak the medicament as adequately and was most available for bacterial ingress. However, when used without a medicament, PTFE tape performed better than cotton and sponge. Addition of iodine to calcium hydroxide medicament provides additional oxidizing antimicrobial action and was more functional in intercepting bacterial contamination. Cellulose sponge and PTFE tape were easy to remove without any signs of bur entrapment and

access cavity residues unlike the fibrous cotton. PTFE tape was found easy to compress and acquired minimum space in the pulp chamber with good support to the overlying restoration. Special care must be excised to compress the spacer in the access chamber to prevent trapping of fibers with the restoration and accommodation of minimum 3.5 mm of provisional restoration.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Not required

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Socio-Demographic and Cultural Factors Influencing Treatment Outcomes among Patients with Tuberculosis Attending Tribal Health Care Centers of H. D. Kote Taluk, Mysuru District

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ABSTRACT

Introduction: Tuberculosis has challenged mankind since ages and unfortunately it remains as a global public health challenge even today despite enormous advances in medicine and rapid expansion of health system. India is inhabited by diverse groups of people, with a wide variety of socio-cultural backgrounds which includes the tribal population. Many of the cultural and socio economic factors among tribal population will determine the health care seeking behaviour and treatment outcomes in relation to tuberculosis.

Objective: To assess the socio -demographic and cultural factors influencing treatment outcomes among patients with tuberculosis among the tribal population

Material and Method: A community based Retrospective and Prospective follow up study was undertaken during February 2014 to October 2014 . All the patients attending VMH, Sargur and H.D.Kote govt. hospital who are diagnosed for TB in past three months and those who will be diagnosed for the same in the next 6 months were included for the study. A pretested structured questionnaire was used for data collection. Data collected was entered in Microsoft excel sheet and analyzed by using SPSS-22.0.

Results: Jenu kurubas are the highest(68.7%) number of study subjects who made first visit to health facility 3 to 4 weeks after the symptoms appeared. 25% of study subjects were defaulters. Local migration for work (12.5%), Negligence as well as the bad habits of the patient(12.5%) were the factors responsible for defaulting.

Conclusion: 25% of the study subjects were defaulters of the DOTS treatment at the end of the study. Local migration for work, alcohol consumption , illiteracy were the factors responsible for defaulting of DOTS treatment. Special attention is to be done to strengthen the network and linkages between the DOTS centres of different places to minimize the effect of migration on treatment outcome.

Keywords: Treatment outcome, DOTS, Tribal population

INTRODUCTION

Tuberculosis remains a worldwide public health problem despite the fact that the causative organism was discovered more than 100 years ago and highly effective drugs and vaccines are available making tuberculosis a preventable and curable disease ¹. The annual risk of tuberculosis infection in high burden countries is estimated to be 0.5-2 per cent. Patient with infectious pulmonary tuberculosis can infect 10-15 persons in a

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year¹. India is the highest TB burden country in terms of absolute number of incident cases that occur each year. It is estimated that about 1.5 million people died of TB, of these 360,000 were HIV positive and 210,000 MDR-TB cases². High mortality rate among tribal population because of TB clearly suggest the lack of awareness among tribal people regarding the disease. Factors which contribute to the patient's adherence to treatment and its outcomes are numerous and it is important to identify and address these factors. Research on TB among tribal population is required because of high default rate, increase in number of MDR TB and increased mortality³.

OBJECTIVE

To assess the socio demographic and cultural factors influencing treatment outcome among patients with tuberculosis of tribal population

MATERIAL AND METHOD

A community based Retrospective and Prospective follow up study was carried out during the period February 2014 to October 2014 at Govt. hospital H.D.Kote and VMH, Sargur of H.D.Kote taluq. Approval was obtained from the ethics committee of JSS Medical College, Mysore and VMH, Sargur for conducting the study. Required permission was obtained from the concerned authorities of the hospitals. All the patients attending VMH, Sargur and H.D.Kote govt hospital who were diagnosed for TB in past three months and those who will be diagnosed for the same in the next 6 months and gave consent for participating in the study were included as study subjects. Eligible cases were identified from the TB registers at H.D.Kote govt.Hospital (TU) and VMH (TU). A pretested structured questionnaire was used to collect the information. The study subjects were interviewed either by house visit or by doing the field visit to the place of work. Three follow up visits were made to each patient to check their adherence to treatment and outcomes. Data thus obtained was coded and entered into Microsoft excel and analyzed using SPSS version 22. Descriptive statistics, Chi square for qualitative discrete data with statistical significance level fixed at $p=0.05$ were used for analysis.

RESULTS

Jenukuruba community comprised of 68.7%. 78% of study subjects were in the age group of 16-30 years,

43.8% were illiterates, 75% were involved in unskilled occupation, 46.9% belonged to socio economic class IV according to B.G .Prasad's classification. History of smoking was present in 34.4% and alcohol was present in 43.8% of study subjects. Local migration for work (12.5%), Negligence and as well as the bad habits of the patient (12.5%) were the reasons non adherence during the second and third visit leading to defaulting of treatment. Association between illiteracy, alcohol use, alcohol frequency and non adherence to treatment were found to be statistically significant ($p<0.05$). 25% of the study subjects were defaulters by the end.

Table 1: Socio Demographic Profile of Patients

Sl. No.	Details		Number	Percentage
1.	Sex	Male	17	53.1
		Female	15	46.9
2.	Age	16-30Yrs	25	78.1
		31-60 Yrs	7	21.9
3.	Education	Illiterate	14	43.8
		Primary school	9	28.1
		Middle school	5	15.6
		Secondary	4	12.5
4.	Tribal Category	Jenu kuruba	22	68.8
		Kadu Kuruba	2	6.3
		Yerava	4	12.5
		Soliga	4	12.5
5.	Type of occupation	Unemployed	1	3.1
		Unskilled	24	75
		Semiskilled	1	3.1
		Skilled	6	18.8
6.	History of smoking	Present	11	34.4
		Absent	21	65.6
7.	History of Alcohol	Present	14	43.8
		Absent	18	56.2
8.	SES Status Socio-economic status	I- Upper class	0	0
		II-Upper middle	1	3.1
		III-Lower middle	5	15.6
		IV-Upper lower	15	46.9
		V-Lower	5	15.6
		Non- Respondents	6	18.8

Table 1 shows that most of the study population belonged to Jenukuruba community, comprised of 68.7% of the total study population. Most of the study subjects are in between the age group of 16 to 30 yrs, constituted 78% of the total study population. Majority of the study subjects were males who constituted 53% of the total study subjects. 43.8% were illiterates, 56.2% of the subjects were literate. Majority of the study subjects (75%) were involved in unskilled occupation while 18.8% were in skilled occupation. Majority of study subjects (46.90%) belonged to upper lower, lower middle (15.6%) and lower (15.6%) socio economical status according to modified B G Prasad socio economic scales. . History of smoking was present among 34.4% study subjects and history alcohol use was present in 43.8% of study subjects.

Table 2: Factors influencing Adherence during second visit

Sl. No.	Adherence	Factors	n (%)
1.	Yes	Wants to cure and live/ should not spread	16 (50)
		Wants to live healthy	5 (15.6)
		Told by hospital staff/ dots provider	4 (12.5)
		Fear of death	0
2.	No	Local migration for work	4 (12.4)
		Negligence/ Bad habits	3 (9.3)
		Side effects of drug	0 (0)

Table 3: Factors influencing Adherence in third visit

Sl. No	Adherence	Factors	n (%)
1.	Yes	Wants to cure and live/ should not spread	13 (40.6)
		Wants to live healthy	9 (28.1)
		Told by hospital staff/ dots provider	2(6.3)
		Fear of death	0
2.	No	Local migration for work	4 (12.5)
		Negligence/ Bad habits	4 (12.5)
		Side effects of drug	00

Total 3 visits had been made by each patient during their full course of the DOTS treatment.

During the first visit the adherence was 100%. The commonest reason influencing adherence was the motivation from the hospital staff/ DOTS provider (68.8%).

During the second visit the commonest reason influencing adherence was the self motivation by the patient to cure the disease (50%). The commonest reason for non adherence was local migration for work (12.4%). [Table 2]

During the third visit the commonest reason influencing adherence was self motivation/ and should not spread to others (40.6%). Again the commonest reason for non adherence was local migration for work (12.4%) , Negligence as well as the bad habits of the patient (12.5%). [Table 3]

Table 4: Factors determining Adherence to treatment in second visit

Sl. No	Characteristics	Adherence		
		Yes	No	p-value
01.	Tribals			0.556
	Jenu Kuruba	16	6	
	Kadukuruba	2	0	
	Yarava	3	1	
	Soliga	4	7	
02.	Age (Years)			0.511
	16-30	19	6	
	31- 60	06	1	
03.	Education			0.108
	Illiterate	9	5	
	Literate	16	2	
04.	Occupation			0.294
	Service	1	0	
	Agriculture	1	0	
	Labourer	20	4	
05.	Distance to Health facility			0.400
	0-10 Kms	18	6	
	11-20 Kms	7	1	
06.	Smoking			0.456
	Yes	8	3	
	No	17	4	

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07.	Alcohol			0.050
	Yes	7	5	
	No	18	2	
08.	Alcohol frequency			0.086
	None	18	2	
	Daily	5	3	
	Alternative days	1	2	
	Weekly	1	0	

Table 4 shows that Jenu kurubas are in the majority in this study. 50% of the Jenu kurubas were successfully adhering to the DOTS treatment. Regarding non adherence to the treatment 18.7% of the Jenu kuruba were in the majority, which was not statistically significant. In the age group of 16 to 30 years majority of 59.3% of the patients were adhering to the treatment. 56.2% of the patients who were living within the 1 to 10 kms distance from the DOTS centre had successful adherence, which was not statistically significant. 56.2% of non smokers were successful to adherence of DOTS, which was statistically significant($p<0.05$).

Table 5: Factors determining Adherence to treatment in third visit

Sl. No	Characteristics	Adherence		
		Yes	No	p-value
01.	Tribals			0.467
	Jenu Kuruba	15	7	
	Kadukuruba	2	0	
	Yarava	3	1	
	Soliga	4	0	

Table 6: Final treatment outcome

DOTS category	Outcome		Total n (%)
	Default n(%)	Cured/completed n(%)	
Category 1	6 (18.7)	21 (65.6)	27 (84.4)
Category 2	2 (6.2)	3 (9.5)	05 (15.6)
Total n (%)	8 (25)	24 (75)	32 (100)

Table 6 shows that out of 32 study participants 24 (75%) patients were cured because of their successful adherence and 8 (25%) patients were defaulters of the treatment.

DISCUSSION

- According to this study majority of study subjects were from the productive age group of 16 to 30 yrs.

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02.	Age (Years)			0.423
	16-30	18	7	
	31-60	6	1	
03.	Education			0.050
	Illiterate	8	6	
	Literate	16	2	
04.	Occupation			0.409
	Service	1	0	
	Agriculture	1	0	
	Labourer	19	5	
	Un employed	3	3	
05.	Distance to Health facility			0.311
	0-10 Kmtrs	16	7	
	11-20 Kmtrs	8	1	
06.	Smoking			0.256
	Yes	17	4	
	No	7	4	
07.	Alcohol			0.031
	Yes	17	2	
	No	7	6	
08.	Alcohol frequency			0.006
	None	18	2	
	Daily	5	3	
	Alternative days	0	3	
	Weekly	1	0	

Table 5 shows that 50% of the literate patients were successful to adherence, whereas 18.7 illiterate patients were unsuccessful to the adherence of DOTS treatment, which was statistically significant. 6.2% of the alcoholic patients were not successful to adherence, which was statistically significant. Patients who consume alcohol daily or alternate days were unsuccessful to adherence of DOTS, which was statistically significant($p<0.05$).

This will indirectly increase the financial burden on the families of the patients.

- In a study conducted by **Murry CJL et al⁴** observed that TB affects the most productive age groups. While morbidity and mortality in any age group has significant social and economic costs, death in

prime aged adults (economically productive age) who are parent and bread earners in most societies have a particularly enormous burden.^[4]

- Majority of the patients (93.8%) came in direct contact with TB patients before developing TB. It shows the lack of awareness regarding preventive measures by the patient as well as the people suffering from TB.
- In this study history of smoking was present among 34.4% study subjects. It shows that people who smoke have a greater risk of becoming infected with tuberculosis and of having that infection turn into active TB disease.
- Similarly **Jerard M et al⁵**, also found that tuberculosis was significantly associated with smoking.^[5]
- In the present study the history of alcohol use was present in 43.8% of study subjects. It shows that the people who consume alcohol have a greater risk of becoming infected with tuberculosis and of having that infection turn into active TB disease. Similar observation was done in a study conducted by **Rajeshwari R et al.⁶**, found that patient delay was greater if the patient was an alcoholic.^[6]
- Adherence to the long course of TB treatment is a complex, dynamic phenomenon with a wide range of factors impacting on treatment-taking behavior. Patients' adherence to their medication regimens was influenced by the interaction of a number of these factors. The findings of this review could help inform the development of patient-centered interventions and of interventions to address structural barriers to treatment adherence.^[10] Similarly in this study, three different visits made to patient to know the factors influencing the treatment adherence
- During the first visit the adherence was 100%. The commonest reason influencing adherence was (68.8%) the motivation from the hospital staff/ DOTS provider. During the second visit the commonest reason (50%) influencing adherence was self motivation by the patient to cure the disease. The commonest reason for losing adherence was the local migration for work(12.4%).
- **Nabil et al⁷** in their study, the observed that barriers to DOTS adherence stem from a multiple

dimensions of socio-cultural influences, leading to a clash between cultural and public systems as well as a gap between patient and provider's perspectives. During the third visit the commonest reason influencing adherence was the self motivation/ and should not spread to others. Again the commonest reason for non adherence was the local migration for work (12.4%) , Negligence as well as the bad habits of the patient (12.5%). Similarly in their study **Nabil et al⁷** stated that the main reason for not completing the treatment was the impression of being cured. Several studies have reported feeling cured as the main reason for defaulting. Local migration for work and bad habits are two important factors for non adherence to treatment.^[7]

- Poor compliance with treatment was common among patients with poor knowledge, disruption of medication often occurred because patients failed to fully understand the necessity and importance of prolonged, uninterrupted treatment in this study^[11]. A study in Egypt revealed that the significant risk factors for treatment failure were non-adherence to treatment, due to deficient health education and poor patient knowledge about the disease^[08]. In a study by **Nabil Tachfouti, et al⁷** conducted on 'to study is the first to explore knowledge, attitude and treatment default in Fez region'.found that, Poor awareness especially regarding symptoms and treatment results and consequence were reported to have been associated with treatment non-completion, in accordance with other settings results.^[9]

CONCLUSIONS

25% of the study subjects were defaulter for the DOTS treatment at the end of the study. Local migration for work and negligence/bad habits were the strongest barriers for adherence to treatment. Introduction of a checklist including all socio demographic factors responsible for defaulting the treatment. Special attention to strengthen the network and linkages between the DOTS centres to mitigate the default to treatment due to migration for work. Creating awareness through specific, effective and innovative IEC and BCC campaigns in tribal areas.

Conflict of Interest: None declared

Source of Funding: No funding sources

Ethical Approval: Approval was obtained from the institutional ethics committee

Limitations: Study was conducted in tribal areas the results of which cannot be generalized.

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Language Proficiency among Higher Secondary Students with Respect to Psychological Factors

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ABSTRACT

Language differentiates the person from other living creature. Especially the English language universally connects the people with no bias. In this study language proficiency measured with reading and writing skills. The both skills are compliments each other. The psychological factor refers to the scores obtained by the eleventh standard students in the multidimensional personality inventory. Psychological factors affect the language skills of the person. The domains namely cognitive and affective influence the language skills of the learner. In this study the researcher used the English language proficiency test by K.S. Misra and Ruchi Dubey, for reading and writing skills. For assessing the psychological factors, Multi-dimensional personality inventory by Agarawal (1986) was used. The statistical calculation inferred that self- concept and temperamental traits of psychological factors show difference in reading and writing skills, while other psychological factors namely: social participation, dependency, adjustment doesn't influence the reading and writing skills of the students.

Keywords: language proficiency, writing skill, reading skill, psychological factors

INTRODUCTION

Language according to Cambridge dictionary is “a system of communication consisting of sounds, words, and grammar, or the system of communication used by people in a particular country or type of work”.¹ Languages differentiates the person from other living creature. Especially the English language universally connects the people with no bias. In this study language proficiency measured with reading and writing skills. The both skills are compliments each other.

Language acquisition is a process wherein an individual acquires the basic elements of language: the semantics, alphabets, sentence construction, manner of articulation, grammatical structure. It is multi staged process where the individual develops vocabulary initially followed by sentence formation and finally developing language competency.²

Reading skills: Reading is one of the language skills and one of the gateways of getting worldly knowledge. Traditionally, reading was considered as a passive skill, but it is today considered as an active one, and one's reading ability decides his academic success. Reading

is the best source of input of our human brain. The vast reading enhance the good output of writing skill

Reading is a complex and conscious activity using the written symbols meaning and ideas are obtained. However, the readers' background knowledge is necessary for complete understanding of a text.

The important components of the reading skills are³:

- Recognition of the graphemes.
- Recognition of the correlation of graphemes within words.
- Recognizing word boundaries and sentence boundary.
- Recognizing the meaning of words and its relationship in sentence.
- Recognizing relationship between and among sentences in a discourse.
- Deducing meaning of unfamiliar words
- Inferring implicit and explicit information and ideas of text, etc.

Writing skills: Writing is a planned activity done consciously. A mono literate is a person who can read and write in a language and a biliterate or multi literate can read and write in more than one language. A literate person in a language can convey his inner speech through written mode. That is to say that one may be literate in one language and illiterate in another language. Writing is the best form of communication that occurs in the world. The ideas, concepts of a person are apparently conveyed through writing skills.

The writing skill includes a number of sub skills given by (Sobana, 2003:26)³:

- Mechanics-handwriting, spelling, punctuation
- Word selection-vocabulary, idioms, tone.
- Organization-paragraphs, topic and support, cohesion and unit
- Syntax-sentence structure, sentence boundaries, stylistics, etc..
- Grammar-rules of verbs, agreement, articles, pronouns, etc.
- Content-relevance, clarity, originality, logic, etc.
- The writing process-getting ideas, getting started, writing drafts, revising etc.
- Purpose-the reason for writing, justification

Psychological factors: The psychological factor refers to the scores obtained by the eleventh standard students in the multidimensional personality inventory. Psychological factors affect the language skills of the person. The domains namely cognitive and affective influence the language skills of the learner⁵.

OBJECTIVES OF THE STUDY

1. To study the reading skills among higher secondary standard students.
2. To study the relationship between reading and writing skills and Psychological factors.

Hypothesis of the Study

1. There is no relationship among language skills and psychological factors among students.

Sample of the Study: The sample consists of 11th standard students studying in different types of

management schools n and around kanchipuram district in Tamil Nadu state. A total of 477 11th standard students constitute the sample of the present study.

Tools Used in the Study: The following tools are used in this present investigation:

Assessment of Reading and writing skills

English language proficiency test by K. S. Misra and Ruchi Dubey ⁶.

This test was used to find out the reading and writing skills. This test consists of 56 questions in 14 areas of English language. The English language proficiency test is based on the course based on U.P board for class X. On the basis of Hubley's (2003) definition. Proficiency in English may be defined as the knowledge related to English language that individual acquires through a formal educational experience. Proficiency in English encompasses student's terminal performance in English Language⁷.

Table 1: Showing content areas and weightage given to ELP test

S. No.	Areas/Content	Weightage (%)
1.	Noun	7
2.	Pronoun	7
3.	Adjective	7
4.	Verb	7
5.	Adverb	7
6.	Preposition	7
7.	Spelling	7
8.	Tenses	7
9.	Sentence	7
10.	Article	7
11.	Translation	7
12.	Word-formation	7
13.	Active-Passive	7
14.	Direct-indirect	7

Assessment of Psychological factors

Multidimensional Personality Inventory: For assessing the psychological factors, Multi-dimensional personality inventory by Agarawal (1986) was used. This tool contains 120 items with 6 dimensions namely⁸:

- 1. Extraversion-introversion:** This variable identifies whether a person's orientation is based on objective condition or facts (Extrovert) or on one self (introvert). Extroverted behaviour is primarily directed by external environment, objectives or facts, whereas introverted behaviour is directed by him.
- 2. Self-concept:** The self-concept has been considered central construct of the personality. It is the organized conceptual relationship of the 'I' and 'me' to others and to various aspects of life together value attached to this in terms of self-personification, self-esteem, self-image and self-sentiment.
- 3. Independence-dependence:** It is associated with the personality which has close relationship to intelligence and its influences.
- 4. Temperament:** This refers to the reactions of the person towards emotional situations. It is related to the consistency or mental imbalance and is considered as one of the important factors of personality
- 5. Adjustment:** It is an index of integration between needs and stress which has close relation to personality. By the process of adjustment an individual experiences several facts and events by which he tries to reshape his personality.
- 6. Anxiety:** Concept of anxiety occupies a very important place in the study of human personality

and multitude activities of the mind. Anxiety is something felt unpleasant effect of state or condition. This state was characterized by all that is converted by the word 'nervousness' apprehension or anxious expectations and different discharge phenomena⁹.

The inventory has 120 items and each 20 items are related to the above mentioned dimensions of personality. Each item has three alternatives answers 'yes', 'sometimes' and 'no'. The score is given in the following manner. 3 for yes, 2 for sometimes and 1 for no.

Reliability and validity: Cronbach Alpha reliability and validity values are found to be 0.86 and 0.92 respectively for teacher samples and .83 and .91 respectively for student samples. The reported reliability value for the inventory is .74.

ANALYSIS AND INTERPRETATION

Table 2: showing Mean and Standard deviation of language skills¹⁰

Variables	N	Max. Scores	Whole sample	
			Mean	S.D
Reading and writing skills	477	100	28.69	12.06

From the table 2 is found that the mean value of reading skills is 28.69 and hence the selected samples of higher secondary school students have average level of reading skills.

Table 3: Showing the mean and Standard Deviation of reading and writing skills with respect to different Psychological factor groups

Variable	Groups	N	Mean	S.D	t- value	df	Level of significance at .01 level
Reading and writing skills	Introvert students	101	30.15	9.58	1.373	475	Not significant
	Ambivert students	376	28.30	12.63			
	Low self- concept	365	27.18	12.04	5.068	475	Significant
	High self- concept	112	33.62	10.79			
	Independent students	130	29.90	11.69	1.343	475	Not significant
	Dependent students	347	28.24	12.19			
	Good temperament	432	28.06	12.08	3.583	475	Significant
	Poor Temperament	45	34.75	10.21			
	Good Adjustment	290	28.05	12.10	1.454	475	Not significant
	Poor Adjustment	187	29.69	11.96			

From table 3, it is inferred that self- concept and temperamental traits of psychological factors show difference in reading and writing skills, while other psychological factors namely: social participation, dependency, adjustment doesn't influence the reading and writing skills of the students.

FINDINGS OF THE STUDY

1. Students have average level of reading and writing skills.
2. The psychological factor: social participation doesn't influence reading and writing skills.
3. The psychological factor: dependence doesn't influence reading and writing skills.
4. The psychological factor: temperament influence reading and writing skills.
5. The psychological factor: Adjustment doesn't influence reading and writing skills.
6. The psychological factor: Self-concept influence reading and writing skills.

RECOMMENDATIONS

1. As the reading and writing skills is average measures has to be taken to improve the reading and writing skills among higher secondary school students.
2. The self-concept and temperamental traits influences the reading and writing skills of the students and hence it has to be taken into to account while enhancing the reading and writing skills.
3. For enhancing the language proficiency the students have to think and analyze the content in the English language itself. The teachers provide the platform for them showcase their talents.

Ethical Clearance: Not Required

Source of Funding: Self

Conflict of Interest: Nil

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Profile of Patients Who Underwent Abortion in Tertiary Medical College in Trichy: A Descriptive Study

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ABSTRACT

Introduction: The Medical Termination of Pregnancy (MTP) was legalized in India by an Act in 1971.

Method: This study is a retrospective data based study of two years. The objective of the study was to study the profile of patients who underwent abortion in a medical college hospital in Trichy.

Results: Prevalence of abortion were more common between the age of 21 and 30 years of which spontaneous abortion was more common. In our study abortions were almost equal in first and second trimester. Various other parameters like educational status in which abortions were common were also studied.

Conclusion: Poor utilization of abortion services as reflected in the present study calls for creation of awareness among women regarding availability of safe abortion services.

Keywords: Abortion, tertiary care, Profile, Retrospective study, Tamil nadu.

INTRODUCTION

Abortion is the termination of pregnancy before its full term. Spontaneous abortion is pregnancy resulting in miscarriages without the application of any deliberate methods to terminate it during the early weeks after conception. Risk factors for abortion include old age, previous miscarriage, tobacco use, obesity, diabetes, thyroid problems, drugs and alcoholism. Common causes of spontaneous abortion include hormonal factors, chromosomal factors, uterine abnormalities, autoimmune disorder. Induced abortion on the other hand is often done using several dangerous procedures under substandard clinical and unsanitary conditions. Women access to safe abortion services is essential to safeguard their health and is one of the important components of Reproductive and Child Health Programme.

Abortion was liberalized in India after the 1971 Medical Termination of Pregnancy (MTP) Act came into effect on 1 April 1972, according to which a pregnancy may be terminated within 20 weeks of gestation. Before 1972, abortion was permitted only if it was necessary to save the life of the woman. Now it is also allowed on the grounds of preserving her mental or physical health, as well as in case of pregnancy due to rape, incest or

contraceptive failure. In India, where abortion has been legalized for over twenty-five years, various surveys suggest that abortions are responsible for 10-20 per cent of all maternal deaths.¹ Very few studies have tried to present some kind of valid estimates about the incidence of abortion both at the national and global level.² This huge data gap in the area of abortion is to some extent due to the fact that safe and legal abortion services are far and few between with the result that a large number of women receive abortion services from illegal sources and these are never reported³. Hence the study was conducted to ascertain prevalence and various factors affecting Abortion.

METHODOLOGY

This retrospective record based study was carried out in a tertiary care hospital in Trichy, Tamil Nadu for a period of two months. Data was collected from medical record department for a period of 2 years (2016-2017). Of the total sample size 142, 100 fitted in the inclusion criteria. Patients of medical abortion lost to follow up, Patients undergone MTP at other center and then referred, Vesicular mole and septic abortion were excluded from the study. Data was entered and analyzed using SPSS v.15.0

RESULTS

Table 1: Abortions In Different Age Categories

Age	Spontaneous	Induced	Total
<20	7 (70%)	(30%)	10
21-25	35(89.7%)	4(10.3%)	39
26-30	32(97%)	1(3%)	33
31-35	11(84.6%)	2(15.4%)	13
>36	5(100%)	0	5
Total	90	10	100

Abortions are more common among 21- 30 age group. 67% of abortions were spontaneous abortions 13.3% of abortions were induced abortions. abortion is least common among the age group >36 years in which spontaneous abortion forms 100% and induced abortion 0%

Table 2: Abortions in relation to educational status (n = 100)

Education	Type of Abortion		Total	Percentage
	Spontaneous	Induced		
Illiterate	3(100%)	0	3	3%
Upto Middle School	28(95.2%)	1(4.2%)	29	29%
High School & Higher Secondary	48(88.6%)	7(11.4%)	55	55%
Graduates	11(85%)	2(15%)	13	13%
Total	90	10	100	100%

Abortion Is More Common(55%)In The High School And The Higher Secondary School Category in which spontaneous abortion forms 88.6% and induced abortion 11.4% and least common(3%) in illiterate category. However spontaneous abortion is common(100%) in illiterate category than induced abortion(0)

Table 3: Abortions in different religions (N = 100)

Religion	Types of Abortion		Total	Percentage
	Spontaneous	Induced Abortion		
Hindu	62(89.9%)	7(10.1%)	69	69%
Muslims	11(84.6%)	2(15.4%)	13	13%
Christians	17(94.4%)	1(5.6%)	18	18%
Total	90	10	100	100%

In our study abortions are more common in hindu category(69%),of which 89.9% was spontaneous abortions and 10.1% was induced abortion

Table 4: Abortions in relation to trimesters (N = 100)

Trimester	Type Of Abortion		Total	Percentage
	Spontaneous	MTP		
First Trimester	43(86%)	7(14%)	50	50%
Second Trimester	47(94%)	3(6%)	50	50%
Total	90	10	100	100%

In our study abortions are almost equal in first and second trimesters(50%) however spontaneous abortion is common In second trimester and MTP is common in second trimester.

DISCUSSION

The prevalence of abortion in different age group, trimesters, education status in the present study is similar to study conducted by Biswas DK et.al⁴ who found nearly 61.2% of their abortion cases were between the age of 20 to 29 years followed by 12-19 years of 31.5%. In our study 72% of abortion cases were between the age of 20 and 29.

In the present study 48% of abortions were occurred at primi gravida, whereas multigravida comprised of 52% which is similar to study conducted by Biswas DK et.al in which 51.3% abortions resulted in primi and 48.7% in multigravida. Whereas in a study conducted by Ameet Patki et al.⁵ 68% abortions resulted in primi gravida and 32% in multigravida⁴

With regards to educational status 35% belonged to high school followed by illiterates and primary school, which is similar to study conducted by Biswas DK 55% abortions occurred in grade 6th to 10th.

In the present study nearly 70% underwent MTP during first trimester, 30% were among second trimester which is similar to study conducted by Veena L.⁶

CONCLUSION

Poor utilization of abortion services as reflected in the present study calls for creation of awareness among women regarding availability of safe abortion services.

Source of Funding: Self

Conflict of Interest: None declared

Ethical Clearance: Obtained from institutional ethical committee of CMCHRC, Trichy

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The Enigma Era of SEZ in HRD

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ABSTRACT

Human capital generation is the right indicator for the sustainable development of the economy. The nation will have a dynamic growth, once it achieves high literacy rate, high standard of living, no poverty and high per capita income, self-sufficient in their resources and growth in human capital. The current study throws light on performance of SEZ in India with respect to two indicators, such as Investment and Employment. Chapter one provides basic about Special Economic Zone (SEZ). Chapter two enlists the review of literature. Chapter three describes the investment pattern of SEZ in India. Chapter four envisages the employment generation of SEZ in India. Chapter five analyses the investment value per employment in SEZ. The last chapter concludes the human capital employment status in SEZ.

Keywords: SEZ, Investment, Employment generation, Human capital, performance of SEZ

INTRODUCTION

India was the first Asian country that started Export Processing Zone in Kandla during late 1960's, knowing the importance of export and foreign investment in economic development. But she was not able to face the global competition due to several reasons such as tax holidays and incentives to the promoters were not attractive, absence of infrastructure facilities and concentration of export promotion activities alone but failed to implement the policy framework. In order to overcome all these shortcomings, SEZ scheme was incorporated through EXIM policy effective from April 2000. Special Economic Zones (SEZ) is a specifically delineated duty free enclave and free from all rules and regulations governing imports and exports, which shall be deemed to be a foreign territory for the purposes of trade operations and duties and tariffs.

The Government of India announced the introduction of Special Economic Zones to achieve the following objectives:

- Generation of additional economic activity
- Promotion of exports of goods and services
- Promotion of investment from domestic and foreign sources
- Creation of employment opportunities
- Development of infrastructure facilities

REVIEW OF LITERATURE

Aradhna Aggarwal,¹ in her working paper, has exposed the export performance of Export Processing Zones. According to her, the EPZ policy in India underwent gradual relaxation of procedural and operational rigidities. The changes effected in this policy since 1991 have been far reaching and significant. It is believed that the overall EPZ investment climate has an overwhelming bearing on the EPZ performance.

S. K. MISRA and V.K. PURI,² in their study, "A scheme for setting up Special Economic Zone (SEZs) in the country to promote exports was announced by the Government in the Export Import Policy on March 2001, The SEZs are to provide free environment for exports and are expected to give a boost to the country's export. The policy has provided provisions for setting up SEZs in the public sector, joint sector or by the State Government. It also announced that some the existing EPZs would be converted into SEZ. Accordingly, the Government has issued notification for conversion of all the existing EPZs into Special Economic Zones. Exports by SEZ units during 2004-05 were of Rs.18,309 crores."

M. Suchitra,³ in her study, has pronounced that, the Neo-liberal trade and economic policies have already resulted in the spread of an exploitative work culture in India and other developing countries, especially with

regard to unorganised labour. As of now, apart from the huge revenue losses, large scale displacement of farmers and regional development disparities, the proliferation of SEZs will certainly worsen the plight of workers. In fact, promoting these export enclaves, where domestic trade, tariff and labour laws are not applicable, as the one and only way for the development which is likely to have negatively impact on the real development that the country needs.

Chandrachud S,⁴ the SEZ approvals are expressed under four stages based on their level of processing such as Formal approvals, in-principle approvals, notified approvals and exporting SEZs. Formal approval is awarded to those SEZs approved in-principle that can show that land has been assembled for the purpose. In-principle approval is the first stage of approval process given to the person or the State Government concerned incorporating additional conditions, if any specified

by the Board while approving the proposal. Notified approval is the last stage of process after the Government is satisfied that the developer has legal possession and irrevocable rights over the proposed land to develop SEZ and has received all necessary approvals provided that leasehold right for the period of not less than twenty years and the identified lands is contiguous vacant land with no public thoroughfare.

Inflow of Investment in Special Economic Zone (SEZ): Table 1 depicts the incremental investment in Special Economic Zone (SEZ) from February 2006 upto 30th September 2017. The major Special Economic Zone controlled by the Central government has increased from Rs.2,279.20 crores to Rs.17,941.55 crores with the additional investment of Rs. 15,662.35 crores. The state or private SEZs before 2006 has the total investment of Rs. 12775.83 from Rs. 1,756.31 with the incremental investment of Rs. 11019.52 crores

Table 1: Inflow of investment in SEZ from February 2006 to 30 September 2017

Investment	Investment (As On February, 2006)	Incremental Investment	Total Investment (As On 30 September 2017)
Central Govt. SEZ	Rs.2,279.20 cr.	Rs. 15,662.35 cr.	Rs.17,941.55 cr.
State/ Private SEZs before 2006	Rs 1,756.31 cr	Rs. 11019.52 cr.	Rs.12775.83 cr
SEZ notified under the act	-	Rs. 4,18,115.05 cr.	Rs4,18,115.05 cr
Total	Rs. 4,035.51 cr.	Rs. 4,44,796.92 cr	Rs. 4,48,862.43cr

Source : Fact sheet on SEZ, MOC, <http://sezindia.nic.in/cms/updated-factsheet-on-sezs.php>⁵

However, the Notified SEZ under SEZ Act has the huge investment of Rs. 4,18,115.05 croress (four lakh eighteen thousand one hundred and fifteen lakhs croress approximately) – i.e., Rs.418115,05,00,000 with one of the object of creating more employment opportunities.

Employment generation in Special Economic Zone (SEZ): Table 2 envisages the Employment generation in Special Economic Zone (SEZ) from February 2006 upto 30th September 2017. The major Special Economic Zone controlled by the Central government has generated 1,22,236 persons in 2006 to 2,35,305 persons with the additional employment of 1,13,069 persons. The state or private SEZs before 2006 has the total investment of 99,400 persons from 12,468 persons with the incremental investment of 86,932 persons.

Table 2: Employment generation in SEZ from February 2006 to 30 September 2017

Employment	Employment (As On February, 2006)	Incremental Employment	Total Employment (As On 30 September 2017)
Central Govt. SEZ	1,22,236 PERSONS	1,13,069 PERSONS	2,35,305 PERSONS
State/ Private SEZs before 2006	12,468 PERSPMS	86,932 PERSONS	99,400 PERSONS
SEZ notified under the act	0 PERSONS	14,88,746 PERSONS	14,88,746 PERSONS
Total	1,34,704 PERSONS	16,88,747 PERSONS	18,23,451 PERSONS

Source : Fact sheet on SEZ, MOC, <http://sezindia.nic.in/cms/updated-factsheet-on-sezs.php> 6

It is to be noted that Notified SEZ contributes 16,88,747 employment had been generated under the SEZ Act, Which is amounting to more than 75 percent of total employment generation. As on 30th September 2017,

the total employment generated are 18,23,451 persons. Here the Enigma of proportion between the investment and Employment generation exposed. For creating the employment opportunities of 15 lakhs persons, the total

investment of Rs.418115,05,00,000 in the last decade. One of the objective of SEZ policy is to create more employment opportunities by means of export promotion, world class infrastructure and tax holidays etc.,

Enigma Era of SEZ in Human Resource Development: While comparing the incremental investment and employment generation in the last decade, there is a paradigm in the proportion. Table 3 shows the analysis of investment and employment generation during the last decade.

Table 3: Proportion of Investment made with employment generation in SEZ

Period	Investment	Employment (persons)	Investment per employment (Rs.)
Up to Feb. 2006	Rs. 4,035.51 cr.	1,34,704 PERSONS	2,99,583.53
2006-2017	Rs. 4,44,796.92 cr	16,88,747 PERSONS	26,33,887.25
As on Sep. 2017	Rs. 4,48,862.43cr	18,23,451 PERSONS	24,61,609.50
Incremental growth	111.23 times	13.54 times	8.214 : 1

Source: Calculated by author.

CONCLUSION

The present study finds a new exemplar thought about the SEZ performance. As per the government factsheet published by the Ministry of Commerce and Industry, during January 2018, as on September 2017, the proportion of investment with the employment generation is 8.214 is to 1. The investment made in SEZ during last decade increased by 111.23 times but employment generation increased by 13.54 times. Unfortunately, per employment cost in SEZ is approximately Rs. 24, 61,600. In easy words, the cost incurred to create one employment opportunity in Special Economic Zone is nearly 24.61 lakhs.

Therefore, the current study suggest that if this investment are made in micro, small, medium enterprises, they may create more employment opportunities than current employment level, and the Gross Domestic Product will be considerably increased which in turn the possibility of more export promotional activity through MSME. Secondly, if a part of this investment made in the primary sector, India will be the number one country in the globe in food production.

DISCUSSION

The modus operandi of the current the current study, is to analyze the proportion of investment made in SEZ in the last decade with the proportion of employment generated in the same period. The inference of the current research indicates that there is an abnormal proportion between investment and employment generation in SEZ.

This paves way for new research on Investment appraisal of SEZ, Human resource strategy of SEZ, re-structuring the EXIM policy and provision for better economic development etc. The current discussion exposes that high value for the investment in case of per employment generation ranging 24 to 25 lakhs.

Ethical Clearance: Completed. (Dept. level committee at VELS)

Source of Funding: Self

Conflict of Interest: NIL

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Role of Mdct in Evaluation of Acute Abdomen

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ABSTRACT

Background: Acute abdomen is defined as a clinical syndrome characterized by sudden onset of pain in the abdomen. Multi detector CT plays an important role in the diagnosis of the cause of acute abdominal pain and thereby initiating proper treatment.

Aims and Objectives: The primary objective of this study was to find the efficacy of multi detector computed tomography in detecting and characterizing the findings of acute abdomen and further planning of treatment.

Materials and Method: A total of 160 patients were included in this study who were referred with symptoms of acute abdominal pain and patients with blunt trauma. MDCT examination was conducted and results are confirmed with gold standard investigations.

Results and Conclusion: The sensitivity and specificity of MDCT in detecting the cause of acute abdomen is very high. MDCT should be the first line of investigation for most of the acute abdominal conditions.

Keywords: Acute abdomen, Multi Detector CT, Acute appendicitis, Acute cholecystitis, Bowel obstruction.

INTRODUCTION

Acute abdomen is defined as a clinical syndrome characterized by sudden onset of pain in the abdomen.¹ Acute abdomen could be a term often used to describe the acute abdominal pain in a subgroup of patients who are seriously sick and have abdominal tenderness and rigidity that develops over a period of hours. Acute abdomen includes the diseases which can involve the gastro intestinal system, hepato-biliary system, solid viscera or genitourinary system etc.

Before the widespread use of imaging, these people were the candidates for surgery. However, with the role of imaging, some patients with acute abdomen need not undergo surgical intervention.

Conventional radiography is usually the initial imaging examination performed. Patients suspected to have intestinal obstruction, hollow viscous perforation, urinary tract calculi, or foreign bodies² the accuracy of diagnosing is good using conventional radiographs.

Ultrasonography (US) is one of the most common type of imaging modality used in diagnosing the cause of acute abdominal pain.³ Easy availability, lower prices, and lack of radiation exposure are the benefits of this modality. The main advantage of this method is that it is a real time technique and the radiologist can look for the peristalsis and using doppler, the blood flow can be depicted.

Computed tomography has gained widespread acceptance as an accurate modality to diagnose the cause of acute abdominal pain.⁴ The introduction of multidetector CT scan (MDCT) technology has created an additional benefit in diagnosing the patient with acute abdominal pain. There are many advances in MDCT scanner like 3D reconstruction, contrast dynamics, and high-resolution volumetric information acquisition. MDCT is a fast and cost-efficient method. Conventional CT studies in acute abdomen have demonstrated almost 95% accuracy.⁵ Along with the diagnosis of primary abnormality, MDCT can additionally help in detection and characterizing the

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total extent of the disease. Hollow viscera, solid organs, peritoneum, lymph nodes, retroperitoneum etc., are easily viewed with MDCT. Information can be acquired in different phases making MDCT an ideal modality for evaluation of mesenteric ischemia or vascular disorder like abdominal aortic aneurysms.

Magnetic resonance (MR) imaging is not so widely used in the diagnostic work-up of patients who present with acute abdominal pain. Lack of ionizing radiation is the major advantage of this examination. The intrinsic contrast resolution with MR imaging is another advantage. The use of MR imaging at this point is limited to selective patients like pregnant women where US demonstrating nonspecific diagnosis.

In our study, the primary objective is to find the accuracy of MDCT in detection of cause of acute abdominal pain and in characterizing the imaging findings to diagnose the disease which further helps in planning the treatment.

AIMS AND OBJECTIVES

1. To evaluate the accuracy of multi detector computed tomography in detection and differential diagnosis of acute abdominal pain
2. To evaluate the efficacy of multi detector computed tomography in characterization of the spectrum of imaging findings which helps in the diagnosis.
3. To evaluate the role in assessment and further planning of treatment.

MATERIALS AND METHOD

In this prospective study, 160 patients referred from various departments to Department of Radio diagnosis and Imaging at Sri Lakshmi Narayana Institute of Medical Sciences with symptoms of acute abdominal pain and blunt trauma abdomen were included. Patients with penetrating abdominal injuries and obstetric emergencies are excluded from study.

32 slice Siemens Somatom Scope MDCT system with advanced workstation was used to scan the patients.

STATISTICAL ANALYSIS

Data was collected and statistically analyzed. Data was analyzed using SPSS software and data was used in

categorical variable Chi Square/ Fischer Exact Test. The level for statistical significance was taken as $p \leq 0.05$.

FINDINGS AND RESULTS

The findings at multi-detector CT abdomen were diverse and were divided into following groups:

1. Inflammatory Conditions
 - (a) Acute urinary colic
 - (b) Acute pancreatitis
 - (c) Acute appendicitis
 - (d) Acute pyelonephritis
 - (e) Acute cholecystitis
 - (f) Intra-abdominal abscess
 - (g) Acute diverticulitis
2. Mechanical Causes
 - (a) Bowel obstruction
 - (b) Perforation of hollow viscus
3. Bowel ischemia or vascular causes
4. Traumatic causes
5. Miscellaneous

Table 1: Case Distribution of the Study Population

Cases	Total Number of Each Case Type N = 160	Percentage (%)
Acute urinary colic	36	22.5
Acute pancreatitis	30	18.75
Acute appendicitis	22	13.75
Acute pyelonephritis	14	8.75
Miscellaneous (epiploic appendagitis, acute mesenteric adenitis, acute colitis, peritonitis, etc.)	11	6.875
Acute cholecystitis	11	6.875
Bowel obstruction	9	5.625
Intra-abdominal abscess	7	4.375
Perforation of hollow viscus	6	3.75
Traumatic causes	6	3.75
Bowel ischemia or vascular causes	5	3.125
Acute diverticulitis	3	1.875

1a. Acute Urinary Colic: MDCT diagnosis of acute urinary colic was made in 36 cases, out of which 12 cases were of renal calculi, 22 cases of ureteric calculi and 2 cases of urinary bladder calculus (Fig 1).

CT scan showed peri renal/ peri ureteric stranding in 26 patients and hydro uretero nephrosis in 28 patients. Out of 26 patients with HUN, 8 patients were having Grade 1 HUN, 9 patients were having Grade 2 HUN, 7 patients were having Grade 3 HUN and 4 patients were having Grade 4 HUN.

All cases diagnosed on CT were confirmed on surgery or responded to conservative management.

Denis Tack et al in a study of 106 patients with acute renal colic demonstrated sensitivity of 94.7 and specificity of 100% in the year 2003.

Present study demonstrates 100% sensitivity and specificity.



Fig 1(a, b)- Coronal and Sagittal CT KUB images showing hydronephrosis (white arrow) in right kidney due to right proximal ureteric calculus (yellow arrow). Coronal images of CT abdomen(1c) demonstrating a large bladder calculus (yellow arrow) causing bilateral hydro ureteronephrosis (white arrow).

1b. Acute Pancreatitis: MDCT diagnosis of acute pancreatitis was made in 29 patients and out of which 13 patients had acute mild pancreatitis CTSI-(1-3), 12 patients had acute moderate pancreatitis CTSI-(4-6), and 4 patients had acute severe pancreatitis CTSI-(6-10).

CT scan of abdomen revealed focal/diffuse enlargement of pancreas in 29 patients, peri pancreatic fat stranding in 26 patients, peri pancreatic fluid collection in 15 patients and lack of parenchymal enhancement in 12 patients.

3 patients were associated with gall bladder calculus/calculi. 2 patients had pseudocyst of pancreas. 1 patient had pseudoaneurysm (Fig 2c).

1 case was false negative by CT scan, which was confirmed by clinical and laboratory parameters like amylase & lipase levels.

Rest of all the patients were diagnosed by CT and subsequently responded to treatment of acute pancreatitis or confirmed by laboratory parameters and/or on surgery (Fig 2a, 2b).

Dario Casas et al⁶ in a study conducted in the year 2004 with a study population of 148 demonstrated a sensitivity of 100% and Specificity of 61.6% for predicting morbidity

Present study demonstrates 96.6% sensitivity and 100% specificity.

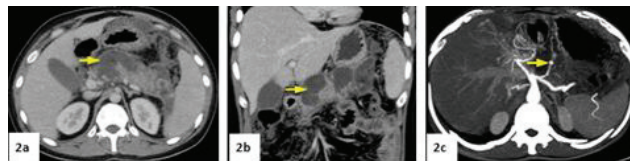


Fig (2a, b)- Axial and Coronal CT images of abdomen demonstrating bulky pancreas with heterogeneous enhancement (yellow arrow) with non-enhancing necrotic collection (>30%) involving the entire length of pancreas extending into peripancreatic region with surrounding fat stranding. Fig (2c)- Axial CECT image showing a small pseudoaneurysm (yellow arrow) in a case of acute pancreatitis.

1c. Acute Appendicitis: MDCT diagnosis of acute appendicitis was made in 22 patients.

CT scan revealed distended lumen (>6mm diameter) in 22 patients, peri-appendiceal inflammation in 22 patients, adenopathy in 17 patients, extraluminal fluid in 13 patients, appendicolith in 6 patients and abscess in 3 patients.

The intra-operative findings were consistent with the CT findings in all the patients (Fig 3a, 3b).

Ujiki, Michael B. et al in a study conducted in the year 2002 with a study population of 125 patients demonstrated a sensitivity of 90% and Specificity of 89%.

Present study demonstrates 100% sensitivity and specificity.

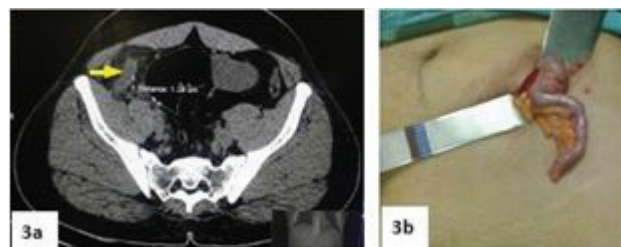


Fig 3a- Axial CT image of abdomen showing distended lumen of appendix (yellow arrow) with peri-appendiceal fat stranding suggestive of acute appendicitis. Fig 3b- Intra operative image of acute appendicitis.

1d: Acute Pyelonephritis: MDCT diagnosis of acute pyelonephritis was made in 13 patients.

CT scan revealed edematous part of the kidney in 13 patients, perinephric fat stranding in 13 patients, non enhancing areas in 13 patients, debris in collecting system/ collecting system wall thickening in 9 patients and gas within the collecting system in 3 patients (emphysematous pyelonephritis).

One case was false negative on CT and was confirmed to have acute pyelonephritis clinically and with laboratory parameters like urine routine and microscopic examination. Rest all cases responded to conservative treatment or confirmed on surgery (Fig 4a).

Mitterberger et al in a study conducted in the year 2002 with a study population of 100 patients demonstrated 98% sensitivity and 100% specificity.

Present study demonstrates 92.8% sensitivity and 100% specificity.

1e: Acute Cholecystitis: MDCT diagnosis of acute cholecystitis was made in 9 patients (Fig 4b).

CT scan revealed gallbladder wall edema in 9 patients, gall bladder distension in 6 patients, pericholecystic fluid collection in 7 patients.

2 suspected cases which showed negative findings on CT and needed ultrasound correlation, from which 1 case was confirmed as calculus cholecystitis and 1 case was acute acalculus cholecystitis.

The usefulness of ultrasound scanning is high compared to CT in diagnosing the cause of acute cholecystitis whether calculi were present or absent. USG can detect pericholecystic fluid and soft calculus more accurately than CT, suggesting it is the modality of choice for acute cholecystitis.

Bennett GL et al⁷ et al in a study conducted in the year 2002 demonstrated a 92% of sensitivity and 99% specificity.

Present study demonstrates 81.8% sensitivity and 100% specificity.

1f: Intra Abdominal Abscess: There were 7 cases of intra-abdominal abscess out of which 1 case was liver abscess (Fig 4c), 1 case was renal

abscess, 1 case was peritoneal abscess, 1 case was appendicular abscess, 1 case was iliopsoas abscess and 1 case was ruptured diverticula with abscess.

1 case was false negative, in which the CT diagnosis was not liver abscess and which was later confirmed as liver abscess based on clinical and lab parameters. Rest of all the cases diagnosed on CT, were confirmed on surgery or responded to conservative treatment.

Go HI et al⁸ in a study conducted in 2005 demonstrated 95% sensitivity and specificity.

Present study demonstrates 85.7% sensitivity and 100% specificity.

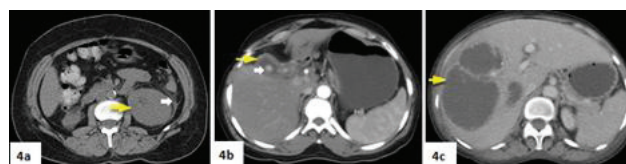


Fig. 4a: Axial CT abdomen at the level of kidneys showing edematous left kidney (yellow arrow) and perinephric fat stranding (white arrow) suggestive of acute pyelonephritis. **Fig 4b-** Axial CT showing edematous GB (yellow arrow), few intraluminal calculi (white arrow) and pericholecystic fluid suggesting acute cholecystitis. **Fig 4c-** Axial CT abdomen shows hepatomegaly with multiple well-defined rim enhancing hypodense lesions (yellow arrow) in right lobe of liver suggestive of liver abscess.

1g: Acute Diverticulitis: CT findings of wall thickening and surrounding fat stranding was demonstrated in all 3 patients.

3 cases were confirmed on surgery (Fig 5a).

Kircher MF⁹ in a study conducted in 2002 demonstrated 99% sensitivity and Specificity.

Present study demonstrates 100% sensitivity and specificity.

2a: Bowel obstruction: This group revealed 9 total number of cases, out of which 1 case was mid gut volvulus and 3 cases were sigmoid volvulus (Fig 6a, b), confirmed on surgery and colonoscopy followed by surgery respectively. 5 cases were of SBO (Fig 5b), of which 1 case was gall stone ileus, 2 cases were intussusception (Fig 5c) and 2 were jejunal closed loop obstruction. Among these cases of bowel obstruction, strictures & adhesions were the common causes.

Beall et al¹⁰ in a study conducted in 2002 for SBO demonstrated 95% sensitivity of 95%, and 100% specificity.

Frager et al¹¹ in a study conducted in 1998 for LBO demonstrated 96% sensitivity and 93% specificity.

Present study demonstrates 100% sensitivity and specificity.



Fig 5a- Coronal CT abdomen showing multiple diverticulae (white arrows) in the ascending colon of which one diverticula (yellow arrow) in right hypochondrium showing peri-diverticular fat stranding suggesting acute diverticulitis. **Fig 5b-** Axial CT abdomen demonstrating dilated small bowel loops (yellow arrow) due to a short segment stricture (white arrow) with enhancing wall and adjacent fat stranding suggestive of small bowel obstruction. **Fig 5c-** Axial CT abdomen showing herniation of distal jejunal loops with its mesenteric fat and vessels into proximal jejunal loops suggesting of jejunojejunal intussusception (yellow arrow).

2b: Perforation of Hollow Viscus: This group showed 6 cases out of which 1 case was gastric perforation, 2 cases were perforation of 2nd part of duodenum, 1 case was jejunal perforation and 1 cases were gall bladder perforation and 1 diverticular perforation. All cases were confirmed on surgery (Fig 6c).

Hainaux et al¹² in a study conducted in the year 2006 with a study population of 85 demonstrated a Sensitivity of 89%, Specificity of 100%.

Present study demonstrates 100% sensitivity and specificity.

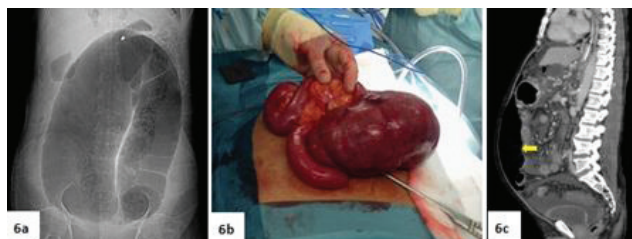


Fig 6a- CT scanogram showing ahastral dilated loop of large bowel with an inverted U-shaped configuration (coffee bean) arising from pelvis

and its apex pointing towards left upper quadrant suggestive of sigmoid volvulus. Fig 6b- Intra operative image of sigmoid volvulus. **Fig 6c-** Sagittal CT image showing intra-abdominal free air (white arrow) suggestive of hollow viscus perforation.

3: Bowel Ischemia Or Vascular Causes: 5 cases of bowel ischemia or vascular causes were found, out of which 2 cases were diagnosed as omental infarcts, 1 case was descending aortic aneurysm, 1 case was diagnosed as ischemic colitis while 1 case was diagnosed as dissecting aortic aneurysm. Cases of bowel ischemia was confirmed on triple phase CT, while abdominal aortic aneurysm was confirmed on surgery and omental infarction responded to conservative management.

Hassan et al in a study conducted in 2003 demonstrated a Sensitivity of 86.7% and Specificity of 100%

Present study demonstrates 100% sensitivity and specificity.

4: Traumatic Causes: 6 cases were diagnosed, all the cases had hemoperitoneum in common, & all 6 cases were confirmed on laparotomy. In 6 cases, 2 were AAST GRADE II liver injury, 1 was GRADE IV splenic injury, 1 was GRADE V kidney injury, 1 was GRADE II splenic injury and 1 was AAST GRADE I splenic injury.

Joshua et al¹³ in a study conducted in 2004 in 1082 patients demonstrated a Sensitivity of 82% and Specificity of 99%.

Present study demonstrates 100% sensitivity and specificity.

4: Miscellaneous: There were 11 cases out of which 4 cases of Acute Colitis, 3 cases were of Acute Mesenteric adenitis, 2 cases were Acute Epiploic Appendagitis and 2 cases were Acute Peritonitis. All the cases were responded to conservative therapy or confirmed on surgery.

Ruedi F. Thoeni et al¹⁴ in a study conducted in 2006 demonstrated a Sensitivity of 100% and Specificity of 80% for colitis.

Richard M. Gore et al¹⁵ in a study conducted in 2000 demonstrated a Sensitivity of 88% and Specificity of 97% for colitis for acute mesenteric adenitis and choledocholithiasis.

Present study demonstrates 100% sensitivity and specificity.

CONCLUSION

MDCT is playing a great role in the detection and characterization of acute abdominal pathology. The sensitivity and specificity of CT in determining the presence of acute abdominal pathology is very high and it is very accurate in finding the cause leading to acute abdomen. Multidetector CT has allowed the radiologist to display a finding in any desired plane as it has transformed an axial imaging modality into a volumetric one.

The diagnosis based on clinical findings is not accurate most of the times. The fact that a common symptom can arise from a broad spectrum of diseases combine to make acute abdomen difficult to diagnose. Therefore, MDCT helped to pick up correct diagnosis and its treatment in patients with acute abdominal pain. MDCT is the most important non-invasive, rapid and painless imaging tool to diagnose acute abdomen and it gives detail information about status of the disease and helps in intervention.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Obtained

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Patterns and Distribution of Dental Caries and Dental Fluorosis in School Children of Sivakasi

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ABSTRACT

Aim and Objective: To assess the prevalence of dental caries and dental fluorosis in school children living in sivakasi.

Background: Dental fluorosis is a developmental disturbance of dental enamel caused due to excessive ingestion of fluoride during enamel formation. The main cause is the water containing excess fluoride content especially ground water of particular community.it has become a major public health problem in india.This study is done to measure the prevalence of dental caries and dental fluorosis in school children residing in sivakasi.

Materials and Method: This study was done in school children of low socio-economic status between the age group of 6-10. 90 students from a school was selected.A proper dental examination was carried out after obtaining informed consent. Dean's fluorosis index (DFI) and DMFT was calculated. Severity and prevalence of dental fluorosis were assessed with DFI and Community Fluorosis Index (CFI) and was used to measure the burden of dental fluorosis in the study area.

Conclusion: The study concluded that 19% of children are affected by dental fluorosis and 55.5% of children affected by dental caries. Dental caries still remains as a major oral health issue among children.

Keywords: *fluorosis, caries, prevalence, children, dental*

INTRODUCTION

Dental Caries is the most prevalent and chronic oral disease of human beings⁽¹⁾. As dental caries prevalence is more both in children and adults ,it has been considered as most significant global oral health burden⁽²⁾. In developing countries, nutritional transition with easy access to refined carbohydrates, low use of fluorinated toothpaste and irregular tooth brushing habits lead to increased prevalence of dental caries⁽³⁾. The International Caries Detection and Assessment

System(ICDAS) developed caries detection based on visual inspection. This system is used for clinical research and epidemiological surveys for detecting cavitated and non-cavitated lesions with acceptable reliability⁽⁴⁾.

Fluorine is one of the essential microelement for proper growth and function of human body .It's complex form is fluoride which exists in groundwater ⁽⁵⁾ . In dentistry, deficiency of this fluoride is associated with defective enamel formation and excess of fluoride leads to dental and skeletal fluorosis⁽⁶⁾ .Dental fluorosis appears as opaque white spots or lines and in some severe cases, there is presence of discolored and brittle enamel which leads to chipping⁽⁷⁾ .Dental fluorosis is more prevalent in people consuming groundwater due to high level of fluoride in it⁽⁶⁾ .Fluoride can also be present in foods like salt water fish,sorghum,finger millets. Thus consuming these food in excess can even lead to dental fluorosis⁽⁸⁾.

Therefore, a school based cross sectional study was done to quantify the prevalence of dental caries and dental fluorosis among school children in Sivakasi

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MATERIALS AND METHOD

The present study was carried out in Sivakasi, a town located in the south side of Virudhunagar District, Tamilnadu. The topography is almost plain, with no major geological formation. There are no notable mineral resources available in and around the town. The ground water was free from colour, odour, and taste. This study was done in school children of low socio-economic status between the age group of 6-10.90 students from a school was selected. The dental examination was done by a single qualified dental professional using a probe and mouth mirror in bright daylight along with artificial light source with subject seated on an ordinary chair. Instruments were disinfected with an antiseptic solution after every use. Dean's fluorosis index (DFI) and DMFT was calculated. Severity and prevalence of dental fluorosis were assessed with DFI and Community Fluorosis Index (CFI) and was used to measure the burden of dental fluorosis in the study area. Prior to the examination, study design was explained to the qualifying participant's parents and informed consent was obtained from the parents.

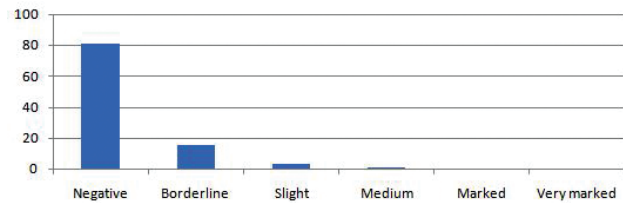
RESULTS

According to the study done in primary school, the Community Dental Fluorosis was found to be 0.2 which falls under negative. 81% of the children fall under negative, 15% of the children are in borderline, 3% of the children have very mild fluorosis and 1% have mild fluorosis. Among 81% of the children falling under negative in fluorosis index, seventeen are 6 year old children, nine are 7 year old children, seventeen are 8 year old children, fifteen are 9 year old children and fourteen are 10 year old children. 8 year old children are comparatively more prone to fluorosis followed by 9 year, 10 year, 6 year, 7 year old children respectively. The study has shown that males are more prevalent to fluorosis than females. 54.5% of males are affected and 45.4% of females are affected.

The dental caries index taken gave the result of 40 caries free children, eleven children having score 1, eleven children having score 2, nine children having score 3, ten children having score 4, two children having score 5, two children having score 6, one child having score 7, three children having score 8 and one child having score 10. Among the 40 caries free children, 6

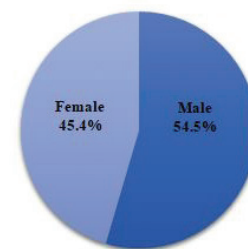
yr old children contributes 17.5%, 7 year old children contributes 22.5%, 8 year old children contributes 12.5%, 9 year old children contributes 7.5% and 10 year old children contributes 40%. The highest DMFT was scored by a 6 year old female and also it has been found that males are more prone to caries than females showing 56% males affected by dental caries and 44% of females affected by dental caries.

Dental Fluorosis Index



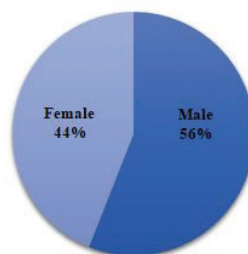
Graph No.1: Dental Fluorosis Index

Prevalence of dental fluorosis



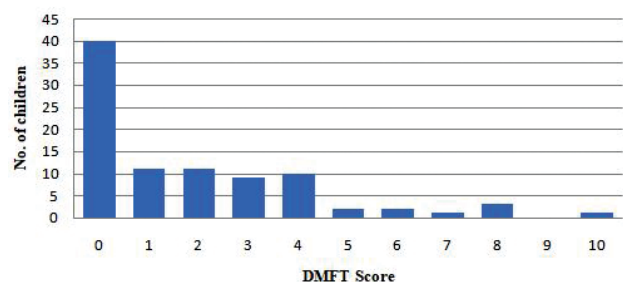
Pie Chart No.1: Prevalence of dental fluorosis

Prevalence of dental caries

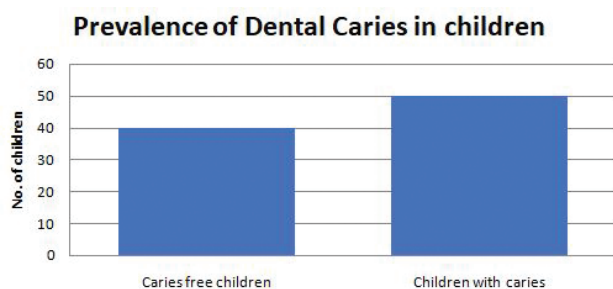


Pie Chart No.2: Prevalence of dental caries

DMFT Index



Graph No.2: DMFT Index



Graph No.3: Prevalence of dental caries in children

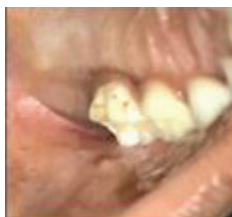


Figure1: Dental fluorosis



Figure 2: Dental fluorosis affecting anterior teeth

DISCUSSION

Sivakasi is located to east of the Western Ghats and it consists of charnockite, quartzite, pegamatite, laterite, and sandstone. Alluvial soil in this area acts as a good aquifer along the Vaippar and Gundar river beds, which are major sources of water supply to the villages. The borewells are drilled to a depth of 40-70 m. Due to the nature of the rocks and weathering, fluoride ions leach out into groundwater aquifers. The dissolution of apatite or fluorapatite minerals from charnockite rocks releases the fluoride into groundwater. According to S.Manimegalai and L.Muthulakshmi, the fluoride ion concentration in Sivakasi is found to be 1.8 mg/L⁽⁹⁾.

Considering these data, our curiosity led to this study. This study showed 19% of children affected by dental fluorosis and 55.5% of children affected by dental caries. According to Ashish Bhalla, 18% of Kanpur children were affected by dental fluorosis out of which 53.9% are males and 46% are females⁽⁶⁾. While in our study 54.5% are males and 45.4% are females. Our study slightly differs from a study done by Monica Chaudhry in Greater Noida, Uttar Pradesh which shows 21% of

children affected by dental fluorosis. But in this study, prevalence in females (51.7%) is higher compared to males⁽¹⁰⁾. Another study done by Saravanan in Cuddalore district is similar to our study in that prevalence of dental fluorosis is more in 8 and 9 year old children comparatively. It shows 35.9% of 8 year old children and 38% of 9 year old children are affected by dental fluorosis while in our study it is 27.2% of 8 year old children and 22.7% of 9 year old children are affected⁽⁵⁾.

According to a research done by Jayashri Prabakar in 2016, 47.3% of children are affected by dental caries while in our study it is 55.5% children⁽¹¹⁾. A study done in RBI Staff Quadrant School, Chennai by Nausheen Mobeen, in which females (63%) have more prevalence of caries than males (37%)⁽¹²⁾. This is in contrast with our study in which males (56%) are more prevalent compared to females (44%). A research done by Naziya in Chennai school is similar to our study where 54% of males were more affected than 46% of females⁽¹³⁾. Ramachanran Karunakaran's study has increased prevalence of dental caries ranging 65.88% which was conducted in Nammakal District of Tamilnadu⁽¹⁴⁾.

CONCLUSION

This study was done to know the prevalence of dental caries and dental fluorosis among primary school children in Sivakasi consuming bore well water. The study concluded that 19% of children are affected by dental fluorosis and 55.5% of children affected by dental caries. Dental caries still remains as a major oral health issue among children. Thus awareness based programs should be conducted as well as educating the parents is also necessary for preventing dental fluorosis. As a dentist it is our duty to create awareness in the society to prevent the occurrence of dental caries and dental fluorosis.

Ethical Clearance: Taken from institutional ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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Prevalence of Reproductive Tract Infections and Treatment Seeking Behavior among Women of 15-49 Years Age Group in Haldwani Block, District Nainital, Uttarakhand, India

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ABSTRACT

Background: Reproductive Tract Infections are one of the major public health problems in India, and have a huge impact on the lives of women and men along with their families and communities.

Objectives:

1. To estimate the prevalence of RTI among married women in the age group of 15-49 years.
2. To assess the pattern of treatment seeking behavior among women with symptoms of RTI.

Methods: Cross-sectional study design was used to investigate RTIs in 30 villages of Haldwani block, district Nainital, with 30 cluster sampling technique.

Results: Out of 450 women interviewed, 145 of them were found to be suffering from RTIs resulting in a prevalence of 32.2%. Out of 145 symptomatic women, only 14.5% reported that they received treatment while 85.5% did not receive any treatment.

Conclusion: The study showed a high prevalence of RTI but poor treatment seeking behavior among the study participants.

Keywords: Reproductive Tract Infections, Treatment seeking behavior, Syndromic approach

INTRODUCTION

Reproductive Tract Infections (RTIs) are one of the major public health problems in India. Generally presenting as 'silent' epidemic, RTIs have a serious impact on women, their families and communities¹. Untreated RTIs can result in infertility, ectopic pregnancy, chronic pelvic pain, miscarriage, increased risk of HIV infection, cervical cancer and even death².

Globally each year, there are estimated 357 million new infections with 1 of 4 STIs: chlamydia (131 million), gonorrhoea (78 million), syphilis (5.6 million), trichomoniasis (143 million)³. In 2014 the estimated cases in India were about 37,269 cases of syphilis and 74,390 cases of gonorrhea⁴. NFHS-4 & DLHS-4 reported 23.5% & 10.9% prevalence of RTIs/STIs respectively⁵. The scenario of the prevalence of RTIs in Uttarakhand, according to a study done in Dehradun was 13% (Aggarwal et al. 2011)⁶.

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AIM & OBJECTIVES

1. To estimate the prevalence of RTI among married women of 15-45 years age group.
2. To assess pattern of treatment seeking behavior of symptomatic women.

MATERIALS AND METHOD

The present study was a community based cross sectional study done in Haldwani block of district Nainital in the state of Uttarakhand conducted for a period of one year from September 2016 to August 2017.

Study Subjects: The study subjects were all married women from age group 15-49 years residing in Haldwani block of district Nainital in the state of Uttarakhand. Women who refused to participate, with missed periods at the time of study, widow, divorcee, separated, undergone hysterectomy, with a history of drug allergy, recent antibiotics intake, bleeding per vaginum and having systemic disease and who could not be contacted even after two visits were excluded from the study.

Sample Size: The sampling procedure adopted was 30 cluster sampling. Sample size was calculated by using the formula for indefinite population [$n = 4pq/d^2$] by taking the prevalence of RTIs to be 23 %⁵ and permissible error of 5%. After applying design effect of 1.5 and adding 10% non-response rate the final sample size came out to be 450.

Sampling Technique: Two stage sampling technique was used taking village as primary sampling unit. In Haldwani block there are 252 villages or clusters, list of which was obtained from the tehsil. Out of these, 30 villages or clusters were selected randomly using the lottery method. From each selected village or cluster, 15 households were selected using simple random sampling. One reproductive female from each selected household was interviewed. If there were more than one eligible woman in the household, one was selected randomly by using lottery method. Two repeat visits were made if the required female was not found at first visit.

Data Collection: Data was collected after taking informed verbal consent from the participants, by means of a pre-designed, pre-tested and semi-structured questionnaire covering information regarding socio-demographic profile & treatment seeking behavior of women for RTIs symptoms. Interview of eligible woman was followed by general examination, visual inspection of external genitalia and per abdomen examination.

Data Analysis: Data was entered and analyzed using SPSS software version 21 for windows. Syndromes were defined as per given in World Health Organisation, Training Modules for the Syndromic management of Sexually Transmitted Infections⁷.

RESULTS

Table 1: RTI prevalence since last 1 month

Presence of RTI	Number (N)	Percentage (%)
Yes	145	32.2
No	305	67.8
Total	450	100.0

It was observed that, out of 450 study participants, 145 women were suffering from RTIs giving a prevalence of 32.2%.

Table 2: Socio-Demographic Profile of the Study Subjects (N = 450)

Socio-demographic Characteristics		Number (N)	Percentage (%)
Age group (years)	15-19	28	6.2
	20-24	86	19.1
	25-29	106	23.6
	30-34	91	20.2
	35-39	67	14.9
	40-44	40	8.9
	45-49	32	7.1
Education	Illiterate	156	34.7
	Primary	87	19.3
	Middle	57	12.7
	High school	49	10.9
	Intermediate	55	12.2
	Graduate and above	46	10.2
Occupation	Unemployed/ Housewife	416	92.4
	Employed	34	7.6
Socio-economic Status*	Class I	51	11.3
	Class II	123	27.3
	Class III	119	26.5
	Class IV	149	33.1
	Class V	8	1.8

* Modified BG Prasad Classification, updated 2016

Table 2 showed that majority (23.6%) of the study participants were in the age group of 25-29 years, illiterate (34.7%), unemployed/housewife (92.4%) and belonged to socioeconomic Class IV (33.1%).

Table 3: Distribution of symptomatic women with RTI and their health seeking behavior

Health care seeking behavior	Number of RTI cases	
	Number (N)	Percentage (%)
Sought some treatment	21	14.5
Not sought any Treatment	124	85.5
Total	145	100.0

Table 3 depicts that out of 145 women with symptoms, only 14.5% reported that they received treatment, while 85.5% did not received any treatment.

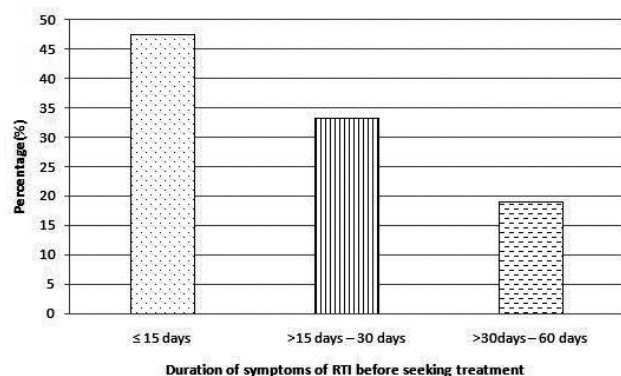
**Figure 1: Distribution of women with duration of symptoms of RTI before seeking treatment**

Fig. 1 shows that maximum (47.6%) women sought treatment within ≤ 15 days while 52.4% women sought treatment after 15 days. Median duration of symptoms of RTIs before seeking treatment was 20 days.

Table 4: Distribution of Sources of treatment preferred by Symptomatic women

Variable	Category	Number of RTI cases	
		Number (N)	Percentage (%)
*Sources of T/t preferred	Home Remedies	6	28.6
	Allopathic doctor	13	61.9
	Ayurvedic	11	52.4
	Chemist shop	2	9.5
	Traditional healers/ Quacks	7	33.3

*Multiple responses

Table 4 shows that the maximum (61.9%) symptomatic women went to allopathic doctors for treatment followed by Ayurvedic (52.4%), traditional healers/ Quacks (33.3%), chemist shop (9.5%). Home remedies were preferred by 28.6% women.

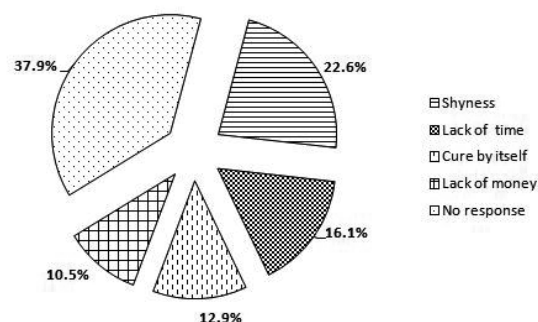
Reasons for not seeking health care (N=124)**Figure 2: Distribution of symptomatic women with RTI and the reasons for not seeking health care**

Fig. 2 depicts that maximum (37.9%) symptomatic women stated no reason while reasons stated by 62.1% women for not seeking treatment were shyness, lack of time, cure by itself & lack of money

DISCUSSION

The mean age of study participants was found to be 30.1±7.9 years. Age group 25-29 years constituted the majority of study subjects (23.6%) followed by 30-34 yrs age group (20.2%). Similar findings were observed by Saluja N et al⁸, Bote MM et al⁹ & Thekdi KP¹⁰ et al in their study who found that majority of the study participants were in the age group of 25-29 years. However, Sreelatha CY et al¹¹, Rizwan SA et al¹², Mamta et al¹³, Mani G et al¹⁴ reported that maximum participants in their study belonged to age group of less than 25 years.

The proportion of illiterates was found to be 34.7% in present study; total percentage of literates being 65.3%, which is comparable to the literacy status of females (70.01%) in Uttarakhand population as shown in census 2011.²¹ This value is lower than those collected in other studies conducted by Rasheed N et al¹⁶ in Delhi (83.5%), GK Ratnaprabha et al²² in Bangalore (78.5%) & Bhilwar M et al¹⁹ in North-East Delhi (72.8%) who reported comparatively higher percentage of literates. This variation may be because the later studies were conducted in major metropolitan cities of India having a higher literacy status.

Majority (92.4%) of study subjects were found to be unemployed/housewives and merely 7.6% were engaged in some form of employment. The number of unemployed females/housewives in studies done by Bhilwar M et al¹⁹, Mathew L et al¹⁸, Mani G et al¹⁴, S Anitha et al²⁰, Mamta et al¹³, Meher S et al¹⁷ & GK Ratnaprabha et al²² were 88.9%, 82.7%, 80.8%, 79%, 76.7%, 70.3% & 60.2% respectively.

It was seen that maximum (34.9%) study subjects belonged to socio-economic Class IV & V. Bote MM et al⁹, G. K. Ratnaprabha et al²², Kumar PV S et al²³, Thekdi KP et al¹⁰ & Rasheed N et al¹⁶ also reported that majority of study participants belonged to lower socio-economic class.

In our study, the overall prevalence of RTI in reproductive age group was found to be 32.2% which was similar to the prevalence found in a study by Sreelatha CY et al¹¹, S Anitha et al²⁰, Mani G et al¹⁴ & Rasheed N et al¹⁶ i.e. 32%, 32.2%, 33.3% & 34.5% respectively. Use of same methodology as these authors can be held responsible for this. Saluja N et al⁸, Bhatia R et al²⁴ & Bote MM et al⁹ reported 13.19%, 45.6% & 50% prevalence of RTI in their respective studies. This variation may be because of use of different methodology and definitions in their studies.

The treatment seeking for RTI was found to be poor in our study. It was found that out of 145 women with symptoms, only 14.5% reported that they received treatment which was lower than studies conducted by Garg S et al (27.8%)²⁵, Bhandari MN et al (33.3%)²⁶, Philip PS et al (35.6%)²⁷, Rizwan SA et al (40%)¹², GK Ratnaprabha et al (45.2%)²², Chakrabarty S et al (49%)²⁸ & Mathew L et al (63.9%)¹⁸. This may be due to lack of awareness as majority of women in our study were illiterate and also this was again a pointer to the fact that reproductive health problems were not perceived as abnormal and requiring medical attention. Median duration of symptoms of RTI before seeking treatment was 20 days which was comparable to the study done in Pakistan who reported that over 53% waited for 7-30 days before seeking treatment. In our study majority (61.9%) of the women had taken allopathic treatment followed by ayurvedic treatment (52.4%). The study findings were comparable to study done by Kaur S et al¹⁸ & Bhilwar M et al¹⁹ who also reported that maximum women visited to allopathic doctors for treatment.

About 85.5% symptomatic women who did not seek treatment had their reasons. Some of them reported that

they were feeling shy in explaining symptoms to family members as well as doctor (22.6%). One of the reason was 'lack of time' as they were busy in their routine work (16.1%). Some of them considered it a minor problem which cure by itself (12.9%). Lack of money (10.5%) was also stated while majority of the women (37.9%) stated no reason.

CONCLUSION

Prevalence of RTI in study population was 32.2%. On assessing the treatment seeking behavior of 145 symptomatic women, only 14.5% reported that they had received treatment, while 85.5% did not receive any treatment. The median duration of symptoms of RTI before seeking treatment was 20 days. With regard to preference of treatment, 61.9% of symptomatic women went to allopathic doctor. Among women who did not sought treatment, majority (37.9%) of symptomatic women did not state any reason behind not seeking treatment while shyness (22.6%) was reported as second common factor among women who did not sought treatment.

RECOMMENDATIONS

This study showed a high prevalence of RTIs and poor treatment seeking behavior among the study participants. This high burden could be attributed to two reasons i.e. failure to prevent the occurrence of new cases and failure to identify and effectively treat the prevalent cases. Two possible ways of reducing the failure of the health system in terms of preventive measures are awareness generation and curative measures such as effective and holistic treatment.

Conflict of Interest: Nil

Source of funding: Nil

Ethical Approval: Ethical approval was taken from institutional ethical committee of Government Medical College, Haldwani.

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Sustainable Agriculture and of Irrigation Practices in India

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ABSTRACT

Agriculture is the mainstay of Indian economy. The share of agriculture in terms of domestic product has come down to about 12 per cent in 2014-15, while its share in employment and providing livelihood is still quite considerable, as more than 50 per cent of the population depends on this sector. Thus, it becomes paramount to improve upon the status of agriculture in order to increase the income level and thereby the living standard of the rural population. In this sense, stable growth of agriculture possesses the key for a balanced and more inclusive growth of the economy. Stable growth of agriculture necessitates consistent growth of irrigation potential in the country, since the sector is still remaining a 'gamble of monsoon'. In this chapter, the development of irrigation is analysed at both the national level and also in Tamil Nadu.

Keywords: *Domestic Product, Employment, Growth of Agriculture.*

INTRODUCTION

Water is a major factor constraining agricultural development, especially in a developing country like India and there has been much discussion on how to use economic instruments to allocate irrigation water in an efficient, equitable and sustainable manne. As a result, policy makers find it difficult to formulate suitable water pricing policies and design other institutional reforms to meet the increased water requirements of the farmers, and to recover the full cost. Becomes vital in the process of deciding the economic viability of new irrigation projects (Joshi et al, 2003).¹

Allocation of the scarce resource. Both under pricing of water and lack of cost recovery mechanisms in government managed irrigation systems had resulted in poor operation and maintenance. One strategy is to reduce water demand by adopting water conservation programs and improving water use efficiency, while another strategy involves a water pricing policy. This policy has the advantage that the income could be used to finance developments like the operation and maintenance of irrigation system. Pricing of water can also be considered as a pre-requisite for sustainable use of water resources.² The underlying principle of irrigation water pricing in relation to sustainability concerns is that it should reflect the benefits forgone in the future from using a unit of water today which refers to the opportunity cost of irrigation water (Rajapure and Kothari, 2016).

Sustainable of Agriculture: Agricultural sustainability implies the maintenance of the quantity and quality of agricultural produce over very long periods of time. Apart from good seeds, agricultural productivity depends on soil health, irrigation water quality and quantity. Two-thirds of India's agriculture is in rain fed areas and therefore, agriculture is referred to as a 'gamble with monsoon'. In more recent years, monsoon has become even more erratic on account of possible climate change-induced vagaries. On the other hand, over use of water mainly due to free or low cost electricity has resulted in exploitation of water resource.³ Exploitative agriculture offers great danger if Irrigation without arrangements for drainage would result in soils getting alkaline or saline (Ministry of Agriculture, 2010).

Unscientific tapping of underground water will lead to the rapid exhaustion of this capital resource.⁴ Water is considered as the most critical resource for sustainable agricultural development worldwide. The sustainable use of irrigation water is a priority for agriculture in arid areas, which can be done through better water management techniques. Better management usually refers to improvement of water allocation and/or irrigation water efficiency with the help of scientific methods of water application that includes drip irrigation and sprinkler irrigation (World Bank/Government of India, 2006).⁵

Irrigation Practices and Agricultural Development: As a result, policy makers find it difficult to formulate suitable water pricing policies and design other institutional reforms to meet the increased water requirements of the farmers, in irrigation water becomes vital in the process of deciding the economic viability of new irrigation projects (World Resources Institute, 2009).⁶

Given India's unique food security policy, there is a growing need to manage water for agriculture. Given the political economy of growth based on urbanization and industrialization, there will be a greater pressure to allocate an increasing quantum of water for industrial and municipal uses (Dhawan, 2002). This will pose a threat to food security at the aggregate level. The problems would be acute in semiarid Gujarat, Tamil Nadu, Rajasthan and Maharashtra, which also experience ever increasing demand for water in all sectors. Land degradation would add to the challenges. Mainly, food security of the poor will be at risk, as they would face severe resource constraints not only in accessing water,

but also in investing in land and water management (Bhatty, 2007).⁷

Source-Wise Irrigation In India: The changing trends in the different sources of irrigation in an area explains the effort taken by the Government in augmenting the irrigation potential over the years and also the way in which the pattern has undergone changes. Table – 1 provides the data pertaining to the source-wise irrigation in India since 1950-51.

It is inferred from the table that the proportion of area under canal irrigation has increased from 39.78 per cent in 1950-51 to 42.05 per cent in 1960-61, but has declined continuously since then and came down to the level of 24.64 per cent in 2010-11. The total area under canal irrigation has however, increased initially from 8.30 mha in 1950-51 to 17.45 mha in 1990-91, then declined consistently and came down to 15.67 mha in 2010-11. The area under tank irrigation has declined in both absolute and proportion-wise over the period.⁸ the total area, though has increased initially from 3.61 mha in 1950-51 to 4.56 mha in

Table 1: Source-wise Irrigation in India, 1950-51 to 2010-11*

Year	Canals	Tanks	Tube Wells	Other Wells	Others	NIA
1950-51	8.30 (39.78)	3.61 (17.33)	Nil	5.98 (28.67)	2.97 (14.23)	20.85 (100)
1960-61	10.37 (42.05)	4.56 (18.49)	0.14 (0.55)	7.16 (29.01)	2.44 (9.89)	24.66 (100)
1970-71	12.84 (41.28)	4.11 (13.22)	4.46 (14.34)	7.43 (23.88)	2.27 (7.29)	31.10 (100)
1980-81	15.29 (39.49)	3.18 (8.22)	9.53 (24.62)	8.16 (21.08)	2.55 (6.59)	38.72 (100)
1990-91	17.45 (36.34)	2.94 (6.13)	14.26 (29.69)	10.44 (21.73)	2.93 (6.11)	48.02 (100)
2000-01	15.97 (28.96)	2.46 (4.45)	22.57 (40.94)	11.26 (20.42)	2.89 (5.23)	55.08 (100)
2001-02	15.27 (26.88)	2.19 (3.86)	23.24 (40.93)	11.73 (20.66)	4.36 (7.68)	56.67 (100)
2002-03	14.04 (26.17)	1.80 (3.36)	23.48 (43.76)	10.66 (19.87)	3.67 (6.83)	53.78 (100)
2003-04	14.45 (25.31)	1.96 (3.43)	26.69 (46.75)	9.69 (16.97)	4.30 (7.53)	57.09 (100)
2004-05	14.77 (24.94)	1.73 (2.92)	25.23 (42.60)	9.96 (16.82)	7.54 (12.73)	59.23 (100)
2005-06	16.72 (27.48)	2.08 (3.42)	26.03 (42.78)	10.04 (16.50)	5.97 (9.81)	60.84 (100)
2006-07	17.03 (26.84)	2.78 (4.38)	26.94 (42.46)	10.70 (16.86)	6.00 (9.46)	63.45 (100)
2007-08	16.75 (26.51)	1.97 (3.12)	28.50 (45.10)	9.86 (15.60)	6.11 (9.67)	63.19 (100)
2008-09	16.88 (26.52)	1.98 (3.11)	28.37 (44.58)	10.39 (16.33)	6.02 (6.46)	63.64 (100)
2009-10	14.98 (24.18)	1.58 (2.55)	28.38 (45.82)	9.99 (16.13)	7.01 (11.32)	61.94 (100)
2010-11	15.67 (24.64)	2.00 (3.14)	28.55 (44.89)	10.51 (16.53)	6.87 (10.80)	63.60 (100)

Note: Figures in Million Hectares and those in brackets are percentage to NIA. NA–Not Available.

*Irrigation data is available only upto 2010-11.

Source: Agricultural Statistics at a Glance, 2015, Govt. of India.

1960-61, it has declined since then and has come down to 2 mha in 2010-11. Its share in NIA has gone up

from 17.33 per cent in 1950-51 to 18.49 per cent in 1960-61, but has decreased to 3.14 per cent in 2010-11. In

the absence of any concerted efforts by the Government in enhancing the role of canal and tank irrigation in the country over the years, the structure of irrigation has shifted towards well irrigation and especially towards tube well irrigation.⁹ This also implies the fact that augmenting the extent of irrigation has been left to the poor farmers, as the state has been withdrawing from the same. In 1950-51, tube well irrigation was not known much in the country, as it has no share in the NIA. In 1960-61, tube well irrigation was practised to the extent of 0.55 per cent of the NIA, which has increased to 44.89 per cent in 2010-11. In the same way, the total area under tube well too has increased from 0.14 mha in 1960-61 to 28.55 mha in 2010-11.¹⁰

There has been a similar trend in the expansion of irrigation by other wells which include open or surface wells. Its total area has gone up from 5.98 mha in 1950-51 to 10.51 mha in 2010-11. The proportion of area under the irrigation of other wells, however, has declined from 28.67 per cent in 1950-51 to 16.53 per cent in 2010-11. This indicates that though the pattern of irrigation has moved in favour of well irrigation, within well irrigation, open or surface wells cannot be sustained in the long run, since it should be dug deeper in every passing year. This forces the farmers, especially those who can afford, to shift towards tube well irrigation. This method of irrigation is not only highly expensive, but also highly unsustainable in the long run, as it should also be dug deeper and in that process, drives away the neighbouring small and marginal farmers, for whom the water table becomes 'unreachable'. The proportion of area under other sources like streams and other water ways has accounted for 14.23 per cent in 1950-51, which has declined sharply to 5.23 per cent in 2000-01, but has also increased equally sharply to 10.80 per cent in 2010-11. This suggests that the basic structure of irrigation in the country has undergone major shift over the years. The combined share of canal and tank irrigation which was more than 50 per cent until 1970-71, has given way to well irrigation (both tube well and surface well) in the later period, as it now accounts for more than half of the NIA in India.

Sustainable Water Management: It considers conservation of all water resources using appropriate technologies and their use with social acceptability, economic viability, and eco-friendliness. Under the head of social acceptability, cross subsidization of available

water needs to be made into legitimate interregional (rural versus urban) and inter-sectoral (agricultural versus industrial) needs. Such considerations ahead of the scarcity will provide flexible practices in irrigation management (Goal et al, 2014). Otherwise, politically oriented and ill-considered decisions tend to aggravate human sufferings, cattle perishing, agricultural stagnation or decline and reduced industrial output, cumulatively affecting GDP adversely.¹¹

Under aridity, consideration of low moisture carrying capacity of the ecosystem in right perspective needs irrigation in small dosages and at higher frequency so that immediate hardships out of aridity are minimized (Sarwar and Bastiaanssen, 2001). This is a case of moderate contingency arising out of water scarcity.¹²

Drought being a natural, but temporary imbalance in the availability of moisture caused by lower than the average rainfall over the years, its uncertain frequency, limited duration and severity of sunlight aggravate the rate of evapo-transpiration, resulting into diminished moisture availability for plants to sustain. Severity of such situation needs application of soil conditioner (Chaudhari and Kothari, 2009) and DI at night time so that due to water-holding capacity of the soil conditioner, crop is sustained at a minimal loss due to evapo-transpiration, providing the hope of livelihood, especially for rural and economically weaker population. This is a case of immediate contingency due to acute water scarcity (Pereira, 1999).

Desertification in a large measure is man-made problem over longer duration, carried forward from the past in the availability of water. While drought aggravates desertification, recycling of water for human and cattle consumption and recycling for irrigation provides a workable strategy to arrest the rate of desertification and thereby human hardships.¹³

CONCLUSION

Water scarcity has huge implications for health, hygiene, sanitation, drinking water, agriculture and industry. Therefore, equitable distribution of this scarce resource has been accorded prime consideration in form of sustainable irrigation, which serves as a springboard to provide food for public consumption as well as industrial raw materials. For this purpose, central, state, district and local (village level) governments have

ensured voluntary public code of conduct to minimize the risk of over use of underground reservoirs and protect their water quality. Therefore, water extraction, conveyance, storage and delivery infrastructure is Agriculture being the major user of water, besides reliance on rain-fed irrigation, gradually surface or flood irrigation is being replaced by sub-surface micro irrigation, which has inherent capacity to double the acreage under irrigation, without loss to agricultural output. To reduce water use and transform saline soil into a productive matrix, sustainable water management is made through the enhanced use of farmyard manure, soil conditioner, which permit reduced use of water and at the same time soil fertility, is enhanced over 3-4 year duration. Everything said and done, the ultimate success of irrigation practices depends on certain regulatory measures by the government and public participation through keen awareness.

Ethical Clearance: Yes

Source of Funding: Self

Conflict of Interest: Nil

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A Study to Assess the Knowledge Regarding Cervical Cancer Screening and Prevention among Women in Rural Areas in Trichy

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ABSTRACT

Background: Most of the cervical cancer cases are diagnosed late leading to poor outcomes. Very few studies have explored the awareness, screening and prevention among women in reproductive and perimenopausal age group about cervical cancer in India. Hence this study was conducted with the objective of knowing the knowledge of women about cervical cancer, its risk factors & preventive measures.

Method: A primary health center based Cross-sectional Study was conducted among the women attending the outpatient department of PHC in Pullampadi and RHTC in Sangaenthi in Trichy district during the period December 2017 to February 2018. A total of 300 study subjects were included in the study. A Pre-tested, semi structured questionnaire was developed and it was administered to women in language of their preference. Data was entered and analyzed using SPSS v. 15.

Results: A majority 68% of women had poor knowledge about cervical cancer and its screening. None of the study subjects had undergone screening or had been vaccinated. Whatever little knowledge the women had was obtained from mass media.

Conclusion: Majority of women had poor knowledge. Mass media could be used to educate the women. There is a need to conduct community based study to know the practices of doctors and assess if they are educating and offering suggestions for screening.

Keywords: cervical cancer, knowledge, screening, Vaccination, Symptoms

INTRODUCTION

Cervical cancer is one of the most common cancers worldwide. In India, it is one of the leading causes of mortality among women accounting for 23.3% of all cancer deaths.^[1] India accounts for about 20% of cervical cancer cases reported from the world.^[2] More than three-fourth of these patients are diagnosed in advanced stages leading to poor prospects of long term survival and cure.^[2] Early detection of cervical cancer is possible with pap smear tests. The proportion of women who undergo pap smear testing ranges from 68% to 84% in developed countries as compared to India where the rates range from 2.6% to 6.9% among women in communities.^[3-6] It has been found that, in many developed countries, annual incidence and prevalence of cervical cancer has decreased by 50 to 70% after introduction of Population based screening.^[2] So, if women in India undergo screening for cervical cancer, it is possible to detect cervical cancer in early stages, thereby reducing

mortality and morbidity. Screening would be broadly influenced by Knowledge about cervical cancer, its screening among women. Role of health care providers who come in contact with women in hospitals and the sources of information. Facilities available and the awareness of facilities.

Hence, this study was undertaken to know the knowledge about cervical cancer, screening facilities among women attending OPDs of sangenthi and pullambadi RHTC and PHC respectively. It was planned that after the data collection, the women would be educated about cervical cancer, its screening methods and the facilities available for screening in the hospitals.

METHODOLOGY

A primary health center based cross-sectional study was conducted among women aged between 18 to 60 years, who attended Outpatient department of primary

health center, Sangenthi and Pullambadi in Trichy district of Tamil Nadu. The study was conducted during December 2017 to February of 2018. A Pre-tested, semi-structured questionnaire was devised containing various components of sociodemographic profile like age, occupation, educational status, knowledge about cervical cancer & Screening was applied to assess the study subjects. Only those subjects consenting for the study was included in the study. Those below 15 years & above 60 years and also non-consenting women were excluded from the study. During the study period around 300 study participants were interviewed by using the questionnaire and data entered and results analysed using SPSS v.15.0. Each of the knowledge based questions about cervical cancer was assessed if they had heard about cervical cancer. The questionnaire mainly consisted of Symptoms/manifestations of cervical cancer, Risk factors, screening and vaccination for cervical cancer.

Informed Consent and Ethical Clearance: Study protocol was approved by institutional ethical committee. The women were approached in OPD and invited to participate in the study. The nature and purpose of the study was explained and consent sought. It was made clear that participation in study is voluntary.

Service Component: After the collection of data the women were informed about the cervical cancer, the importance of screening and facilities available for it. Implications of positive and negative results were explained.

Statistical Analysis: The data was entered and analyzed using SPSSv.15.0. Basic subject characteristics were expressed as proportions in appropriate tables.

RESULTS

The study was conducted among 300 study participants between the age group of 18 to 60 years. Among the study only 96 (32%) of them knew about Cancer Cervix.

Table 1: Awareness of Cancer Cervix based on Age Category (n = 300)

Age Category	Total	Awareness	Percentage (%)
18-20 years	9	2	22.2
21-30 years	74	40	54.1

Contd...

31-40 years	90	34	37.8
41-50 years	84	20	23.8
51-60 years	43	0	0
Total	300	96	32

Although the proportion of the people in age group 31-40 years were higher, the awareness was highest among women in the age group of 21 to 30 years (54.1%), whereas none of women in the age group of 51 to 60 years had any awareness.

Table 2: Awareness based on the literary status (n = 300)

Literacy Status	Total	Awareness	Percentage (%)
Illiterate	92	2	2
Primary	42	3	7.1
Secondary	28	2	7.1
High School	52	9	17.3
Diploma	9	5	55.5
Graduate	77	75	97.4

The Awareness regarding cervical cancer increased with increase in educational status. Hence, the highest level of awareness was seen among graduates and least among illiterates.

Table 3: Awareness based on occupational category

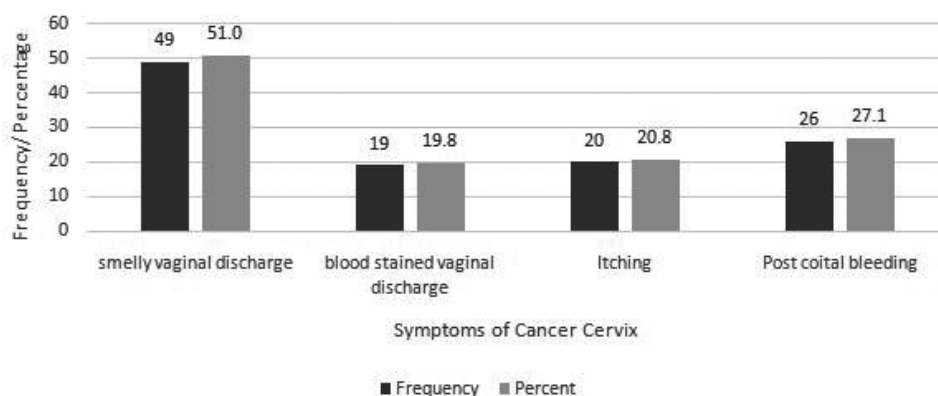
Occupational Category	Total	Awareness	Percentage (%)
Professional	8	2	25
Semi-professional	36	35	97.2
Clerk, Shop Owners, Farmers	12	7	58.3
Skilled	8	0	0
Unskilled	20	0	0
Unemployed	214	52	24.2

With respect to occupational categories, awareness was highest among the semi-professionals and least among skilled and unskilled.

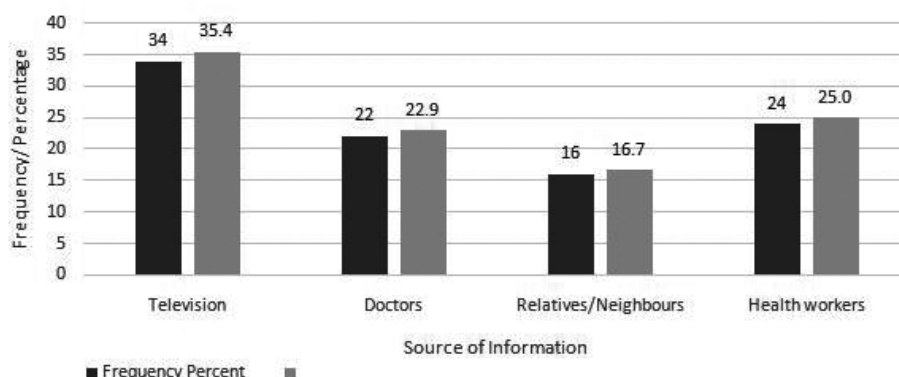
Table 4: Awareness based on Risk factor categories

Risk Factors Awareness		Total (n)	Awareness	Percentage (%)
Menstruation History	Participants with Early menarche	13	4	30.8
	Participants with Late menopause	11	0	0.0
Parity	0-2	204	75	36.7
	3-5	88	21	23.9
	6-9	8	0	0.0
Cervical cancer is caused by infection		96	48	50.0
Knowledge about methods of prevention		96	41	42.7
Maintenance of Personal Hygiene		96	37	38.5
Vaccination prevents cervical cancer		96	31	32.3
Ideal age for Vaccination		31	11	35.4
Availability of investigations for diagnosing cancer cx		96	23	24.0
Early detection possible		23	19	82.6
Ideal age of Screening		23	9	39.1

Among the 300 study participants, 13 had risk factor of early menarche and 11 had late menopause. Among those who had early menarche 30.8% had awareness, while none of them with late menopause had any awareness. Women with lesser parity (0-2) had more awareness (36.7%) than those with higher parity. about 32.3% of women had awareness about availability of vaccine to prevent the occurrence of cervical cancer, among these 35.4% were aware of ideal age for vaccination.

**Fig. 1: Knowledge about symptoms of cervical cancer (n = 96)**

Blood stained vaginal discharge, smelly vaginal discharge, itching & Post-coital bleeding were the most common symptoms known by the study population. Nearly half of the those aware of cervical cancer had knowledge of smelly vaginal discharge as symptom of cervical cancer.

**Fig. 2: Main Source of information regarding cervical cancer (n = 96)**

Television and health workers were found to be the major sources of information regarding cervical cancer in comparison to others.

DISCUSSION

Recently, studies have been reported from India on awareness of cervical cancer and its screening among women [1-8]. Based on the study conducted by Aswathy S et.al. in Kerala 74.5% of the population were aware of the methods of early detection of cervical cancer. Based on the study conducted by Shekhar S et.al. 77% of them knew that pap smear is used for early detection of cervical cancer. Based on the study conducted by Shekhar S et.al., among the women of rural India 69% of the study population had awareness about cervical cancer. 70% of those who participated in the study conducted by Shan V among the nursing staff of a tertiary health institute in Ahmedabad had awareness about cervical cancer. Study conducted by Asthana S, proves that 85.5% of women were aware of cancer cervix and its screening methods. Based on the study conducted by Basu P et al in which in spite of the low literacy rate 95% of the women were aware of cancer cervix whereas in our study lower literacy status is associated with lesser awareness. Women's perceptions and social barriers determine compliance to cervical screening- results from population based in India: cancer detect prev. 83% of the women were aware of the fact that cervical cancer screening methods are available and they were willing to undergo such studies, whereas in our study only 32% of women taken into study were aware about cervical cancer. Studies exploring the knowledge of women about cervical cancer are focused on either on "nursing staff" working in hospitals or on women in the rural community [1-5]. Three of these studies, which focused on "nursing staff" have reported good awareness of cervical cancer and its screening, though the proportion of who have ever undergone pap smear ranges from 7-8% respectively [2-4] where as in our study, though 24% women were well aware of cervical cancer and its screening methods, none had undergone pap smear testing. Two studies which were done on women in rural communities have also reported awareness of about 72% though only 2%-6.9% ever had pap smear test [1,5]. One study among women who attended the outpatient departments has reported low awareness (16%) though 10% had ever received pap test [6]. Another study from India did not provide any information on knowledge or the proportion of women who have undergone pap smear test [7]. A study carried out on college girls, which explored only the knowledge has reported low levels of

awareness (20%) [8]. None of the studies have explored the role of the healthcare providers who come in contact with women, sources on information in the context of early diagnosis.

Conflict of Interest: None declared

Source of Funding: Self

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Study on Utilization of Breast Feeding Booths in Major Bus Terminals by Lactating Mothers in Selected Districts of Tamil Nadu

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ABSTRACT

Introduction: Breast feeding is the optimal source of infant nutrition. Our government of India and Tamilnadu have taken various steps to promote breastfeeding, one of which was lactating rooms or nursing covers in major bus terminals in Tamilnadu. This project aims at analyzing the utilization of lactating booths by breastfeeding mothers and spreading awareness about breastfeeding booths in bus terminals and making sure that the lactating mothers are comfortable with every aspects.

Methodology: It is a cross sectional descriptive study involving major bus terminals in Tamilnadu involving mothers of child less than 2 years of age crossing our study site for a period of one month with sample size of 200 by interviewing them with predesigned semi-structured questionnaire.

Result: Among the study population, 71.5% (143) are aware of lactating booths and only 19.5 % (39) of surveyed population is making use of breastfeeding booths, while others are not happy with breastfeeding booths because of various aspects like feeling of insecurity/ shyness, poor infrastructure, use of bottle milk etc. Utilization of lactating booths by breastfeeding mothers has been increased from 38.5% in past one year to 61.5% in past 6 months.

Conclusion & Recommendation: Though lactation booths increases the rate of breastfeeding, it can be achieved more by removing the social stigma on breastfeeding and making it more acceptable.

Keywords: Breast feeding booths, Privacy, Bus Terminals, Utility, Tamil Nadu

INTRODUCTION

Breastfeeding is the first fundamental right of the child. Breastfeeding is an important public health strategy for improving infant and child morbidity and mortality, improving maternal morbidity, and helping to control health care costs.¹ The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommended that every infant should be exclusively breastfed for the first six months of life, with breastfeeding continuing upto two years of age or longer.¹ Breastfeeding is the unique source of nutrition and it plays an important role in the growth, development and survival of the infants². Breast feeding also provides health benefits for mother such as reducing postpartum blood loss, prevents breast and ovarian cancer and most importantly it increases the bonding between mother and the child.

TRI CORE interventions related to breast feeding are, 1. Improving lactation support, 2. Enhancing maternal & staff lactation education and 3. Fostering maternal confidence in their ability to breastfeed³. Of all health protective interventions, regular breastfeeding of infants under two years of age has the greatest impact on child survival⁴. Breastfeeding has been globally recognized as the measurement indicator for the health outcome of population⁵.

As we are living in the era of migration, travelling is inevitable in our day today life. Barriers to breastfeeding can include obesity, returning to work, poor family support, embarrassment about feeding in public and lack of education⁶. However on a regular basis there is an increasing outcry about a mother who has been told to cover up or move away from a public area while she is breast feeding. Discomfort with idea of breast feeding

in public has been cited as a reason for some women choosing not to initiate breast feeding or planning a shorter duration of breast feeding. Other women are choosing to express and bottle feed their expressed milk when they are in public. Mothers should feel free to breastfeed whenever they need to. There comes the need for nursing covers.

On august 3, 2015, lactating room or nursing covers was introduced in major bus terminals in Tamil Nadu. Overall 352 such lactating rooms were established at various bus terminals all over the state. It has been a year since the scheme has been initiated. The main objective of this study is to assess the current status of the program and the accessibility by the common people, to determine the perceived needs of women who are breastfeeding in lactating room at bus terminals and to identify challenges faced by mothers which are need to be addressed to make breast feeding at public places more friendly.

METHODOLOGY

It is a cross sectional descriptive study involving major bus terminals in Trichy, Thanjavur, Nagapattinam which covered mothers of children less than 2 years and who are on travel and about to cross our study site on that particular day. Study period was for one month including a sample size of 200. The study tool was a predesigned semi-structured questionnaire which included demographic details like age and number of children, awareness about lactating booths, facilities and difficulties in the lactating rooms, with the study technique of Interview with breastfeeding mothers. Data was collected, entered and analyzed using SPSS V 15.0 software.

RESULTS

The study consisted of interview among 200 lactating mothers who were transiting the bus terminals of Trichy, Thanjavur and Nagapattinam. Among the study subjects, only 71.5% of the study population are aware about the breast feeding booths.

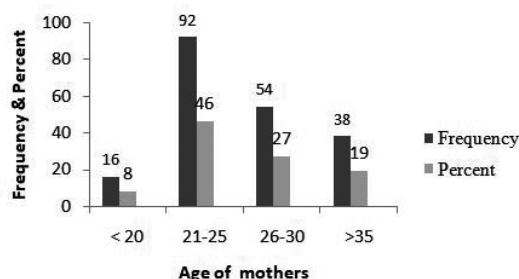


Figure 1: Distribution of Age Group of Lactating Mothers (n = 200)

Figure 1 shows about 46% of the breastfeeding mothers are in age group of 21-25 years. Around 65% of the study population breastfeed in public places. Among lactating mothers who used these breastfeeding booths majority of them had single child.

Table 1: Distribution Of Common Public Breast Feeding Sites Utilized By Lactating Mothers (n = 200)

Common Breast Feeding Public Sites	Frequency	Percent
College Campus	2	2.3
Beach	5	3.8
Marriage Hall	5	3.8
Airport	6	4.6
Office	7	5.3
Hotels/Restaurants	7	5.3
Beauty Parlour	8	6.1
Temple/Church	8	6.1
Shopping Centre/Market	11	8.4
Park/Theatres	12	9.2
Railways	14	10.7
Hospital	16	12.2
Bus Stand	29	22.1
Total	131	100

Table 1 shows that majority of travelling lactating mothers commonly use bus stand to breastfeed followed by hospitals and railway stations.

Table 2: Frequency of Usage of these Booths by Lactating Mothers (n = 200)

Frequency of Usage of these Booths	Frequency	Percentage
>8 Times/Month	7	4.9
4-8 Times/Month	12	8.4
<3times/Month	20	14
Not At All Used	104	72.7
Total	143	100

Table 2 shows that among travelling mothers who lactate, 72.7% of the people do not use these booths even though they are aware of these booths.

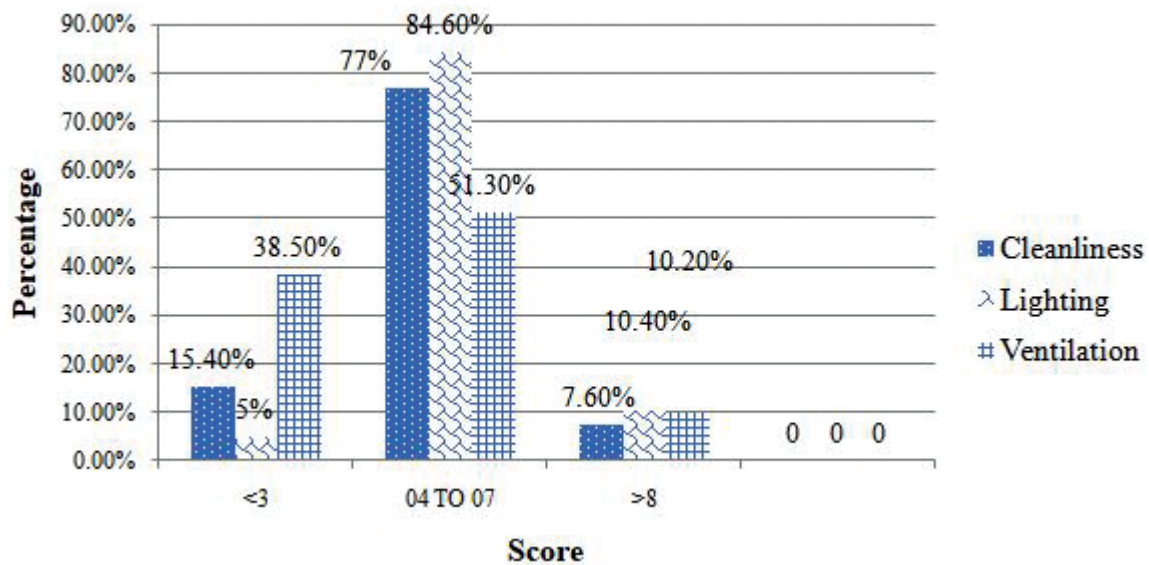


Figure 2: Scores Given For Cleanliness, Lighting & Ventilation by Lactating Mothers Who Used Breast Feeding Booth

Figure-2 shows that majority of the lactating mothers gave scores (out of 10) in 0-7 range for cleanliness, lighting & ventilation, which stress the importance of improving the ambience in these breast feeding booths.

Table 3: Problems Faced By Lactating Mothers in Breastfeeding Booths

Factors affecting Booth utilisation	YES		NO	
	Frequency	Percent	Frequency	Percent
Facility To Sit	38	36.5%	10	25.6
Privacy Status	20	19.2%	12	30.7
Adequacy Of Breast Feeding (Satisfaction)	19	18.2%	8	20.5
Usefulness Of Booth	27	26.1%	9	23.2

This table shows that lack of privacy is the major problem faced by lactating mothers.

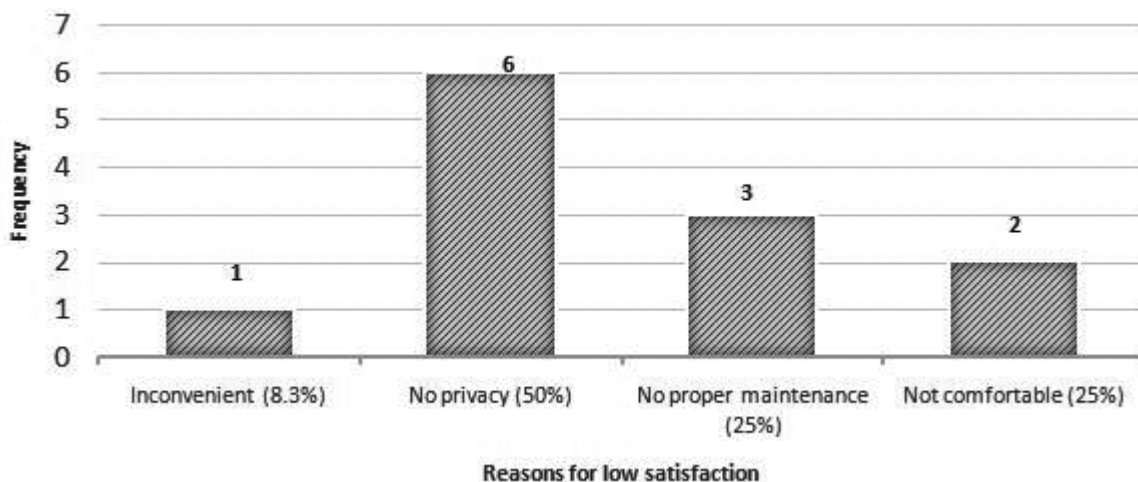


Figure 3: Reason For Low Satisfaction using Breast Feeding Booths (n =12).

This ensures that lack of privacy (50%) & lack of proper maintenance (25%) is the major reason for poor satisfaction among lactating women using breast feeding booths.

DISCUSSION & RESULTS

From the study we conducted among 200 breast feeding mothers, we got the information that out of 200 only 143 are aware of such breastfeeding booths in bus terminals which forms 71.5% of total population. Our main aim is to make every women breastfeed adequately every time irrespective of the place they are in. Out of 143 who are aware of the breast feeding booths only 39 are using it which forms a mere 19%. Only a 2/3 rd (131) of total study population had breastfed in public places while remaining 69 which forms about 34.5% of total study population choose not to breastfeed in public places because of use of bottle milk, insecurity, shyness.

Based on study, besides Bus Terminals other commonly used breastfeeding places were hospitals and railway stations. Out of 200 study population the people utilizing the breastfeeding booth mainly belongs to that 35.5% who are mothers of 1 child. Caretaker should be provided for each breast feeding booth to help mothers travelling alone with more than one child. Mothers who are using these booths for the past 1 year is 15(38.5%) which show drastic increase over the past 6 months which is around 24 (61.5%). Digital banners and placards in and around bus terminals will make this facility visible to everyone.

According to a study by South Asia Infant Feeding Research Network⁷ (SAIFRN), exclusive breastfeeding rates were 42.55 in Bangladesh, 46.4% in India and 53.15 in Nepal. The rate of full breastfeeding ranged between 60.6% and 73.9%. There were no factors consistently associated with the rate of exclusive breastfeeding across countries.

Utilization of health services (more antenatal clinic visits) was associated with higher rates of exclusive breastfeeding in India but low rates in Nepal. Delivery at a health facility was a negative determinant of exclusive breastfeeding in India. India has no legal statute dealing with breastfeeding. Prevalence and social acceptance vary from region to region⁸.

In Taiwan, The Public Breastfeeding Act since November 2010 safeguards the right to breastfeed in public, while lactation room are setup to deal with privacy and to provide access to hot water and power supplies, with fines against interfering with a mother's right to breastfeed⁸.

In UK, breastfeeding in public (restaurants, cafes, libraries etc.) is protected under the sex Discrimination Act 1975 under the provision of goods, facilities and services section. If the child is under six months old, the mother has additional protection under a 2008 amendment to the act which protects maternity right. This is superseded by the Equality Act 2010 which clarifies that a business must not discriminate women who is breastfeeding a child of any age in a public place. Her companion(s) are also protected by this act⁹.

CONCLUSION

The utilization of the breast feeding booths in bus terminals was found to be very low i.e 19% among the study population. Among the 39 study participants, only 69.2% felt that these booths are useful. While the remaining 30.8% had complained about various drawbacks about breastfeeding booths like absence of privacy, inconvenient and no proper maintenance.

RECOMMENDATION

The problem is that instead of identifying the root cause, we are trying to adjust current stigma of society. The only way to make it happen is that shifting the status of stigma to more acceptable. In addition to organizing breastfeeding booths, government should take initiative to have digital posters and paintings of breastfeeding women around bus terminals, thereby making it more acceptable. In partnership with community members establish minimum criteria for achieving and maintaining breastfeeding friendly status by overcoming the drawbacks of the lactation booths. Conduct future research in the area of breastfeeding friendly environment and workplace.

Ethical Approval: Obtained from Institutional Ethical Committee

Conflict of Interest: Nil

Source of Funding: Self

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Study to Assess Knowledge, Practice and Attitude of about Self Breast Examination among Women in Field Practice Area of a Medical College in Trichy

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ABSTRACT

Background: Breast cancer is one of the leading causes of cancer mortality worldwide. In spite of benefits of Self Breast Examination (SBE) many women don't even know how to perform it. The study is aimed to assess knowledge, practice and attitude of SBE among women in urban field practice area of Medical College in Trichy.

Method: Cross sectional study was conducted among 150 women between 20 years to 60 years in field practice area of Trichy SRM Medical College Hospital & Research Centre. Data was collected using a pre-tested semi-structured questionnaire, the mode of data collection was through interviews. The Data was entered and analyzed using descriptive and analytic statistical methods.

Results: The mean age of the respondents was 32 (+/-) 12 with 12.5% of the women aged between 20-34yrs. The proportion of married women was 140 (93.3%). Majority (144) 96% respondents reporting that they do not know about SBE. The commonest symptoms of breast cancer known among those aware were bloody discharge from nipple, pain and presence of masses in the breast. They also believed that it is a deadly disease and person once diagnosed with cancer will eventually lose her life.

Conclusion: Health education programmes are needed to create awareness and to encourage and improve women's practice of SBE.

Keywords: Breast cancer, Self-breast examination, Knowledge, Practice, Urban Area.

INTRODUCTION

Breast cancer has been ranked number one cancer among Indian females with mortality 12.7 per 100,000 women. The incidence rate of carcinoma of the breast was 41 per 100,000 women for Delhi, Chennai (37.9), Bangalore (34.4) and Trivandrum (33.7). Mortality-to-incidence ratio was found to be as high as 66 in rural registries whereas as low as 8 in urban registries. Besides this young age has been found as a major risk factor for breast cancer in Indian women¹. Breast self-exam (BSE), or regularly examining breasts on their own, can be an important way to find a breast cancer early, when it's more likely to be treated successfully. Not every cancer can be found this way, but it is a critical step you can and should take for self². Though, Substantial support for breast cancer awareness and research funding has helped create advances in the diagnosis and treatment of

breast cancer, still many women lack knowledge on SBE being the first easiest step in early detection of cancer.

METHOD

A community based cross-sectional study was conducted among 150 women in urban field practice of Trichy SRM Medical College Hospital and Research Centre, Trichy from December 1st 2017 to January 31st 2018. A pre-tested semi-structured questionnaire was used to collect information. The questionnaire obtained information on respondents on sociodemographic characteristics, awareness of Breast Cancer and Self Breast Examination (SBE), barriers to SBE practice, practice & knowledge of SBE. Socio demographic variables included: age, education status, marital status etc. Awareness regarding risk factors like family history of breast cancer, previously exposure to mammography, breastfeeding duration etc., were recorded. Breast cancer

and SBE awareness questions included: knowledge & practice questions like heard about breast cancer & SBE, procedure of SBE, age for practicing SBE, if they had ever done SBE & frequency of doing SBE etc.

Data analysis: The collected data, after checking their completeness entered into SPSS version 15.0 for analysis. Descriptive statistics was used to see frequency, mean, median, standard deviation and percentages of the characteristics.

RESULTS

In this study, majority 96% of women in urban field area haven't heard about SBE. Less than 4% women reported practicing it. Mean age of patients in our study population is 31.6 From table 1 we can infer that, 25.8% of women in our study population are graduates, 27.3% of them have completed higher secondary education and 74% have crossed secondary education. 93.3% of women in our study population are married

Table 1: Age and educational status (n = 150)

Variable		Frequency	Percentage
Age	20-30	84	57
	31-40	32	22
	41-50	23	15
	51-60	9	5
	61-70	2	1
Education	Illiterate	19	12.7
	Primary School	20	13.3
	Secondary	31	20.7
	Higher Secondary	41	27.3
	Graduate	39	26

Majority (57%) of the study population belonged to the age group between 20-30 years. Only 12.7% of the population were illiterates.

Table 2: Parity and Breastfeeding Pattern (N = 150)

Variable		Frequency	Percentage
Parity	*Nullipara	10	6.7
	@Primi Gravida	18	12
	#Para 1	47	31.3
	Para 2	43	28.7
	Para 3	17	11.4
	Para 4	10	6.7
	Para 5	5	3.3
Breastfeeding	Yes	122	82
	No	28	18

*Nulli para-refers to who have never experienced pregnancy

@Primi-gravida-Refers to women currently pregnant for first time

#Para-refers to number pregnancy the women has underwent but not currently pregnant

Majority 93.3% of them had experienced pregnancy atleast once before or during the study period. Around 82% of women in our study population have breast fed their children. Only 8.5% of women in our study population have family H/O breast cancer



Fig 1: Duration of Breast Feeding among study subjects: (n = 150)

29.3% of women in our study population have breastfed their children for 1year,68% have breastfed their children for 1 year and above.

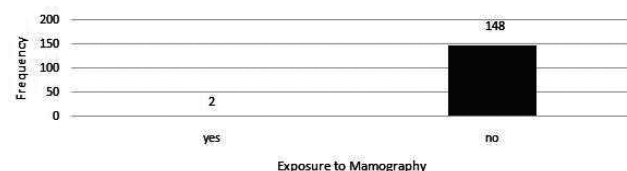


Fig. 2: Exposure to mammography among study participants (n = 150)

Only 1.3% of women in our study population have done mammography before and 98.7% have not done mammography before.

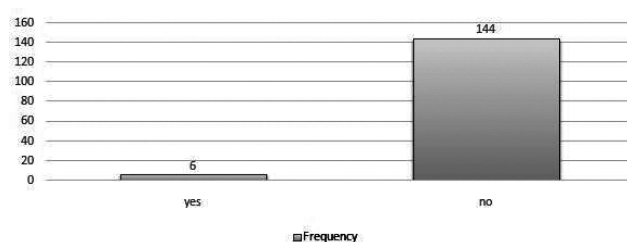


Fig. 3: Exposure to Self-Breast Examination (n = 150)

73.5% women of our study population have considered SBE as embarrassing ,76.7 % were not aware that SBE helps in early detection of breast cancer.100% women in our study population were interested in knowing more about SBE.100% women in our study population considered SBE necessary.

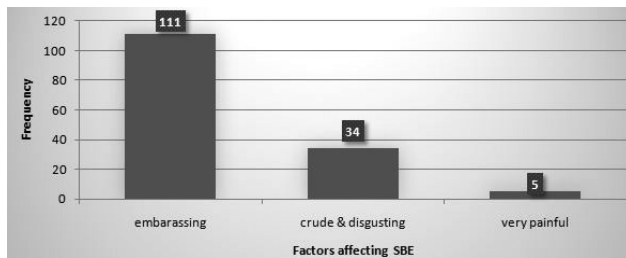


Fig 4: Factors affecting Self Breast Examination (n = 150)

Among 4% of women who have performed SBE before, 3.3% of them have done occasionally. 4% of women in our study population have performed SBE in the bathroom. In our study population among 150 women, 50% of them have not performed SBE as they did not know how to do it, 28.7% were not aware about SBE, 11.7% of them were of the opinion that they can never have breast cancer, 4.3% of them were scared of being diagnosed with cancer.

ASSOCIATION

Table 3: Education and SBE awareness (n = 150)

Education	Aware SBE	Aware %	No	Total	P value [#]
Illiterate	4	11.4	15	19	0.171
Primary School	2	5.7	18	20	
Secondary	5	14.3	26	31	
Higher Secondary	10	28.6	31	41	
Graduate	14	40	25	39	
Total	35	100	115	150	

[#]Chi-square test was not significant

From Table 3 we can infer that education of the study population has no impact on the awareness of SBE. Even most of those have crossed higher secondary education were not aware that SBE helps in early detection of breast cancer.

Table 4: Education and mammogram exposure (n = 150)

Education	Yes	No	Total
Illiterate	0(0%)	19(12.8%)	19
Primary School	0(0%)	20(13.5%)	20
Secondary	1(50%)	30(20.3%)	31
Higher Secondary	0(0%)	41(27.7%)	41
Graduate	1(50%)	38(25.7%)	39

From table 4, Education of the study population has no impact on their awareness on mammography. Right from illiterates to graduates (98%) have not done mammography before.

100% of women in our study population were willing to know more about SBE

DISCUSSION

Our study revealed no significant differences between the respondents age up to 63yrs, educational level and their knowledge on SBE. Only about 4% of

women in our study population have heard about SBE in accordance to the study conducted by Jahan S et.al.³ in Saudi Arabia showed awareness about 30.3%. While a study conducted in Turkey⁴ showed the awareness to be 26.2% and 12% Saadon F.etal., in Kuwait⁵ and in contrast to Tu SP etal., showed to have awareness about 75%⁶

Our study did not show significant relationship between socio demographic variables and practicing SBE, while in contrast to study done by Montazeri A et.al.⁷, there was significant difference. Furthermore the study of Malaysian teachers identified that there was no association between sociographic variables and practicing SBE⁸

Only 24% of women in our study population have recognized SBE as a breast cancer prevention method in accordance to Mary Atanga et al.,⁹ were only 36.67% recognized it as a prevention method. Only 8.5% of women in our study population have family H/O breast cancer in accordance with the study conducted at turkey (5%)¹⁰

Assessment of study population's knowledge, attitude and beliefs showed that majority of women reported that the right time to practice SBE was I don't know before intervention and one week after menses after intervention. Some of the respondents reported that they would not practice SBE because they did not know how to do it and some have not practiced because they were afraid of detecting any evidence of breast cancer.

CONCLUSION

Overall awareness regarding SBE is very low. Although results indicate that the practice of SBE while perceived as being important is not frequently practiced in these women in Trichy. Even those who knew about SBE were not aware of the correct steps of SBE. Since there is a need for a regular vigorous education program. It is recommended to organize frequent breast self-examination education programs and encouraging women to practice SBE. It is hoped that this will help to reduce morbidity and mortality associated with breast cancer.

Ethical Clearance: obtained from Institutional Ethical Committee.

Conflict of Interest: None declared

Source of Funding: Self

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Study on Profile of Pregnancy Outcomes in a Tertiary Care Hospital in Trichy, South India

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ABSTRACT

Introduction: Globally, an estimate of 210 million women become pregnant each year; out of them 15 to 20% results in miscarriage. Antepartum hemorrhage, abruption, hypertensive disorders including eclampsia, premature rupture of membrane, gestational diabetes, and many more complications have been known to precipitate adverse pregnancy outcomes. Decentralized maternal and child health services have greatly expanded coverage; however, hospitals remain the cornerstone of pregnancy related care. High level obstetric services, such as cesarean delivery and blood transfusion must be available in emergency referral situations to reduce the adverse outcomes. Hence, a retrospective record based study was done to determine various outcomes of pregnancy.

Methodology: A record based study on profile of pregnant women who had delivered in Tertiary Care Hospital for a period of 1 year from Jan 2017 – Dec 2017. Data entered and analysed using SPSS V.15.0 and presented in a form of tables.

Results: Among 916 pregnant women, 72.9% were Hindus, 14.5% of people were Christians and 12.6% were Muslims. About 51.6% were in the age group of 19 – 25 years and 92.6% were free from co-morbidities. Of 916 women studied 46.2% delivered normally.

Conclusion: High-level obstetric services will improve the pregnancy outcomes. Adverse outcomes can be reduced by preventing the mothers from developing risk factors through effective antenatal and intrapartum care.

Keywords: *Pregnancy Outcomes, Tertiary Care, Tamil Nadu, Co-morbidities, Complications*

INTRODUCTION

Globally, an estimate of 210 million women become pregnant each year¹. Out of them 15 to 20% results in miscarriage². About 2.65 million result in stillbirths, while 98% of these Stillbirths occur in developing countries³⁻⁷. South Asia has the highest Still birth rates (25 to 40/1000 births) in the world; moreover India alone contributes to the huge burden of these outcomes, i.e., an estimate of 39% of all global SBs⁶, 40% of Asian low birth weight (LBW) babies⁸, and 4.86% miscarriages⁹ occur annually in India. Compared to other states in India, the health risk faced by pregnant women and newborns in Tamil Nadu are low.

Antepartum hemorrhage, abruption, hypertensive disorders including eclampsia, premature rupture of membrane, gestational diabetes, and many more complications have been known to precipitate adverse

pregnancy outcomes^{1-3,5,7,9}. Decentralized maternal and child health services have greatly expanded coverage; however, hospitals remain the cornerstone of pregnancy related care. High-level obstetric services, such as cesarean delivery and blood transfusion must be available in emergency referral situations to reduce the adverse outcome. In this context, this study was carried out in Tertiary Care Hospital to study the Pregnancy Outcomes for a period of 1 year.

MATERIALS AND METHOD

A Record based study regarding pregnancy outcomes and its risk factors was conducted in Tertiary Medical College in Trichy, Tamil Nadu. The study was conducted during January 2018 to March 2018 (2 months). The study included all case records of pregnant women who got admitted in the institution for safe confinement during the period between 1st January 2017 to 31st December

2017. The proforma was designed to collect the data regarding Socio-demographic details, past obstetric history, indications for caesarean section, presence of co-morbidities, course & outcome of the present pregnancy. Data was collected, entered and analysed using SPSS v.15.0. Records were scrutinized after obtaining permission from appropriate authorities. Ethical clearance was obtained from Institutional Ethical committee.

RESULTS

The study consisted of details of 916 pregnant women were admitted for safe confinement. In the Study population, Majority (72.9%) was consisted by Hindus, followed by Christians (14.3%) and Muslims (12.6%).

Almost 88.4% of the Study population belonged to the age group of 20 – 29 years, While 11.1% of them were aged above 30 years and less than 0.4% were aged less than 20 years. Table One, shows about distribution of study population based on Age and Parity. In the study population nearly half (45.6%) of them were para one, 39.1% belonged to para 2, while only 15.3% belonged to Para 3 & above.

Table 1 shows about distribution of study population based on parity and co-morbidities. About 9.8% of the population had co-morbidities. Most common Co-morbidity were Thyroid diseases (4.4%), followed by Diabetes (1.6), Hypertension (1.6), Anemia (1.2%), Eclampsia (0.9%) and Heart diseases (0.1%).

Table 1: Distribution of Study Population Parity and Co - morbidities (N = 916)

Parity Category	Co-Morbidities							Total
	Diabetes	Hypertension	Eclampsia	Anemia	Thyroid	Heart Disease	Nil	
Para 1	4	6	5	2	18	1	382	418
Para 2	10	6	2	6	14	0	320	358
Para 3	1	3	1	3	8	0	124	140
Total (%)	15 (1.6)	15 (1.6)	8 (0.9)	11 (1.2)	40 (4.4)	1 (0.1)	826 (90.2)	916

Table 2 shows the distribution of study population based on mode of delivery and birth weight of the child. Nearly half of them (46.2%) of the study population had Normal delivery, followed by Emergency Caesarean (33.8%), Elective Caesarean (12.4%) and so on. Majority 72.8% of birthweight of children born with normal weight, while 22% belonged to underweight and around 5.1% children had birthweight more than 3.5 kg.

Table 2: Distribution of Birth weights based on Mode of Delivery (n = 916)

Delivery Type	Birthweight in Kgs					Total (%)
	< 1	1 - 1.4	1.5 - 2.4	2.5 - 3.4	> 3.5	
Normal	1	2	101	307	12	423 (46.2)
Forceps	0	0	6	35	3	44 (4.8)
Elective Caesarean	0	1	22	84	7	114 (12.4)
Emergency Caesarean	1	1	63	221	24	310 (33.8)
Vaccum	0	0	2	18	1	21 (2.3)
VBAC	0	0	2	2	0	4 (0.4)
Total (%)	2 (0.2)	4 (0.4)	196 (21.4)	667 (72.8)	47 (5.1)	916 (100)

Table 3: shows the distribution of child birthweights based on parity of the mother. 1.2% of mothers of second Parity had given birth to very Low birth weight babies (0.6%) and extremely low birthweight babies (0.6%), while higher weight category of more than 3.5 kg (6.1%) birthweight were also seen in the second group.

Table 3: Distribution based on Parity and Birth Weight

Parity Category	Birthweight in Kgs					Total (%)
	< 1	1 - 1.4	1.5 - 2.4	2.5 - 3.4	> 3.5	
Para 1	0	2 (0.5)	103 (24.7)	292 (69.8)	21 (5.0)	418 (45.7)
Para 2	2 (0.6)	2 (0.6)	58 (16.2)	274 (76.5)	22 (6.1)	358 (39.1)
Para 3 & above	0	0	35 (25.2)	101 (71.9)	4 (2.9)	140 (15.2)
Total (%)	2 (0.2)	4 (0.4)	196 (21.4)	667 (72.8)	47 (5.1)	916 (100)

Table 4 shows distribution of study subjects based on previous history of Abortion and Still Births. Nearly one-fifth (20.7%) of the study population had previous history of Abortions, while 1.9% of them had experienced Stillbirths in previous pregnancies. Among those who had abortions, 3.2% had experienced more than three abortions, while among those who experienced stillbirths, 5.9% of them had two stillbirths.

Table 4: Distribution of study subjects based on parity and pregnancy outcomes

Parity Category	No. of Previous Abortions			Total	No. of Previous Still Births		Total	Grand Total
	1	2	3		1	2		
Para 1	41	10	0	51	1	0	1	418
Para 2	63	21	4	88	1	0	1	358
Para 3 & above	44	5	2	51	14	1	15	140
Total (%)	148 (77.9)	36 (18.9)	6 (3.2)	190 (100)	16 (94.1)	1 (5.9)	17 (100)	916

Table 5 shows, the distribution of type of previous delivery based on parity and age groups. Among 916 study population only 512 (55.9%) had underwent previous delivery. In this study nearly one-fourth (24.3%) of the study-population underwent previous Elective caesarean section, while 17.1% underwent Emergency Caesarean Section. While, almost equal percentage distribution of Normal (60%), Elective (25%) and Emergency Caesarean Section (20%) is seen among different age groups.

Table 5: Distribution based on Parity, Age and previous Delivery Type (n = 502)

Parity/Age Category	History of previous Delivery type			Total (%)
	Normal	Elective Caesarean	Emergency Caesarean	
Para 1	8	0	0	8 (1.6)
Para 2	193	97	65	355 (70.7)
Para 3 & Above	93	25	21	139 (27.7)
Total (%)	294 (58.6)	122 (24.3)	86 (17.1)	502 (100)
≤19	2 (100)	0	0	2 (0.4)
20 – 24	109 (60.6)	34 (18.9)	37 (20.6)	180 (35.9)
25 – 29	138 (58.2)	67 (28.3)	32 (13.5)	237 (47.2)
30 – 34	42 (57.5)	16 (21.9)	15 (20.5)	73 (14.5)
≥35	3 (30)	5 (50)	2 (20)	10 (2.0)
Total (%)	294	122	86	502 (100)

Table 6, shows monthly distribution patterns of mode of delivery from January to December 2017. Normal and emergency caesarean section were the most common mode of delivery during the period. The number of deliveries peaked during the months of July, October and November. This pattern is noticed all modes of deliveries.

Table 6: Month-wise distribution pattern of Mode of Delivery (n = 916)

MONTHS (2017)	Mode of Delivery						Total (%)
	Normal (%)	Forceps (%)	Elective Caesarean (%)	Emergency Caesarean (%)	Vacuum (%)	VBAC (%)	
JAN	19 (4.5)	1 (2.3)	6 (5.3)	17 (5.5)	1 (4.8)	1 (25.0)	45 (4.9)
FEB	21 (5.0)	2 (4.5)	4 (3.5)	10 (3.2)	1 (4.8)	0	38 (4.1)
MAR	45 (10.6)	3 (6.8)	12 (10.5)	9 (2.9)	0	0	69 (7.5)
APR	29 (6.9)	2 (4.5)	5 (4.4)	27 (8.7)	0	0	63 (6.9)
MAY	33 (7.8)	3 (6.8)	7 (6.1)	18 (5.8)	0	0	61 (6.7)
JUN	38 (9.0)	4 (9.1)	5 (4.4)	19 (6.1)	5 (23.8)	0	71 (7.8)
JULY	46 (10.9)	5 (11.4)	6 (5.3)	48 (15.5)	5 (23.8)	0	110 (12.0)
AUG	40 (9.5)	6 (13.6)	15 (13.2)	26 (8.4)	2 (9.5)	2 (50.0)	91 (9.9)
SEPT	28 (6.6)	4 (9.1)	11 (9.6)	30 (9.7)	1 (4.8)	1 (25.0)	75 (8.2)
OCT	42 (9.9)	5 (11.4)	15 (13.2)	34 (11.0)	2 (9.5)	0	98 (10.7)
NOV	47 (11.1)	4 (9.1)	23 (20.2)	33 (10.6)	4 (19.0)	0	111 (12.1)
DEC	35 (8.3)	5 (11.4)	5 (4.4)	39 (12.6)	0	0	84 (9.2)
Total (%)	423 (46.2)	44 (4.8)	114 (12.4)	310 (33.8)	21 (2.3)	4 (0.4)	916 (100)

Most common reasons for Cesarean section were Previous LSCS 161 (77.4%), followed by Meconium stained liquor 60 (28.8%), Oligohydramnios 45 (21.6%), fetal distress 40 (19.2%), Cephalo-pelvic disproportion 40 (19.2%), Delayed labour 23 (11.1%), Scar Tenderness 22 (10.6%), Breech Presentation 15 (7.2%), Abnormal Presentation 7 (3.4%), Medical co-morbidities 6 (2.9%) and least common were IUGR 5 (2.4%).

DISCUSSION

The study consisted of details of 916 pregnant women were admitted for safe confinement. In the Study population, Majority (72.9%) was consisted by Hindus & nearly half (45.6%) of them were para one. Almost 88.4% of the Study population belonged to the age group of 20 – 29 years, while only 26.14% of similar age-group was reported in a study from Karnataka¹⁰. About 9.8% of the population had co-morbidities, most common Co-morbidity were Thyroid diseases (4.4%), followed by Diabetes (1.6), Hypertension (1.6), Anemia (1.2%), Eclampsia (0.9%) and Heart diseases (0.1%), which is higher than that was reported in the study from Karnataka¹⁰. Nearly half of them (46.2%) of the study population had Normal delivery, followed by Emergency Caesarean (33.8%) & Elective Caesarean (12.4%). Around 22% birth weight of children born were underweight (i.e < 2.5 Kg) and around 5.1% children had birthweight more than 3.5 kg. Nearly one-fifth (20.7%) of the study population had previous history

of Abortions, while 1.9% of them had experienced Stillbirths in previous pregnancies. In this study nearly one-fourth (24.3%) of the study-population underwent previous Elective caesarean section, while 17.1% underwent Emergency Caesarean Section, these findings corroborates with the study of Chaudhari DR¹¹ in Kolapur. Normal and emergency caesarean section were the most common mode of delivery during the period, which is lower than that was reported in the study of Damaru P Paneru from Karnataka¹⁰. The number of deliveries peaked during the months of July and December. This pattern is noticed all modes of deliveries.

CONCLUSION

In the study, less than half (46.2%) of the pregnancy outcomes were Normal Vaginal Delivery, which is low. Prevalence of low birth weight was also higher (22%). Prevalence of Co-morbidities was also higher in this study. Provision of High-level obstetric services at right time will improve the pregnancy outcomes. Adverse outcomes can be reduced by preventing the mothers from developing risk factors through effective antenatal and intrapartum care and Health education.

LIMITATIONS

Despite the well-established recording system in the study hospital, a limitation of the retrospective design is also persisting in this study. A prospective study can

help us to determine many factors that affect pregnancy outcome which were not mentioned in the records.

Ethical Approval: obtained from Institutional Ethical Committee.

Conflict of Interest: None declared.

Source of Funding: Self

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“A Study of Knowledge, Attitude and Practice Regarding E-waste Management among Nursing Students at a Tertiary Care Hospital”

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ABSTRACT

Background: Our world is marching towards a major crisis regarding solid waste management and public health recognized as E waste or WEEE (Waste Electrical and Electronic Equipments).

Aim: is to assess the general awareness of nursing students regarding E waste management.

Method: This cross sectional study was conducted amongst nursing students of GNM course at KINS, Karad, Maharashtra. After obtaining institutional ethical clearance; a predesigned pretested questionnaire was administered to nursing students with their informed consent. Sample size calculated was 86, but all students from all academic years of GNM course from KINS were included in this study (150). Percentages, Proportions were calculated from collected data. Chi-square Test was applied to get Chi-square value and p-value. SPSS – 20 and GraphPad InStat software used for statistical work.

Results: Among the 150 study subjects 139 (92.7 %) subjects have heard the term E- waste. They were aware of toxic nature of E waste (58.0%), impact of improper disposal of E waste (84.7%) and its environmental and health hazards (73.3%). They knew that there were rules and regulations about E waste disposal (69.3%).

Conclusions: Creating awareness is not enough but concurrent change in the attitude of people will play measure role in handling of E waste.

Keywords: E-waste, Management, Awareness, KAP, WEEE

INTRODUCTION

The “E-waste” or the “Electronic waste” includes the used electronics which are intended for resale, recycling, reuse, and salvage or disposal e.g. discarded computers, television sets, mobile phones and radios, refrigerators, office electronic equipment.¹ India ranks 5th position in generation of E waste, with USA (1st), China (2nd), Japan and Germany.^{2,3} In 2016, 44.7 million tons of E waste was generated globally at compound growth

rate of 20%. Out of this only 20% (8.9 million tons) was properly collected, recycled and documented. India generates about 2 million tons of E waste per annum. Out of which only 5% is recycled and rest 95% is managed by unorganized sector and scrap dealers. Currently India is generating E waste at a rate; that is 4.56 times greater than its annual processing capacity. By the end of 2018 India is likely to produce 3 million tonnes of E waste annually.² Currently E waste is disposed by recycling, landfilling, incineration, and reuse.⁴

This E waste contains hazardous metals viz. lead, cadmium, beryllium etc. (60%), plastic (30%) and hazardous pollutants (2.70%). It also contains valuable metals like copper, silver, gold.⁵ Incorrect processing or dismantling of E waste can spread these hazardous materials into dust, soil, river sediment, surface water, and ground water etc. Exposure to them can cause respiratory disorders, skin disorders, bronchitis,

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lung cancer, heart, liver, and spleen damage². It also affects environment e.g. land filling of e wastes forms contaminated leachates pollute ground water e.g. cadmium from one mobile can pollute 600 m³ of water. Incineration of e waste can emit toxic fumes and gases and pollutes air.⁴In India E-waste Rules were notified in 2011 and came into force from May 2012.⁶ Recently they were amended for effective management of E-Waste in the country.⁷ Extended Producer Responsibility is the base of framework and the rules state that the Producers of electronic and electrical equipments (EEE) set up a system to collect and manage the end-of-life equipments. Punishments for improper disposal, and the law for these punishments is introduced by Central Pollution Control Board or CPCB.¹

E waste has become a global crisis because of its rapid generation rate and its contents that are dangerous to both human health and environment¹. Lack of awareness, appropriate skill for disposal, a legal framework, a collection system, are worsening the problem⁴.In view of this we are conducting this study with the following aims and objectives.

AIM AND OBJECTIVES

Aim: To study knowledge, attitude, and practices regarding E waste amongst nursing students of Krishna Institute of Nursing Sciences.

Objectives:

1. To study the knowledge status of E waste and its environmental and health hazards.
2. To study the awareness regarding the existence and current disposal practices of E waste.
3. To study the knowledge related to E waste rules and proper disposal methods.

MATERIALS AND METHOD

Study Design: A cross sectional study.

Study Subjects: Nursing students at Krishna Institute of Nursing Sciences (KINS), Karad, Maharashtra.

Mode of Selection of Subject: All students from all academic years of GNM course from KINS were included in this study.

Study Tool: A pretested Questionnaire. It contained questions related to knowledge of E waste and its environmental and health hazards, E waste rules and proper disposal methods.

Sample size: According to a study conducted by Cynthia et al⁵, the knowledge of e waste management amongst girls was 30.95% and in boys 38.88 %. Considering allowable error of 10%, sample size calculated using the formula $n = 4pq/L^2$ was 86. But all 150 students from all three academic years were included in the study.

Institutional ethical committee clearance was obtained before commencing the study. Informed consent was obtained before the questionnaire was administered to nursing students.

Statistical Methods for Analysis: Percentages, Proportions were calculated from collected data. Chi-square Test was applied to get Chi-square value and p-value. SPSS – 20 and GraphPad InStat software used for statistical work.

OBSERVATION AND RESULTS

Table 1: Age wise distribution of subjects who heard the term E-waste

Subjects who heard the Term E-waste	Age		Total
	Below 20 years	Above 20 years	
Yes	106 (92.2%)	33 (94.3%)	139 (92.7%)
No	9 (7.8%)	2 (5.7%)	11 (7.3%)
Total	115 (76.7%)	35 (23.3%)	150 (100.0%)

Among the 150 study subjects 11 (7.3 %) were male and 139 (92.7 %) were females. Among them 58 (38.7 %) were from first year, 43 (28.6 %) were from second year, and 49 (32.7 %) were from third year of GNM course. 115 (76.7 %) were below 20 years of age and remaining 35 (23.3 %) were above 20 years.

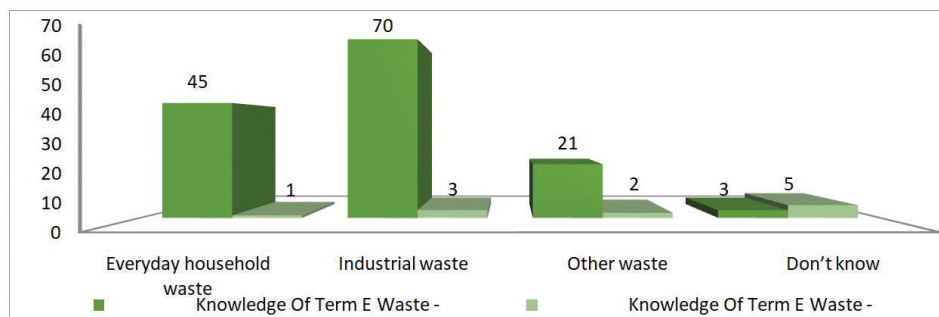


Figure 1: Exact knowledge of E-waste

139 (92.7%) subjects said they heard term E waste. 70 (50.3%) subjects consider industrial waste as E-waste, 45 (32.4%) subjects as everyday household waste, 21 (15.1%) subjects thought E-waste is other kind of waste

than the above two types. Rest 2.2% subjects admitted they didn't know the answer. 92.7 % (139) subjects know the term E waste but they don't have an exact and clear idea of E waste.

Table 2: Distribution of subjects according to their Knowledge about term E-waste

Criteria	Responses	Knowledge about term E-waste		Total	Chi-Square Value	P-value
		Yes	No			
Nature of E-waste	Correct Answer (Toxic)	81(58.3%)	6 (54.5%)	87(58.0%)	0.05815	0.8094
	Wrong Answer	58(41.7%)	5 (45.5%)	63(42.0%)		
E-waste disposal practices	Correct Practices	77(55.4%)	3 (27.3%)	80(53.3%)	2.208	0.1373
	Wrong Practices	62(44.60%)	8(72.72%)	70(46.7%)		

87(58.0%) subjects knew toxic nature of E waste. Among the 63 subjects who said it is non toxic, 58 subjects who knew term E waste but did not know exact nature of E waste. Such major group who don't perceive toxic nature of E-waste may/will contribute to production as well as improper disposal of E-waste.

77 subjects who have heard the term E waste are inclined towards the correct methods of E waste disposal (Second hand market, Return/ exchange at the brand store, licensed recycler), while 62 subjects, even though they knew term E waste are disposing their unused EEEs in wrong way (Kabaadiwalas, Giving to Friends /Relatives/ Maids, Just throw it away with regular waste, Stockpile in house or garage).

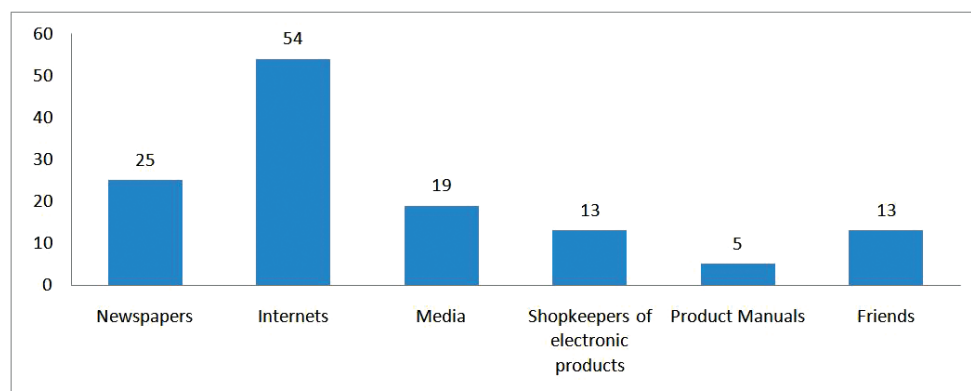


Figure 2: Source of information regarding E-waste

Internet 54 (36 %), followed by newspaper (16.7 %) and Media (12.7%) were major sources of information on E waste for these study subjects.

Table 3: Distribution of subjects according to their awareness about the impact of improper disposal of the EEE

Criteria	Responses	Awareness about the impact of improper disposal of the EEE		Total	Chi-Square Value	P-value
		Yes	No			
Effects of improper disposal of the electrical and electronic equipments	Have correct Knowledge of effects of improper disposal of EEE	93 (73.2 %)	17 (73.9%)	110 (73.3%)	0.004668	0.9455
	Don't have correct knowledge of effects of improper disposal of EEE	34 (26.8 %)	6 (26.1%)	40 (26.7%)		

Conted...

Responsibility of proper E-waste management	Correct Answer	67 (52.8%)	11 (47.8%)	78 (52.0%)	0.04353	0.8347
	Wrong Answer	60 (47.2%)	12 (52.2%)	72 (48.0%)		

110 subjects (73.3%) were aware of effects of improper disposal of EEE. Out of these 93 said improper disposal of EEE has impact on both health and environment. 34 subjects agreed with them although they are aware of impact of improper disposal of EEE. Majority subjects knew that it is not right to dispose EEE in improper way but didn't know the exact reason.

Here 78 (52.0%) subjects were convinced that responsibility of proper E waste management should be equally shared by all i.e. Government Agencies, Producers, and Consumers which is a correct response. While other 72 (48.0%) subjects put this responsibility on any one of the above mentioned agencies.

Table 4: Distribution of subjects according to their thoughts on buying second hand products

Criteria	Responses	Thoughts on buying second hand products		Total	Chi-Square Value	P-value
		Yes	No			
Reasons for buying new equipments	Permanent damage/loss of function	23 (36.5%)	27 (31.0%)	50 (33.3%)	0.2771	0.5986
	Lifestyle demand	40 (63.5%)	60 (69.0%)	100 (66.7%)		
Attitude towards unused EEE	Yes, It Is Waste	14 (22.2%)	12 (13.8%)	26 (17.3%)	1.271	0.2595
	No, Can be Repaired and/or Reused/Can Utilize Components/ Raw Materials	49 (77.8%)	75 (86.2%)	124 (82.7%)		

Permanent damage or loss of function were the ultimate reasons to buy new gadget for 50%. But lifestyle demands like desire for newest technology and greater functionality (66.7%) precedes over them. This explains the reasons behind excessive and rapid production of EEE and generation of E waste.

The attitude of 124 subjects (82.7%) towards unused EEEs was to repair or reuse or utilize the components or raw materials but 75 subjects among them didn't want to buy second hand products. This attitude of not buying old equipments for advances in technology would help to increase in E waste production.

DISCUSSION

92.7% subjects in present study have heard the term E waste and 58.3% of them regard E waste as toxic. Even though more people have heard the term E waste in present study it seems they haven't gained more

information beside the term itself, which is similar to the study by toxic links⁶. In a study conducted in importers (82%), scavengers (94%) and householders (78%) were not aware about hazardous nature of e-waste⁸, because this study was done in 2013 in a underdeveloped country like Nigeria. Also other factors like economic status, educational status, age, customs and belief, scarcity of information services may be responsible for it.

In present study return or exchange at brand store was major practice of disposing unused EEE (24.0%). While in toxic links⁶ study it was (15.285%). In Toxic links⁶ kabaadiwala (46.08%) was preferred for disposal. Options like exchanging, changing markets and online stores may have helped here. Second hand market is another lurking option in present study (11.3%) and in toxic links⁶ study it was (21.045%). Second hand market was easily available method to people, but decreased percentage might be due to less returns from second hand market compared to returning or exchanging the unused

EEEs. In present study 17.3% voted for licensed recycler compared to toxic links⁶ (0.753%). However in study by Anuj Shah⁹ people preferred to sell or give their unused EEE to their personal contacts (35%) or to keep them in home (26%). In present study both of these percentages were 8.0 % and 8.7% respectively. People have adopted these practices because either they didn't know proper methods of disposal or they were not available to them.

84.67% subjects of present study were aware of impact of improper disposal of unused EEE. 73.2% of them knew E waste has both environmental and health hazards. While 65% respondents in Anuj Shah's⁹ study either didn't perceive any health or environmental hazards to E waste or didn't know of specific hazards. Present study showed more awareness of people regarding impact of improper disposal of E waste.

In present study 69.3% subjects were aware of existence of E waste disposal rules. While in a study by Anuj Shah⁹ (89%) and Toxic Links⁶ (66%) study participants were not aware of E waste rules. 52% of the study subjects in this study considered responsibility of E waste management is on government agencies, producers, and consumers altogether, as compared to 21.99% from study by toxic links⁶. The present study shows increase in awareness of people regarding existence of rules and regulations E waste disposal accompanied with change in attitude of people towards accepting responsibility of proper disposal.

Desire for newest technology was the leading reason for purchasing new EEE by subjects in present study (38%) similar to studies by Anuj Shah⁹ (61% i.e. mobiles and computers) and Cynthia et al⁵ (45.83% i.e. new gadgets). Current lifestyle trend of being updated and rapid changes in technology are the driving forces to make people buy gadgets with newest technology. 82.7% subjects of present study think unused EEE are not waste instead they can be repaired, reused or can utilize its components as raw materials. This percentage is more than Anuj Shah's⁹ study i.e. 61%.

CONCLUSION

It seems subjects only knew the term E waste. They don't understand how E waste is produced around them which contribute to more generation of E waste and its improper disposal. Raising awareness might

help to control E waste generation at its origin and its segregation from regular waste. They knew the rules and regulations but not in detail, which makes them to deny their share of responsibility in proper disposal of their unused EEE's. Rapid change in the technology, design, functionality, lifestyle changes, and attitude of subjects towards second hand EEE's are also contributing for E waste generation. Subjects are more inclined towards method of disposing which is easy, within their reach and beneficial to them.

RECOMMENDATIONS

We can increase their knowledge, awareness, & change their attitude through internet & mobiles in their hand. Online stores can help to collect unused EEE's through exchange offers. Adding more topics and hands on activities regarding E waste in their curriculum will also help. Being nursing student, they are going to be in contact with community around them and they can be useful tool to tackle E waste at rural level if they are made to interact more with various aspects of E waste.

Source of Funding: No funding sources

Conflict of Interest: None declared

Ethical Clearance: This study was approved by institutional Ethics Committee

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Hostile Tobacco and Oral Health—A Review

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ABSTRACT

Tobacco is being used in various forms. Smoking type includes bidis, cigarettes, cigars and others. Smokeless tobacco products are Betel quid, mawa, dry snuff and many more. By 2020, it is predicted that tobacco will account for 13% of all deaths in India. Oral cavity is the first to encounter tobacco and the major tobacco related oral lesions are tooth stains, abrasions, Acute Necrotizing Ulcerative Gingivitis (ANUG), Periodontitis, dental implant failure, smoker's melanosis, nicotinic stomatitis, palatal erosions, pre-malignant lesions and oral carcinoma. Active role of dental professionals in tobacco control initiatives and cessation programmes is important due to their direct contact with patients who are at increased risk. This article emphasizes in detail on the various effects of tobacco on oral health.

Keywords: Tobacco, Oral lesions, Dental Professionals.

INTRODUCTION

Plants of the genus 'Nicotiana' are used for the production of tobacco. Tobacco use dates back since the dawn of human civilization. Tobacco has been used in smoke form and smokeless form¹. Smoking type includes bidis, cigarettes, cigars, pipes, chillum, kreteks, hookah, water pipes and other locally used forms. Smokeless tobacco products are Betel quid, mawa, dry snuff, gutka, khaini, and many more^{2,3}. WHO states that there are 1100 million regular smokers in the world today. Globally one in ten adults die because of tobacco related causes and 15 million deaths occur each year. India is the world's third largest tobacco growing country and the second largest consumer of tobacco products⁴. By 2020, it is predicted that tobacco will account for 13% of all deaths in India. Smoking or chewing tobacco has significant detrimental

effects on general and oral health. Tobacco use is a potential risk factor for chronic conditions like cancer, cardiovascular and pulmonary diseases. Oral cavity is the first to encounter the ill effects of tobacco smoking or chewing. More than one type of lesion can occur in any individual patient and the site and appearance of such tobacco associated lesions are influenced by the forms of tobacco usage. The major tobacco related oral lesions can be described under dental, gingival and mucosal conditions which include tooth stains, abrasions, Acute Necrotizing Ulcerative Gingivitis (ANUG), Periodontitis, dental implant failure, smoker's melanosis, nicotinic stomatitis, palatal erosions, pre-malignant lesions and oral carcinoma. Deleterious effects of tobacco are due to changes in cell morphology, cellular atypia, increased nuclear cytoplasmic ratio and widening of intercellular spaces, increased oxidative stress, neuronal apoptosis, and DNA damage.

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EFFECTS OF TOBACCO ON ORAL HEALTH

Halitosis, Taste and Smell: Smoking is likely to cause halitosis and may affect smell and taste. Alteration of taste and smell is associated with coated tongue caused due to tobacco habits.⁶

Among extrinsic causes of halitosis, smoking is often quoted as an etiological factor. This is generally referred to as smoker's breath^{4, 6}. Cigarette smoke contains Volatile Sulphur Compounds (VSCs) which can be detected using a halimeter, although the concentration of detectable VSCs in the breath is strongly influenced by the time since the last cigarette was smoked. Volatile sulphur compounds also arise due to bacterial metabolism of amino acids.⁶

Discoloration: Smoking has been reported to cause brown/black discoloration of teeth, dental restorations and dentures, caused by tar and other by-products of combustion. Although deposits are primarily of esthetic concern, they may also promote plaque accumulation⁷.

Abrasion: Pipe smoking and the use of smokeless tobacco are commonly associated with tooth abrasion. Abrasion from pipe smoking occurs on the occlusal surfaces in association with placement of the pipe stem, whereas abrasion from smokeless tobacco usually occurs on the vestibular surface opposite the wad of smokeless tobacco, but may involve the occlusal surfaces if the tobacco is chewed². Abrasion may result in dentin hypersensitivity, pulp exposure or apertognathia. Apertognathia develops in pipe smokers and usually occurs unilaterally on the smoker's favorite side.⁸

Dental caries: Smoking has been correlated with increased caries incidence.⁹ Cigarette smoke impairs salivary function, where saliva has an important protective role against dental caries. Other authors have indicated that smokers and non-smokers may have different salivary buffering capacity, which may also affect susceptibility to caries.¹⁰ Tobacco in fact might increase dental decay as it lowers salivary pH and the buffering power.⁹ In vitro evidence suggests nicotine may increase biofilm formation¹¹.

Caries risk may be greater with smokeless tobacco, possibly related to the prolonged exposure to sugars. Increased susceptibility to root caries is presumed to result from the gingival recession and the high sugar content of smokeless tobacco. Sugar content been reported to be 34% on average in different preparations of chewing tobacco.¹²

Effects on periodontium: Although gingivitis and periodontitis are caused by bacteria, smoking has been strongly implicated as a risk factor for the initiation and propagation of periodontal diseases.¹³ Smoking

has been associated with increased calculus deposition, which can accelerate plaque accumulation, recession and deepening of periodontal pockets.¹⁴ Smokers were recorded to have a 2.5 to 3.5 times greater risk of severe periodontal attachment loss.

The pathogenic subgingival biofilm has both direct and indirect effects on the periodontal tissues. Tobacco smoking affects the humoral mediated and the cell mediated immunity of the host and this may increase susceptibility to periodontal disease.¹⁵

Periodontal disease severity and quantity of calculus accumulation is directly correlated with the frequency of smoking. Smoking is also associated with an increased risk of periodontal attachment loss and formation of periodontal pockets, as well as alveolar bone loss¹³.

There is evidence for impact of smoking on bone metabolism as there is increased secretion of the bone resorbing factors PGE and IL-1 β or a decreased intestinal uptake of calcium, and these factors increases the susceptibility to periodontal disease in smokers. Tobacco smoking disrupts the physiological turnover of tooth-supporting structures with the net effect being periodontal tissue breakdown.¹⁵ Smokers respond less favorably than non-smokers to nonsurgical and surgical periodontal therapy.

Acute necrotizing ulcerative gingivitis (ANUG): Smokers tend to have higher prevalence of ANUG than non-smokers. Recently, a similar relationship has been reported between smoking and ANUG-like lesions in HIV infected individuals. ANUG primarily affects young adults who smoke heavily and have poor oral hygiene. Although the exact interaction between ANUG and smoking is not clear, local and systemic effects have been suggested.¹⁴ Plaque accumulation in sites with tar deposits and tissue ischemia secondary to nicotinic vasoconstriction enhances progression of ANUG¹⁶. The main vasoconstrictive property of nicotine exerts its effect at the end-arterial vasculature of the gingiva and hence gingival bleeding in smokers is 'less severe' than in non-smokers. Tobacco smoking may exert a masking effect on gingival symptoms of inflammation, which might give smoking patients a false sense of gingival health assurance. However smoking up regulates the expression of pro-inflammatory cytokines, such as interleukin-1, which contributes to increased tissue damage and alveolar bone resorption¹⁶.

Wound healing: Tobacco negatively influences wound healing in the mouth. Healing after periodontal scaling, curettage, periodontal surgery or tooth extraction is affected in tobacco users. The mechanism of impaired healing is associated likely with increased plasma levels of adrenaline and noradrenaline after smoking, leading to peripheral vasoconstriction. Impaired PMN function has also been observed in smokers compared to nonsmokers¹⁷.

Dental implant failure: Smoking is correlated with a greater peri-implant disease incidence, including peri-implant mucositis and peri-implantitis. Tobacco use directly compromises the osseointegration of root-form dental implants.¹⁷ Peri-implantitis is the formation of deep mucosal pockets around dental implants, inflammation of the peri-implant tissues, and increased resorption of implant-surrounding bone. Chronic peri-implantitis results in implant failure when left untreated.¹⁸

Tobacco smoking contributes to increased tooth mobility and tooth loss occurs 1.53 times more frequently in smokers than in non-smokers. The evaluation of the current literature indicates that implant failure, postoperative infections and greater marginal bone loss are more common among smokers than non-smokers, although the scientific evidence remains limited.¹⁷ Periodic periodontal therapy may assist in reducing the incidence of peri-implantitis. When surgical intervention is considered to improve peri-implant supportive tissues, smoking or smoking history may compromise healing and the treatment outcome. The best method to reduce the effect of smoking on implant failure and peri-implant disease is to not smoke¹⁸.

Smoker's melanosis: Smoking is associated with a number of surface epithelial changes that affect tissue appearance. Heavy cigarette smokers show a pigmentation prevalence of about 30% thus giving rise to the designation smoker's melanosis which is most prevalent on the attached gingiva. Smoker's melanosis associated with cigarette or pipe smoking can occur on maxillary and mandibular alveolar mucosa or buccal mucosa and commissures, respectively. It is asymptomatic, the change is not premalignant, and the pigmentation is reversible although it usually takes a year or more after cessation of the smoking habit.¹⁹

Smokeless tobacco keratosis: Snuff pouch or smokeless tobacco keratosis is a white keratotic lesion which

has a translucent appearance rather than an opaque whiteness. Buccal or labial mucosal changes associated with smokeless tobacco use occur at the site where the individual holds the tobacco. This lesion is located only in areas of direct contact with snuff or chewed tobacco and is reversible when the patients stop the habit¹⁹. The keratosis is dependent upon the type of tobacco and how it is used. The surface epithelium exhibits hyperkeratosis and acanthosis.

Continuous smokeless tobacco use might place the individual at greater risk of carcinoma due to the higher concentration of nitrosamines in the processed tobacco. Conversely, mucosal tissue can resolve to normal within weeks after cessation²⁰.

Nicotinic stomatitis: Nicotinic stomatitis characteristically occurs posterior to the rugae as redness on the palate, which later assumes a grayish-white and nodular appearance due to periductal keratinization of the minor salivary glands. A characteristic finding is the appearance of multiple red dots, which represent the dilated and inflamed duct openings of the minor salivary glands¹⁹. Thermal and chemical agents acting locally are responsible for the occurrence of this condition. Nicotinic stomatitis is not considered to be a precancerous lesion. Painful palatal erosions due to heavy smoking may occur in addition to nicotinic stomatitis. The erosions are due to the elevated temperature in the oral cavity for a long period. Thickening of the epithelium and white lesions may also occur. Cessation of smoking and a biopsy must be performed to rule out epithelial dysplasia or carcinoma.²⁰ Painful palatal erosions due to heavy smoking may occur in addition to nicotinic stomatitis. The erosions are due to the elevated temperature in the oral cavity for a long period.

Leukoplakia: Leukoplakia is often associated with tobacco use though idiopathic forms of leukoplakia are recognized. Oral mucosal leukoplakia is potentially premalignant with a reported prevalence among heterogeneous studies of 2.60%.²¹ Incidences may be 6 to 10 times greater in smokers compared to non-smokers. A smoking dose-response relationship also exists with developing oral leukoplakia, and the lesion may regress upon smoking cessation.

The site of the oral cavity affected by leukoplakia is often said to be associated with the type of tobacco habit practiced; lateral tongue and floor of mouth in cigarette

smokers, palate in pipe smokers and reverse smokers, commissures in bidi smokers, buccal groves in tobacco chewers where they place the quid and lower or upper labial mucosa in snuff dippers²⁰.

A large number of oral carcinomas are associated with precursor lesions of leukoplakia; 3 to 6% of leukoplakia undergoes malignant transformation, with this frequency increasing with longer follow-up periods. Leukoplakia in a patient with a tobacco habit should always be biopsied to determine the presence of epithelial dysplasia or a carcinoma.

Patients with mild or moderate dysplasia have a significant, but not absolute, potential for reversibility and can be managed with the elimination of the suspected etiologic factors. Patients with severe dysplasia or carcinoma in situ have a low potential for reversibility and should be managed by complete surgical excision of the lesion(s) using a regular scalpel followed by histologic examination of the excised tissue²¹.

A case-control study, conducted by Shiu et al in Taiwan, showed that the adjusted ratio for betel nut chewing and smoking on the occurrence of leukoplakia were 17.43 and 3.22, respectively²². These findings suggested that smoking cessation may reduce the number of leukoplakia cases by 36%, while elimination of betel nut may prevent 62% cases of leukoplakia and 26% cases of malignant transformation to oral carcinoma.

Oral Cancer: Oral cancer is the eighth most common cancer in the world. Incidence rates of oral cancer are high in developing countries, particularly in areas of South Central Asia where oral cancer is among the three most frequent types of cancer²³.

Cancer of the oral cavity is high among men. Oral cancer is dominated by squamous cell carcinoma (present in 90%-95% of all oral cancers), and the role of tobacco in the development of oral squamous cell carcinoma is well recognised²⁴.

Tobacco smoke has a direct carcinogenic effect on the epithelial cells of the oral mucous membranes and there is a dose-response relationship for tobacco use and the risk of the development of oral cancer.

There are 55 carcinogens in cigarette smoke that have been evaluated by the International Agency for Research on Cancer (IARC) and for which there is "sufficient evidence for carcinogenicity" in either laboratory animals or humans.

The long-term prognosis is quite poor, and treatment can lead to further functional and cosmetic problems. Tobacco use, including reverse smoking (smoking with the lit end inside the mouth), chewing of betel quid (a mixture of areca nut, slaked lime, and tobacco wrapped in betel leaf), and use of smokeless tobacco, increases the risk of cancers of the upper aerodigestive tract²⁴.

CONCLUSION

Tobacco use is a major preventable cause of premature death and also a common risk factor to several general chronic diseases and oral diseases. A clear link between oral diseases and tobacco use is evident. Diagnosis of tobacco-induced oral lesions and complications by routine intra oral examination by a dental health professional may prevent serious sequelae. Oral health professionals have the advantage of being in direct contact with patients who are at increased risk and hence their active role in tobacco control initiatives and cessation programmes is important.

Ethical Clearance: Not applicable

Conflicts of Interest: NIL

Source of Funding: None

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Soft Tissue and Alveolar Bone Repair of Platelet Rich Fibrin Over Platelet Rich Plasma in Extraction of Impacted Third Molars

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ABSTRACT

Aims: To compare clinically and radiologically the effects of Platelet Rich Fibrin (PRF) over Platelet Rich Plasma (PRP) on alveolar bone repair following extraction of impacted third molars

Materials and Method: This study included split mouths of 25 patients who underwent bilateral extraction of impacted third molars. PRF and PRP were prepared at the same appointment, and was placed in the right and left extracted sockets, respectively. Post operative follow up of the soft tissue healing and hard tissue healing were recorded and was then compared between the two sites of the same patient.

Results: The mean values of soft tissue healing and the mean values of bone density measured post operatively was better and statistically significant in PRF group as compared to PRP group.

Conclusion: PRF is clinically and statistically significant in soft tissue healing and also has faster regeneration of bone when compared with PRP.

Keywords: Impaction, PRF, PRP, Platelet growth factors

INTRODUCTION

Impaction is defined as the tooth that has failed to erupt completely or partially to its correct position in the dental arch and its eruption potential has been lost. Third molar eruption and continuous positional changes are related to race, nature of diet, intensity of use of the masticatory apparatus and possibly due to genetic background. Mandibular third molars impaction has difficulties in the degree of extraction along with different risk of complications. Impacted third molar surgery performed by an oral surgeon. The most

common post operative complications are pain, trismus, swelling, infection at the surgical site, alveolar osteitis etc¹. Developing a strategy to reduce the post operative complications and risks is of prime importance to oral and maxillofacial surgeons.

Healing is the process by which the injured tissues are cured and its integrity is restored. During healing cellular communications occur by means of specialised proteins termed as 'cytokines.' The proliferation of cells is stimulated by 'Growth factors', which are a subclass of cytokines².

Platelets, also called thrombocytes, are the components of blood which are involved in the coagulation of blood. Platelets are activated by the coagulation cascade, especially thrombin and sub endothelial collagen and thereby a number of growth factors are released into the wound site³. These in turn activate the proliferation and differentiation of the local osteoprogenitor cells into bone forming cells leading to the formation of new bone matrix and mineralization.

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Regenerative potential of platelets was introduced by Ross et al in the year 1974⁴. The understanding of this regenerative potential has improved in the past two decades. This has thereby lead to the increased therapeutic applications of platelets in its various forms.

Platelet rich plasma an autologous concentrate of platelets is a proven source rich in platelet derived growth factors (PDGFs) and transforming growth factors beta 1 and 2¹. By combining with calcium chloride and and thrombin, PRP releases growth factors. PRP also favours stabilised coagulation of blood, owing to the rich concentration of fibrinogen, thereby favouring regeneration of osseous defects at an early stage.

Platelet Rich Fibrin (PRF) is a new generation of platelet concentrates which is obtained without adding anticoagulants like heparin, bovine thrombin etc. During the production of platelet rich fibrin, other cellular elements like leukocytes are activated, in addition to platelets⁵. Once the artificial hemostatic and inflammatory phenomenon has been induced by centrifugation, cytokines are released. The PRF then regulates inflammation and stimulates immune process of chemotaxis.

Studies on PRP and PRF efficacy in enhancing wound healing in oral and maxillofacial surgery have yielded varied results and divergence of opinion on the activity. The majority of these studies have focused on enhancing graft healing and dental implants. There are very few studies comparing the effects of PRF and PRP on extracted socket. This cross-over design greatly enhances the statistical power and validity of the study. The use of this study design is highly desirable when comparing factors in the same patient.

The study was based on the hypothesis that there is a significant difference between PRF and PRP on alveolar bone repair following extraction of impacted third molars.

The aim of the study is to compare clinically and radiologically the effects of Platelet Rich Fibrin (PRF) over Platelet Rich Plasma (PRP) on alveolar bone repair following extraction of impacted third molars

METHODOLOGY

This was a non randomised experimental study conducted on 25 patients with bilateral completely impacted mandibular third molars attending the O.P at the Department of Oral Surgery in Sree Balaji Dental College & Hospital Chennai

Ethical committee clearance from the institution was obtained prior to the study.

The patients were thoroughly informed, explaining the advantages and disadvantages of the treatment modalities. The patients had to give informed consent or refusal regarding participation in the study. The patient information was documented.

Inclusion Criteria

- Patient's in the age group of 18 to 40 years
- Patients with bilateral, impacted mandibular third molars requiring extractions.

Exclusion Criteria

- Patients with infections or lesions such as pericoronitis, periapical infection, with respect to impacted third molars
- Patients with supra erupted maxillary third molars with traumatic occlusion or impinging on the lower arch
- Patients who were smoker and or alcoholic
- Immunocompromised patients or patients with any systemic diseases
- Those on recent antibiotics or steroid use

Surgical removal of impacted third molar was done. After obtaining the consent 12 ml of patient's blood was drawn in a vacutainer and with help of centrifugation PRP and PRF were made in same appointment and placed in extracted third molar sockets, respectively. PRF was placed on the right side and PRP on the left side.

Measurement of outcome variables: Assessment of patients was done postoperatively for the assessment of soft tissue healing and radiographic assessment for bone healing was conducted after 1, 2, and 6 months. All the patients received identical postoperative medications and instructions.

Soft tissue healing -assessment of the areas around the soft tissue of the extracted third molar socket was done and scored as per the Landry and Turnbull index.⁶

Bone healing -assessment of the healing of the bone in the third molar extraction socket was measured in terms of three parameters as per index given by Kelly et al.⁷

The bone healing parameters used were:

1. Lamina Dura
2. The Overall density and
3. The Trabecular pattern

RESULTS

Table 1: Comparison of soft tissue healing between PRF and PRP

Mean values of soft tissue healing (Paired T test)				
	Mean	N	SD	SEM
PRF side	4.5500	25	0.58828	0.12577
PRP side	4.1100	25	0.89781	0.20541
	Paired differences mean	t	df	Sig
PRP to PRF	0.4400	4.287	17	0.001

Table 2: Comparison of alveolar bone healing between PRF and PRP

Mean values of bone tissue healing (Paired T test)				
	Mean	N	SD	SEM
PRF side	157.2587	25	9.86965	2.26576
PRP side	146.1429	25	10.27541	2.63256
	Paired differences mean	t	df	Sig
PRP to PRF	11.1158	5.287	18	0.001

Both the soft tissue and bone healing index showed significant difference between PRP and PRF group with PRF being better comparatively which was statistically significant too

DISCUSSION

Surgical removal of impacted mandibular third molars is the most frequent procedure performed by oral surgeons. This procedure maybe associated with considerable post operative complications including pain, trismus, oedema, surgical site infection etc^{8,9}. The purpose of this study was to assess and thereby compare the effects of platelet rich plasma (PRP) and platelet rich fibrin (PRF) on soft tissue healing and bone formation following the removal of impacted mandibular third molar sockets

In Split mouth of 25 patients, evaluations pertaining to classes of third molar impaction were done (Pell and Gregory classification) before placement of PRP on one side and PRF on the other. The hypothesis of the study was that growth factors could be used to promote wound healing, minimise postoperative complications and thereby enhance patient outcome.

We evaluated the soft tissue clinically using healing index by Landry et al. and our results were in accordance with the study by Y Tejesh et al.¹⁰ in which they found a significant difference in the healing potentials of PRP

and PRF and they found PRF to be better (Table 1). The results being similar to the study conducted by Y Tejesh et al. and also in accordance with the study conducted by Hatakeyama et al¹¹

He et al. conducted a study to evaluate and compare the effect of biologic features of PRP and PRF on proliferation and differentiation of rat osteoblasts.¹² It was observed that PRF demonstrated controlled and long-term release of the growth factors as compared to PRP. Furthermore, PRF showed better effects on the proliferation and differentiation of rat osteoblasts as compared to PRP. This is in supportive of our study results showing better bone healing in PRF side compared to PRP side (Table 2).

In our study, it was observed that the healing of extraction socket in terms of hard as well as soft tissue was faster in the PRF group which leads us to derive a similar conclusion. The study clearly indicates that both PRP and PRF show improved soft tissue and bone healing at the third molar extraction sockets when used as graft materials.

PRP and PRF contain growth factors in concentrated form. PRP or PRF when placed in the extraction sockets release PDGF, transforming growth factor-beta, fibroblast growth factor, vascular endothelial factor, and numerous other proteins that facilitate soft and hard tissue healing, collagen production and improve wound strength.

CONCLUSION

To conclude from the study conducted, PRP and PRF has beneficial effects on the improvement of bone formation, soft tissue healing and reduction of pain after mandibular third molar impaction surgery. PRF attributed to be a better platelet concentrate, in promoting soft tissue healing and osseous regeneration than PRP.

The improvement of soft tissue wound healing, decrease in pain and increase in bone formation signifies and highlights the use of PRF as a valid method in promoting an accelerating soft and hard tissue regeneration, over the use of PRP.

The method of procuring PRF is easy as compared to that of procuring PRP. PRF also has better tissue handling properties. A long-term follow-up along with histological study of the bone is required for further assessment of the efficacy of various graft materials.

Conflict of Interest: None

Ethical Clearance: Institution ethical committee approval obtained

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Workplace Spirituality and its Impact on Organizational Commitment and Employees' Job Satisfaction amongst Higher Educational Institution Teachers

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ABSTRACT

This research was planned to ascertain the impact of workplace spirituality towards organizational commitment and employees' job satisfaction amongst Higher Educational Institution Teachers. The organizational commitment and job satisfaction has been treated as dependent variables and workplace spirituality constituted the independent variable for the research. The research employed normative survey method and mix sampling technique for the purpose of investigation. The investigator used self-constructed workplace spirituality questionnaire, organizational commitment scale and Job Satisfaction Scale to collect personal information and to measure workplace spirituality, organizational commitment and job satisfaction amongst Higher Educational Institution Teachers. This research employed Analysis of Variance (ANOVA), Pearson Product Moment Correlation Coefficient and linear regression analysis to obtain the results. The research revealed that there was statistical significant and positive relationship of workplace spirituality with organizational commitment and job satisfaction and further revealed that there was positive and significant impact of workplace spirituality towards organizational commitment and job satisfaction amongst Higher Educational Institution Teachers.

Keywords: *Workplace Spirituality, Organizational Commitment, Job Satisfaction, mix sampling, normative survey method*

INTRODUCTION

The strength of every nation is system of education in which teachers occupy vital place. The most vital factors in achieving the goals of the organization are human resources. In educational organizations, the most important human resources are teachers who not only function as a guide and facilitator for acquisition of knowledge but also an inculcator of values and transformer of inner being. They also have to nourish the young minds to be a great one. Employees of the future need to demonstrate to the organizations that they can add value to the organization. This is not an easy task as only the best can bring out the best in us. Thus, to produce quality individuals, we need quality teachers. In recent years, spirituality has become an important part of our lives as well as workplace. Spirituality is considered as one of the key factors for the success of the educational organizations and ultimately for the professional life of the teacher. When people have high spirituality in the workplace, it may be more responsible for the organization and they have a high loyalty¹.

It was prospective that highly satisfied teachers will be more committed to their respective educational institutions resulting into larger withholding and weakening in their turnover rates. In today's era, there is desperate requirement of extremely satisfied, fulfilled, creative, committed and dynamic teachers in an organization to attain and survive their competitive growth. But teachers were feeling stressed, discouraged and insecure due to unstable work environment characterized by downsizing and new technologies in their institutions. So, all these uncertainties prepare them to quest for spiritual manifestation. It appears that unfulfilled spiritual needs inspire teachers of today's educational institutions to gaze for the actual meaning in their lives. Therefore, the spiritual outlook was producing alteration in the workplace values endorsing cooperative teamwork rather than panic at the workplace. People work with not only their hands, but also their hearts (spirit). It was when people work with their hearts or spirit that they find meaning and purpose, a kind of fulfillment that means the workplace can be a place where

people can express their whole or entire selves and be fulfilled. Enabling the expression of human experience at its deepest, most spiritual level may not only reduce stress, conflict, and absenteeism, but also enhance work performance³. Spirituality was seen increasingly as an important factor in the workplace^{1, 3}. Thus, training programs that incorporate a spiritual dimension enable the development of the whole person, and not just the “head” and “hands.” Developing our spiritual selves means expanding our consciousness so that we might see the world free of normal constraints⁷ and setting ourselves free to see more clearly thereby enables opportunities to creatively enrich our relationships with others. In case of academicians, their role goes beyond teaching or imparting knowledge but also require them to involve in character building of students to develop future leaders. Today’s academicians need to keep pace with increasing job demand and rapid acceleration of change which may require them to balance up between inner and outer life to remain healthy and avoid burnout. Workplace spirituality represents an attempt to experience spirituality not only in their personal lives but also at work where they spend a large amount of time. When place of work are able to generate surroundings that are favorable to teachers, be subjected to harmony in conduct and faith, their ethics, and a sense of motive in their profession, a definite configuration of spiritual orientation will appear.

OBJECTIVES OF THE RESEARCH

To study impact of workplace spirituality towards organizational commitment and job satisfaction amongst Higher Educational Institution Teachers.

Hypothesis of the Research: There exists no significant impact of workplace spirituality towards organizational commitment and job satisfaction amongst Higher Educational Institution Teachers.

Delimitation of the Research

1. The present study was delimited to Agra district of Uttar Pradesh.

2. The study was confined to teachers working in government aided Higher Educational Institutions of Agra district, Uttar Pradesh.

METHOD OF THE RESEARCH

For the accomplishment of the objectives of the present study, Descriptive survey method was employed, which was concerned with investigation of the phenomena in the natural settings. The organizational commitment and job satisfaction were dependent variables and workplace spirituality was independent variable for the research. For the purpose of collecting data the investigator selected seven government aided Higher Educational Institutions of Agra District, Uttar Pradesh, India through accidental non- probability method of sampling technique. The list of selected Higher Educational Institutions of Agra district Uttar Pradesh are Agra College, Dayalbagh Educational Institute, R.B.S College, St. John’s College, Institute of Social Sciences, Baikunthi Devi College and B.D Jain College respectively and 420 teachers of six academic streams (arts, science, commerce, engineering, social science and education) from seven government aided Higher Educational Institutions of Agra district, Uttar Pradesh, India were selected through Random sampling technique. As a whole, mix sampling method of sampling technique was applied. This research employed Analysis of Variance (ANOVA), Pearson Product Moment Correlation Coefficient and linear regression analysis to obtain the results. The investigator used self-constructed workplace spirituality questionnaire, organizational commitment scale² and Job Satisfaction Scale^{1,2} to collect personal information and to measure workplace spirituality, organizational commitment and job satisfaction amongst Higher Educational Institution Teachers.

FINDINGS OF THE RESEARCH

To determine the impact of workplace spirituality towards organizational commitment and job satisfaction amongst Higher Educational Institution Teachers, linear regression analysis was carried out with the help of correlation analysis. Correlation matrix was formed which shows inter-correlation among the variables of the research shown in Table 1:

Table 1: Correlation Matrix exhibiting relationship amongst workplace spirituality, organizational commitment and job satisfaction

Variables	Workplace spirituality	Organizational commitment	Job satisfaction
Workplace Spirituality	1		
Organizational commitment	0.536**	1	
Job satisfaction	0.489**	0.271*	1

**Significant at 0.01 level, * Significant at 0.05 level

The matrix of coefficient of correlation Table 1 indicates that workplace spirituality and organizational commitment scores have significant and positive correlation ($r = 0.536$). There was also significant and positive correlation found between workplace spirituality and job satisfaction ($r = 0.489$). There was slight and positive correlation found amongst job satisfaction and organizational commitment ($r = 0.271$). Correlations were calculated to determine to what extent workplace spirituality correlated with organizational commitment and job satisfaction. As can be seen in Table 2, significant positive correlations were formed among all three variables. This results shows that there was strong relationship between workplace spirituality, organizational commitment and job satisfaction amongst Higher Educational Institution Teachers^{6, 8, 9}.

The result from the correlation in Table 1 fulfils the required conditions for regression analysis. Thus, the regression analysis can be carried out here. Linear regression analysis is used to determine the contribution of the independent variable which is workplace spirituality towards dependent variables which are organizational commitment and job satisfaction amongst Higher Educational Institution Teachers.

Table 2 and 3 reveals the results of linear regression analysis which gives contributory role of workplace spirituality towards organizational commitment and job satisfaction. The linear regression analysis shows that the independent variable which is workplace spirituality is the indicator with correlation ($r = 0.536$) and the value of R^2 ($R^2 = 0.288$) contributes 28.8% towards organizational commitment amongst Higher Educational Institution Teachers.

Table 2: Analysis of Linear Regression between Workplace spirituality towards Organizational Commitment

Model	r	R ²	Adjusted R ²	Standard error	β	Contribution (%)
1	0.536	0.288	0.282	0.595	0.419	28.8%

Predictor: workplace spirituality

Dependent variable: Organizational commitment

The contribution of workplace spirituality towards organizational commitment amongst Higher Educational Institution Teachers forms the linear regression as:

$$Y = 2.604 + 0.419X_1 + 0.595$$

Y = Organizational Commitment

X₁ = Workplace spirituality

Constant 2.604

Standard Error 0.595

The linear regression analysis showed that workplace spirituality contributes 28.8 % towards organizational commitment amongst Higher Educational Institution Teachers. This means that 28.8% variation in the organizational commitment can be explained by the workplace spirituality. The above regression equation showed positive impact of workplace spirituality towards organizational commitment^{1, 3}.

For testing the significance of regression model ANOVA has been applied which is shown in Table 3:

Table 3: Analysis of variance results for workplace spirituality and organizational commitment

Source	Sum of Squares	df	Mean square	F-ratio	Level of significance
Regression	18.607	1	18.607		
Residual	46.064	418	.110	169.15	Significant at 0.01 level
Total	64.670	419			

It was found that F-ratio is 169.15 which exceeds table value ($= 2.59$) at 0.01 level of significance. Thus, null hypothesis was rejected that there exist no significant impact of workplace spirituality towards organizational commitment amongst Higher Educational Institution Teachers.

Table 4 showed the result of linear regression

analysis which gives contributory role of workplace spirituality towards job satisfaction. The linear regression analysis shows that the independent variable which was workplace spirituality is the indicator with correlation ($r = 0.489$) and the value of R^2 ($R^2 = 0.239$) contributes 23.9% towards job satisfaction amongst Higher Educational Institution Teachers⁵.

Table 4: Analysis of Linear Regression between workplace spirituality towards Job Satisfaction

Model	r	R ²	Adjusted R ²	Standard error	β	Contribution (%)
2	0.489	0.239	0.233	0.615	0.332	23.9%

Predictor: workplace spirituality

Dependent variable: Job Satisfaction

The contribution of workplace spirituality towards job satisfaction amongst Higher Educational Institution Teachers forms the linear regression as below:

$$Y = 3.080 + 0.332X_1 + 0.615$$

Y= Job satisfaction

X₁= workplace spirituality

Constant 3.080

Standard Error 0.615

The linear regression analysis shows that workplace spirituality contributes 23.9 % towards job satisfaction amongst Higher Educational Institution Teachers. This means that 23.9% variation in the job satisfaction can be explained by the workplace spirituality. The above regression equation shows positive impact of workplace spirituality towards job satisfaction.

For testing the significance of regression model ANOVA has been applied which is shown in Table 5:

Table 5: Analysis of variance results for workplace spirituality and job satisfaction

Source	Sum of Squares	df	Mean square	F-ratio	Level of significance
Regression	18.607	1	18.607		
Residual	46.064	418	.110	169.15	Significant at 0.01 level
Total	64.670	419			

It was found that value of F-ratio is 132 which exceeds table value (=2.59) at 0.01 level of significance. Thus, null hypothesis was rejected that there exist no significant impact of workplace spirituality towards job satisfaction amongst Higher Educational Institution Teachers.

From the linear regression analysis it was inferred that workplace spirituality contributed the most towards organizational commitment which was 28.8%, followed by 23.9% towards Job Satisfaction amongst Higher Educational Institution Teachers.

CONCLUSIONS AND RECOMMENDATIONS OF RESEARCH

1. It was also inferred that there was significant and positive relationship found amongst workplace spirituality with organizational commitment and job satisfaction whereas job satisfaction has slightly positive relationship with organizational commitment.
2. There was positive and significant impact of workplace spirituality found towards

organizational commitment and job satisfaction amongst Higher Educational Institution Teachers which emerges from regression analysis. It was also inferred that workplace spirituality contributed the most towards organizational commitment which is 28.8%, followed by 23.9% towards job satisfaction amongst Higher Educational Institution Teachers and remaining percentage of 47.3% can be explained by other variables which can be further investigated for future research^{5,13}.

3. Workplace spirituality was identified as a significant contributor to organizational commitment and job satisfaction amongst Higher Educational Institution Teachers. Therefore, it was recommended that Higher Educational administration must take steps to enhance conducive environment of workplace spirituality for teachers.
4. This research also recommends arrangements of workshops and sessions on yoga, meditation and other relaxation practices and behavioral, technical and leadership training for the Higher Educational Institution Teachers to enhance their abilities.

5. It recommends minimization of exertion, simplification of guidelines, rules and procedures, recruitment of competent, well-educated and competent teachers identifying a good work offering frequent and non-critical feedback to teachers on their enactment for self-development to overcome inadequacies.
6. This research additionally advocates constitution of personnel management team in each institute to resolve work related concerns of teachers, to identify, analyze and resolve work related problems of teachers leading to expansion in their full performance and enrichment of their work life which will lead to enhancement in their total performance and enrichment of their work life and also avoidance of political interference in the management and administration of college.
7. Procedural justice and the degree of fairness in the procedures by which rewards were disseminated amongst employees by the organization directly influence an employee's degree of satisfaction. Therefore, it was recommended that the organization's rules, policies and procedures should be unbiased and justifiable.

Ethical Clearance: Not required as per study

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The Role of MRI in Non-Traumatic Chronic Hip Joint Pain

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ABSTRACT

MRI is changed the face of diagnostic techniques, it has been used for diagnosing the hip pathologies & is the earliest applications of MRI in diagnosing musculoskeletal disorders. MRI detects articular, extra articular and osseous pathologies in hip joint. Thus is important in diagnosing the cases of chronic hip pain which indicates a long list of causes. MRI is also the investigation of choice for imaging avascular necrosis, radiographically occult fractures, marrow replacement disorders, musculoskeletal neoplasms, and various arthritides involving the hip joint.

This study was designed to assess the role of MRI in non-traumatic chronic hip joint pain in adult age group, carried out at Department of Radio Diagnosis, Krishna Institute of Medical Science Karad, Maharashtra. The study included 54 patients with hip pain who were evaluated by plain radiograph and MRI.

Majority (42.59%) of the patients were from the age group of 31 – 50 years, majority of the patients, 36 were males (66.67%). Most common chief complaint was unilateral hip pain (79.6%), and most common pathology found was avascular necrosis in 27 cases (50 %). There was no significant association between the age groups and AVN ($p=0.582$), while gender showed significant association with AVN ($p = 0.021$). Plain radiograph was abnormal in 41 out of total 54 cases (75.93%). The accuracy of detecting etiology by MRI in current study was 96.2 % as compared to plain radiograph was 75.9 % in current study. Thus MRI was seen to be more effective in diagnosing cases of painful hip joint where plain radiographs may be entirely normal.

Keywords: MRI, AVN, X ray, hip joint.

INTRODUCTION

One of the most revolutionary advances in the field of medicine that has essentially changed the face of diagnosis is Magnetic Resonance Imaging (MRI). One of the earliest reported use of musculoskeletal magnetic resonance imaging (MRI) is imaging of the hip. In the

last few years, advantages such as reduced scan time and better image quality have significantly widened the scope of MRI¹.

MRI is a highly specific and sensitive technique for detecting a number of abnormalities involving the hip and surrounding tissues i.e. it helps in evaluation of articular, extra articular and osseous structures which can be affected by hip pathology. The hip is an important weight-bearing joint. Hip pain is an indication with a long list of etiologies including intraarticular, periarticular and extraarticular disorders².

The exact origin of hip pain determination can be quite challenging³. Therefore, to maintain an awareness of neighboring structures as well as of the hip is important⁵. In the absence of known acute trauma, hip pain is a common diagnostic problem⁴.

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MRI is also the modality of choice for imaging avascular necrosis, radiographically occult fractures, marrow replacement disorders, musculoskeletal neoplasms, and various arthritides involving the hip joint⁶.

MATERIALS & METHOD

Study Population: An observational & cross sectional study was carried out on 54 patients over a period of 2 years from November 2016 to November 2018. Institute Ethics Committee Clearance was obtained before the start of the study.

Inclusion Criteria:

- Both sexes
- Patients of adult age group (above 19 year old).
- Non-traumatic clinically suspected cases of chronic hip joint pain: patients with unilateral or bilateral groin, buttock, thigh or knee pain, deformity or limitation of range of hip movement.

Exclusion Criteria:

- Patients with history of trauma
- Patient having claustrophobia.
- Patient having history of metallic implants insertion, cardiac pacemakers and metallic foreign body in situ.
- Patients with previous history of hip surgery.

MRI was performed using MAGNETOM AVANTO 1.5-TESLA Tim + Dot MR System. All the patients undergone conventional hip AP and lateral radiographs on ALLENGERS MARS 50 preceding the MRI examination.

The patient was asked to lie in supine position with the hip in close relation to the array surface body coil and both hips were examined simultaneously. Spin-echo T1-weighted (coronal/sagittal), PD FAT SAT (coronal/axial), T2-weighted (oblique sagittal) sequences of both hips sequences were performed. Intravenous contrast (Gadolinium @ 0.1mmol/kg) was administered when thought necessary based on the MRI findings.

RESULTS

Fifty four patients with unilateral or bilateral hip pain of adult age groups and both sexes were studied by plain radiograph and MRI scan.

Most of patients i.e. 23 (42.59%) in our study were from 31 – 50 years of age, followed by more than 50 years 18 (33.33%) and lastly 19 – 30 years 13 (24.08%). Majority of the patients, 36 were males (66.67%) and rest 18 (33.33%) were females. The ratio of male: female came out to be 2:1.

The most common chief complaint in our patients was unilateral hip pains in 43 (79.6%) patients {(Left Hip Pain- 24 (44.44%) followed by Right Hip Pain -19 (35.19%) patients}. Other presenting complaints were Backache 9 (16.67%), Bilateral Hip Pains 8 (14.81%), and Bilateral Lower Limb Pains with limitation of limb movements 6 (11.11%), fever 5 (9.2%), Swelling 3 (5.56%) and Pain in the thighs 1 (1.85%) patients respectively.

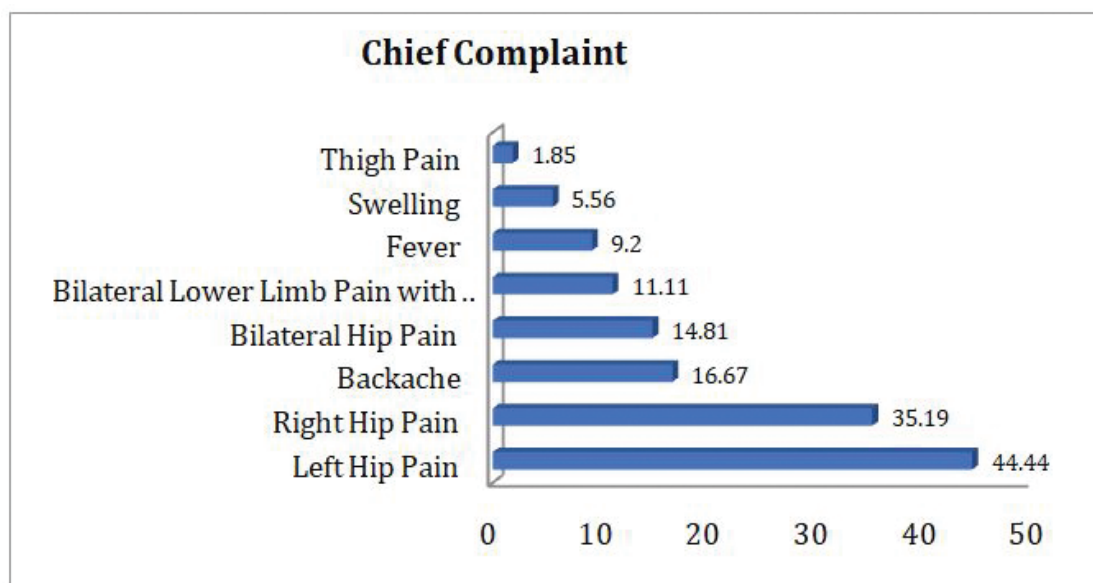


Fig. 1: Chief complaints of the study participants

Table 1: Different pathological diagnosis on MRI in study participant

Diagnosis		Number	Percentage* (%)
AVN (total)		27	50%
Secondary osteoarthritis		13	24.07
Stress fracture		1	1.8
Sacral Insufficiency Fracture		1	1.8
Transient Osteoporosis		2	3.7
Sacroilitis		3	5.55
Infective	Pyogenic arthritis	1	1.8
	Synovitis with Joint effusion	1	1.8
	Abscess	1	1.8
	TB Arthritis	1	1.8
	Joint effusion	2	3.7
	Osteomyelitis	1	1.8
Primary bone tumours	spindle cell sarcoma	1	1.8
	Enchondroma	1	1.8
	Osteoid osteoma	1	1.8
	Aneurysmal bone cyst	1	1.8
	Osteochondroma	2	3.7
	Simple bone cyst	1	1.8
Metastases		2	3.7
Multiple Myeloma		2	3.7
Normal (in degenerative spine)		2	3.7

The study revealed pathological findings in 52 patients. Out of which the most common finding encountered in our study was avascular necrosis (50 %). Followed by Sec. Osteoarthritis (24.07%). All the tumours (including primary and secondary) together constituted 20.37% while infective pathologies 12.96 % of the patients

AVN was seen in half cases (27 cases – 50%), Majority of the AVN cases- 13 (48.15%) were from age group of 31 – 50 years, more than 50 years of age had 9 (33.33%) of cases and rest 5 (18.52%) were from 19- 30 years. In 27 cases without avascular necrosis, majority of patients 10 (37.04%) were from the age group of 31- 50 years, 8 (29.63%) were from 19-30 years and rest 9 (33.33%) were from more than 50 years of age. There was no any association between age groups and presence of pathologies especially Avascular necrosis ($p = 0.582$) in current study.

Table 2: Association between Gender and AVN

Gender	AVN	Other than AVN
Males	22 (81.48%)	14 (51.85%)
Females	5 (18.52%)	13 (48.15%)
Total	27 (100%)	27(100%)
$X^2 = 5.333$ $p = 0.021$		

We saw more number of males in our study -22 with AVN than females - 5. There was significant association between presence of AVN and gender. ($p=0.021$).

Out of the 27 AVN cases, we had majority- 12 (44.44%) patients with left hip AVN, Right hip AVN was seen in 11 (40.74%) cases and bilateral was seen in 4 (14.82%) cases. So in total we had $27 + 4 = 31$, 31 total number of hips with AVN.

Table 3: Staging of Avascular necrosis

Staging		Number of Hips*	Percentage (%)
Stage 0		00	0%
Stage I		2	6.45 %
Stage II	a	2	6.45 %
	b	4	12.9 %
Stage III		6	19.35 %
Stage IV		13	41.93 %
Total Hips with AVN		31	100%
*Total Number of Hips = $27 + 4 = 31$			

Majority of our patient's hips (41.93%) were from stage IV of AVN, while others were in stage II (19.35 %), Stage III (19.35 %) and stage I (6.45 %).

Table 4: Diagnosis on plain radiographs

Diagnosis	No. of Patients (N = 54)	Percentage
Avascular Necrosis	13	24.07%
Osteoarthritis	13	24.07%
Primary Neoplasms	7	12.96%
Metastasis	2	3.70%
Multiple Myeloma	2	3.70%
Abscess	1	1.85%
Infection	2	3.70%
Sacroilitis	1	1.85%
Normal	13	24.07%
Total	54	100%

Out of a total of 54 cases, Plain radiographs were abnormal in 41 patients (75.93%) and normal in remaining 13 cases (24.07%), with most common diagnosis seen as AVN and Osteoarthritis in 13 patients each (24.07%).

Table 5: Correlation of Plain Radiographs with MRI

		MRI		Total
		Normal	Abnormal	
Plain Radiograph	Normal	2 (3.70%)	11 (20.37%)	13 (24.07%)
	Abnormal	0 (0%)	41 (75.93%)	41 (75.93%)
Total		2 (3.70%)	52 (96.30%)	54 (100%)

Out of all 52 (96.30%) abnormal cases detected on MRI, plain radiograph was abnormal in 41 patients, 11 cases more (20.37%) were seen on MRI. Sensitivity of x ray in comparison with MRI was 78.8 % and Specificity was 100%. The accuracy of detecting etiology by MRI was 96.2 % as compared to plain radiograph is 75.9 % in our study

DISCUSSION

The hip is a primary weight-bearing joint. Hammer⁷ mentioned that in absence of known acute trauma, hip pain is a common diagnostic problem with many etiologies. MRI is the most sensitive mean of diagnosing AVN, representing the gold standard of non-invasive diagnostic evaluation.

Fifty four patients were evaluated, whose age group range from 19 years and above, in which majority 23 (42.5 %) from age group of 31-50 years, followed by more than 50 years (33.33%) and then 19 – 30 years (24.08%). Similar age wise distribution was seen in Tushar et al⁸ study. The study by Arvindkumar et al⁹ had most of the patients from 41- 50 years of age group similar to the current study. In the present study, out of 54 patients, majority were (66.67%) males and rest (33.33%) females. Male predominance was seen in the study by Arvindkumar et al⁹, similar to the current study. Male: female ratio = 2:1. Mitchell et al¹⁰ got a gender ratio of 1.43:1 and Beltran et al¹¹ got 1.7:1. Thus, in our study, we got a slightly higher gender ratio.

The commonest chief complaint in our patients was chronic hip pain. Out of 54 cases, unilateral hip pain (79.6%) {(Left Hip Pain (44.44%) followed by Right Hip Pain (35.19%)}. Other presenting complaints were Backache (16.67%), Bilateral Hip Pains (14.81%), Bilateral Lower Limb Pains with limitation of limb movements (11.11%), fever (9.2%), Swelling (5.56%) and Pain in the thighs (1.85%). The study by Venkateshet al¹², had 57.6% who had unilateral pain while in our

study there were 79% patients with unilateral hip pains which is higher.

In the current study we come across with a wide range of lesions who presented with chronic hip pain. Out of 54 patients who were evaluated, the most common finding encountered in our study was avascular necrosis (50 %). Followed by Sec. Osteoarthritis 13 (24.07%). All the tumours (including primary and secondary) together constituted 20.37% while infective pathologies 12.96 % of the patients. Ragab¹³ et al studied 34 patients with hip pain using MRI and found similar spectrum of disease conditions prevalent in the population.

In our study, avascular necrosis (AVN) turned-out to be the most common hip pathology i.e. 27 (50%) with age varying from 19 to 70 years. The most common involved age group was 31 – 50 years, which comprised (48.15 %) of the cases which was similar to Khanna et al¹⁴ and Kamal¹⁵ studies.

In our study, we saw more number of males (81.485 %) with AVN than females (18.52%). There was significant association between presence of AVN and gender. (p=0.021). Study by Patterson et al¹⁶ on AVN had 83% male and 17% female patients.

In the present study, AVN was present unilaterally in 23 patients (42.59%) and bilaterally in 4 patients (14.82%). These results were similar to the study by Patterson et al¹⁶. They concluded that, bilateral AVN was found in 64% cases, however bilateral AVN may not match in their class, so either AVN is developing with different speediness in both hips or it may have been started early in one hip. Majority of our patient's hips (41.93%) were in stage IV of AVN, while others were in stage II (32.25 %), Stage III (41.93%) and stage I (6.45 %).

In the present study, stage-4 was the most common stage of AVN present in 13 (41.94%) of the cases followed by stage II (32.25 %) {Stage II a = 4(12.9 %) &

stage II b = 6 (19.35 %)}, Stage III (19.35 %) and stage I (6.45 %). In current study, most of the patients (61.2%) were from advanced disease i.e. stages III and IV. Kamal et al ¹⁵. In his study found that majority (85.87%) were diagnosed in advance evolutionary stages of disease, stage 3 and stage 4.

Beltran¹¹ stated that in early stages of avascular necrosis, diagnosis with the help of conventional radiography is difficult. Hence, MR imaging is often used. Thus, the two main goals in MR imaging evaluation of early avascular necrosis are: determination of (a) extent of involvement of femoral head pathology and (b) percentage of femoral head involved segment.

In our study the 2nd common pathology was Sec. Osteoarthritis 13(24.0%), the study by Venkateshetal¹², had 11% of osteoarthritis. In the present study, bone marrow edema was found in 37 (68.5%) of the cases. All patients having bone marrow edema had hip pain. KooKHetal¹⁷ in their study established that combination of AVN femoral head and bone marrow edema is strongly associated with hip joint pain.

We had 7 cases with Infective etiology (12.96%) including pyogenic arthritis (1.8%), Synovitis with Joint effusion (1.8%), abscess (1.8%), Tubercular Arthritis (1.8%), osteomyelitis (1.8%) and isolated joint effusion (3.7 %). The study by Tushar et al ⁸, had 12% patients with infection which is slightly less than the current study. In the study by Chevrot et al ¹⁸ had majority cases of infective etiology.

Out of all 54 cases in our study, MR showed abnormality in 52 cases where as plain radiograph was abnormal in 41 patients. All the 41 patients with abnormal plain radiographs had an abnormal MRI study. Only 2 out of 13 patients had normal plain radiographs and normal MRI. Sensitivity of x ray in comparison with MRI was 78.8 % and Specificity was 100%.

The apparent sensitivity of plain radiographs is higher than reported in other cases/studies as the patient's inclusion criteria was painful hip conditions and exclusion of normal individuals.

The accuracy of detecting etiology by MRI in current study was 96.2 % as compared to plain radiograph was 75.9 % in current study.

The similar findings were from study by Huang et al¹⁹.

Conflicts of Interest: None.

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Ethical Clearance: Institutional Ethical Committee, KIMSUDU.

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Computed Tomography Evaluation of Mediastinal Masses

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ABSTRACT

Background: The mediastinum is an extremely complex area. The multitude of diseases affecting the mediastinum vary considerably, ranging from tumors (benign to extremely malignant) cysts, vascular anomalies, lymph node (LN) masses, mediastinitis, mediastinal fibrosis, and pneumo-mediastinum. The differential diagnosis of a mediastinal mass on CT is usually based on several findings, including its location, identification of the structure from which it is arising. Hence the present study was done to assess the role of multi-detector CT in detection and evaluation of mediastinal masses.

Material & Method: 51 patients with the clinically suspected cases of mediastinal masses or who had a chest radiograph with suspicion of mediastinal abnormality. Patients of all age group coming with a mediastinal mass or mediastinal widening on chest x-ray were included. Patients who are hypersensitive to contrast dye and patients with deranged renal parameters were excluded. Somatom emotion 16 slice equipment was used. Plain scan and triphasic scan. Which includes 3 phases viz. Arterial, venous & delayed with 3D reconstruction.

Results: Anterior mediastinum comprised of Lymphoma (36.46%), Invasive thymoma (19.2%), thymoma (15.38%), Metastatic lymph nodes (11.53%), Tuberculous lymph nodes (7.69%), sarcoma, malignant teratoma and metastasis. Metastatic lymph nodes (46.15%), Tuberculous lymph nodes (38.46%). Other rare masses in middle mediastinum were, bronchogenic cyst and lymphatic malformation. Extra medullary hemopoiesis (33.33%), Neural tumours (33.33%), Paravertebral abscess (16.66%) and Tuberculous lymph node (8.33%) were the commonest lesions in the Posterior mediastinum.

Conclusion: Anterior mediastinal masses formed majority of the total masses while posterior mediastinal masses and middle mediastinal masses comprised 23.52% and 25.49% of the total masses respectively. In which we found that the CT is 95.83% accurate in diagnosing mediastinal masses as compared to histopathological examination. Hence finally we conclude that the use of CT scan greatly expedites the diagnosis process.

Keywords: Computed Tomography, Mediastinal Masses, Mediastinal Abnormality.

INTRODUCTION

The mediastinum is an extremely complex area. The multitude of diseases affecting the mediastinum vary considerably, ranging from tumors (benign to extremely malignant) cysts, vascular anomalies, lymph node (LN) masses, mediastinitis, mediastinal fibrosis, and pneumo-mediastinum¹. Mediastinal masses span a wide histopathological and radiological spectrum. The most frequent lesions encountered in the mediastinum are thymoma, neurogenic tumours and benign cysts,

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altogether representing 60% of patients with mediastinal masses. Neurogenic tumours, germ cell neoplasms and foregut cysts represent 80% of childhood lesions, whereas primary thymic neoplasms, thyroid masses and lymphomas are the most common in adults².

The differential diagnosis of a mediastinal mass on CT is usually based on several findings, including its location, identification of the structure from which it is arising, whether it is single, multifocal or diffuse, its size and shape, its attenuation, the presence of calcification and its character and amounts, and its opacification following contrast administration.

Hence the present study was done to assess the role of multi-detector CT in detection and evaluation of mediastinal masses, to study the CT characteristics of mediastinal masses in plain and contrast enhanced CT and correlate CT findings with histopathological/MRI/USG findings wherever possible.

AIM AND OBJECTIVES

- To study the role of multi-detector CT in detection and evaluation of mediastinal masses.
- To study the distribution of mediastinal masses.
- To study the CT characteristics of mediastinal masses in plain and contrast enhanced CT.

- To study the involvement of neighboring structures by mediastinal masses.
- To compare CT findings with histopathological / MRI/USG findings wherever possible.

METHODOLOGY

All patients referred from department of medicine, surgery, pediatrics and TB & chest disease, to the department of radio-diagnosis with the clinically suspected cases of mediastinal masses or who had a chest radiograph with suspicion of mediastinal abnormality. Minimum of 51 cases were included in the present study. Patients of all age group coming with a mediastinal mass or mediastinal widening on chest xray were included. Patients who are hypersensitive to contrast dye and patients with deranged renal parameters were excluded in study. Equipment used was Somatom emotion 16 slice. Plain scan and triphasic scan. Which includes 3 phases viz. Arterial, venous & delayed with 3D reconstruction.

RESULTS

The present study was a prospective analytical study, which was conducted among 51 patients diagnosed with mediastinal masses, for their evaluation, by using computed tomography. In the present study, we assessed demographic parameters of the study population, to know the possible etiological relationships with the mediastinal lesions.

Table 1: Age and Gender Distribution of patients

Age (years)	Male		Female		Total	
	N	%	N	%	N	%
<20	7	13.73%	4	7.84%	11	21.56%
21-30	7	13.73%	3	5.88%	10	19.61%
31-40	8	15.68%	4	7.84%	12	23.53%
41-50	0	0%	8	15.68%	8	15.68%
51-60	3	5.88%	4	7.84%	7	13.73%
>61	3	5.88%	0	0%	3	5.88%
Total	28	54.90%	23	45.10%	51	100%
Mean $\pm$ SD	35.62 $\pm$ 12.5 years		36.04 $\pm$ 15.10 years		45.7 $\pm$ 18.90	

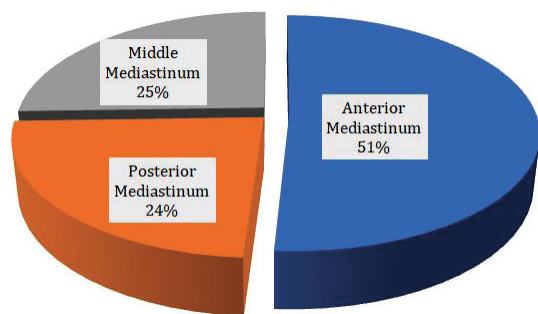
Majority of the patients in the present study were belonged to the age group of 31-40 years, followed by 21.56% in the age group of less than 20 years, 19.61% patients in the age group of 21-30 years. The mean age of the patients was 45.7 $\pm$ 18.90 years.

There was a male preponderance in the given study. 54.90 % participants were males while female patients

constituted 45.10 % of sample group, it was not statistically significant.

Present study, we assessed the mediastinal masses according to the site, type of mediastinum involved. Anterior mediastinal masses formed majority of the total masses 50.98% while posterior mediastinal masses

and middle mediastinal masses comprised 23.52% and 25.49% of the total masses respectively.



Graph 1: Distribution of patients according to Mediastinum Masses

Table 2: Distribution of Anterior mediastinal lesions (based on CT findings) (n = 26)

Anterior mediastinal lesions parameters		Number of cases	Percentage
Diagnosis on CT	Lymphoma	9	34.61%
	Invasive thymoma	5	23.07%
	Thymoma	4	15.38%
	Metastatic lymph nodes	3	11.53%
	Tuberculous lymph nodes	2	7.69%
	Metastasis	1	3.84%
	Malignant teratoma	1	3.84%
	Sarcoma	1	3.84%
Total		26	100%

This study revealed that the majority of the anterior mediastinal masses were Lymphoma (34.61%), followed by Invasive thymoma (23.07%), thymoma (15.38%), Metastatic lymph nodes (11.53%), Tuberculosis lymph nodes (7.69%). Other rare masses in anterior mediastinum were, tuberculous lymph nodes and a single case of sarcoma was also seen. (Table 2)

Table 3: Distribution of middle mediastinal lesions (Based on CT findings)

Middle mediastinal lesions parameters		Number of cases	Percentage
Diagnosis on CT	Metastatic lymph nodes	6	46.15%
	Tuberculosis lymph nodes	5	38.46%
	Bronchogenic cyst	1	7.69%
	Lymphatic malformation	1	7.69%

Here it was observed that the majority of the middle mediastinal masses were Metastatic lymph nodes (46.15%), Tuberculous lymph nodes (38.46%). Other

rare masses in middle mediastinum were, lymphatic malformation (7.69%) and bronchogenic cysts (7.69%). (Table 3)

Table 4: Distribution of posterior mediastinal lesions (Based on CT findings)

Posterior mediastinal lesions parameters		Number of cases (N)	Percentage (%)
Diagnosis on CT	Extramedullary hemopoiesis	4	33.33%
	Neural tumours	4	33.33%
	Paravertebral abscess	2	16.66%
	Tuberculous lymph nodes	1	8.33%
	Esophageal duplication cyst	1	8.33%

It was found maximum of the posterior mediastinal masses: Extramedullary hemopoiesis among 4 (33.33%) cases, Neural tumours among 4 (33.33%) cases, Paravertebral abscess among (16.66%) cases and Tuberculous lymph node (8.33%) cases and a single case of esophageal duplication cyst (8.33%). (Table 4)

Table 5: Distribution of various neural tumours

Neural tumors	Number of cases (N)	Percentage (%)
Neurofibroma	3	75%
Schwannoma	1	25%
Total	4	100%

In the present study, we assessed various neural tumour separately. Thus, it was found out of total 4 neural tumours, 3 were: neurofibroma (75%) while one was schwannoma (25%). (Table 5)

Table 6: Comparison of CT as a modality for diagnosis of mediastinal lesions (in comparison with histopathology findings)

		Histopathology diagnosis		Total
		Positive	Negative	
CT Diagnosis	Positive	46	0	46
	Negative	2	0	2
Total		48	0	48

In the present study, It was observed that Out of total 48 cases which were subjected for histopathological confirmation, CT diagnosed 46 cases as correctly, with two cases false negative cases (Table 6)

Table 8: Sensitivity and specificity of CT scan to diagnose mediastinal lesions

Parameter	Values
Diagnostic accuracy (Sensitivity)	95.83%

When we assessed the diagnosis given by CT scan as compared to histopathological findings, it was observed that CT scan reports Diagnostic accuracy (sensitivity) of 95.83%, which means that CT is accurate to diagnose 95.83% of mediastinal masses. (Table 8)

DISCUSSION

Majority of the patients in the present study, majority of the participants (23.53 %) were in 31-40 years, followed by 21.56% (less than 20 years), 19.61% patients in the group of age 21-30 years. Average age of the patients was 45.7 ± 18.90 years. Tetsuro Araki et al³, in their study, under Framingham study, observed that the participants with anterior mediastinal masses had a mean age of 62.1 years (median 60.9 years, range 39.0–83.8 years) and 12 were female (52%).

In the present study, we assessed the mediastinal masses according to the site, type of mediastinum involved. Anterior mediastinal masses formed majority of the total masses 50.98% while posterior mediastinal masses and middle mediastinal masses comprised 23.52% and 25.49% of the total masses respectively.

Felson et al⁴, conducted a case series of 550 cases, they reported more number of cases being seen in the anterior mediastinum followed by posterior and middle mediastinum. In their study, isolated compartmental involvement is common in posterior mediastinum (n=7, 23.4%) followed by superior (n=4, 13.3%) middle (n=4, 13.3%) and anterior mediastinum (n=3, 10%). However the anterior mediastinal is most commonly involved in trans-compartmental lesions (n=12, 40% and n=2, 6.7%). Therefore anterior mediastinum (n=17, 56.7%) was collectively the most common compartment involved, followed by superior mediastinum (n=16, 53.3%), posterior mediastinum (n=9, 30.1%) and middle mediastinum (n=6, 20.0%). On CT imaging, the commonest location of mediastinal mass in our study was the anterior mediastinum and the results are comparable with other studies as well.

In this study, we reported that the majority of the anterior mediastinal masses were Lymphoma

(36.46%), followed by Invasive thymoma (23.07%), thymoma (15.38%), Metastatic lymph nodes (11.53%), Tuberculosis lymph nodes (7.69%). Other rare masses in anterior mediastinum were, tuberculous lymph nodes, a single case of sarcoma was also diagnosed in the anterior mediastinum.

Akshatha Rao Aroor et al⁵, On CT imaging, the commonest location of mediastinal mass in our study was the anterior mediastinum (42.86%), and the results are comparable with other studies as well. Thymoma (40%) was the commonest tumour in the anterior mediastinum, followed by lymphoma (33.3%). The tumours in the order of frequency of occurrence were lymphoma, bronchogenic carcinoma, thymoma, mediastinal tuberculosis, metastatic carcinoma and germ cell tumours. Lymphoma was the commonest mediastinal tumour (12; 34.28%), which is in comparison with the studies done by Vaziri et al., and Adegbeye et al⁶. However, thymoma was the most common lesion in study done by Singh et al., and Dubashiet al⁷.

Sergi Juanpere et al⁸, in their study reported that, Lipomas predominantly occur in the anterior mediastinum and are reported to represent 1.6–2.3% of all primary mediastinal tumours. At CT, lipomas have homogeneous fat attenuation of approximately -100 HU. In the present study, we could not observe lipomas in anterior mediastinum.

In this study, we reported that the majority of the middle mediastinal masses were Metastatic lymph nodes (46.15%), Tuberculous lymph nodes (38.46%). Other rare masses in middle mediastinum were, Neuroenteric cyst, bronchogenic cyst. All the masses were assessed with the help of computed tomography. All of the middle mediastinal lesions were having heterogeneous enhancement pattern (100%) on computed tomography. 100% cases did not show calcification or mass effect among the lesions on CT. In the present study, we also found one case of sarcoma, which was initially diagnosed as lymphoma, later on histopathology, it was confirmed to be sarcoma.

Akshatha Rao Aroor et al⁵, Middle mediastinal involvement was seen in 11.43% cases, which is comparable with other studies. They found one case of lymphoma (25%) which was a 12.5 x 7.5 x 6.6 cms in the middle mediastinum. (NHL), 2 cases of TB Mediastinum (50%), and one case of metastasis (25%).

Adegboye VO et al⁶, in their study observed middle mediastinal involvement among 14 patients (13.3%).

In the study conducted by Senjuti Dasgupta et al⁹, 5 (22.7%) cases of lymphoma were diagnosed in the middle mediastinum, out of which 3 cases were found to be Hodgkin lymphoma and the other 2, non-Hodgkin lymphoma. These results are in accordance with those obtained by other authors. It has been reported that 50-70% of primary mediastinal lymphomas are Hodgkin type. Diffuse large B-cell lymphoma and acute lymphoblastic lymphoma are the common non-Hodgkin lymphomas found in the mediastinum.

In this study, we reported that the majority of the posterior mediastinal masses: Extramedullary hemopoiesis among 5 (41.66%) cases, Neural tumours among 4 (33.33%) cases, Paravertebral abscess among 2 (16.66%) cases and Tuberculous lymph node among 1 (8.33%) case.

Sergi Juanpere et al⁸, in their study reports that, Neurogenic tumours represent approximately 20% of all adults and 35% of all paediatric mediastinal tumours and they are the most common cause of a posterior mediastinal mass. Seventy to eighty percent of neurogenic tumours are benign, and nearly half are asymptomatic.

Akshatha Rao Aroret et al⁵, in their study observed that the incidence of tumours in the posterior mediastinum (8.57%) not as other studies, but less in comparison with other studies by Adegboye et al⁶ (22.9%). This could be due to the lack of neurogenic tumours in our study.

In the present study, we compared various lesions in all the three mediastinum, based on CT scan, with its histopathological diagnoses. It was observed that Out of total 48 cases which were subjected for histopathological confirmation, CT diagnosed 46 cases as correctly, with two cases false negative. We found that the CT is 95.83% accurate in diagnosing mediastinal masses.

Suyash Kulkarni et al¹⁰, conducted a retrospective analysis of percutaneous CT-guided biopsies of mediastinal lesions. Out of 83 biopsies, distribution of results were primary neoplasm (n = 49), secondary neoplastic process (n = 28) and non-neoplastic conditions (n = 6). In our series, diagnostic accuracy for primary mediastinal neoplasm was found to be 93.8%; and secondary neoplastic process, 96.5%. High rate of neoplastic pathologies in our study is due to our being

a tertiary referral center for cancer. The diagnostic accuracy for non-neoplastic conditions was 100%. These results are in concordance with other studies.

Kato M et al¹¹, in their study of 14 pathologically confirmed ganglioneuromas seen in 13 patients, 13 were evaluated by CT images with and without contrast, All lesions were identified as a well-demarcated oval and/or lobular mass. CT attenuation was predominantly low. Calcification on CT scan was seen in 38% of the cases. Whorled appearance (42%) and tailed-shaped edge (14%) were seen on both CT and MR images. Fat components (29%) observed histologically were also detected in tumors on CT and MR images.

In the present study, we assessed various neural tumours separately. We observed that out of total 4 neural tumours, 3 were neurofibroma (75%) while one was schwannoma (25%).

In the present study, we assessed various lymph nodal masses. Out of 27 total lymph node masses, majority of masses were of lymphoma (33.33%), followed by tuberculous lymphadenopathy (29.62%) and metastatic lymph nodes (33.33%).

Aram Baramet et al¹², in their study observed that 6 patients had middle mediastinal lymphadenopathy and Lymphoma formed about 46% of middle mediastinal masses. Dutta P et al.¹³ found that lymphomas were representing only 8% of mediastinal tumors from which 12% were anterior mediastinal masses and 14.3% middle mediastinal masses.

CONCLUSION

Anterior mediastinal masses formed majority of the total masses 50.98% while posterior mediastinal masses and middle mediastinal masses comprised 23.52% and 25.49% of the total masses respectively. Anterior mediastinum comprised of Lymphoma (36.46%), Invasive thymoma (19.2%), thymoma (15.38%), Metastatic lymph nodes (11.53%), tuberculous lymph nodes (7.69%), sarcoma, malignant teratoma and metastasis. Metastatic lymph nodes (46.15%), tuberculous lymph nodes (38.46%). Other rare masses in middle mediastinum were bronchogenic cyst and lymphatic malformation. Extra medullary hemopoiesis (33.33%), neural tumours (33.33%), Paravertebral abscess (16.66%) and tuberculous lymph node (8.33%) were

the commonest lesions in the Posterior mediastinum. We found that the CT is 95.83% accurate in diagnosing mediastinal masses as compared to histopathological examination. Hence finally we conclude that the use of CT scan greatly expedites the diagnosis process.

Conflicts of Interest: None.

Source of Funding: KIMSDU

Ethical Clearance: Institutional Ethical Committee, KIMSDU

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Horizontal Ridge Augmentation Using Ridge Expansion Technique Followed by Implant Placement

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ABSTRACT

The method of horizontal bone augmentation using ridge split and expansion was introduced by Dr. Hilt Tatum about 30 years ago, and it has been followed since then. Though there are many methods available for horizontal bone augmentation, ridge split and expansion has been used widely. In this case report we describe a case of horizontal ridge augmentation using ridge expansion along with simultaneous implant placement in esthetic maxillary anterior region.

Keywords: Ridge split, ridge augmentation, deficient bone, ridge expansion

INTRODUCTION

Rehabilitation of partially or completely missing teeth using dental implants has become the most demanding treatment option with patients¹. Adequate amount of bone is necessary for successful osseointegration of dental implants and many techniques have evolved so far to improve the quality and quantity of the bone².

Ridge augmentation procedure not only improves the bone quality and quantity but also the orthoalveolar form—which includes the alveolar bone form and the gingival esthetic outcome³. It has been documented that after the extraction or exfoliation of natural tooth, there is a rapid reduction in the labial cortical bone volume of about 25% in the first year followed by a reduction of bucco-palatal width by 40-60% in the next 3 years⁴. Management of such cases becomes even more critical in esthetic region, and calls for special procedures to accept implant retained prosthesis.^{5,6}

Ridge augmentation which has been in use for past 20 years⁷ can be either horizontal or vertical augmentation and can be achieved using different techniques using block bone grafts, distraction osteogenesis and either alveolar bone splitting or expansion or combination of both. *The classic and commonly used technique includes splitting the alveolar ridge into 2 parts with use of osteotomes and chisels, modification of this technique includes the use of rotating instrument, screw spreaders, horizontal spreaders and ultrasonic device.*⁸

Ridge splitting or ridge expansion technique was first introduced by Dr. Hilt Tatum in the year 1970 and can be used in narrow edentulous ridges for both maxilla and mandible provided the width of the bone is more than 3mm and less than 5mm⁹. Proper case selection and diagnosis is important for the success of this technique. In this case report we present horizontal ridge augmentation using ridge expansion procedure in the maxillary anterior esthetic region followed by implant placement and subsequent restoration using PFM bridge.

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Case report: A 20 year old male patient reported to the Department of Implantology, Manipal College of Dental Sciences, Manipal with a chief complaint of unaesthetic appearance due to his missing upper and lower front teeth for past 1 year after a trauma. The patient was using a removable prosthesis and was unhappy with the same.



Fig. 1: Intra-oral examination



Fig. 2: Intra-oral examination

Intraoral examination revealed missing 11, 21, 22 and 41, 42 with thick gingival biotype and reduced labio-palatal alveolar crestal bone width w.r.t 11, 21 and 22 (Figure 1, 2). Hence, it was classified as Siberts Class I ridge deficiency. The patient was moderately built with no relevant medical history.

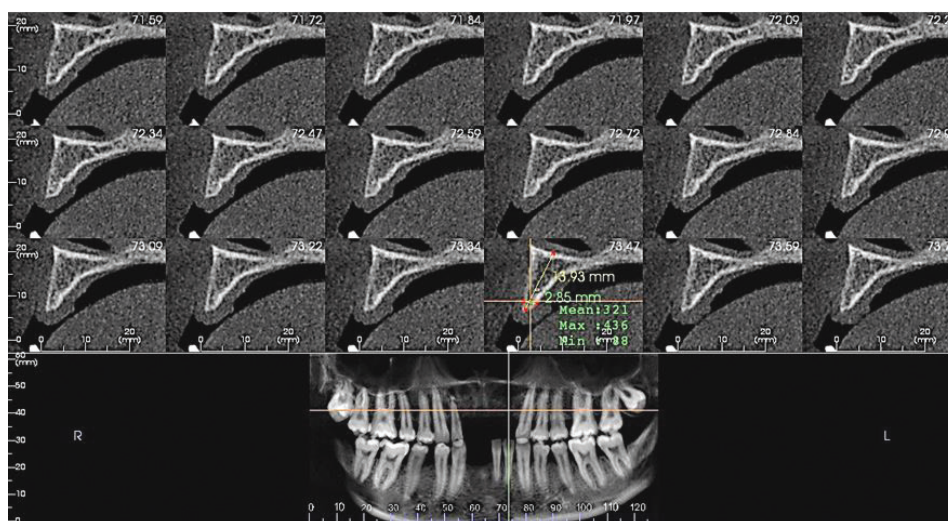


Fig. 3: Pre-op CBCT evaluation

Radiographic evaluation: CBCT examination revealed D4 bone quality with adequate bone height and a width of 2.85 mm in the maxillary anterior alveolar crestal region which increased in diameter apically (Figure 3).

Treatment plan: The patient was given the options of implant supported fixed prosthesis and conventional fixed dental prosthesis. The patient opted for implant supported prosthesis w.r.t 11, 21 and 22 and conventional fixed dental prosthesis w.r.t 41 and 42.

Hence, it was decided to go ahead with horizontal ridge augmentation using ridge expansion technique w.r.t 11, 21 and 22 followed by cement retained PFM implant supported prosthesis and conventional PFM fixed dental prosthesis w.r.t 41 and 42.



Fig. 4: Full thickness flap raised

Surgical technique: The site was anesthetized using 2% lignocaine containing 1:1, 00,000 adrenaline. A sharp incision palatal to mid-crestal was made and full thickness flap was raised to expose the ridge crest (Figure 4). The labio-palatal width as already evaluated in CBCT was 2.85mm and the width increased apically, hence it was decided to reduce about 1mm of bone to attain a minimum labio-palatal width of 3mm.

All the drilling procedures were carried out using Nobel Biocare™ Replace Select Implant Drill Kit and the ridge expansion was performed using Nobel Biocare™ Osteotomy kit.

The exact location of implant was marked using the pilot drill and it was placed 0.5 mm palatal to the mid-crestal region. This gave us good amount of labial bone thickness that will prevent fracture of the labial cortex during ridge splitting.

The initial 2mm drill was used to prepare the osteotomy site approximately 2mm deeper than the final implant length of 11.5mm followed by insertion of successive larger diameter osteotomes of 0.5 mm till the final implant diameter of 3.5mm was obtained. Simultaneously, the length of the osteotome was reduced sequentially than the preceding instrument, so as to expand the base of the bone in V shape.

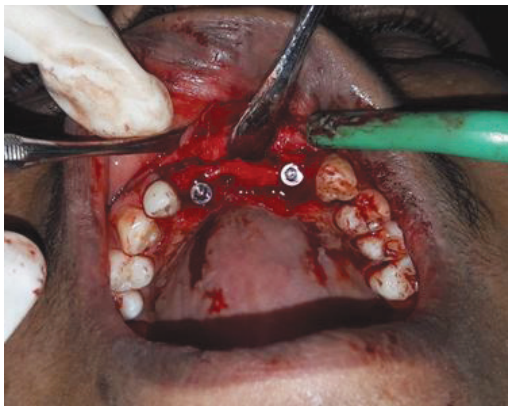


Fig. 5: Implants in place



Fig. 6: NovaBone putty being placed in space between the implants

Two Nobel Biocare™ Replace Select implants of 3.5 X 11.5mm were threaded in to the osteotomy site (Figure 5) and coverscrews were placed, following which the space between the implants were filled with NovaBone® putty (Figure 6). Periosteal releasing incision was made to extend the flap coronally over the implant so as to achieve tension free close approximation of the flap using interrupted suture (ETHICON™ Nylon Suture).

Analgesics and antibiotics along with Chlorhexidine mouthwash 0.2% was prescribed to the patient and postoperative instructions were given.



Fig.7: Prosthetic rehabilitation after 7 months

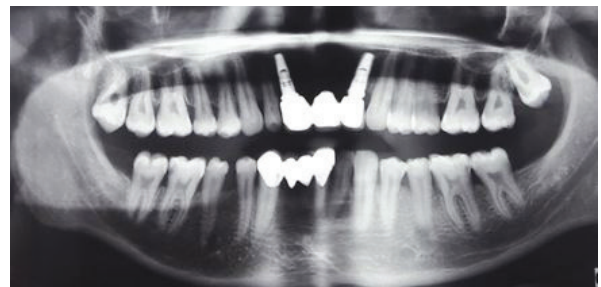


Fig. 8: Post-op OPG

Sutures were removed after 7 days and patient was periodically reviewed for next 7 months followed by prosthetic rehabilitation with PFM bridge (Figure 7, 8).

DISCUSSION

Management of horizontally deficient ridge can be carried out using narrow diameter implants, ridge augmentation by block bone grafts, distraction osteogenesis etc. Use of narrow diameter implants can

create unwanted cantilever effect resulting in fatigue fracture of either the abutment screw or the implant itself. Ridge augmentation using autogenous block bone grafts has its own disadvantages of long waiting period, risk of infection and membrane exposure. Distraction osteogenesis is a cumbersome procedure leaving the patient uncomfortable.

Ridge splitting and expansion of thin alveolar ridges to gain missing ridge width as a method of bone augmentation procedure has been reported for the partially and fully edentulous maxilla and mandible in implant dentistry for almost 30 years. In 1994 Scipioni et al⁴ carried out a study on 170 patients by placing 329 implants using ridge split and expansion technique. The authors reported a success rate of 88.5%. Though it is technique sensitive, the main advantage of this procedure is that it helps in condensing the bone towards the walls rather than removing the bone, thereby improving the quality of the bone.

The most common thickness chosen for ridge expansion technique is around 3 – 5mm. If the thickness of bone is less than 3mm, the medullary bone present between the buccal and the palatal cortical plates will be 1mm or less¹⁰. It becomes an obvious surgical challenge to separate such cortical plates successfully without fracture because more the medullary bone present, more easily the cortical plates can be separated³. Also, the topography of an extraction site is that of an iceberg, which means the diameter increases apically. Hence, it was decided to reduce around 1mm of bone from the crestal surface to increase the width of the labio-palatal ridge from 2.85 mm to 3mm or more.

The osteotomy site preparation was done palatally to the mid-crestal region, so as to provide adequate amount of labial cortical bone for expansion and prevent its fracture. Also, the osteotomes used were increased in their diameter sequentially with a rest of 15 seconds between each tap and rotating them gently and pulling it out axially thereby using the visco-elastic nature of the bone and hence maintaining its resiliency¹¹.

As the osteotomes used were successively increased in their diameter by 0.5mm they were also reduced in their length, which resulted in a V shaped osteotomy site rather than a U shaped osteotomy site. This gives less probability for fracture of labial cortical plate.

The implants were threaded into the osteotomy site using slow speed and in between the implants the gap was filled with NovaBone® putty which is a synthetic graft made up of Calcium Phospho-silicate bone material. This will help in bone remodeling and also reduce the crestal bone loss¹².

CONCLUSION

Though there are many methods available for horizontal ridge augmentation, the success of any technique used depends on proper case selection and bone evaluation. Bone augmentation by means of horizontal ridge augmentation and implant placement is associated with high implant success and survival rates by 86 – 97%^{13, 14, 15}. Hence, the ultimate goal should be a restoration which would fulfil the esthetic and the functional requirement.

Conflict of Interest: The authors hereby declare that there are no conflict of interest and all authors have made substantive contribution to this manuscript and all have reviewed the final paper prior to its submission.

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Ethical Clearance: Ethical clearance—consent was taken.

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Knowledge, Attitude and Practice Among 13-15 Years Old School Children Towards Oral Hygiene

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ABSTRACT

Introduction: Good oral health is essential for good nutrition and ultimately good general health. A set of healthy teeth is achieved by the practices, such as brushing, flossing, and periodic dental visit which should be developed early in the childhood. The study was aimed to assess the knowledge, attitude, and practice of 13 –years old school children towards oral hygiene.

Materials and Method: School children (n=103) aged between 13 to 15 years in a private school were included into this study. The subjects completed a questionnaire that aimed to evaluate school children's knowledge, attitude and practice towards oral health and dental treatment.

Results: The results were tabulated and percentage was calculated. The individuals oral hygiene habits (such as tooth brushing , duration of brushing) were found to be irregular and parents were the source of knowledge in the oral hygiene habits of their children. The study population showed awareness of caries and periodontal conditions. The children in this study also recognized the importance of oral health.

Conclusion: The children in this study recognized the importance of oral health. The results of this study indicate that Comprehensive oral health educational programs for children are required.

Keywords: Attitude, Knowledge, Oral hygiene , Practice, School children.

INTRODUCTION

The most common dental diseases are dental caries and periodontal disease and can be prevented through good oral hygiene practices and reduction in sugar consumption amongst other measures. Good oral health is essential for good nutrition and ultimately good general health. A set of healthy teeth is essential for speech, appearance and normal development of the jaws.^{1,2,3,4}

Promoting the oral health of adolescents through education in school has been prioritised by the World Health Organization (2008). Poor oral hygiene with increasing accumulation of plaque and calculus in the course of time has been reported among children and adolescents in both developed and developing countries.^{3,5,6,7}

At the age of 12 years permanent teeth (except 3rd molars) would have erupted and by 15 years age these teeth are exposed to the oral environment for almost 3 years. WHO has recommends both these ages as the index ages for oral health assessment.^{3,7,8,9,10}

We all know that lack of oral hygiene practices leads to development of oral diseases. These practices, such as brushing, flossing, and periodic dental visit should be developed early in the childhood. Dental flossing and tooth brushing are the most commonly performed oral self-care behaviour.^{5,11,13-16}

Various literature data indicate that the most efficient and economically most cost-effective method of oral

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preventive program worldwide is the School Dental Care (SDC). It is particularly significant because schools may include those children who cannot come (due to socioeconomic reasons), do not want to come (because of fear) or who are not sufficiently motivated and interested in coming for regular checkups and dental repairs.^{6,17-19}

The present study was done with the objective of assessing the knowledge, attitudes, and behavior of children. We intended to use this information for planning a school-based oral health program.

MATERIALS AND METHOD

The present study was an observational, descriptive, cross-sectional survey, conducted in children studying in private school. A convenience sample was selected and survey was done in 103 children under the age group of 13-15 years.

Inclusion and Exclusion: School children (males & female) who have completed 13 to 15 years of age and present on the day of examination were included in the study. Children who refused to participate were excluded from the study.

Pre-tested structured questionnaire, comprising of multiple choice questions, was self-administered to assess their knowledge, attitude, and practices toward oral hygiene. Questionnaire consisted of 20 multiple choice questions which was divided into three parts.

The first part was to evaluate knowledge towards oral hygiene among children. The questions were related to how do they observe tooth decay, if they were aware that clean mouth can prevent tooth decay, where do they learn on oral health, etc.

The second part was to evaluate attitude towards oral hygiene among children. The questions were related to visits to dentist, importance of oral health, the expense of dental treatment, etc.

The third part was to evaluate practices towards oral hygiene among children. The questions were related to brushing techniques and duration, frequency of changing of toothbrush, etc.

The students received a full explanation on how to fill in the questionnaire. It was made sure that all the questions were attempted. On the basis of the responses received, the data obtained were statistically analysed. The total number and percentage were calculated and analysed.

RESULT

Table 1: Knowledge towards oral hygiene among school children

		Total & %
K1	clean mouth prevents tooth decay	
A	Yes	103; 100%
B	No	-
K2	brownish discolouration on/near the tooth?	
A	Calculus	34; 33.97%
B	Stains	45; 43.70%
C	Food particles	23; 22.33%
K3	How do you observe if there is tooth decay	
A	Pain	24; 23.30%
B	Bleeding gums	16; 15.53%
C	Black spot and hole in the tooth	63; 61.17%
K4	If there is bleeding from gums during brushing	
A	Unhealthy gums	96; 93.20%
B	Healthy gums	7; 6.80%
K5	Is oral health important for overall health?	
A	Yes	74; 71.84%
B	No	29; 28.16%
K6	where do you acquire knowledge on oral health	
A	Parents	57; 55.35%
B	School	6; 5.82%
C	Dentists	14; 13.59%
D	Friends/relatives	5; 4.85%
E	Media like TV, newspapers, internet	21; 20.39%

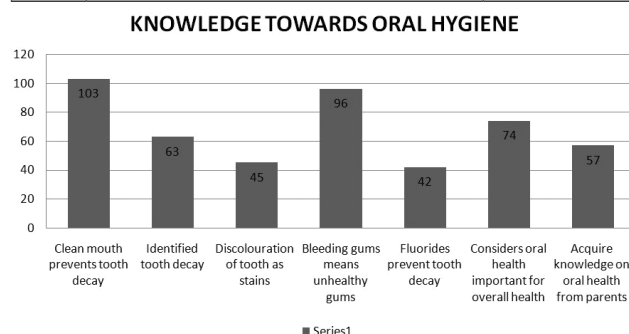


Figure 1: Knowledge towards oral hygiene among school children

In this study, a total of 103 students filled the questionnaire consisting of 20 questions which was divided into three parts as knowledge, attitude and practice towards oral hygiene. In this section of survey (table 1) knowledge toward oral hygiene was measured. There were 7 questions about knowledge towards oral hygiene. All 103 children were aware that clean mouth prevent tooth decay. About 44% of the children

considered brownish discolouration as stains while 34% of the children considered as calculus and 22% considered as food particles. About 61% of the children said that tooth decay was observed as black spot and hole in the tooth while 16% of the children observed tooth decay as bleeding gums and 23% of the children observed as pain. About 41% of the children were aware that fluorides prevent tooth decay while 25% of the children were not aware and 34% of them said that fluorides does not prevent tooth decay. Around 72% of the children believe that oral health is important for overall health whereas 28% of them did not believe that oral health is important for overall health. (figure 1). Parents were the source of knowledge about oral hygiene among 55% of the children, dentists were the source for 14%, media for 20% whereas relatives for 5% and school for 6% of the children were the source of knowledge.

Table 2: Attitude towards oral hygiene among schoolchildren

		Total & %
A1	Previous dentist visit	
A	Yes	59; 57.28%
B	No	44; 42.72%
A2	Is cost of dental treatment is expensive?	
A	Yes	65; 63.11%
B	No	31; 30.09%
C	Don't know	7; 6.80%
A3	How often should you visit the dentist?	
A	Once in 3 months	40; 38.83%
B	Once in 6 months	38; 36.90%
C	Once in a year	25; 24.27%
A4	Why you should take care of teeth and gums	
A	For good looking	33; 32.04%
B	To prevent tooth decay	51; 49.51%
C	To prevent bad breathe	19; 18.45%

ATTITUDE TOWARDS ORAL HYGIENE

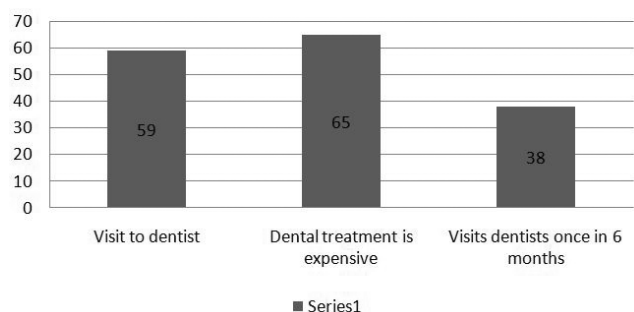


Figure 2: Attitude towards oral health among schoolchildren

In this section of survey, (table 2) attitude toward oral hygiene was measured. Around 59% of children had visited the dentist. Around 63% of the children said that cost of dental treatment is expensive while 30% of them said the cost is not expensive and 7% of them were not aware of the cost for dental treatment. Around 50% of the children thought that they should take care of teeth to prevent tooth decay whereas 32% of them thought for good looking and 18% of them thought to prevent bad breathe. [figure 2]

Table 3: Practice towards oral hygiene among schoolchildren

		Total & %
P1	How often do you brush your teeth ?	
A	Once daily	63; 61.17%
B	Twice daily	36; 34.95%
C	More than once daily	4; 3.88%
P2	how many minutes do you brush your teeth	
A	2-3mins	23; 22.33%
B	1-2mins	27; 26.21%
C	3-4mins	32; 31.07%
D	More than 4 mins	21; 20.39%
P3	How do you brush your teeth ?	
A	Vertical strokes	7; 6.79%
B	Horizontal strokes	31; 30.10%
C	Both a and b	57; 55.34%
D	Circular strokes	8; 7.77%
P4	When do you change your toothbrush	
A	Once in 3 months	20; 19.41%
B	Once in 6 months	45; 43.69%
C	When the bristles are spoilt	21; 20.39%
D	Don't know	17; 16.51%
P5	Do you use mouth wash	
A	Yes	35; 33.98%
B	No	68; 66.02%
P6	amount of tooth paste used	
A	Full length of the bristles	58; 56.31%
B	Pea sized amount	13; 12.62%
C	Half length of the bristles	32; 31.07%

FREQUENCY OF BRUSHING

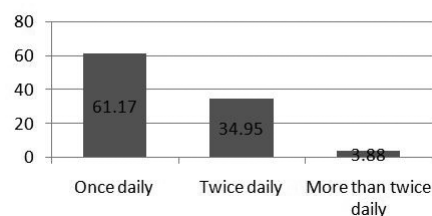


Figure 3: Frequency of brushing

In this section of survey ,(table 3) practice toward oral hygiene was measured. Around 61% of the children brush their teeth once daily while 35% of them brush twice daily and 4% of them brush more than once daily. [figure 3]. About 46% of the children use tongue cleaner while 14% of them use dental floss and 42% were not aware about other oral hygiene aids. Almost 31% of the children brushed their teeth for 3-4mins whereas 26% of them brush their teeth for 1-2mins , 22% of them brush their teeth for 2-3 mins and 20% of them brush their teeth for more than 4 mins. Almost 55% of the children use both vertical and horizontal strokes for brushing while 30% of the children use horizontal strokes , 7% of them use vertical strokes and 8% of them use circular strokes for brushing.. Only 19% of them changed their brush once in 3 months and 17% of them were not aware how frequently they change their brush. About 56% of the children used toothpaste along full length of bristles whereas 31% of them used toothpaste along half length of the tooth paste and 13% of them used pea sized amount tooth paste. Around 54% of the children rinse their mouth at times after every meal while 34% of them rinsed their mouth every time after every meal and 12% of them never rinsed their mouth after every meal.

DISCUSSION

This paper has focused on oral health knowledge and practices among school children in Chennai. The results showed that 35% brushed their teeth twice a day. A similar study conducted by Devishree.et.al ¹⁶ reported 41% student brush twice a day.

Most of the students brush their teeth in random direction (55%) along with a certain set of students using horizontal(30%) , vertical(7%) and circular (8%) brush strokes.

A perturbing result came out when students were asked about various questions on dental knowledge. Only 44% were able to answer that stains means brownish discolouration of tooth. The result obtained when asked about calculus, 34% of student were not aware that it means hard deposit on teeth. About 72% of students were aware that oral health is important for overall health. Around 41% of the student population only knowing that fluoride strengthens teeth, the rest having erroneous knowledge or being completely unaware. 100 % of the student population answered in the affirmative

that they are aware of the importance of oral hygiene and clean mouth prevents tooth decay. About 93% of the student population knew that gingival bleeding could be due to improper oral hygiene practices. These results implicate a acceptable awareness and knowledge of oral hygiene practices and the impact of it on oral health, thus, bringing the need of awareness initiative concerning oral health.

Some of the results that were brought out were that 46% use tongue cleaner and 34% use mouth wash on a regular basis, a large percentage of children indicate no use of tongue cleaner and mouth wash. This could be due to low socioeconomic status and lack of proper oral hygiene knowledge. It coincides with the results of another study done by prashanth et al 2011²⁰. A majority of the student population were aware of the importance of oral hygiene practices exposing a contradiction in their knowledge component. Almost half of the student population brush for 3-4 minutes, change their tooth brush within the stipulated time, use medium tufted brush and rinse their mouth at times after every meal.

Many participants (41%)said that they don't visit dentist because they don't have any dental pain. The results also showed that a majority of group(63%) said the cost for dental treatment is expensive and about 50% students take care of their teeth in order to prevent tooth decay. The outcome also highlighted the importance of parental role and participation in oral hygiene practices.

CONCLUSION

The children in this study recognized the importance of oral health. The results of this study indicate that Comprehensive oral health educational programs for children are required.

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Conflict of Interest: Authors report no conflict of interest of any kind.

Statement of Informed consent: Informed consent was obtained from the concerned authorities or parents of children before the study.

Statement of Human and Animal Rights: No harm was inflicted on any humans or animals on conduction of this study.

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“A Study on Awareness about Self Medication Practices among Working People in Kerala”

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ABSTRACT

The role and the importance of health care systems is well recognized in modern era both in terms of the quality of life and social welfare as well as every day individuals are practicing self-medication in the form of self-care for our health. Self-medication is a human behaviour in which, an individual uses medicines to treat self-diagnosed small or minor ailments. Prevalence of such practices is alarmingly high in developing countries like India. In India, any drugs not included in the list of ‘prescription-only’ drugs are considered as non-prescribed medicines or Over the Counter (OTC) drugs. Anyone can buy medicines for self-treatment from local medical shops, which are also available in supermarkets and other retail shops. Also such medicines include cough and cold remedies, sunscreens etc. The study mainly aims to find out the awareness of people in regarding the usage of OTC drugs and the factors affecting self-medication practices.

Keywords: Self-medication, Over the Counter drugs, Non-prescribed drugs, Awareness.

INTRODUCTION

Good health is considered as one of the fundamental right of an individual. This shows the prominence of health care system in our society. The health issues around the world especially in developing and under developed countries are pathetic. The study of World Health Organization (WHO) reveals that the expenditure on healthcare is extremely high in India and creates a huge financial burden on individuals. In such a condition, Self-medication is widely accepted as a first line approach in most cases of minor ailments and OTC drugs are the most widely self-medicated element to treat minor and common ailments. Self-medication is otherwise called as non-prescribed medicines or OTC drugs.

The Indian pharmaceutical market is estimated to reach at \$55 billion by 2020 at a Compound Annual Growth Rate (CAGR) of 15.92% according to the report by India Brand Equity Foundation (IBEF 2018)^[1] Now a day, every consumer goes for self-care products to help them to get through common minor health issues. This is because they find this practice of self-medication very convenient and easier as they don’t want to wait for a long queue to meet the doctor in their busy scheduled life. Another important reason for adopting self-medication practice is that rise in the cost of health care services. Families, friends, pharmacists, previous experience, advertisement in newspapers and Television are some of the major source of information about self-medication ^[2].

The practice of self-medication would be safe, if one uses it with sufficient knowledge such as its time of intake, dosage, side effects on overdose, duration of course, but lack of adequate information can cause serious effects such as antibiotics resistance, skin problems, allergy etc. Over dosage of painkillers can cause stomach bleeding, kidney problems. Professional estimates that about many people die after unintentionally taking too much of these medicines without knowing the correct dosage. When an individual takes self-medication or even prescribed medicines, certain foods, drugs, herbs,

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vitamins and one's own existing medical conditions will create a harmful reaction. The best way to avoid this is to have a potential interaction with a doctor or pharmacists. But the problem with this is that these days the OTC drugs are sold in grocery stores or in convenient stores. So always there will not be a knowledgeable person to guide an individual to take up the correct medicines.

Statement of the problem: Health is inevitable for everyone, now a day every individual is conscious about their health and their medication practices. In this busy world, no one has the time to meet the doctors or physicians for treating minor ailments, so most of the people prefer self-medication. Here the importance of self-medication arises. But whether they are taking the right medicine for their symptom is very important because some may have adverse effect. The study mainly focuses on the awareness level about self-medication practices and consumption of OTC drugs among working people in Kerala, because many of them may not be fully aware about the consequences of these non-prescribed drugs. So without proper knowledge sometimes the situation can become worse than better.

OBJECTIVES

1. To know the awareness level of consumers in using over the counter medicines.
2. To study the factors affecting in consuming self-medication and the buying behavior of Consumers.
3. To suggest the possible recommendations for further improvements.

RESEARCH METHODOLOGY

Descriptive study has been used for this study. The study is based on a survey of the respondents. For that 150 samples were selected and purposive sampling is the technique used. The data are collected through primary and secondary source. Structured questionnaire has been used for collecting primary data and these are analysed using Statistical Package for Social Sciences (SPSS), Frequency analysis, One-way ANOVA was used to measure the awareness level of consumers with that of their demographic factors such as age, gender, and locality. While secondary data consist of various journals, articles and information from websites.

Hypothesis: There exists no significant difference between demographic factors and awareness level of consumers.

LITERATURE REVIEW

1. Over The Counter Drug Market in India: A Study to Understand the Current Regulatory perspective and industry dynamics-Suniel G Deshpande, Rajesh K Srivastava (2018)^[3]. There has been a rise in the number of over the counter products introduced in healthcare market in India, the government is trying to give legal recognition to the OTC drugs which currently do not have any legal recognition. The parameters that are important determinants of a successful OTC treatment are safety of the drugs, clarity in the indication and administration of the drugs and easy availability. The factors driving the Indian OTC drug market are changing lifestyle, changing food habits, increasing literacy rates, prevalence of untreated common illness, high medical costs etc.
2. Consumer Selection and Buying Behavior Towards Over-the-counter (OTC) Medicine in Jaipur City-Abhishek Dadhich, Dr. Kavaldeep Dixit (2017)^[4]. The study reveal that consumer in Jaipur city are aware regarding the use of OTC medicine for common ailments and there is responsibility of pharmaceutical companies, government to promote knowledge and awareness among consumer for safe and effective use of OTC medicine. T.V. advertisement and pharmacist are the major source of information regarding OTC products. The consumer considers brand names and symptoms for selecting the new OTC brand product so it is necessary for pharmaceutical companies to work intensively on brand building as well as the advertisement should comprise of information about symptoms and indication for which OTC medicine were used.
3. Perception of pharmacists regarding over-the-counter medication: A survey-Abhinaya Ravichandran, Asha Basvareddy (2016) ^[5]. The study found that all of the pharmacists had dispensed OTC medications. It also found that Analgesics and antipyretics, drugs for gastritis and anti-diarrheal agents were the most commonly bought OTC drugs. Most of the pharmacists specified that the consumers have brand preference towards the OTC drugs that they buy. It is also found out that sometimes, the consumers disclose the complaints to the pharmacist who then

decides the suitable OTC medication. However, consulting doctor before taking medications was recommended by many of the pharmacists.

4. Evaluation of Knowledge, Attitude and Practice about Self-medication among Rural and Urban North Indian Population-Akram Ahmad, Muhammad Umair Khan (2015)^[6]. The study aims to find out the self-medication practices, knowledge and the factors affecting self-medication practices in the rural and urban population. The study shows that the awareness regarding non-prescribed drug are significantly more in urban population than in rural people and it also states that there is a need to promote educational campaigns to bridge the gap of knowledge mainly among rural people.

5. A Study on the Dispensing Pattern of Over the Counter Drugs in Retail Pharmacies in Sarjapur Area, East Bangalore-Manjushree Nagaraj, Ananya Chakraborty, and B.N Srinivas (2015)^[7]. The study reveals that the most commonly dispensed OTC drugs were analgesics also the patients were not aware of the side effects. The study concluded that more awareness to patients as well as pharmacists regarding OTC drugs have to be provided in order to reduce harmful effects of such medicines, and this can be done through with the help of mass media and by proper training for pharmacists. The study also states that the concerned authorities should enforce laws pertaining to the dispensing pattern of these OTC drugs.

ANALYSIS AND INTERPRETATION

1. One-way ANOVA

Table 1: One Way Analysis of variance- Age of the Respondents

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.910	4	.227	.849	.496
Within Groups	39.117	146	.268		
Total	40.027	150			

Source: Direct Survey

Interpretation: The result of the above Table 1 reveals that the F value is (0.849) is not significant at ($p < 0.05$). So we accept the null hypothesis and reject alternative hypothesis. So in a nutshell there is no significance difference in the awareness level regarding OTC medication and age of the respondents.

Table 2: One Way Analysis of variance-Gender of the Respondents

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.007	1	.007	.025	.875
Within Groups	40.020	149	.269		
Total	40.027	150			

Source: Direct Survey

Interpretation: The result of the above Table 2 reveals that the F value is (0.025) is not significant at ($p < 0.05$). So we accept the null hypothesis and reject alternative hypothesis. So in a nutshell there is no significant difference in the awareness level regarding OTC medication and age of the respondents.

Table 3: One Way Analysis of variance- Locality of the Respondents

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.753	2	.876	3.389	.036
Within Groups	38.274	148	.259		
Total	40.027	150			

Source: Direct Survey

Interpretation: The above Table 3 indicates that the f value is (3.389) is significant at ($p < 0.05$). So we reject the null hypothesis and accept the alternative hypothesis. In a nutshell there is significant difference in the awareness level with that of the locality of the respondents

2. Reasons for Self-Medication

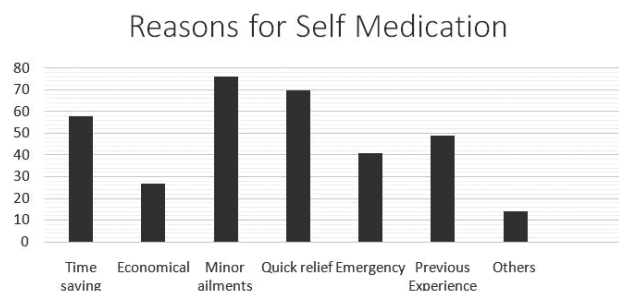


Figure 1: Reasons for self-medication

Interpretation: The above Figure (8.1) represents the reasons for the practice of self-medication, and it is clear that the major factor/reasons which contribute to prefer self-medication are minor ailments, followed by quick relief, time saving and previous experience in using OTC drugs.

FINDINGS

- From the study it was found that most of the users of OTC drugs belongs to the age group of 21-30(46.7%) followed by 51-70(27.3%).
- Most of the respondents prefer self-medication (45.3%) followed by doctor's advice (43.3%) for minor ailments.
- Majority of the respondents buy OTC drugs from medical shops or pharmacies.
- Major reasons for adapting self-medication are minor ailments quick relief and time constraints.
- Most preferred source of information regarding OTC drugs are from Pharmacist.
- Cold and cough, fever, headaches are the common types of ailments for which OTC drugs are used and rubs/balms, painkillers were the mostly used OTC drugs.
- Majority of respondents inquire to the pharmacist for more information regarding the OTC drugs and about its usages.
- Most respondents insist on same brand of OTC they use and the reason for that is quality of the brand, effectiveness and brand familiarity

- Majority of the respondents are of the opinion that usage of OTC drugs has reduced their overall medical expenditure.

SUGGESTIONS

- Proper awareness and education should be given to consumers regarding self-medication, especially for people in rural areas as they don't have much access to such information.
- Dispensing modes have to be improved through strict regulations.
- Proper education to pharmacists must be provided because, sometimes they fail to give the appropriate use of prescribed medication
- Poor prescribing practice from the part of physicians must be taken into consideration as many of the times they may not mention the frequency of dosage, duration period of the medicine to be taken and sometimes physicians prescribe medicines which are of high cost that may not affordable to every patient.
- Pharmaceutical companies should provide information to the consumers with regards to the adverse effect of OTC drugs due to continues usage.
- Many of the consumers prefer OTC medicine for minor ailments as the price of such medicines are considered to be low, but the long term consequences of having such medicines are unknown to many. So the usage of medicines like paracetamol, aspirin etc. should be taken cautiously.
- Government should take necessary steps to prevent the abuse use of OTC drugs.

CONCLUSION

Even though there are many legal restrictions in supply of OTC drugs the quantum of sale is comparatively higher [3]. The study found out that there is no significant difference in the awareness level of OTC drugs with that of the age, gender, occupation, monthly income of the respondents, but there is a significant difference in the awareness level with that of the locality of the respondents. From this it can be understood that the people living in urban and semi urban areas have more awareness about the self-medication practice when compared with people living in rural areas. So proper measures have to be

taken from the side of the regulatory authorities in order to bridge this gap. The survey also found out that even though self-medication is widely accepted for treating minor ailments, professionally qualified as well as self-employed people mostly prefer doctor's advice rather than self-medication, the study also reveals that people having high income category prefer self-medication for treating minor ailments. A number of factors were found that influenced the respondents to use OTC drugs are lack of time and money and many of the respondents were of the opinion that for minor ailments self-medication as a good option and provides them quick relief. Other factors contributing to the prevalence of self-medication is that patients use old prescription as well as consumers request specific medicines directly from pharmacist. The major sources of information regarding OTC drugs are from pharmacist and friends and family. Even though there are many positive factors which drive towards the use of OTC drugs, there are many consequences for the same. So proper knowledge should be given to the consumers regarding the usage of these OTC drugs such as their dosage, side effects etc. Also Government should take necessary actions to prevent the misuse of these OTC drugs by forming strict regulatory framework.

Ethical Clearance: No other companies or organisations are pointed out in this research paper.

Source of Funding: Private

Conflict of Interest: Nil

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Salivary Cortisol Level; Its Role in Stress Induced in Patients Undergoing Dental Treatment; An in Vivo Study

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ABSTRACT

Aims and objective: The stress control is essential in patients to elude the loss of motivation for Dental procedures. The present study was conducted to estimate salivary cortisol response to stress developed in patients undergoing Dental treatment

Methodology: The salivary cortisol level were evaluated in 40 patients ,out of which 10 patients were healthy patient who do not require any dental treatment and 40 patients were the study group who underwent scaling,implant treatment and class 1 cavity preparation for restoration .The groups demarcated were as follows.

Group 1: control group with no treatment and just the saliva sample was taken.

Group 2: The patients undergone scaling

Group 3: The patients undergone implant treatment

Group 4: The patients undergone class 1 cavity preparation for restoration.

The salivary cortisol levels were evaluated using Salivary Cortisol Enzyme Immunoassay Kit.

Results: The salivary cortisol level was highest in Group 3,followed by Group 2 ,Group 4 and least in Group 1.

Conclusion: The stress level was lowest in healthy patient and highest when patient underwent implant placement in appointment.

Keywords: Anxiety, Dental Treatment, Salivary Cortisol Enzyme Immunoassay Kit,Salivary Cortisol Level

INTRODUCTION

The assessment of patient stress is essential to evenly execute Dental procedures. **Buchanan T W,Preston SD¹** reported that the stress ripostes are not invariably hostile. The stress control is necessary in patients to escape the loss of motivation for dental treatment . The stress disturbances are the common mental disturbances.²**Ohura K, Nozaki**

T, Shinohara M , Daito K ,Sonomoto M- Daito M Kiyo³ stated that By lowering stress of Dental procedures ,the patients adjustability improves and motivate them to get their Dental treatment done .⁴The extended stress reaction may develops cortisol dysfunction and immense pain. ⁵ It may results in change in behavior in children and affects the Dental treatment . As collection of Saliva is not invasive and not harmful,therefore it can be used as a specimen for stress-related substance measurement and is easily collected with minimum efforts than blood sampling. Stress-connected substances present in saliva are chromogranin A (CgA), secretory immunoglobulin A (slgA) , and salivary amylase, catecholamine and cortisol^{6,7},

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There is marked contrast in patients reaction to stress in children who are involved not only in a agony

procedure but also a painless treatment . Anxiety develops due to restless tense feeling while in dental chair during the treatment procedure. The outcome with administration of anesthesia and with agony procedures are unavoidable. Dental outlook can be initiator of stress for young patients. Exposure treatment strategy should be followed for phobic anxiety. The raised stress levels should be inscribed in clinical training. ⁸Painful situation generally develops due to the stressful situation. ⁹Therefore the anxiety strand is more in patients undergoing dental treatment and this pressure differ in the further visits that pursue to depend upon to what they are open to, during these visits. Pain rehabilitation is not dissertated but there is connection between stress and pain .Therefore the present study was conducted to estimate salivary cortisol response to stress developed in patients undergoing Dental treatment

AIMS AND OBJECTIVES

1. To estimate salivary cortisol level in healthy patient and in patient after doing scaling
2. To estimate salivary cortisol level in patient undergoing implant treatment
3. To estimate salivary cortisol level in patient after doing class 1 cavity preparation for restoration tooth preparation.
4. To comparatively estimate salivary cortisol level in patients undergoing Dental treatment.

MATERIAL AND METHODOLOGY

There were 50 participants (10 control and 40 study group patients) who participated in the present study. The sample size was chosen using the previous studies done Greabu M Purice M, Totan A, Spinu T, Totan C ¹⁰ the sample size was calculated to be 40 per group keeping a confidence interval of 95% and a power of atleast 80%. All associated subjects were being asked to provide correct medical and dental history. Fifty patients age group ranging 20-25 were included in the present study. The motive of the study was prior notified to the patients requesting them for collection of saliva sample. These patients underwent Dental procedure. They were divided into 4 groups

Group 1: control group with no treatment and just the saliva sample was taken.

Group 2: The patients undergone scaling

Group 3: The patients undergone implant treatment

Group 4: The patients undergone class 1 cavity preparation for restoration.

The saliva was taken 5 minutes before patients sat on Dental chair for group 1 subjects, however for group 2, group 3 and group 4 subjects ,saliva was taken 10 minutes after commencement of Dental procedures . Each of the subject was informed to collect saliva samples in polypropylene vials and placed in freezer .Around 1.0 ml of non revivifying saliva was collected in a sterile tube and frozen latter at 20 degree centigrade for further study. The salivary cortisol levels were evaluated using Salivary Cortisol Enzyme Immunoassay Kit (Salimetric TM, LLC State college PA ,USA) ⁹The software used for the statistical analysis were SPSS (statistical package for social sciences)

Statistical Analysis: The statistical analysis were done using **Kruskal-wallis test and Mann-whitney U test.** P-value < 0.05 is considered as significant.

RESULTS

Table 1: Comparative mean salivary cortisol level (ng/ml) for group 1, group 2, group 3 and group 4

	Cortisol level			
Groups	Mean	S. D.	F-value	p-value
Group 1	9.51	3.07	50.908	< 0.001* ^a
Group 2	24.63	8.69		
Group 3	31.40	10.05		
Group 4	15.62	7.99		
Group 1 vs Group 2 ^b				0.001*
Group 1 vs Group 3 ^b				< 0.001*
Group 1 vs Group 4 ^b				0.038*
Group 2 vs Group 3 ^b				0.045*
Group 2 vs Group 4 ^b				0.020*
Group 3 vs Group 4 ^b				< 0.001*

^aKruskal-wallis test

^bMann-whitney U test

*Significant difference

The mean cortisol level was compared among the different groups using the **Kruskal-wallis test**. There was a significant difference in mean cortisol level between the different groups. The mean cortisol level was significantly more among group 3 in comparison to groups 1, 2 and 4. The mean cortisol level was significantly more among group 2 in comparison to group 4 which was significantly more in comparison to group 1. The mean cortisol level was significantly more among groups 2, 3 and 4 in comparison to group 1. The mean cortisol level was highest in group 3 followed by group 2, group 4 and lowest in group 1 (Table 1 and Graph 1)

DISCUSSION

The cortisone prepares the body for fear or frightening conditions and situations by production of glucose, providing an immediate energy source to large muscles. The cortisol inhibits insulin production in a purpose to halt or terminate glucose from being stored for immediate release ¹¹. The stress exherbation can develop diminished PNS tone, which further increases patients attentional reactions to stressors. It can result in alterations in autonomic nervous systems elevating patients vulnerability to stress. ¹²

The cortisol nourishes and recalls the frightening participation of Dental treatment. **Drexler SM, Merz CJ, TanjaC, Hamacher –Dang, Tengttoff M, Oliver T in 2015** ¹³, stated that there is persistence of powerfull touching revoke happening in fear and post traumatic pressure therapy. **Lai JCL** in 2014¹⁴ reported that it is not always that aging helps in adjustment of stress hormone cortisol during psychosocial disturbance. There is lesser hopefulness, anxiety, mental disorder, depression with severe pressure, distress multiplied with raised cortisol level. The cortisol is produced in response to anxiety, pressure or stress by adrenal gland. The cortisol is also liberated in conditions like getting up early morning, exertion and acute pressure or tension. Dental anxiety, fear, stress results in negligence of proper Dental treatment care. This is the most commom problem in Dental office. ^{15, 16, 17}

The present study was conducted to estimate salivary cortisol response to stress induced during dental treatment procedures. There was significant difference in cortisol level in control group compared to

all study groups {group 2, group 3 and group 4}. The salivary cortisol level was highest in Group 3 (subjects with implant placement [**31.40ng/ml**]), followed by Group 2 (subjects with scaling [**24.63ng/ml**]), Group 4 (subjects with class 1 cavity preparation for restoration [**16.62ng/ml**]) and least in Group 1 (control [**9.51ng/ml**]). These results are similar to studies done by **Padmanabhan V, Rai K, Hedge AM**⁸ The study group (group 2, group 3 and group 4) opened to dental treatment develops in an elevation of salivary cortisol in contrast to control group with no treatment wherein just the saliva sample was taken. Dental treatment raises tension and uneasiness level which further elevates salivary cortisol. Among the study groups {group 2, group 3 and group 4}, group 3 (subjects with implant treatment [**31.40ng/ml**]) produced highest cortisol level. The mean cortisol level was more in group 3 (subjects with implant treatment [**31.40 ng/ml**]) compared to Group 2 (subjects with scaling [**24.63ng/ml**]). The probable reason may be that the local anesthesia administered for implant placement elevated the anxiety level more in these patients which further elevated in mean cortisol level more in comparison to subjects with scaling procedure. Among the study groups {group 2, group 3 and group 4}, group 4 (subjects with class 1 cavity preparation for restoration [**16.62ng/ml**]) produced lowest cortisol level. Group 2 (subjects with scaling [**24.63ng/ml**]) produced higher cortisol level compared to Group 4 (subject class 1 cavity preparation for restoration [**16.62ng/ml**]). The probable reason may be that the patient saw bleeding during the scaling procedure which elevated stress level in these subject resulting with raised cortisol level. The mean cortisol level was more in Group 4 (subject class 1 cavity preparation for restoration [**16.62ng/ml**]) compared to **Group 1: control group with no treatment** [**9.51ng/ml**]). The probable reason may be that the sound of air rotor elevates stress level in these subject resulting with raised cortisol level

Interpratation and Conclusion

1. The mean cortisol level was highest when patient underwent implant placement followed by patients who had undergone scaling and thereafter in patients with class 1 cavity preparation for restoration and lowest in healthy patients (control group)
2. The salivary cortisol is suitable indicator of stress detector.

Strength of the study: Salivary cortisol was used as a diagnostic aid to check stress levels in Dental patients. As collection of Saliva is not invasive and not harmful, therefore it can be used as a specimen for stress-related substance measurement and is easily collected with minimum efforts than blood sampling. The cortisol saliva does not attach to corticosteroid binding globulin as it happens in the blood

Limitations of the study: The salivary cortisol level test was not done at particular time so prejudice can be there due to the day-to-day variation.

Ethical Clearance: Taken from Institutional Ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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Health Care Services by Primary Health Centres in Uthamapalayam Taluk in Theni District of Tamil Nadu- An Economic Analysis

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ABSTRACT

Health is an important constituent of well-being and foundation for prosperity and development of a country human resources development in the form health has been instrumental in accelerating economic growth human health is accelerating economic growth human health is considered as a pre-requisite for optimum socio-Economic development health care has been accepted as the right of every individual in a country. Today knowledge and understanding of health are growing rapidly the accelerated technological regulation in multiplying the potential for improving health and transforming health literacy in to a better educated and modernizing global society people in the developing countries expect their government to but in to place as array of public policies to deal with health challenges. The role of health care in economic development has received increasing mention in recent years. There is a general agreement that economic growth is not rely a function of incremental capital output ratio. Investment in man need allocation for education, imparting skills and health care plays a significant role in fostering economic growth. Health is a state of completion physical mental and social well-being and not merely the absence of disease or infirmity the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without of rare religion political belief economic or social conditions.

Keywords: Human Resources Development, Health Care, Crude Birth Rate, Crude Death Rate, Infant Mortality Rate.

INTRODUCTION

Health is an important constituent of well-being and foundation for prosperity and development of a country human resources development in the form health has been instrumental in accelerating economic growth human health is accelerating economic growth human health is considered as a pre-requisite for optimum socio-Economic development health care has been accepted as the right of every individual in a country. ¹Today knowledge and understanding of health are growing rapidly the accelerated technological regulation in multiplying the potential for improving health and transforming health literacy in to a better educated and modernizing global society people in the developing countries expect their government to but in to place as array of public policies to deal with health challenges. Moving towards health for all requires that health systems respond to the challenges of a changing

world and growing expectations too better performance this involves substantial re orientation and reforms to the ways health systems operate in society today those reforms constitute the agenda of the renewal of primary health center [PHC].

²Health is a state of completion physical mental and social well-being and not merely the absence of disease or infirmity the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without of rare religion political belief economic or social conditions. Government have a responsibility for the health of their people which can be fulfilled only by the provision of adequate health and social measures economics of health as a branch which is relatively recent. Origin in the disciplines of economics health issues to be studied as conceptual research issues and empirical research issues similarly health issues can be studied with a micro perspective both perspectives would have

a significant bearing on policy making. ³Goods health is an important contribution to productive and Economic growth the essential three basic amenities for human being are rate house nutritional food and dress these make a man healthier the healthy human both mentally and physically gives the productivity to the economy the productivity of all individual depends greatly on his or health status of a nation population will contribute greatly to rewards achieving its development goal.

The role of health care in economic development has received increasing mention in recent years. ⁴There is a general agreement that economic growth is not rely a function of incremental capital output ratio. Investment in man need allocation for education, imparting skills and health care plays a significant role in fostering economic growth.

OBJECTIVES OF THE STUDY

1. To identify merits and demerits of the PHC Centers.
2. To offer Suggestions for better health care provisions.

Statement of the Problem: The present research work is to analyze the healthcare services of people in Tamilnadu state in general and in Theni district in Uthamapalayam particular with existing healthcare system and health services available to people in this region study groups on measurement of levels of health had listed various indications to measure the levels of health. ⁵The comprehensive indicators are crude birth rate crude death rate infant mortality rate and expectation of life the specific indicators are death from communicable diseases indicators of health services and activities so in the present study the healthcare services of the state and district has been examined by Considering the movement of indicators of healthcare services and some of the determinates of these indicators. The present study also aims at finding the gap between the demand for health care services and supply of health care services at the level of primary health center [PHC] in Theni district uthamapalayam taluk.

REVIEW OF LITERATURE

Brijshesh et al in their analysis on utilization of health services in India had used the reports of national sample

survey organization (NSSO)1992 and national council of appealed economic research (NCAER) 1992 the authors had studied utilization of health service at micro level tacking I to account the following aspects distance facility available cost and quality of care service under various systems like (ALL-OPATIC) Homeopathic, Ayurvedic and Unani he authors drew the following inference the NSSO and NCAER surveys.

Amartyasen in his working paper on the likeges among objectivity health and policy disclosed the fact that very nation had the responsibility to scrutinize its healthy policy issue he lillustated the status with different health status such as Kerala, Bihar, Utharspradesh he emphasized the role of literacy level in bringing down the prevalence of illness rate the all so pointed out that gender inequity was also one of the reasons for poor health status of women.

Susha attempted to study the health infrastructure of Kerala the author also examined the pattern of health expenditure in Kerala especially in the free system of medicine for similar disease she made a comparison among the three system of medicine namely allopathic, Ayurvedic and homeopathy while studying he health of the people in Kerala. She found that Kerala had already reached the goal of world health organization namely health for all by 2000 AD though Kerala ranked first in the health services among the all states in India the morbidity rate in Kerala was high this was due to mainly increase in longevity of the people which in turn resulted in increase in morbidity level the low per capita income in Kerala was also being the other reason for high level morbidity.

METHODOLOGY

The methodology part deals with the research techniques and method applied in collection and analysis of data so that researcher can use their procedure to complete the study successfully.

Sources of Data: The present study is based on both primary and secondary data. Primary data were collected by using the interview schedule convenience sampling method is used to select 50 respondents for the collections of data. The collections of data is tabulated and presented for analysis and interpretation. Secondary data were collected from journals magazines Newspaper and unpublished these it etc. and of were government hospital office at Uthamapalayam taluak.

Tools: Percentage analysis is used for the analysis of the data.

ANALYSIS AND INTERPRETATION

In this section, the data collected with the help of research methodology was classified, tabulated and treated with scientific methods to get the result after tabulation the results were interpreted to bring out the most sticking relationship between the variable the results have been presented with the help of table and figures, findings are presented.

Table 1: Health Expenditure of Respondents

S. No.	Monthly Expenditure (in `)	No. of Respondents	Percentage
1.	1000-1500	35	70
2.	1501-2000	5	10
3.	2001-3000	10	20
	Total	50	100

Sources: Primary Data

The above table shows that a majority of respondents (70%) spend from `1000 to `1500.

Merits and Demerits of the PHC Centers: In order to identify the merits and demerits of Primary Health Care Centers. The respondents were ranked the following merits and demerits. The respondents were list of various merits and demerits in the study area. They comprise the seven merits and eight demerits.

Table 2: Merits of The Primary Health Centers

S. No.	Particulars	Rank	Number of respondents	Percentage
1.	Free Treatment	I	48	96
2.	Free Drugs	II	42	84
3.	Devotion to Patients	III	24	48
4.	Qualitative Health Care	IV	30	60
5.	Less Waiting Time	V	14	28
6.	Proximity	VI	34	68
7.	Less Transport Cost	VII	38	76

Source: Primary Data

This table reveals that 96% of the respondents are ranked to free treatment and as followed to rank Free Drugs, Devotion to Patients, Qualitative Health Care, Less Waiting Time, Proximity, Less Transport Cost respectively.

Table 3: Demerits of the Primary Health Centers

S. No.	Particulars	Rank	Number of respondents	Percentage
1.	No Functioning on the evening time	I	46	92
2.	Insufficient Drugs	II	42	84
3.	No Facility in Labour Room	III	22	44
4.	Less Building Facility	IV	28	56
5.	No Emergency Ward	V	36	72
6.	Mostly referral to Government Hospital	VI	26	52
7.	No X-ray Infrastructure	VII	18	36
8.	No Mobile Hospital	VIII	12	24

Source: Primary Data

The above table reveals that 92% of the respondents are ranked No functioning and evening time and as followed to rank. Insufficient Drugs, No Facility in Labour Room, Less Building Facility, No Emergency Ward, Mostly referral to Government Hospital, No X-ray Infrastructure and No Mobile Hospital respectively.

FINDINGS

People utilizing Main PHCs are relatively educated much better than users of Additional PHCs. Main PHCs are easily accessible whereas some of the Additional PHCs are situated in interior places. Some main PHCs respondents told that they have to go to the nearest District Headquarters hospital. Some of the respondents expressed that same medicine supplied by PHCs for various types of illness.

So, the government has to supply new medicines to people. For TB patient they give perfect treatment. If the patient forgets to buy the medicine the PHC staff visits to their homes and gives treatment. Especially for AIDS identification PHC plays a vital role. Many respondents explained that PHCs are not functioning in the evening

and non-availability of sufficient drugs. Many Medical Officers of PHCs resided in urban area; in such cases, respondents want doctors to stay in the PHC quarters. Morbidity level is high among users of main PHCs for both male and female adults and male child.

In both Main PHCs and additional PHCs users, morbidity is high among the female. Compare with male child and female child the percentage of morbidity was high among female child both in main PHCs and additional PHCs areas. The respondents demand that along with curative and preventive health care services, they want promotive services like appointing psychologists and physiotherapists in Main PHCs because mental health is one of the important problems in recent years. Now-a-days the number of accidents is increasing in both rural and urban areas. Therefore, services of orthopedic specialists and physiotherapists to be provided in PHCs.

Suggestions and Policy Implications: The government has to adopt health monitoring scheme for elderly population, due to increasing Life Expectation at Birth. Elderly population are severely affected by sudden changes in the climatic conditions. The illiterate population are not interested to make use of the health services when they are sick. Therefore, they are acting as agents for communicable disease like viral fever, malaria, etc.

Hence, the government should create awareness about the significance of preventive health care in rural areas and urban areas in addition with or curative services. Introducing, encouraging and enhancing the research and development on clinical research towards the community and field-oriented health care services to be done instead of institutional oriented health care services.

CONCLUSION

There is high scope to introduce positive measures for further enhancement of survival rate in Theni District as well as in Uthamapalayam Taluk region. To enhance the health status in micro or macro level, policy makers and

health planners will have to focus on action programmes to intensify the health services to reach the doorsteps of the poor community. It is necessary to educate the poor socio-economic group regarding the utilization of health services, proper housing and sanitation.

Employing medical personnel and paramedical personnel in required area particularly main PHCs and additional PHCs will be a fruitful measure according to this study. Hence the researcher concluded from this result obtained in secondary and primary sources that, any positive measures to improve the medical infrastructure in Main PHCs and Additional PHCs in the coming years in Theni District and Uthamapalayam Taluk will enhance primary health centers of the people.

Ethical Clearance: Completed

Source of Funding: Self

Conflict of Interest: Nil

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School Teacher's Knowledge, Attitude and Practices Regarding Oral Health in Ballabgarh Block, Faridabad

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ABSTRACT

Background: School teachers have an important role in oral health promotion and improvement of oral health in school children. Positive attitude, knowledge and practices in school teachers are, therefore important. The present study aims at assessing oral health related knowledge, attitude and practices of school teachers in Ballabgarh, India.

Method: A cross sectional survey of school teachers was conducted among school teachers of all 14 schools in Ballabgarh urban area. A 20-item close-ended questionnaire to assess oral health related knowledge, attitude and practices were administered to those who consented to participate. The data was assessed in SPSS Version 21 for means, frequency, distribution and descriptive statistics.

Results: The total number of participants was 294 (91.8%) with the mean age of 28 - 45 years. It was found in the present study that 55.44% of the participants had visited the dentist in the past one year. Majority of teachers had correct knowledge of oral cleaning aids, however a large number of participants had inadequate knowledge about causes and prevention of gum disease.

Conclusion: School teachers should be trained in this work and they should further educate the parents as well as the school going children about the oral health. Their knowledge should be assessed regularly and further changes in the program should be done in the school oral health program.

Keywords: Oral health, Knowledge, attitude, school teachers

INTRODUCTION

Globally it has been seen that the burden of oral diseases is considerable. Oral disease can lead to pain and tooth loss, a condition that affects the appearance, quality of life, nutritional intake and, consequently, the growth and development of children. Tooth decay and gum disease are among the most widespread conditions in human populations, affecting over 80% of schoolchildren in some countries^{1, 2, 3}. In order to reduce the oral diseases in school children, it is required to provide the oral health knowledge at infant and preschool level. The importance of imparting lessons on hygiene

to infants and pre-school children had been recognized as early as 1878^{4, 5}. Children spend considerable time in school especially during the age when their habits are being formed⁶.

School is also considered as the ideal sites for imparting oral health education, and conducting preventive programs to reduce burden of these diseases as services can be made available to all children, including those who, for a variety of reasons, may not be receiving professional care⁷. The need for the promotion of oral health in schools is evident and it can easily be integrated into general health promotion, school curriculum and activities. Healthy behaviors and lifestyles developed at a young age are more sustainable. Messages can be reinforced throughout the school years^{8, 9}.

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Shaping ways of life and personality development of school children during elementary education is the key responsibility of school teachers and parents¹⁰. School teachers are role models for their student and the role

of teachers during these development stages of the child critical⁶ as they can educate the children about how to prevent oral diseases and promote oral health. They shape the future of the students and they are the one, who are entrusted with the role of carrying out various preventive services and delivering education on oral health in the long run^{11,12}. It has been seen that teachers are more skilled in educational psychology than dentist¹³. Schoolteachers are often asked to conduct oral health education and to administer preventive services also⁷.

Hence, given the continuing, important role of teachers in school oral health programs and in the habits and lifestyle behavior of school children, the objectives of this study were: to assess the oral health knowledge, attitudes, and practices of school teachers

MATERIAL AND METHOD

A cross sectional study was conducted in schools from urban area of Ballabhgarh block, Faridabad district from August-September 2018. Ethical clearance was obtained from the institutional committee for conducting the study. Permission for conducting the study was obtained from the concerned school authorities. A close ended questionnaire was administered to find the level of knowledge of oral health and their determinants like educational qualification and years of experience. The questionnaire included 20 questions and was adopted from the previous studies^{6,10}.

Ballabhgarh block of Faridabad district has 14 schools in urban area¹⁴. All the school teachers working in these schools and present on the days of data collection were included in the study. 4 schools did not give the permission for the data collection. A total of 320 school teachers were working in the remaining schools. Participation was voluntarily. The overall complete questionnaires collected at the end of the study were 294. The response rate found in the present study was 91.8%. Two dental professionals evaluated the prepared questionnaire to maintain its face and content validity. This questionnaire was then pretested

on 20 school teachers and required changes were made in the questionnaire.

The questionnaire measured demographic details, knowledge, attitude and practices of school teachers regarding oral health and dental treatment. The knowledge questions assessed tooth cleaning medium, tooth cleaning materials, causes of decay and its prevention, any accessory tooth cleaning aid, frequency of tooth brushing, causes and prevention of gum diseases.

Attitude was assessed using questions regarding visiting dentist, parent's restriction on snacks, fluoride protection and inspection of lunch boxes by teachers. Further, the practices were assessed using questions on brushing activity (frequency of brushing, brush changing frequency) and visiting dentist. After consent, participants were explained regarding purpose of the survey. The questionnaire was self-administered and one of the authors stood by the participant to answer any query. On an average, it took 10 - 12 minutes to the participant to complete the questionnaire. Data was compiled and analyzed using SPSS version 21 (IBM Chicago). Descriptive statistics were obtained and means and frequency distribution were calculated

RESULTS

The total number of participants in the present study was 294 with the mean age of 28 - 45 years. Male subjects were 60 (20.41%) and female were 234 (79.59%). Majority of the participants were graduates i.e. 62.58% and 71.42% were married. It was found in the present study that 55.44% of the participants had visited the dentist in the past one year and the most frequent reason for visiting the dentist was routine dental checkup (40.47%). Further it was also observed that majority of school teachers were brushing twice daily (56.80%) and few were brushing even thrice and more (16.32%). Most of the study participants were changing the tooth brush in every three months i.e. 41.49%. Table 1 is showing attitude of the study participants regarding oral health.

Table 1: Attitude of school teachers regarding oral health

	Yes	No
School teachers should inspect lunch boxes	206 (70.06%)	88 (29.93%)
Fluoride protection against decay is required	193 (68.64%)	101 (34.35%)
Regular checkup by dentist is necessary	201 (68.3%)	93 (31.63%)
Parents should restrict consumption of sweet and sticky snacks	185 (62.92%)	109 (37.07%)
Children less than 10 years need help while brushing	223 (75.85%)	71 (24.14%)

DISCUSSION

Assessing the knowledge, attitude and practices for oral health among school teacher is important as they have the most critical role to play in the behavioral practices of school students. Majority of the participants in the present study were females. This is similar to the study done by Sekhar V et al. in Pondicherry and Glasrug P S et al in University of Minnesota, where most of the study subjects were female i.e. 79% and 84% respectively^{10, 15}.

It was seen in the study done by Almas et al that majority (62%) of the participants brushed their teeth with Miswak daily due to Sunnah¹⁶. However, it was found in the study done by Mwangosi et al that 98.7% of the school teachers were brushing only once a day²². It was observed in the present study that around 56.80% of the participants were brushing twice daily. This reflects the social and religious norm of the society in the study done by Almas et al. But when asked for knowledge in the present study regarding brushing frequency then it was found that around 68% knew that one should brush twice daily¹⁶. Similar results have been reported in the study done by Mota A et al where majority of the teachers (88.7%) believed that a child should brush at least twice a day and expected exceptional oral hygiene practices from children⁶. However, the teachers themselves exhibited moderate oral hygiene practices. So, this shows that the school teachers are practicing the twice brushing habit less frequently even if they have the correct information.

It was seen in the present study, that majority of the study participants (45.23%) had knowledge regarding causes of dental decay i.e. bacteria and sugar. Similar results had been reported in other studies done by Sekhar V et al, Nyandindi et al., and Khan et al^{10, 17, 18}. However, it is in contrast to study done by Lang P of China¹⁹. When school teachers in the present study were asked about their knowledge for tooth cleaning medium and material then it was seen that toothbrush and toothpaste was most frequent answer given by the participants.

As to prevention of dental caries, regular brushing was suggested by 29.95%, regular brushing and avoidance of sweets by 21.76% and regular dental visits by 30.27%. However, in the study done by Altamimi et al it was found that 76 per cent considered toothbrushing, 73 per cent of the teachers suggested the use of Miswak,

and regular dental visits were recommended by 76 per cent²⁰. The reason for this difference is that the preventive techniques were differently classified in the questionnaire of the other study.

In the present study, it was observed that 55.44% of the participants had visited the dentist in the past one year and the most frequent reason for visiting the dentist was found to be routine dental checkup (40.47%). Similar results have been found in the study done by Ehezele et al, where 42.4% of the respondents have ever been to the dentist for routine dental checkup²¹.

Around 38% of the study participants from the present study believed that irregular brushing is the main reason behind gum diseases. However in the study done by Sekhar V et al it was seen that majority of the school teachers believed that plaque and calculus is the main causative factor for gum diseases¹⁰.

The school teachers were asked about the role of fluoride in dental caries prevention. It was observed that 68.64% of the study subjects were aware about the role of fluoride and hence said that fluoride protection is required for caries prevention. In the study done by Sekhar V et al it was found that around 74.5% teachers know that fluoride protects against tooth decay¹⁰.

Dental floss and other interdental cleaning aids are known as important dental hygiene aids and are essential for removing debris, food particles and plaque from interdental areas of tooth^{21, 23, 24}. The percentage of teachers knowledge regarding use of dental floss as accessory dental aid in the present study is very low (7.14%). Interestingly, many of the teachers have knowledge about mouth wash as an accessory tooth cleaning aid (31.29%). Whilst the reason behind this difference could not be ascertained, one probable explanation could be the more promotion of mouth washes in visual media and newspapers.

The present study gives an insight into the knowledge as well as attitude of school teachers regarding oral health. National oral health policy gave special emphasis to preschool children primary and secondary school children, expected and nursing mothers²⁵. It has also emphasized on training of trainers. So teachers should be trained for providing oral health educations to the students. No comparison was done among different demographic variables for knowledge

and attitude questions in the present study. The study was done only on urban school teachers of Ballabgarh block. So, further studies can be done on other rural as well as in other blocks of Faridabad district to know about the level of perception among school teachers for oral health.

CONCLUSION

The school teachers in the present study had fair level of knowledge. School teachers should be trained in imparting oral health education to the parents as well as the school going children about the oral health. Their knowledge should be assessed regularly and further changes in the program should be done in the school oral health program.

Conflict of Interest: None

Source of Funding: None

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Representation of Knowledge Through Ontology for Swine Flu Disease in Semiarid Tropical Regions

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ABSTRACT

The practice of using ontologies in medicine is mainly focussed on the representation and re-organization of medical terminologies. Physicians developed their own specialized languages and lexicons to help them store and communicate general medical knowledge and patient-related information efficiently. Such terminologies, optimized for human processing, are characterized by a substantial amount of implicit knowledge. Medical information systems, on the other hand, need to be able to communicate complex and detailed medical concepts unambiguously. This is noticeably a complex task and requires a intense analysis of the composition and concepts of medical terminologies. But it can be accomplished by fabricating medical domain ontologies for demonstrating medical terminology systems. Moreover, there are limited ontologies available in the domain of pulmonary diseases and as such tropical diseases like swine-flu(H1N1) are yet unexplored. Swine-flu is rapidly spreading disease and the information for it available from books, newspaper articles and internet which is unmanageable and unorganized. Therefore, in this paper, we propose to develop a medical ontology based information system for Swine-flu. We have implemented this system using Protégé 4.1 Beta Software and then hosted it onto Apache Tomcat Server. The deployed version can be viewed in XML and RDF formats and DL query can be used where user can get answers to their queries when questioned. Finally, to evaluate the performance functional testing with Fact++ Reasoner is used with ontology browser.

Keywords: *Ontology, Swine-flu, Protégé, Fact ++ Reasoner.*

INTRODUCTION

Swine flu strain, causing 2009 pandemic was first observed in Mexico USA. Researchers named it as novel H1N1, as it mainly identified infecting people and the two main surface antigens involved are H1 (Hemagglutinin type 1) and N1 (Neuraminidase type 1)¹. The H1N1 virus outbreak had previously occurred India during the 2009 flu pandemic. Integrated Disease Surveillance Programme(IDPS), a Ministry of India capitulated 8,544 people to fatal Swine Flu disease between September 2010 and November 2017. The virus is known to spread during monsoon months, and it has been more prevalent in semi-arid tropical regions of India like Maharashtra, Telangana, Andhra Pradesh, Kerala.

As identified, Swine flu is a highly communicable pulmonary disease infecting pigs and the root is one of several swine influenza A viruses. Transmission of swine influenza viruses to humans is uncommon. However, swine

influenza virus can infect humans when contact with pigs or surroundings contaminated with swine flu viruses³.

Not only in India, the severity of Swine flu disease in d United States is determined by vast things including traits of affecting viruses, the seasonal timings and how vaccine is fighting with the disease causing virus and the number of people got vaccinated. CDC trails rigorousness principally through its national Influenza Surveillance System that keeps track of disease through key indicators like percentage of deaths resulting from respiratory diseases like influenza or pneumonia and the number of hospitalizations, paediatric deaths and rate of visits to clinics for influenza-like illness².

Swine flu related data has been varied. This data need to be extracted from different places and from different formats to a one place with same format and with particular subject focused, the data itself will

become an easy content of information to refer and the web used for this is semantic web⁸. More the information about diseases that exists in digital form, better the understanding about disease, disease environment, and its cause and so forth. Scientists, researchers and inventors add content pertaining to diseases to the web that is of an immensely diverse nature. This disease information on the web is growing closer to a real universal knowledge base, with the problem of the interpretation of its true context. So there is a lucid requirement for the disease information to be more semantically assembled thus promising a semantic web for disease intelligence. The aim of introducing semantics into the disease information is to enhance the precision of search, but also enable the use of logical reasoning on the disease information in order to answer queries. Also when a logical structure is incorporated to this information it will become machine/computer readable as well as machine/ computer processable, ensuring some kind of intelligence⁶ associated with this information.

Disease like H1N1 has its own characteristics changed rapidly at different places of the world and those characteristics reported by doctors at those places are not quickly available to other researchers/doctors in the other side of the world for reference. For example, if a researcher wants to analyse symptoms he may want to use his own set of data as well as other set of data given through other sources. If he manually searches the relevance and freshness of other sets of data, it will be a tedious and error prone task. Although he uses conventional search engines they will only provide much larger set of information which is still hard to refer due to its largeness and unsatisfactory order. If machine can filter in relevance/meaningful, fresh, coherent and consistent data then his task of research will become much easier⁷.

The major focus of this research is to demonstrate how disease intelligence can be achieved through semantic web. The methodology followed in achieving this disease intelligence through web is based on ontologies⁹ and the ontologies can be created using OWL(web Ontology Language)^{4,5} as well as evaluated by the reasoners available today. The ontology created here is termed as swine flu disease ontology and it serves as a way to constitute the disease domain.

So following are the main objectives of the study:

1. Find out a proper way to extract the information about Swine Flu Disease.
2. Create ontology to extract the information about swine flu disease using a correct web semantic¹⁰ language.
3. Make information extraction available through ontology browser .
4. Carry out a Functional Testing with the help of Fact ++ Reasoner.

Literature Review-Medical Ontologies: Latest developments in Information Communication and Technology opens varied prospects for the implementation of high quality health care systems. These technologies confirm the provision for better medical data processing. A main feature of Medical Information System is the explicit communication of intricate details of medical concepts. So, ontologies provide a more efficient knowledge sharing in the field of medicine¹⁰.

However ,it is difficult to develop such a system and a thorough analysis of structure and concepts of medical terms are required. Ontological approach is very much useful here for representing and integrating them in medical ontology¹³. Medical ontologies have played crucial role in facilitating re-use, propagation and sharing of patient information across dissimilar platforms. They have been used in semantic-based statistical analysis of medical data. Examples include CO-ODE, LinkBase, Medical Ontology Research Program, JULIE at Jena University, GALEN, ON9 Methodology, Gene Ontology Consortium. In addition Bio-portal consists of more than 683 ontologies that include various aspects of medicine such as humans, plants, principled ontologies which are semantically interoperable¹².

Methodology-Development of ontology: The authors are from diverse fields like computer professionals, Medical Informatics and clinical experts from pulmonology field. The following Figure 1 illustrates step by step workflow of the ontology development.

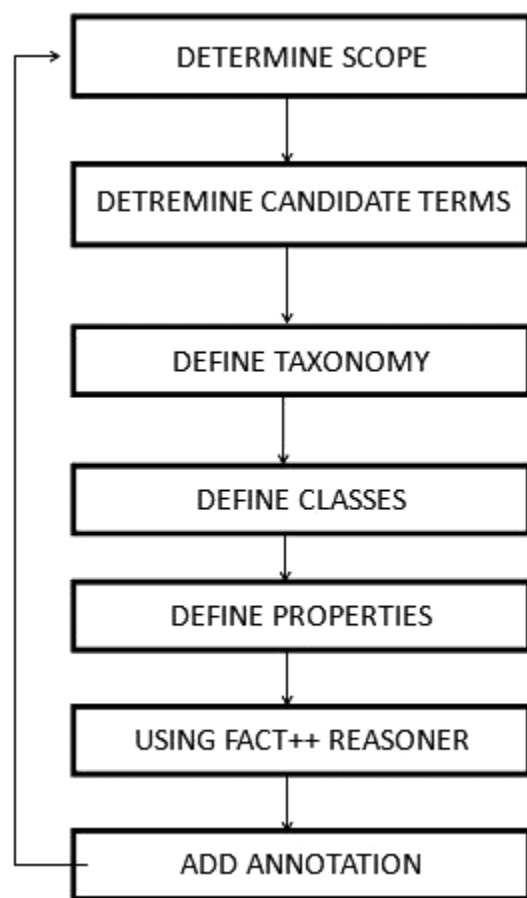


Fig. 1: Work Flow of Swine Flu Ontology

It is vital to determine the ontology scope so that the area that ontology covers and the queries that can be answers and also determine the users of ontology. In the case of tropical disease ontology it is clear that unification of information is required. This enhances the chances of constructing decision support tools and provide common terminology for tropical diseases.

Determining Scope: Protege is developed by the Stanford Medical Informatics group and it is now a core technology of National Center for Biomedical ontology(NCBO) ¹⁴. Protege allows OWL format and other formats such as RDF/S, OWL and XML Schema. In addition to it, plugins which comprises 70 plugins which involves ontology visualization, ontology alignment, ontology mapping and rule engines.

Foundation for Candidate Terms: The knowledge for swine flu includes Identification of symptoms, therapeutic approach and etiology and epidemiology. The main objectives are from symptoms, ,caused_by, risk factors, vaccines, drugs, type_a or type_c. Domain knowledge is provided by the Faculty of ESI Hospital, Hyderabad.

Formalization was gathered from indexed articles, Research articles and public health domain textbooks. It has been measured that candidate determination is continuous and recurring process. Entities in candidate terms of swine flu disease has some aspects ¹⁵. These aspects are:

- a. Swine Flu should represent highest occurrence of Disease and its diagnosis
- b. Symptoms of individuals
- c. Causes of disease
- d. Its prevention and Vaccines
- e. Etiology

Taxonomy Definition: The high level graphical representation of swine flu disease ontology is shown in Figure 2 Term candidates are selected and are written in an unstructured list and are displayed in summary as shown below:

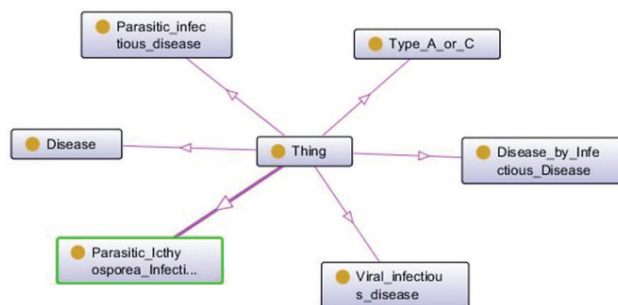


Fig. 2: Display of Term Candidates in an Unstructured List

The construction of tropical disease ontology should obey formal ontological principles to prevent interpretation bias on each individual terminology. In this stage, relationship constraints between each individual terminology were developed. Constraint relationship in swine flu disease is based on inter individual relations and are applied between terminologies. This constraint relationship is also inherited relationship, which means relationship are also defined in their individuals and concepts. This relationship type is sufficient for the purpose of indexing and annotating initial infectious disease ontology, especially for medical purposes. Focus of individual-relations of this initial phase is on Disease_by_Infectious_Agents concepts to others listed concepts.

Interrelationships established: The relationships are inherited and the inherited relationships can also be represented and are explained in concepts which is enough

for indexing and annotating swine flu disease ontology. The inter individual relations are shown in Figure 3

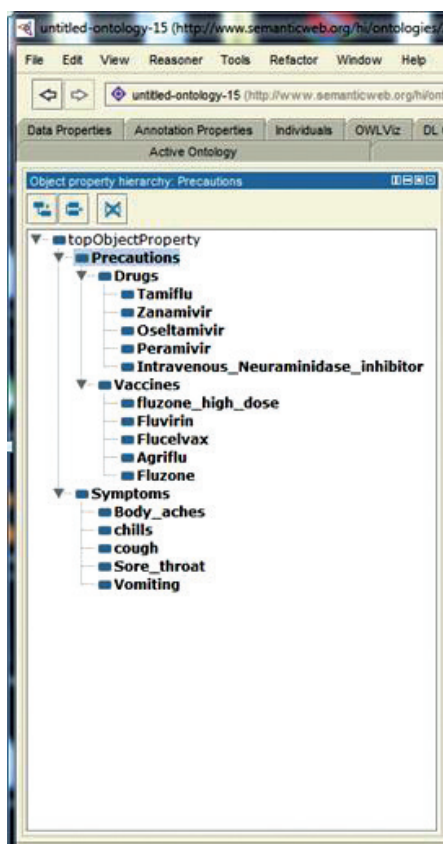


Fig. 3:snapshot of inter individual relations in swine flu diseases

The properties that were used to figure out individual relations for the initial phase can be used as hypernym/hyponym (*is-a*) and meronym/holonym (*has-of*). Description logic Language syntax is used for classification in defining inter-individual relationship of swine flu disease. There are only two types of restrictions used here *some* and *only*. Keyword “*some*” is used to describe classes that participate in atleast one relationship. Keyword “*only*” is used to describe classes that participate in relationships along with this class.

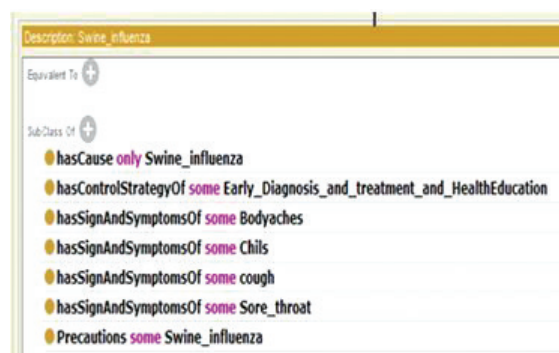


Fig. 4: Summary of Swine Flu disease properties

Finally, annotation is added to provide information to classes, individuals and object properties. The swine flu disease ontology provides relationship properties with 70 annotations. Overall structure of Swine Flu disease is drawn using OntoGraph¹¹ and OWLViz tool in Protégé

Ontology Visualization: After the formation of the ontology file, now we host the link on to the live web browser with the help of a server. The server that is been used in our research is Apache Jena fuseki server. We have installed jena fuseki server through Jena.apache.org. After the installation with the help of the <http://localhost:3030/browser/> we got the XML files of the ontology file that has been deployed onto the server.

In order to view the visualization, a process is followed to upload SwinefluDisease1.owl file which is hosted onto the web hosting provider. Apache Jena server runs in web hosting provider and corresponding XML files are generated.

EVALUATION

The resource developed by us can be used for other applications also it was important to evaluate its correctness. To verify the correctness whether ontology is linking relations and properties correctly or not. So, we configured a Fact++¹⁶ Reasoner in Protege for retrieving DL based queries. When we gave the class name to the reasoner, it retrieved the query in terms of classes, individuals, super classes, domain and range. With the results of the Reasoner, we were convinced that ontology is created without any defects as the system was able to retrieve desired classes, super classes and its associated relations and properties. This ontology gives us the case when treatment was given as an input and it fetched equivalent class, sub-class, super-class etc. In another case we gave causes and executed the query. This fetched all the ancestor super-classes and all the instances of the concept. Similarly each concept, relation and instance was verified for correct results.

CONCLUSION & FUTURE WORK

In this paper we have demonstrated the development process of swine flu ontology . We have discussed various stages in the development of swine flu ontology. We have also evaluated our ontology using a Fact++ Reasoner which verified the ontology by executing

each class and their properties. As an extension of this work, we would like to enhance the ontology by adding more diseases and its cures. Our future work is to show visualization in a better way using machine learning techniques and using effective similarity measures when it comes to matching one ontology with another. This gives us more accuracy and less computation cost which provides better model for online ontology assessment.

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Conflict of Interest: None declared

Ethical Clearance: This research was approved by the Research and Ethics Committee of the ESI Hospital, Pulmonology center, Chest Diseases, ESI, Hyderabad, India.

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Knowledge, Attitude & Practices Regarding Prevention of Dengue and Malaria among Residents of Urban Area in Kolhapur City, Maharashtra

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ABSTRACT

Background: Vector-borne diseases account for more than 17% of all infectious diseases, causing more than 1 million deaths every year globally. Since we got epidemic of dengue this year in Kolhapur District, it was very much necessary to plan health education programs in our field practice area. Vector control methods can be successful only if there is community participation and for success of community-based program, it's important to assess community's perception regarding the disease, its mode of transmission and breeding sites. Knowledge, attitude and practice studies help to make educational diagnosis of community.

Objective: To assess knowledge, attitude and practices regarding dengue and malaria among residents of urban area in Kolhapur city.

Methodology: We conducted community-based cross sectional study to know the knowledge, attitude and practice regarding dengue and malaria in our field practice area of urban health centre selecting 480 residents by systematic random sampling technique.

Results: Majority i.e 92% of participants were aware of dengue and malaria as mosquito-borne diseases. Nearly 22% participants could not tell any preventive method against mosquito-borne diseases, 76% people think that preventing these infections is sole responsibility of Government, 32% people don't follow any precautions and around 62% don't follow any method to prevent mosquito breeding in and around house.

Conclusion: There is urgent need to increase awareness about mosquito borne diseases in our community with respect to breeding places, all preventive measures, symptoms, treatment options available in order to prevent and control epidemics in future.

Keywords: *knowledge, attitude, practice, malaria, dengue, urban*

INTRODUCTION

Mosquito Borne Diseases (MBDs) are major health problem in India & growing urban problems because of unplanned urbanization, industrialization & excessive population growth coupled with rural to urban migration.¹

The world's fastest growing VBD is dengue, with a 30-fold increase in disease incidence over last 50 years. Every year there are more than 1 billion cases and over 1 million deaths from VBDs. In India, 27% population live in malaria high transmission area.² Diseases are common in tropical and subtropical regions and places where access to safe drinking water and sanitation system is problematic.³

Although, dengue has a global distribution, the World Health Organization South-East Asia Region (SEAR) together with Western Pacific Region bears nearly 75% of the current global disease burden.⁴ The sole method of prevention and control is the knowledge, attitude and practices (KAP) for the same. Although, dengue is considered an urban and semi-urban disease

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in recent years due to water storage practices and large-scale development activities in rural areas, dengue has become endemic in rural areas of India as well increasing the scale of the dengue challenge in the country.⁵

METHODOLOGY

This community-based cross sectional study was conducted from 1st July to 30th September 2018 in the field practice area of UHTC under jurisdiction of Department of Community Medicine. Data was collected by face to face interview by using pretested, semi structured questionnaire by trained interviewers after receiving approval from institutional ethical committee. The houses for data collection were selected by systematic random sampling technique. One adult respondent from each selected households was selected randomly & verbal consent was obtained before collecting the information. Details were collected by face to face interview regarding causative agents for dengue and malaria, their breeding places, signs and symptoms, treatment seeking behaviour, prevention & control measures actually adopted by the participants were recorded.

- **Study design:** Community-based cross sectional study
- **Study period:** July to September 2018.
- **Study area:** Field practice area of UHTC
- **Sampling technique:** Systematic random sampling by selecting every 5th house from total 2460 households.
- **Sample size:** 480.
- **Study tool:** Pretested, semi-structured questionnaire.

Our survey questions focused on socio-demographic profile, knowledge regarding vectors responsible for dengue and malaria both, breeding sites, mode of transmission, symptoms, treatment, attitude & preventive measures actually adopted for malaria and dengue. Data was entered in Microsoft Excel & analysed by SPSS 20 version.

RESULTS

We interviewed 480 people for gathering the required information for our study. Majority of the participants were males (60%) belonging to age group of 41 to 50 years (40%) and were married (79.5%) & from upper middle socio-economic background (61%).

Table 1: Knowledge regarding dengue and malaria

Question	Number	Percentage
Are you aware of dengue and malaria?		
Yes	446	92.9
No	34	7.1
Dengue and malaria spread by-		
Close personal contact	6	1.2
Mosquito bite	438	91.2
Contaminated food, water	8	1.6
Don't know	28	5.8
Do you know breeding sites for dengue mosquito?		
Dirty water	138	28.7
Fridge tray/household water collections/tyres/flower vase	90	18.7
Don't know	120	25
Garbage	132	27.5
Dengue mosquito bites during-		
Daytime	42	8.7
Night	172	35.8
Day & night	82	17.1
Don't know	184	38.3
Different methods to prevent dengue/malaria		
Screens for windows, mosquito nets	82	17.2
Wearing full sleeves clothes	118	24.5
Chemical spraying	134	25.8
Use of odomos/liquid vaporizer	194	40.4
Don't know	106	22.1
Symptoms of mosquito-borne diseases		
Fever	426	88.7
Joint pain, bodyache, headache	188	39.1
Spots on body/rash	18	3.7
Don't know	26	5.4

When we studied knowledge level regarding dengue and malaria, we found that majority of the participants (92%) were aware of both dengue and malaria. Nearly 91% knew that both spread by mosquito bite. Nearly 22% of the people could not tell any method to prevent these diseases while 38% participants didn't know that the dengue mosquito bites during day time.(Table-1)

Table 2: Attitude regarding dengue and malaria

Question	Number	Percentage
Are you at risk of getting dengue/malaria?		
Strongly agree	394	90.8
Agree	42	8.7
Disagree	34	7.1
Not sure	10	2.2
If you take precautions can you prevent mosquito-borne diseases?		
Strongly agree	380	81.2
Agree	38	7.9
Disagree	10	2
Not sure	52	10.8
Preventing mosquito-borne diseases is responsibility of-		
Government	368	76.6
Self	42	8.7
Government + self	70	14.5

Regarding attitude towards these diseases, 90% of people believed that they are at risk of getting them while 76% think that preventing these diseases is sole responsibility of Government. (Table-2)

Table 3: Practices followed to prevent dengue and malaria by study participants

Question	Number	Percentage
Which method do you adopt to prevent dengue, malaria?		
Wear full sleeves clothes	252	52.5
Use repellent like <i>Odorous</i>	128	26.6
Use mosquito net	48	10
Close doors, windows in evening	372	77.5
Nothing	156	32.5
Precaution followed to prevent mosquito breeding in & around house-		
To empty pots/fridge tray etc regularly	62	12.9
Pour oil/ kerosene in collected water	54	11.2
To close vessels tightly	68	14.1
Nothing	296	61.6

As shown in Table -3, when we studied the actual practices adopted to prevent dengue and malaria 32% of

the people did not follow any method while around 62% participants did not follow any precaution to prevent mosquito breeding in and around house.

DISCUSSION

In our study majority i.e 90% participants were aware of both dengue and malaria similar results were obtained by study conducted by Mehta D. at Bhavnagar, Gujarat⁴ where 88% were aware of mosquito-borne diseases and Ashutosh S² in Kota, Rajasthan. Pradeep C⁶ in their study conducted in Bangalore reported that 70% of the respondents heard about dengue which was less than our observation. In our study 91% people knew that dengue and malaria are mosquito borne diseases, similar results were obtained by Borker A⁷ in their study done at Nagpur, Maharashtra where 88% participants knew that mosquito bite is responsible for malaria and dengue. Little higher results were obtained by Tamilarasi R⁸ in research done in urban area of Chennai where 97% of the participants answered correctly about mode of transmission of mosquito borne diseases while study conducted by Nagoor K³ in Chittoor in Andhra Pradesh reported that only 68% of study participants knew that its mosquito borne disease and also by Bhatt A⁹ from Kerala where 65% respondents knew about mosquito borne diseases. When we compared correct information about breeding sites for different mosquitoes, only 19% could tell it correctly about dengue mosquito which was very low compared to findings from Chennai urban area residents (81%) according to Tamilarasi R⁸ study and as per findings of Yerpude NP¹⁰ (91%) from study done in Guntur, South India. According to our findings, 88% respondents knew fever as symptom of dengue and malaria while study conducted in Kota, Rajasthan² it was known to 97% of people. Similar results were also obtained in the study carried out in Chennai by Tamilarasi R⁸ wherein 92% respondents answered it correctly.

Among our study respondents 91% accepted that they were at risk of getting dengue and malaria. According to our observation, 81% people think that dengue and malaria are preventable if they follow precautions while little higher results were obtained in the study conducted in Kota² which was around 90%. Results similar to us were obtained in the study carried out by Gupta S¹¹ at Jhansi wherein they found that 76% of the participants had positive attitude that these mosquito borne diseases are preventable. As per our findings,

only 9% people thought that preventing these diseases is individual responsibility but study carried at Pune by Singru S¹ noted that 31% of the participants thought the same which is higher than our results.

In our study, only 39% of the participants regularly followed preventive measures to prevent dengue and malaria which was very less compared to findings of Nagoor K³ in Chittoor, AP where 79% of the subjects were following correct practices to avoid these diseases. The study carried out in Pondicherry by Snehalata et al¹² reported that 99% participants followed protective measures which was really appreciable and much higher compared to us. Another study done at Belgavi, Karnataka by Kulkarni RR¹³ noted that 90% participants follow preventive measures which are again higher than our results. Study carried out by Babu et al¹⁴ also reported that 98% of participants follow them correctly which is again much higher than our reports. Another study done in Nagpur, Maharashtra by Borkar A⁷ reported that 85% of the participants use any of the preventive methods which is again higher than our observation. Findings similar to us were noted by Panda R. in their research done in Bastar district in Madhya Pradesh where 45% of people adopted protective methods against mosquitoes.¹⁵ Study conducted by Joseph N¹⁶ in Mangalore found that 64% of the participants used preventive practices which was again higher than our reports. Another study done in Darjeeling, West Bengal by De MA¹⁷ reported that 47% participants used repellent creams to prevent mosquito borne diseases which was little higher than our reports (26%). As per findings of Yadav SP¹⁸ from their study conducted in Jodhpur, Rajasthan 16% of the participants used repellents which were less than our reports. There is a big gap between the knowledge and the actual preventive measures adopted in the community which has to be addressed on regular basis.

CONCLUSION

We found that there is a wide gap in knowledge and actual practices that are followed regarding prevention of dengue and malaria in our field practice area. Health education on regular basis is required to modify behaviour of people to adopt preventive measures which will help to prevent such outbreaks in future.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Obtained from Institutional Ethical Committee.

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Comparative Evaluation of Efficacy of Oral Diazepam and Buspirone in Reducing Anxiety and Discomfort in Mandibular Third Molar Surgery- In Vivo Study

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ABSTRACT

Introduction: Fear of the dentist and dental surgical procedure is a common and potentially distressing problem. Thus, the use of oral anxiolysis is indicated for anxious patients. Aim: - To evaluate and compare efficacy of (oral) diazepam and buspirone in reducing anxiety and discomfort in mandibular third molar surgery.

Materials and Method: A prospective, double blinded, comparative split mouth, cross-over study was conducted on 28 patients requiring surgical extraction of bilaterally impacted mandibular third molar. Patient were categorized into two groups : Group A were prescribed tab diazepam 5mg and Group B were prescribed tab buspirone 10mg respectively. After a wash out period of 3 weeks the groups were crossed over and the sequence of tablets was reversed. Anxiety levels were recorded on Gatchel's anxiety scale before surgery, 30 minutes after medication, intraoperative, post operatively. Comfort level was subjectively assessed.

Results: The results showed that there was no significant difference in the anxiety level in the diazepam group but there was a significant reduction in anxiety in the buspirone tablet group from pre-operative to postoperatively. The subjective comparison of comfort level showed that 78% participants were more comfortable using tablet buspirone, while, only 44% were comfortable with tablet diazepam.

Conclusion: This study reveals that buspirone is comparatively more effective than diazepam to reduce anxiety. Also, the patients are more comfortable with buspirone postoperatively.

Keywords: Fear; Anxiety; Diazepam; Buspirone; Anxiety Scale; Comfort.

INTRODUCTION

The third molar extraction is one of the most common procedures performed in oral and maxillofacial surgery^{1,2}. As the third molar is the last tooth to erupt

it has the greatest incidence of impaction which may be attributed to the insufficient space in the dental arch. Surgical extraction of third molars is often accompanied by pain, swelling, trismus, and general oral dysfunction during the healing phase^{2,3}. All of these including the fear of going under blade causes anxiety and develops fear among the patients and this leads to various complications in later stages. Although related, fear and anxiety differ, in that fear may be considered the physiological process that occurs in the body when threatened by danger, whereas anxiety is the anticipation of the possibility of danger and is perceived to be less immediate in nature⁴. Patients who are fearful and anxious

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indirectly increase the complexity of dental procedures also⁵. Fear and anxieties in dentistry have been estimated in various populations across the world. Dental anxiety level has been reported in the range of 4.2% to 20.9%⁴. Treatment option to help these patients includes behavioral modification, systemic desensitization, hypnosis and guided relaxation, for individuals where these techniques are insufficient and they may require sedation in order to undergo dental procedures⁵. The use of oral anxiolysis is better alternative to parental sedation for the patients who are sufficiently anxious regarding needle and oral surgical procedures. Benzodiazepines (BZ) are most commonly used oral sedative drug with a high therapeutic index. It is categorized under hypnotics. Ingestion of hypnotic dose does not endanger life. There is no loss of consciousness and respiratory depression. It produces centrally mediated skeletal relaxation without impairing voluntary activity. Diazepam is considered the proto-type of benzodiazepine and the “grandfather” of this drug class; it has been available for over 42 years and continues to be widely used⁶. Buspirone is first azapirone, known since 1988 antianxiety drugs distinctly different from benzodiazepines⁷. Unlike the benzodiazepines, buspirone lacks hypnotic, anticonvulsant and muscle relaxant properties, and hence has been termed anxiolytic. As evidenced by clinical trials, buspirone 15 to 30 mg/day improves symptoms of anxiety assessed by standard rating scales similarly to diazepam, alprazolam and lorazepam. Sedation occurs much less often after buspirone than after the benzodiazepines; other side effects are minor and infrequent. In healthy volunteers, buspirone does not impair psychomotor or cognitive function, and appears to have no additive effect with alcohol]. Evidence suggests that buspirone has limited potential for abuse and dependence⁸. But it is surprising that no clinical comparative studies have been done in dentistry for the use of tablet buspirone as oral anxiolytic drug. There are various scales in literature to check the level of anxiety like Modified Corah Dental Scale, Spielberger’s State Trait Anxiety Inventory and Kleinknecht’s Dental Fear Survey, Gatchel’s ten point scale etc⁹. Gatchel’s ten point scale is simple to use which checks subjective level of anxiety in a simple ten point scale. Thus, this study used Gatchel’s ten point scale to assess the efficacy of antianxiety drugs¹⁰. The purpose of the study was to evaluate and compare efficacy of oral diazepam and oral buspirone in reducing anxiety and discomfort in mandibular third molar surgery.

MATERIALS AND METHOD

This prospective, double blind, comparative split mouth, cross-over study was conducted on 28 patients reporting to the Department of Oral and Maxillofacial Surgery, of DR D Y Patil Dental College and Hospital, Pimpri, Pune requiring surgical extraction of bilaterally impacted mandibular third molar and with similar Pederson’s difficulty index² range from 5-7. Institutional ethics committee clearance was obtained prior to commencement of the study. Patient with history of allergy to benzodiazepines or buspirone and any medical history that contraindicate use of diazepam and buspirone e.g. depression, pregnancy, lactating, personality disorder etc. were excluded from the study. Patient and relatives of the patient were explained about the procedure and the study. Informed written valid consent was taken from the patients for participation in the study. Pre operative investigation like hemoglobin level, bleeding time, clotting time and blood sugar level was carried out for each patient. 28 patients were recruited for the study. Patients were divided into 2 groups equally with 14 participants in each group by SNOSE (sequentially numbered opaque sealed envelopes) to avoid bias. Group A patients were prescribed tablet diazepam 5 mg and group B were prescribed tab buspirone 10mg respectively, once before the surgical procedure. Perioperative anxiety was recorded using Gatchel’s 10-point anxiety scale, where a score of 1 indicates no fear, a score of 5 indicates moderate fear, and a score of 10 indicates extreme fear. Comfort level was subjectively assessed as “Yes” or “No”. Anxiety was recorded preoperatively, 30 minutes after medication, intraoperatively and postoperatively. Standard surgical procedure for removal of impacted mandibular third molar was used. Standard scrubbing, painting and draping was done. Local anesthesia 1:200000 lignocaine with adrenaline administered. Incision made for third molar surgery, mucoperiosteal flap was reflected, bone guttering and tooth sectioning was done. Tooth was luxated out of the socket. Wound debridement and bone filing was done. After achieving haemostasis, wound closure was done with 3-0 black silk. Patients were discharged with analgesic and antibiotics. Patients were reviewed after seven days for suture removal. After a wash out period of 3 weeks the groups were crossed over and the sequence of tablets was reversed. The surgical extraction of the contra lateral side was done, the same procedure was repeated

and all the parameters were recorded in same manner. All procedures were carried out by the same operator. Statistical analysis For the purpose of evaluation, the data of all the 28 participants using Diazepam and Buspirone was categorized separately. Repeated measures ANOVA and posthoc tukey test and chi-square test was used for statistical analysis using SPSS version 17. A p value of $p < 0.05$ was considered statistically significant.

RESULTS

Table 1: Comparison between the anxiety levels at different time periods for the Diazepam group

	Pre-op	After 30 mins	During extraction	Post op
Diazepam group	4.64 (1.28)	4.17 (0.98)	4.32 (1.36)	3.85 (1.29)

$F=1.97$, $p>0.05$ (not significant)

A total of 28 patients (16 males and 7 females) with age range of 18-50 years (mean age of 29.03 years) were included in the study. Anxiety The mean anxiety in Gatchel's anxiety scale rating in Diazepam tablet group: pre operatively , 30 minutes after giving medication , during extraction and post operatively was, 4.64 ± 1.28 , 4.17 ± 0.98 , 4.32 ± 1.36 and 3.85 ± 1.92 respectively [Table 1]. The reduction in anxiety preoperatively till post operatively was not statistically significant ($F=1.97$, $p>0.05$)

Table 2: Comparison between the anxiety levels at different time periods for the Buspirone group

	Pre-op (1)	After 30 mins(2)	During extraction(3)	Post op(4)
Buspirone group	4.92 (1.84)*	3.96 (1.5) ^a	3.39 (2.02)*	2.67 (1.67) ^{a*}

$F=8.08$, $p<0.05$ (statistically significant) Post hoc tukey test significant for 1*3, 1*4 and 2^a4

The mean anxiety in Gatchel's anxiety scale rating in the buspirone tablet group: pre operatively, 30 minutes after giving medication, during extraction and post operatively was 4.92 ± 1.84 , 3.96 ± 1.5 , 3.39 ± 2.02 and 2.67 ± 1.67 respectively [Table 2]. Overall, there was reduction in anxiety from pre-operative to post-operative and the difference was statistically significant ($F=8.08$, $p<0.05$). Post hoc tukey test shows that there

was a significant difference between anxiety Pre-operatively and during extraction and pre-operatively and post-operatively and between after 30 minutes to postoperatively.

Table 3: Comparison of the comfort level between the 2 groups

	Yes	No
Diazepam group	12	16
Buspirone group	22	06

$X^2=7.48$, $p=0.006$

Comfort On subjective comparison (i.e on verbal response only): The comfort level in patient with tablet diazepam and tablet buspirone was 78%, i.e. 22 out of 28 participants were more comfortable while using tablet buspirone and only 44.8%, i.e. 12 out of 28 participants were comfortable which tablet diazepam. There was a statistically significant difference between the comfort level ($X^2=7.48$, $p<0.05$) [Table 3].

DISCUSSION

Anxiety was the reason why 7.6% of patients had ever missed, cancelled, or avoided a dental appointment⁶. Of those with high anxiety, 49.2% had avoided a dental appointment at some point because of anxiety as opposed to only 5.2% from the no or low anxiety group⁶. Encountering patient who are fearful and anxious is common in dental practice and these factors can increase the complexity of dental procedures. Studies suggested dental anxiety is usually higher in tooth extraction, in procedure involving dental anaesthesia and when rotatory instrument is needed. For these reasons, the surgical extraction of impacted lower third molars is a procedure that almost certainly involves some degree of anxiety in the patients^{11,12}. The study subject had age range from 18-40 years with no systematic disease, extreme of ages preventing anxiety due to fear of unknown or previous experience. This split mouth design reduces possible research bias by avoiding physiological and psychological differences between tested individuals¹³. For surgical extraction of impacted third molar, both the anti-anxiety drugs can be compared for same patient, as the study includes bilaterally impacted teeth with approximately same Pederson's difficulty index² range from 5-7. A double blind study prospective cross over

design was used to avoid bias between the groups. The age and gender of the patients did not have any significant relation with the anxiety level⁹. The use of oral anxiolysis is better alternative to parental sedation for the patients who are sufficiently anxious regarding needle and oral surgical procedures. This finding is conferred by study conducted by Dionne RA et al in their study where oral benzodiazepine relatively fast onset, short elimination half-life, and minimal respiratory and cardiovascular effects make it desirable for outpatient use compared with other sedatives that have less favorable pharmacodynamic and pharmacokinetic properties¹⁴. The use of an orally administered drug avoids exacerbating anxiety in patients who are fearful of venipuncture. The cost of care also is substantially less for an orally administered agent compared with that involving a parenterally administered sedative¹⁴. Buspirone does not impair any higher function nor does it cause any sedation^{5,6}. Available literature suggests that buspirone has limited potential for abuse and dependence. It is effective in the treatment of patients with generalized anxiety disorders and anxious patients¹⁵. Buspirone leads to less depression of the central nervous system than benzodiazepines or clorazepate, and that it appears to be effective in reducing symptoms associated with cognitive and interpersonal disorders. Oral buspirone is safe drug for helping a patient to cope pharmacologically and behaviorally with anxiety. In our study, it is seen that as compared to pre-operative anxiety, the anxiety had reduced after 30 minutes. Even during the procedure, the anxiety was still less with tablet buspirone. The difference between preoperative and postoperative anxiety had significantly reduced in buspirone group. This finding corroborates with finding of studies conducted by Goldberg HL¹⁶ and Hulscher BE¹⁷. In this study, there was no significant reduction in anxiety in the diazepam group. Diazepam is considered as prototypical benzodiazepine which is most commonly used oral sedative drug. For the anxious patient with a history of alcoholism who requires premedication, oral buspirone appears to be a safer agent than benzodiazepines because of the absence of CNS depression. Similarly, for a patient identified as a drug abuser or a potential drug abuser, buspirone appears to be preferable because its mechanism of action avoids tolerant benzodiazepine receptors^{17,18}. The advantage of this study was, the same sample had experienced both the drugs and also there was a 3 weeks wash out period before the cross-over.

One limitation of the study was that, there was unequal distribution of participants from the three levels of anxiety. Majority were from mild and moderate group. A further study is recommended, by recruiting equal number of samples in the three anxiety levels (mild, moderate and severe) and checking the efficacy.

CONCLUSION

Within the limitation of the present study, it can be concluded that, buspirone was comparatively more effective in reducing the anxiety as compared to diazepam. The patients were more comfortable with buspirone than diazepam. It can be recommended that one tablet of buspirone can be prescribed for significant reduction in the anxiety level of patients undergoing surgical removal of impacted mandibular third molars.

Conflict of Interest: Nil

Source of Funding: Self

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Post Marital Depression among Women

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ABSTRACT

Marriage, for women in a patriarchal society is an enormous transitional process. Being the centre of attention in her house is not valued much after her marriage and that is what all women can relate to. She juggles with new responsibilities and expectations which is quite overwhelming for her. But with the feelings of worthlessness and feeling trapped and bound in loveless and thankless bond, sets in depression. Depression is a state of mind producing serious, long term lowering of enjoyment of life or inability to visualize a happy future. Therefore, this study aims to find out the level of depression among women in relation to various factors of life which can examine their experience of well-being in their marriage life so far. A self-prepared questionnaire was developed to assess the level of post marital depression among women, the samples were selected randomly from Coimbatore city and the total number of participants were 66 married women. Self-prepared questionnaire on post marital depression was constructed to assess their level of depression. Results revealed that young aged women experienced higher post marital depression due to new family life, high expectations from in law's and husbands and managing home and work and managing children. But the study did not observe any significant difference among working and non-working women's post marital depression.

Keywords: Married women, Post Marital Depression

INTRODUCTION

Nations have perished, and people have lived without going to schools, churches, but rarely without marriage and family. In the complex and fast-moving world of today, where the unexpected has become a part of everyday life, it is a relief for everyone to realise that the family lives provides our needs and comfort as it has been providing for centuries. It is the place where we all get the satisfaction of basic human needs and rights. Hence, even with all the possible shortcomings, we prefer to be in close connection with our family members. And even those people whose home life has had more sadness than happiness often look forward to a happier marriage and family life for themselves and as well as for their children. ^[1]

Marriage is known as a social system through which a man and a woman come closer to and start to live together and bond with each other. Intact and harmonious marital relationships are vital not only for the psychological health of the individual, but also for offspring and thus, for the society in the broader perspective. But unsatisfying and stressful marital relations leads to an increased emotional turbulences and marital disruption. ^[1]

Marriage is simply a promise which involves a lot of affection and obligations for maintaining and balancing peace, harmony, happiness and strong family bonds. The most vital relationship that a man and a woman could share is nothing but marriage. It comprises of emotional and most importantly a legal commitment. Moreover, to choose a partner and to enter into a committed contract is considered to be both matured milestone and also personal success. People get married for various reasons, such as; to love and receive love, to live in peace, to have a company, and the desire to have their own children.”^[2]

Marriage is a socially genuine union between the 2 sexes, that begins with a public announcement and with some ideas of permanence; it is assumed that rights and responsibilities between the spouses and children originates with a strong bond of marriage contract. Marriage is the key to adjust, involve and satisfy one and other in a positive way. Marriage is our most common routine in one's lifetime. ^[3]

Women with nearly over half of the population around the globe, especially in developing countries like India, should pay attention to their mental health and join mental health programs. Women's significant

roles in global development of society, child care, family endorsement and work, their mental health maybe affected by many socio-cultural factors. ^[4]

Women are essential to all facets of society. However, there are multiple roles that they play in society that renders them at a bigger risk of experiencing mental problems than others in the community or society. Women bear the load of many responsibilities which are associated with being a wife, mother and career minders of others and many more. In adding to all of that there are many pressures placed on women, like, they have to bear gender discrimination and the associated factors such as poverty, hunger, malnutrition and overburden of work. An extreme but common expression of gender inequality is in sexual and domestic violence, perpetrated against women. These forms of socio-cultural violence, contribute to the high occurrence of mental problems experienced by any women in the country such as depression. ^[5]

The husband and wife should be able to live together, cooperate with each other, share their feelings, ideas, beliefs and opinions, accommodate each other while adjusting with their flaws and accepting them the way they are for a better and a happy life. As marriage is a very important institute, it helps in solving various problems such as social, traditional, private and sexual issues. ^[6]

Based on this the following objectives were made:

- To assess the post marital depression among women
- To know the influence of age and their work status with post-marital depression.

Hypotheses

- There is no significant difference observed among age and post marital depression
- There is no significant difference observed among work status and post marital depression

MATERIALS AND METHOD

Coimbatore was the area selected for the conduct of the study. A total of 66 married women were selected by convenient sampling method. A self-prepared questionnaire on 'Post marital depression among women' was framed to assess the level of depression among married women. This questionnaire consists of 45 statements which contains positive and negative

statements and can be rated in three-point scale. Higher the score, higher the level of depression. Investigator developed rapport with the selected married women and explained about the purpose of the study and also confirmed that confidentiality of the study would be maintained. The collected information's were analysed and appropriate statistical applications were applied to know the results.

RESULTS AND DISCUSSION

Table 1: The level of Post marital depression among women based on age

Sl. No.	Age	Depression level			
		Low		High	
		N	%	N	%
1	20-40 (33)	11	33.3	22	66.6
2	41-60 (33)	13	39.4	20	60.6

Table-1 predicts the level of post marital depression among women. Among selected samples, majority of young aged women's (66.0%) are suffering from post-marital depression than middle aged women (60.06%).

Table 2: Mean, SD and t-value of Post marital depression among women based on age

Sl. No	Age	N	Mean	SD	t-value
1	20-40	33	129.82	36.007	2.964*
2	41-60	33	109.12	17.681	p=.004

*significant at.05% level

Table-2 shows the mean and SD value of Post marital depression among young aged women were 129.82 and SD 36.00. Where as in case of middle aged, the obtained mean and SD values are 109.12 and SD 17.68 respectively. The calculated t-values of post marital depression among young and middle-aged women is 2.964 with p value.004 which is significant at 0.05% level. From this table we can conclude that young aged married women were experienced higher levels of post-marital depression compared to middle aged married women's. Hence hypothesis 1 could be rejected.

This study is contradictory to the study of Sneh. (2017) in the study of "Marital Adjustment and depression among couples" found out that married women from the middle age group have been experiencing high levels of depression than young age married women.

Table 3: The level of post marital depression among women based on work status

Sl. No.	Work status	Depression level			
		Low		High	
		N	%	N	%
1.	Working (31)	14	45.1	17	54.8
2.	Housewives (35)	10	28.5	25	71.4

Table-3 predicts the level of post marital depression among women based on working and non-working status. Among selected samples, majority of house-wives (71.4%) are suffering from post-marital depression than working women (54.8%).

Table 4: Mean, SD and t test value of Post marital depression among women based on the working status

Sl. No.	Work status	N	Mean	SD	t-value
1.	Working	31	115.45	31.739	-1.024 Ns
2.	Housewives	35	123.03	28.385	p=.313

Ns- Not significant

Table-4 shows the mean and SD value of Post marital depression among working women were 115.45 and SD 31.739. Where as in case of housewives, the obtained mean and SD values are 123.03 and SD 28.385 respectively. The calculated t-values of post marital depression among working women and housewives is -1.024 with p value.313 which is not significant at 0.05% level. From this table we can conclude that housewives were experiencing higher levels of post-marital depression compared to working women's. Hence hypothesis 2 could be accepted.

This study is contradictory to the results of Hina. (2007) in their study "Marital Adjustment, Stress and Depression Among Working and Non-Working Married Women". They examined working and non-working married women (150 total). The results showed that women who were working had to face much more problems in their marital life and suffered from depression at a larger amount than non-working married women.

CONCLUSIONS

Post-marital depression is the common illness affecting married couple with different perspectives and in different socio-demographic factors in India and all over the world.

At the individual and family level, post-marital depression leads poor quality family life, causing problems with marital life. Failure to recognise post-marital depression at an early stage may leads to poor adjustments among couples and leads to mental or emotional illness. It is essential to find out the level of post-marital depression among women and hence the present study focussed to assess the post-marital depression among married women in Coimbatore city. To conclude, one may develop depression due to lack of love and affection with spouse, lack of trust, lack of adjustment with in-laws, lack of entertainment, Lack of companionship, giving more importance to in-laws rather than wife, lack of help by husband in child rearing, lack of income/low income, due to work schedule, less time for couples to be together and male oriented society.

This present study shows that post marital depression is high among young married women hence it is very essential to provide appropriate intervention for the affected young married women for her future health and well-being of family.

Conflicts of Interest:

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Various Techniques Used to Diagnose Psychogenic Non-epileptic Seizures (PNES): A Brief Overview Contributors

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ABSTRACT

Psychogenic non-epileptic seizures (PNES) mimic epilepsy with multiple biopsychosocial etiology without involvement of cortical activity as in epilepsy. Till date professionals are facing problems in its basic categorization which creates a big challenge in its diagnosis. Although video-encephalography is the gold standard for the diagnosis of PNES, but it is restricted due to its cost and availability issues. Therefore, professional use other techniques like semiological details: ictal and post-ictal observation, psychological measure, neuro-physiological measures, induction protocols and bio-chemical markers etc. These techniques or procedures are having their own limitation. This paper will provide a brief overview of possible diagnostic procedure involved in PNES diagnosis.

Keywords: Epilepsy, Psychogenic non-epileptic seizures, Diagnosis, Video-encephalography.

INTRODUCTION

Psychogenic non-epileptic seizures (PNES) are episodes of altered movement, sensation, or experience similar to epilepsy but caused by psychological process with multi facet etiology ^[1]. PNES are such class of pseudo-neurological condition which poses challenge to medical professionals to diagnose it because still PNES is in its infancy stage and requires further elucidation. Further, PNES is classified under dissociation and conversion disorder under ICD-10 and DSM IV respectively ^[1]. However, presently it is classified under somatization disorder under DSM5 criteria ^[2] although debatable.^[3] Further, dissociation and conversion shares much similarity with PNES and it is the major co-morbid condition with PNES which pose difficulty for the professionals to differentiate between

them. Therefore, one peculiarity which differentiates between PNES and dissociation/conversion disorder is that PNES is characterized as sudden intensification of symptoms (paroxysmal) but in somatization/conversion such paroxysmal elements are absent ^[4, 5, 6]. Further, PNES finds home neither in psychology nor in medical setting because none of the wings such as its psychology, neurology or psychiatric claims PNES to be in its realm.^[7] Thus patient pirouette between psychologist, neurologist and psychiatrist which is troublesome for the patients and puts them in unnecessary economic burden, if unknowingly they are exposed to anti-epileptic or anti-convalescent medication.^[8]

Further there is huge population who are suffering from mental disorders and according to one report about 20% ^[9] of adults in India are suffering from psychiatric disorders. Moreover many of them among cases shares co morbidity with PNES. One point should be addressed here that regarding PNES, handful of epidemiological studies has been conducted in India. Therefore the actual epidemiology of this disorder needs elucidation. However, studies conducted in American and European continent reported the prevalence of PNES ranging from 2 to 33% ^[10] in general population and 5 to 20%

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among epileptic population. In epilepsy there is an abnormal discharge in the brain, whereas PNES is caused by emotional turmoil condition.^[3, 11] However some recent studies have come up with the findings of cortical involvement^[12,11, 13] but still this notion is under elucidation process.

Diagnostic proctols used by professionals: It is very difficult to differentiate between epilepsy and PNES because there lies difference only in their degree of occurrence and severity. In addition, the intractable and refractory state of epilepsy has further complicated the issue. Though recent decade has evident the advancement of PNES diagnosis but still the mean latency period is 7.2 years.^[14] Further, it is much prevalent practice regarding PNES diagnosis is that, professional much rely on the exclusion of epilepsy. Thus misdiagnosis is possible because ruling out epilepsy possibility does not mean that a person is suffering from PNES.

At present, the gold standard to evaluate PNES is video-encephalography (V-EEG)^[15] but is too costly with less availability.^[16] Therefore professional depends upon other techniques like semiological details: which includes ictal and post-ictal observation (like respiration pattern, motor movement, body-postures), neurophysiological measures, interactional pattern, psychological measures, various induction/provocation techniques^[17] as well as various chemical bio-markers.^[18] to evaluate PNES patients Following is the brief description of some of the techniques.

With semiological signs: Semiological details are the first hand information which professional attains while diagnosing PNES. It includes ictal and post-ictal signs which are crucial for the professional to make a rough assessment of the patient's condition because epileptic and non-epileptic symptoms are almost close to each other and the difference lies only in the degree of occurrence Commonly while diagnosing PNES from epilepsy a professional ask about the onset of seizure activity, frequency and duration of seizure episodes, information regarding body movement (such as limb, trunk, and pelvic movement), tongue bite position, activity in facial position during the seizure episodes and about eyes opening and closure. Professionals also seek valuable information from patients attendants regarding cognitive make-up like how was the memory of the patient after seizure episode, voice and awareness of the patient during and after seizure episode. In addition,

signs such as injury occurrence, incontinence and respiration pattern are also some important semiological details which are considered by professional while differentiating between epilepsy and PNES^(14, 19, 4)

With psychological investigation: PNES has been explained lucidly by Sigmund Freud. Before Freud, Mandeville, Charcot and Gowers has given their valuable insight to understand its pathphysiology and underlying psychological mechanism. Equivocally, psychological factors are assumed behind causation of PNES. Further, patients who are suffering from PNES experience episodes of severe dissociation thus affecting their thought, feelings, memories, and identity. Also, They are unable to identify^[20] and regulate their emotion^[21] Since, they are unable to recognize and regulate their emotion (majorly negative and painful) which remains suppressed for a long time, where it gets converted into bodily symptoms and manifest in form of seizure^[8]

Majorly psychological factors are assumed behind the cause of PNES and are widely accepted. There is evidence that psychological factors accounts 95% in causing PNES whereas organic factor causing only 5% of the cases.^[22] Most of the PNES patients are reported of being associated with depression, anxiety, mood disorders, factitious, somatoform, personality, and posttraumatictraumatic stress disorder.^[23, 24, 25] Further, ^[26] claimed that dissociation and conversion disorders are found among 90% of the cases suffering from PNES. Therefore, it forms a strong background to see the possibility of psychopathology among PNES patients providing promising platform for professionals to differentiate PNES from epilepsy.

Thus during diagnosing of PNES patients professionals may apply various psychological test to differentiate it from epilepsy because there is high probability that PNES will score more on psychopathological orientation as compared to epilepsy patients.

With Induction/provocation protocol: We have discussed that how psychological measures and semiological details are helpful in diagnosing PNES from epilepsy. Besides, induction or provocation techniques are also being frequently used by professional to differentiate PNES from epilepsy. Induction or provocation protocols are such maneuver of activity which leads to seizure activity if it were of psychogenic in nature, often this procedure is used during V-EEG.

Various induction techniques like compressed temple region (CTR), verbal suggestion (VS), tuning fork application (TFA), moist swab application (MSA), torchlight stimulation (TLS), and intra-venous saline injection (SI) are largely employed. [17, 27] Among these induction techniques SI is being frequently used in which normal saline water is injected and patients is told that this will provoke seizure, if there, with VEEG. These induction techniques are not sole used to diagnose PNES but play a complementary part with other diagnostic procedure to make sure diagnosis. These techniques are easy to administer like in CTR: temple region is gently massaged with suggestion that this activity will bring seizure in the patient, if present. In MSA also temple region is involved. In VS and TLS patients are stimulated through suggestion and torchlight on their eyes respectively. One catch with this protocol is that patient who are fake becomes prey to this procedure and are identified though, these are deliberate effort but are unconscious in nature.

With neuro-physiological measures: Recent and past decade has evidenced some researches that have shifted its orientation from psychoanalytic view to more concrete neurophysiological base. These researches have argued the involvement of cortical abnormality and degeneration in particular brain area responsible for PNES like episodes supporting the physiological causation behind PNES. Number of studies have investigated the organic pathology of PNES and concluded that PNES is caused due to organic brain pathology and dissociation between neural networks. [28, 29, 30] PNES patients have disruption in their thought, memories, feelings, and sense of identity and lack ability channelize their emotion. These all affective function are governed by specific brain areas like somatosensory area, insular area, orbito-frontal area, frontal area, parietal area, and other association which work together and help individuals to deal with the current demand of the situation. [12] Therefore any abnormality/degeneration/atrophy in this area can be potential physiological marker to distinguish between PNES and epilepsy can be used for diagnostic purpose. Further alteration in resting-state network, fronto-parietal network, sensorimotor network and default-mode network have been found more in PNES. Moreover, degeneration in motor, pre-motor, sensorimotor region, sub-cortical region and default-mode network region have been more among PNES patient. Therefore, with the help of neuro-imaging techniques professional can be sure for PNES diagnosis.

With chemical bio-markers: PNES research professional have evidenced chemical bio-markers to differentiate between PNES and epilepsy. Biomarkers like, creatine kinase, neuron-specific enolase (NSE), cortisol, neuropeptides (ghrelin and nesfatin-1) and platelet membrane serotonin transporter have been found in elevated level in epileptic patients as compared to PNES. [19] Besides this serum prolactin (PRL) and cortisol level are also promising biomarkers to diagnose PNES because there is no any evidence of increased cortisol level if seizure was of psychogenic in nature. Thus professional can rely on chemical biomarkers to differentiate PNES from epilepsy and can be subsequently be assessed with other diagnostic procedure.

CONCLUSION

Mainly in diagnosing PNES patients from epileptic patients professional much rely on semiological details and patient's past history of seizures activity to make a rough diagnosis about the type seizure activity. But this is also suspected because semiological details are usually given by the patient of the attendant which can be faulty or full of errors. There is also possibility (especially in case of PNES) that patients may lie in order to be diagnosed as ill because most PNES case are attention seeker. Moreover, the semiological specificity are almost close to each other and is mediated through various factors and can vary from person to person which pose challenge for professionals. Moreover, till now there is no any single equivocally agreed semiological etiology which is widely accepted. However, diagnosing the type of seizure activity vary from professional to professional (due to experience). Thus on the basis of semiological history and diagnosing seizure activity (labeling as PNES) can be skeptical and need further investigation though, it gives valuable information and is promising.

One noted problem with PNES patient is that they are first usually seen by the neurologist because medicine or general physicians consider it being as neurological case. Normally the PNES cases are having epileptic manifestation but underlying pathology is psychological (which is not dealt by neurologist). Thus neurologist misses psychological aspects and sometimes the patient is put on anti-epileptic drugs. Which creates unnecessary problem and medication cost for patients. Second, if diagnosed for PNES where condition of the patient is so pronounced and obvious close to neurotic behavior,

patient is referred to psychiatric ward. In Indian settings it is thought to be as taboo to go to psychiatric ward and sometimes patients denies consulting (even attendants, if case is female) which worsen the situation more. There in psychiatric ward patients are put on medication which is good because in number of cases depression, anxiety, mood disorders, personality disorders or PTSD are comorbid condition and help a lot in managing the patient. But the thing which is left that they are not psychologically treated and therapeutic intervention merely applied to most cases. It is very much important to give psychological intervention and therapy because patients have to get rid of his/her faulty processing and have to develop insight into his/her problem which is only provided by clinical psychologist. In addition, people are less aware about the role of psychologist in Indian setting. Also, the cost and time for psychological intervention is more costly and patient is not having patience to deal with it especially among middle income group (observed in hospital by researcher).

Further, in diagnosing PNES patients the role of neuro-physiological measure is limited because the role of cortical degeneration and alteration of circuits in specific areas of brain is evidenced only in present and previous decades. Therefore its use is limited and in India we are lacking the required infrastructure and technology to put it on public platform. Moreover again the financial position of patients limits him/her to go through such costly procedure. The induction and provocative techniques to distinguish between epilepsy and PNES are mainly used in combination of other techniques to help in clearing the diagnosis. However chemical biomarkers also provides a conclusive help but it has certain limitation because the electrolytes or markers like PRL or cortisol should be measured in particular time after seizure activity then only it is useful to distinguish between PNES and epilepsy.

Thus we can conclude that all the diagnostic procedure are more or less helpful to diagnose PNES but none of them claims hundred percent proficient, though when used complementarily to each other provides definite diagnosis.

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A Study on Problems and Difficulties in Implementing Knowledge Management Practices in Education Sector

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ABSTRACT

Nowadays managing knowledge has become challenging task for management. The main objective of this research is to study the problems and difficulties in implementing knowledge management practices in private engineering colleges in and around Chennai. Although, knowledge management has been widely discussed by many academics and practisurs, there is relatively little information only available on problems and difficulties faced by management in implementing knowledge management practices. The paper aimed at examining the problems and difficulties in implementing knowledge management practices related to demographical characters of employees in education sector. In this study questionnaire were issued out conveniently to professors in private engineering colleges in and around Chennai. Out of 150 copies of questionnaire administered, 132 were collected and analyzed. SPSS software was used to analyze and interpret the questionnaire. Weighted average and ANOVA are used to prove and disapprove the hypothesis.

Keywords: *knowledge management practices, Education sector, Problems and difficulties, Demographical characters.*

INTRODUCTION

Globalization has become the contemporary element of today's business environment. This globalization has given rise to other elements like intense competition, changing organizational structures, technical improvements in information technology and rise in knowledge management. Among them knowledge management has started to play a vital role in business organizations. Knowledge management has given new insights and understandings to complex mechanisms which governs organization's effectiveness. This contemporary concept has its own history that can be traced from mid's 1975 onwards. Management thinkers like Peter Drucker, Peter Senge, and Paul Strassman from United States are said to be the major contributors to knowledge management. Proceeding on to late 1970's the contributed knowledge management was understood and diffused within the organizations. During the 1980's the knowledge management was treated as comparative asset which was utilized to make strategies and methods in business organizations. It also entered into new usage in conferences, books, journals etc. Further in this period knowledge management also saw the development of systems and also had other developments like

knowledge acquisition, knowledge engineering, and knowledge based systems etc. In 1990's several U.S., European, and Japanese firms started to institute for in-house knowledge management programs.

By the mid-1990's Programs on knowledge management was growing and this happened via the internet technology. Along with these other programs like conferences, seminars also grew and organizations started to focus on knowledge based resources. At present this concept of knowledge management has been utilized by the organizations in order to achieve competitive advantage. As knowledge management has started to gain importance in recent day's contributors like wiig(2000) has emphasized that knowledge based assets are vital for viability and success at any level. The commonly quoted definition for knowledge management is "identify, capture, structure, value, leverage, and share an organization's intellectual assets to enhance its performance and competitiveness".

In today's competitive business environment, most educational institutions including self-financing engineering colleges are struggling to meet the increasing demands put upon them by their customers, competitors,

sustain a competitive advantage that will exceed the current and future demands placed upon them. So it is important to create an appropriate KM Practices. KM is not a single program or series of programs or projects, but the synthesis of core business processes that should permeate every aspect of an institution. But implementing a new practices has lots of difficulties due to lack of interest of employees, risk averting nature of employees, facilities provided by top management etc.

REVIEW OF LITERATURE

According to **Maryam Alavi et AL. (1999)**⁴ in their article “Knowledge Management Systems: Issues, Challenges and Benefits” organizational culture influences the knowledge management system relatively higher than the organizational structure. They concluded that knowledge users must be involved in not only design part and compulsorily in maintenance part of knowledge management system which will improve the success of knowledge management system. They suggested that to find the difficulties in knowledge management system it is better to ask about the stifling point where they are not coping with the situation. They revealed that the relationship and care with external factors avoids the difficulties in implementing knowledge management systems.

J. Gretchen Smith et al. (2008)¹ in their study “Knowledge Management Practices and Challenges in International Networked NGOs: The case of one world international” said that managerial control on style and remuneration for knowledge management system, resources and environmental factors related to its culture act as a major challenges to implement knowledge management systems.

According to **Dr. M. Subba Rao (2012)**⁵, in his article “knowledge management: Some Issues and Challenges for corporate Excellence in the 21st century”, understanding of core competencies and its values for their customers is very important for corporate house. He identified that the key challenges for knowledge

management as 1) to make changes in the methods of attracting customers according to internet and E-commerce.2) to transform its processes according to information technology.3) to transfigure the mindset of employees to adopt the knowledge in the organization.

Manzoor Hashmani et AL. (2016)³ in their conference paper “Challenges and benefits of implementing KMS in an IT based company – Case study of Limton Innovative Systems” stated that the following are the some issues faced by the IT Company named Limton Innovative Systems. Information is available freely from many ways which may not be systematic. There is no specific operating procedure which leads to information may not be authenticated. Unclassified data are hard to search and retrieve. Getting approval to retrieve and verify the imperative knowledge should be provisioned in the software. Less attention is paid on employees’ motivation. The open access control which is followed by the company is major threat. Data duplication is another most issue in IT industry.

OBJECTIVE OF THE STUDY

To explore the problems and difficulties in implementing KM practices with relation to demographical characters of employees.

Hypothesis

H0: There is no significant relationship between demographic characters and difficulties in implementing KM practices.

H1: There is significant relationship between demographic characters and difficulties in implementing KM practices.

DATA ANALYSIS AND INTERPRETATION

Primary data for this study has been collected from assistant and associate professors and professors in engineering colleges in and around Chennai city.

Table 1: Problems and Difficulties in Implementing Knowledge Management Practices

S. No.	Criteria	S.A.	A	N	D.A	S.D.A	Weighted Average	Rank
1.	Resistance from the professors	10(50)	20(80)	12(36)	64(128)	26(26)	320	9
2.	Confrontation to take risks	51(255)	57(228)	6(18)	14(28)	4(4)	533	6
3.	Lack of confidence on professors	53(265)	58(232)	6(18)	12(24)	3(3)	542	4

Conted...

4.	Lack of readiness of professors to accept change	44(220)	72(288)	-	16(32)	-	540	5
5.	Absence of proper Performance appraisal System	3(15)	59(236)	18(54)	50(100)	2(2)	407	8
6.	Inappropriate/poor training methods	63(315)	51(204)	8(24)	10(2)	-	545	3
7.	Magnitude of employees	1(5)	3(12)	14(42)	66(132)	48(48)	239	10
8.	Stereotyped performance in the departments	36(180)	76(304)	7(21)	11(22)	2(2)	529	7
9.	Lack of administrative support	48(240)	75(370)	4(12)	3(6)	2(2)	630	1
10.	Lack of transparency	65(325)	53(212)	11(33)	2(4)	1(1)	575	2

Source: Primary Data.

From the above table 1 it has been inferred that Lack of administrative support has scored 630 as weighted average and it has been ranked as the first and foremost difficulty or problem and Lack of Transparency has scored 575 as weighted average and it has been ranked as the second difficulty or problem faced by employees for implementing knowledge management practices in education sector. Resistance from professors and magnitude of employees have been ranked in ninth and tenth position.

FINDINGS

- 43.2% of respondents were from the age group between 30 and 40 and 40.9% of respondents were between 40 and 50 of age group and 12.9% of respondents were from the age between 20 and 30 and 3% of respondents were above 50 age group.
- 64.4% of respondents were male and 35.6% of respondents were female.
- 80.3% of respondents were married and 17.4% of respondents were unmarried and 2.3% of respondents were divorced or widowed.
- 72% of respondents were having P.G. qualification and 23.5% of respondents were having Ph.D., qualification and 3.8% of respondents were having only U.G. qualification.
- 36.4% of respondents were having more than 10 years of experience and 32.6% of respondents were between 6 and 10 years of experience and 17.4% of respondents were having 3 to 6 years of experience and 13.6% of respondents were having below three years of experience.

- 40.2% of respondents were from the income group between 20001 and 30000 and 30.3% of respondents were between of 10000 and 20000 income group and 16.7% of respondents were from the income group between 30001 and 40000 and 12.9% of respondents were under the above 40001 income group.

SUGGESTIONS

- Without administrative support nothing is possible hence organization must understand the importance of knowledge management and should encourage its employees to adopt knowledge management practices.
- Openness will lead to interest among employees. Hence empowerment will be helpful for implementing knowledge management practices.
- Proper training should be given to proper employees at an appropriate time.
- Professors should show their willingness and involvement towards organizations and management should consider involvement of its employees.
- Proper training and explanation about the change should be given to employees to attract them for new implementation.
- Management can give appropriate remuneration to induce risk averters.
- Proper leadership control will eliminate stereotyped performance in the departments. Some employees are not satisfied with existing performance appraisal system. Performance about the employees can be discussed with particular employee confidentially.

- Management should convince their employees by demonstrating about importance of KM practices and its benefits for employees.
- Team work will be helpful for any new implementation.

Table 2: Over All Relationship Between Demographic Characters and Problems and Difficulties in Implementing Knowledge Management Practices

Hypothesis: There is no significant relationship between demographic characters and difficulties in implementing KM practices.

One way

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.	Result
Age	Between Groups	4.785	12	.399	.710	.740	N.S.
	Within Groups	66.874	119	.562			
	Total	71.659	131				
Marital status	Between Groups	2.609	12	.217	.994	.459	N.S.
	Within Groups	26.020	119	.219			
	Total	28.629	131				
Qualification	Between Groups	2.223	12	.185	.692	.756	N.S.
	Within Groups	31.838	119	.268			
	Total	34.061	131				
Experience	Between Groups	10.673	12	.889	.805	.644	N.S.
	Within Groups	131.410	119	1.104			
	Total	142.083	131				
Income	Between Groups	13.142	12	1.095	1.134	.339	N.S.
	Within Groups	114.918	119	.966			
	Total	128.061	131				

From the above table 2 significant level of age is 0.740 which is greater than 0.05 and significant level of marital status is 0.459 which is greater than 0.05 and significant level of qualification is 0.756 which is greater than 0.05 and significant level of experience is 0.644 which is greater than 0.05 and significant level of income is 0.339 which is greater than 0.05. Hence Null hypothesis is accepted.

Result: Hence there is no significant relationship between demographic characters except gender and difficulties in implementing KM practices.

Table 3: Relationship between Gender and Problems and Difficulties in Implementing Knowledge Management Practices

T-Test

One-Sample Test

	Test Value = 2					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Gender	21.968	131	.000	2.038	1.85	2.22

From the above table 3 significant levels is .000 which is less than 0.05. Hence null hypothesis rejected.

Result: There is no significant relationship between gender and problems and difficulties in implementing knowledge management practices.

CONCLUSIONS

A drastic boom in education section sector needs proper acquisition, storage and dissemination of knowledge to serve not only that industry also the country. Identifying and overcoming the difficulties and problems faced by the professors will help the organizations to develop themselves and also employees which will lead to proper implementation of knowledge management practices. Various criteria were given to professors to identify their difficulties on implementing knowledge management practices in which lack of administrative support plays the major role. Hence researcher concluded that support from management will convince the professors for implementing knowledge management practices.

Ethical Clearance: Completed

Source of Funding: Self

Conflict of Interest: Nil

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A Comprehensive Study on Novel Hybrid Approach for Decision Support System in Disease Diagnosis

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ABSTRACT

Large quantity of Data Mining techniques have been anticipated through many authors but they are not able to provide better classification. Therefore modifications in the machine learning techniques were made many people in the past which received extraordinary interest in the healthcare sector. Therefore, various combinations of classification techniques, called Hybrid algorithms, were made and achieved a high classification accuracy by the fusion of algorithms and also by the removal of inappropriate attributes. Thus many best hybrid classifiers were made which attracted the attention of many scientists. Even though a good number of hybrid algorithms have been proposed, the hybrid approach given by Sharmila and Vedha Manickam(2016) achieved the highest, 100% accuracy using MRK-SVM hybrid in classifying diabetic dataset. Guvenir and Emeksiz (1998) showed the second level of classification accuracy with 99.25%, using voting feature intervals-5, Nearest Neighbor and Naïve Bayes, during the analysis of erythematous-squamous diseases. Dinesh K.Sharma (2016) also obtained 99.25 % of classification accuracy by using Artificial Neural Network) with Support Vector Machine.

Keywords: Healthcare analytics, Data mining, Hybrid algorithm, Disease Diagnosis, Classification, Attribute selection.

INTRODUCTION

Use of computers has generated a huge amount of data in various areas. In health care industry, industry, substantial measure of complex information, identified with the clinical reports, specialist's notes, treatment report, healing facility asset administration records, electronic patient records, drug and wearable body sensors, are being produced. The investigation of medicinal services parameters and the expectation of the resulting future wellbeing conditions are still in the newborn child organize(Sahoo et al. 2017)¹. This expansion in volume and imprudent association of information, requires manners by which information can be separated and prepared effectively. Extraction of information from Big data has turned into a challenging tasks due to the essentially complex and divided information (Gagan kumar and Rohit Kalra, 2016)². Machine learning techniques form a novel approach to improve their performance through the use of software. These methods have been successfully implemented in various sectors like finance, health care etc. in addition to classification of various diseases in the past (Madhura Rambhajan et al. 2015)³.

Diagnosis of life-threatening diseases is a very crucial task in medical treatments. One of the application region of analyzing database and disease findings is the computerized indicative framework to help specialists in settling on precise symptomatic choice for which there is a need to consolidate unmistakable procedures to play out a superior classification⁴.

Hybrid Algorithm: Jen et al.(2012) are of the view that all the active traditional Data Mining techniques are not able to execute enhanced analytics in classifying healthcare big data⁴. Since some properties required are not present in a single method, Hybrid Technique is introduced to obtain desired output in classification. In Hybrid algorithm, two prevailing computational insight systems are intergrated adequately to expand into a good classifier enabled by feature selection. The fused hybrid approach carry out both feature selection and data classification ⁵. Tan et al. (2009) have depicted that the work process of the cross breed demonstrate contains two principle stages. These wellness esteems are then utilized in the choice of the best arrangement of qualities. After the determination of best arrangement of characteristics, information order is finished utilizing best classifier⁶.

Feature Selection: Data pre-processing is a vast advance in the knowledge disclosure process amid information mining, since quality choices depends just on quality information. Subsequently information decrease is connected before mining, which can significantly enhance the general nature of the learning disclosure and quality choices. Mining on the lessened arrangement of characteristics has extra advantages by which it improves the characterization precision and decreases the machine getting the hang of running time^{7,8}. Right now, there are three techniques for highlight choice. The primary technique, Filter approach, goes before the genuine arrangement process which is autonomous of the learning calculation. It is computationally basic, quick and versatile. Utilizing channel strategy, include determination is done and afterward the chosen properties are given as contribution to various classifiers⁹. The second one is the Wrapper technique which displays preferable execution over channel strategies in light of the fact that the element choice process is upgraded for the grouping calculation to be utilized. Be that as it may, wrapper strategies are excessively costly for extensive dimensional database regarding computational unpredictability and time^{10,11,12}. As of late, a third technique, Embedded strategy has been recommended that endeavour to join the upsides of both past strategies.

Hybrid approach: In the recent past, many workers have embraced hybrid approach utilizing different combinations of algorithms and techniques. Many biomedical learning administration, information mining and text mining frameworks receive such a mixture approach. One such prominent methodology is the combination of PSO optimization approach with SVM. It performs improvement first on list of capabilities and afterward classifier SVM is connected to arrange data¹³. In another model, KNN is melded with fluffy rationale to diminish calculation time¹⁴. Wan et al.(2012) have incorporated K-Nearest Neighbor (KNN) characterization approach with the SVM. This Nearest Neighbor-Support Vector Machine arrangement approach is instituted as half and half SVM-NN¹⁵. The new hybrid approach, K-SVM achieved the objective of diminishing the size of preparing set and consequently decreasing the preparation and foreseeing time (Yukai Yao et al.)¹⁶. Ahmad Kazem et al. have executed another novel hybrid approach show utilizing disorderly firefly calculation for securities exchange value anticipating¹⁷.

Sharmila and Vedha Manickam(2016) have proposed a hybrid model for big data analysis using the classification techniques and clustering to work on Hadoop platform. This hybrid model efficiently predicts the diabetic patients who are having the risk of Cardio Vascular Disease, Nephropathy, or Retinopathy. This prediction enables the patients for the early treatment¹⁸.

Many systems have been worked to consolidate diverse ways to deal with shape Hybrid strategies. For instance, Mendes et al., (2001) have used fuzzy logic to lead enlistment and hereditary calculations¹⁹. Genetic algorithms have been combined with neural network by Chen and Kim(1994)²⁰. Jerez-Aragones et al.,(2003) combined neural network and decision trees model for prognosis of breast cancer relapse²¹. Sahan et al. (2007) have applied a new hybrid method based on fuzzy-artificial immune system and K-NN algorithm for breast cancer diagnosis²².

Review on Efficiency of Hybrid Algorithms: In the recent past, heap of works on hybrid algorithms are printed. The comprehensive survey on the potentiality of various hybrid algorithms in the form of percentage of accuracy, has been created. Ubeyli (2009) have used a hybrid technique in that they have combined multiclass SVM with error correcting output code (ECOC) for the identification of erythemato squamous diseases. This model has achieved classification accuracy of 98.32%²³.

Alaa M. Elsayad (2010) has developed AN ensemble model by combining 3 techniques C5.0, Multilayer perceptron, Linear Discriminant Analysis and achieved 98.23% of accuracy at testing stage²⁵. Xie et.al (2011) have rumored a hybrid technique of Support Vector Machine and f score in ordered forward rummage around for medical specialty dataset. During this the initial F-score may be a easy filter technique. With this model they have achieved ninety eight.61% of classification accuracy mistreatment twenty one options²⁶. Akin Qzcift et al., (2013) have planned a hybrid technique of genetic algorithmic rule wrapped theorem network Feature choice for Erythemato squamous dataset in that they have achieved 99.20% of classification accuracy²⁷.

Mohammad Javed Abdi et.al (2013) have proposed a hybrid method based on particle swarm optimization. The PSO optimization technique blended with SVM to carry out optimization first on feature set and then the

classifier SVM is carried out to separate records. They have additionally proposed an stepped forward hybrid approach based totally on particle swarm optimization, guide vector gadget and association guidelines and acquired ninety eight.91% of class accuracy²⁸. Karbatak and Inee (2009) have proposed a hybrid model of affiliation policies (AR) and Neural community(NN) for the classification of dermatology illnesses and received 98.sixty one% of class accuracy.

However, Dinesh K.Sharma have used artificial neural community with support vector machine and acquired 99.25 % of class accuracy²⁹.Polat and Gunes (2009) have used C4.5 approach and one in opposition to all, and acquired ninety six.71% of accuracy³⁰. Guvenir et.al[1998] have proposed VFI5 for the differential prognosis of erythemato squamous and has acquired 96.25% of type accuracy³¹. Nanni (2006)³² and, Xie and Wang (2011)³³ both used SVM and characteristic selection strategies. The proposed method accomplished ninety eight.61% classification accuracy. Among all, Guvenir and Emeksiz (2000) had the very best classification accuracy, ninety nine.25%, at the differential diagnosis of erythemato-squamous illnesses the usage of vote casting characteristic intervals-5, Nearest neighbor and Naïve Bayes³⁴.

Ubeyli (2008) proposed an automatic analysis device, for detecting breast most cancers based on association rules (AR) and Neural network (NN), in which AR is used for lowering the dimension of breast most cancers database and NN is used for clever type. within the proposed AR + NN gadget, the type accuracy charge is 95 %³⁵.

In a observe, Kemal Polat ,SalihGunes (2009) have proposed a unique hybrid category gadget primarily based on C4.five decision tree classifier and one-in opposition to-all approach to categorise the multi-magnificence troubles which include dermatology, picture segmentation, and lymphography datasets taken from gadget studying database. in this work, first of all C4.5 choice tree was run in three instructions of datasets and accomplished 84.forty eight%, 88.79%, and eighty.11% class accuracies for dermatology, photograph segmentation, and lymphography datasets respectively³⁶.

Xie et.al (2011) have developed a analysis version based on guide vector machines (SVM) with a novel hybrid feature selection method to diagnose erythemato-

squamous diseases. The experimental consequences display that the proposed SVM-based totally model with IFSFS achieves ninety eight.61% class accuracy the use of 21 capabilities³³. as a consequence, from the above account, it is clean that the hybrid algorithm executed well and carried out a maximum classification accuracy of 99.25 %.

DISCUSSION

Extraction of beneficial statistics from large data is possible by using the technique of records mining thru gadget gaining knowledge of techniques. Inside the latest beyond, modification in conventional machine studying procedures has earned brilliant interest in healthcare area. To boom classifier accuracy, unique combination of fusion techniques are employed. within the latest beyond, many researchers have adopted specific hybrid tactics using different mixtures of algorithms and techniques in which powerful computational intelligence strategies are mixed to develop an excellent classifier empowered by feature choice²⁹. Ubeyli (2008) have used a hybrid method in which they've mixed multiclass SVM with blunders correcting output code (ECOC) for the analysis of Erythemato squamous sicknesses³⁵. KNN is fused with fuzzy logic to decrease computation time. For detection of Parkinsons sickness, fuzzy approaches had been fused with okay-Nearest Neighbour for better category¹⁵. Similarly Genetic algorithms (fuel) and aid vector machines (SVMs) are integrated successfully by Tan et al. (2009) based on a wrapper method. The effects justify the upgrades inside the type accuracy and exhibit its potential to be an excellent classifier for future records mining purposes⁷. The usage of MRK-SVM algorithm, Sharmila and Vetha manickam (2016) completed the velocity of the processing time²⁷.

Asha Gowda Karegowda et.al, (2010) have verified that characteristic subset selection is of tremendous significance in the discipline of information mining. real lifestyles facts sets are frequently noisy, making the subsequent facts mining technique difficult, however mining at the reduced set of attributes reduces computation time and category accuracy³⁷.

Sahoo et al. (2016) are of the opinion that Cloud-enabled large information analytic platform is the nice way to analyze the dependent and unstructured statistics generated from healthcare management structures. it's far determined that this protocol might be used for

diverse applications related to healthcare and patient tracking along with coronary heart disorder prediction or most cancers severity classification¹.

CONCLUSIONS

From the above survey it is concluded that the removal of redundant attributes from the data using the hybrid improves the quality of the data sets and enable a better classification of reduced feature data. From the above survey it is concluded that the proposed hybrid models are able to produce a high classification accuracy due to the removal of redundant attributes from the data and fusion of algorithms. The analysis of the above survey also indicates the viability of the hybrid as a good classifier. Among the various hybrid algorithms put forwarded, the hybrid model given by Sharmila and Vedha Manickam(2016) achieved the highest 100% accuracy using MRK-SVM hybrid in classifying diabetic dataset.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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Management of Calcific Metamorphosis with Minimally Invasive Porcelain Veneers—A Case Report

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ABSTRACT

The management of traumatized permanent teeth can present as a significant challenge to the dental practitioner. Calcific metamorphosis occurs commonly in young adults as an end result of trauma. It is usually evident in the anterior region of the mouth and can partially or totally obliterate the pulp space radiographically. Most of the studies and case reports suggest that endodontic therapy is not intervened unless a periapical pathology is detected and/or when the concerned tooth becomes symptomatic. This case report presents the anterior teeth with calcific metamorphosis treated with porcelain veneers.

Keywords: Dental trauma, discoloration, calcific metamorphosis, porcelain veneers.

INTRODUCTION

Calcific Metamorphosis according to American Association of Endodontists is termed as “A pulpal response to trauma characterized by rapid deposition of hard tissue within the canal space.”¹ However, the definition of Calcific Metamorphosis (CM) has been varied among various authors. It can also be mentioned as Canal Obliteration, Dystrophic Calcification, Diffuse Calcification and Calcific Degeneration.²

Some have proposed it to be response of pulp to trauma which is detected with hard tissue deposition within the root canal space.³ Although the exact mechanism of CM remains unclear, but damage to the neurovascular supply of the pulp has been considered to

be the reason for the same.⁴ The diagnosis and treatment modalities for teeth with CM are always considered as a controversial issue.⁵ This case report describes management of calcific metamorphosis with minimally invasive porcelain veneers.



Figure 1: Discoloured 11,21

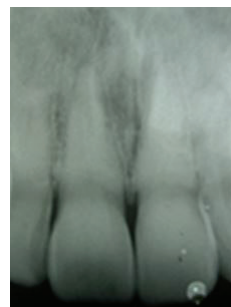


Figure 2: IOPA of 11,21 showing calcified canals

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CASE REPORT

A 28-year-old male patient reported to the department of conservative dentistry and endodontics with a chief complaint of discolored front teeth and compromising esthetics [Figure 1]. After taking an elaborate history which revealed that the patient had a trauma to the permanent teeth when he was 18-years-old. Clinical intraoral examination revealed discolored upper central incisors. There was no tenderness on percussion. Pulp sensibility tests were performed on 11 and 21. Negative response was reported for thermal and electric pulp testing indicating the non-vital status of the pulp. The intra oral periapical radiographic examination showed calcified canal with respect to 11 and 21 and no abnormality of the hard tissue at the periapical area [Figure 2]. Diagnosis was made as Calcific Metamorphosis with respect to 11 and 21. Treatment was planned after taking various factors into account such as preservation of tooth structure, esthetics, occlusion, and economic status of the patient.



Figure 3: Veneer preparation 11, 21



Figure 4: Cemented veneers on 11 and 21

During the initial appointment, thorough oral prophylaxis was done. Veneer Preparation was carried out. Deep chamfer finish lines were given using SC850-018, super-coarse, round end taper diamond point

(IQ Dental Supply Inc.). Finish lines were kept at the equigingival level and incisal overlap preparation was done. [Figure 3]. Tooth reduction was done for about 1 mm all around to accommodate ceramic material. Impressions were made using vinyl polysiloxane impression material (Dentsply Caulk, USA). Veneers were prepared using pressable all ceramic material (Cergo Kiss, Dentsply, India). Teeth were polished with pumice and cleaned thoroughly to remove debris, if any. Veneers were checked for occlusion and cemented with resin cement Rely XTM Veneer cement (3M ESPE, Puerto Rico). Crown margins were polished with ceramic polishing kit (Shofu, Inc., Japan). Six months follow-up showed the crown margins are in satisfactory condition [Figure 4].

DISCUSSION

The end result of the trauma to the primary or permanent teeth results in two common variants of pulpal pathologies which are either calcific metamorphosis or internal resorption. Calcific metamorphosis begins by the activation of odontoblasts. Internal resorption occurs by the excitation of odontoclasts. If the continuous activation of odontoblasts and odontoclasts progresses, the resultant events worsens the situation. In this particular the reversal of the condition took place. The reason for this scenario, may be due to the existence of mother cells for odontoblasts and odontoclasts from the same undifferentiated mesenchymal stock, the odontoblasts idiopathically develop into odontoclasts. Another practical reason for this situation to take place is that eventually to the first phase of trauma exposure that caused calcific metamorphosis, the patient may have undergone another round of trauma which could bring about the excitation of the odontoclastic activity. As the presence of periapical pathologies were not seen radiographically and the patient rendered totally asymptomatic, thus endodontic intervention was not attempted. The patient was kept on observation and ceramic veneers were planned.

The most important factor in the procedure of ceramic veneer in the initial evaluation treatment phase, should involve radiographic and clinical examination, with the purpose of discernment and discovering all the practical etiological factors associated that provoked the darkening of the teeth.⁶ When the clinician comes across darkened tooth, at first an IOPAR is recommended to check for the periapical status and any possible signs of resorption process. In this particular case, the history of traumatic exposure in adolescent was a vital tool of

information for the diagnosis and treatment planning. The tooth involved following trauma was totally asymptomatic, however, severe changes in the esthetic appearance occurred resulting in discolored tooth. In a study conducted by Oginni-e- Adekoya-Sofowora et al. (2009), it was found that the teeth involved in trauma, resulted in severe color alteration, usually presented with yellowish discoloration of teeth.⁷

Teeth affected with trauma may demonstrate the periapical changes on radiograph after many years of impact. With regard to this case report, one year follow-up showed signs of complete radiographic obliteration with no changes in the periax and no painful symptoms. Taking these conditions into account, the involved tooth was not attempted for endodontic therapy due to the complete canal obliteration and the follow-up visits did not result in aggression of the existing problem.⁸

McCabe and Dummer (2012) declared in their study that majority of the teeth (75%) affected with pulp canal obliteration usually remain symptomless and no treatment should be instituted other than monitoring it radiographically. Besides once the endodontic situation is resolved, the esthetic management plays an important role because the yellowing of tooth causes great discomfort for many patients.⁹

Various studies conducted suggested that the treatment administered does not bring about any changes in the properties of the tooth, like morphology, roughness and wear resistance and micro-hardness.^{9,10,11} In the clinical case reported, after detailed examination and radiographic modulation, the associated ceramic veneer procedure was done for the treatment of the discolored tooth with calcific metamorphosis. This treatment was rendered effective and met the expectations of both the patient and professionals. The consent was taken from the patient to perform the required procedure and the prognosis of treatment was also informed to the patient. The patient was recalled on periodic follow-ups for clinical and radiographic monitoring, in order to maintain the periapical health, due to the high incidence of recurrence of periapical lesion.

CONCLUSION

Calcific metamorphosis poses a great challenge to the dentist. Diagnosis and treatment planning for the calcific metamorphosis should be done with precise skill and intervention for successful outcome. This case report suggests that teeth with calcific metamorphosis can be treated without the intervention of endodontic

therapy when periapical pathosis are not present with conservative mode of treatment with ceramic veneers.

Ethical Clearance: Taken from Institutional Ethics committee

Source of Funding: Self

Conflict of Interest: NIL

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Performance of Indian Agricultural Export-An Analysis

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ABSTRACT

The present analytical paper has been written for the awareness on Indian agricultural export and its impact on the GDP growth during the present decade. The authors have identified the volatility during the period of the Indian economy to restore the sustainable portions to be filled by the Indian agricultural export. Neither the national income is highly depended on the service sector or industrial sector. But the agricultural sector is not in a position to restore the 1950-55 situations. The agricultural and extension activities will develop based on human resources and technology, that resources are not utilized properly for the benefit of the people and nations development. The directorate and secretariat for the Department of Agriculture is unable to provide and facilitate the farmers by means of finance, equipments, pesticides, fertilizers, and agro based consultancies to develop the agriculture. The rural and villagers are hesitated to live there duo to poor agricultural employment and income, hence the migration of the people from rural to semi-urban or urban or city are taking place; the generation gap and understanding of the people on the agricultural is merely lower level and otherwise it is depressed job by community and their cost of living. Most of the employees are simply sitting and monthly getting concepts; there is no target of the agricultural process when compared to the other well developed nations. The government data are not updated up to date in its website, due to lack of managerial abilities. Most of the data are hooked up and manipulated to show better through the concern department ministry and officials. Hence, the academicians and scientists are unable to do their research on the agricultural sector. This circumstances are have been prevailing for the past two decades of our Indian economy. Now the politics is renamed as “politico-business” Purchase of Legislative Individuals to Inward Corruption. This is mainly because of the political parties election strategic process, consumption of time to procuring vote, waste of money spent for political agitation activities for the for and against of the ruling parties of state and central. These are done more than the agricultural cultivation process; waste of time and money for the legal formalities to complete the case on willful defaulters regarding misusing government money; and most of the industries are enrooted under corruptions linked with higher officials and politicians. These are the major hindrances of Indian agricultural export is unable to move further after the 70s to 80s. The present paper will implicate the policy makers to what they need to go for the further updating the right data sources to the outside the world.

Keywords: Performance; Indian Agriculture Export

INTRODUCTION

Any country's economy, agriculture is considered as backbone. All segments of the society in India are expected the agro food, but now a days the situation is quietly changed into adulteration on agro food due to higher demand of the particular grains/oils/cereals. The marketing system of agricultural products in India is done by both the private and the Government Public Distribution System (PDS). The government has been procuring the agricultural produces from the farmers

through Food Corporation of India (FCI) and the States Civil Supplies Corporations (TNCSC). Most of the States in India, the PDS is done by civil supplies, cooperatives and Self-Help Groups (SHG). The demand of agricultural products of the nation is identified through several organization including organized and unorganized markets, committees and boards are working in zonal, regional and district levels. The growth of agricultural products in India is unsatisfying the demands of population and also the reduction of cultivatable lands into other industrial sectors of the economy is the

another cause of reducing the agricultural productions. As on March 21, 2017 India has 7.68 per cent of entire global agricultural production. GDP of Industry sector is \$495.62 billion and world rank is 12. In Services sector, India world rank is 11 and GDP is \$1185.79 billion. Contribution of Agriculture sector in Indian economy is much higher than world's average (6.1%).

The Indian Gross Value Added (GVA) of Agriculture and allied sector is 23.82 lakh crore INR and its share is only 17.32 per cent. The following figures are portrays Indian economy at present conditions, the GVA growth, GDP sector of economy, agriculture portions on basic value of GVA and GDP growth since 1950.

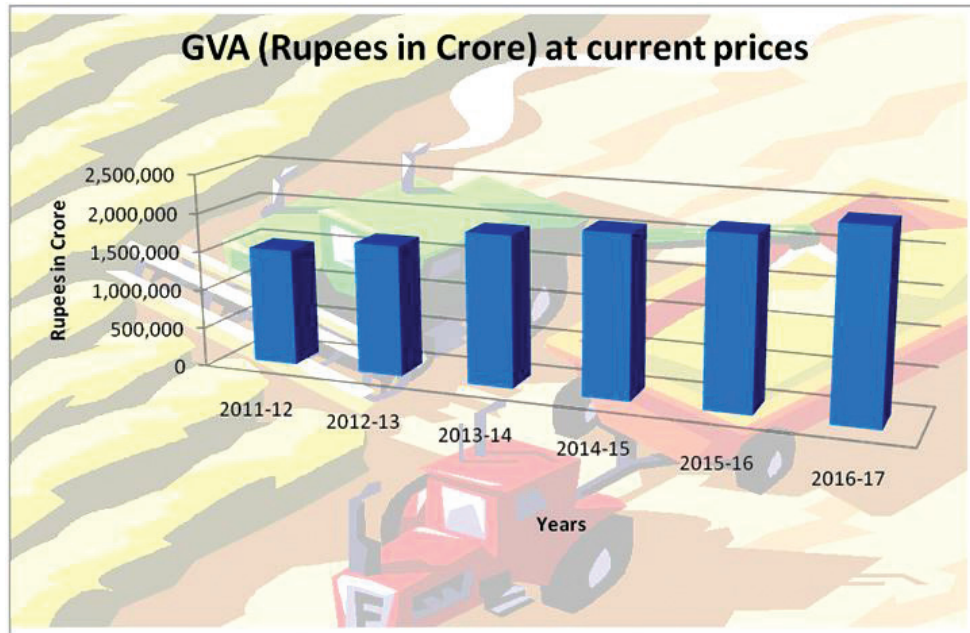


Fig. 1: Agricultural Sector Growth in India

Source: Planning Commission, Government of India (2017)

(Gross Value Added)

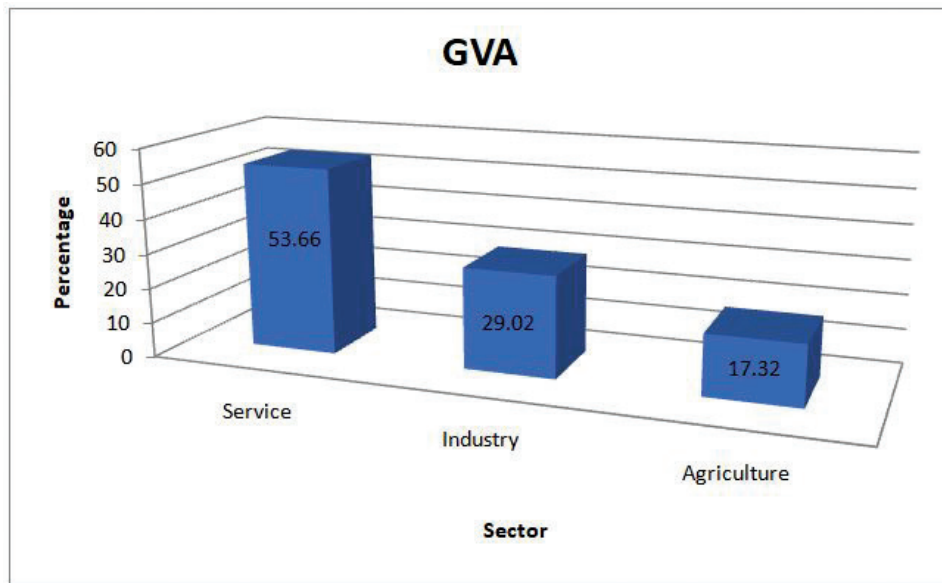


Fig. 2: Indian Economy 2017

Source: Planning Commission, Government of India (2017)

(Gross Value Added)

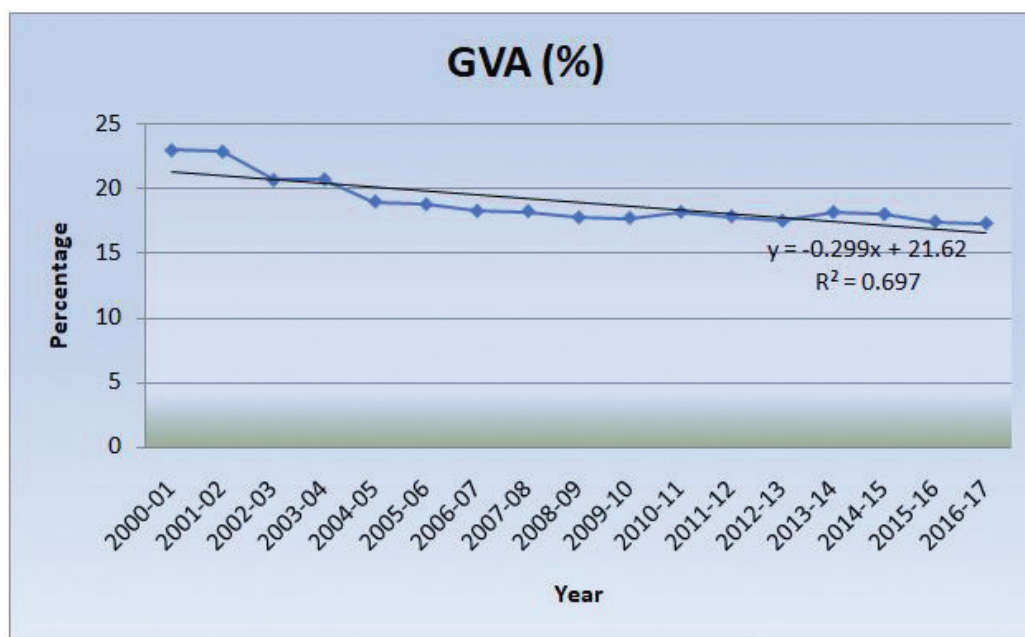


Fig. 3: Agriculture portion on GVA basic value 2000-2017

Source: Planning Commission, Government of India (2017)

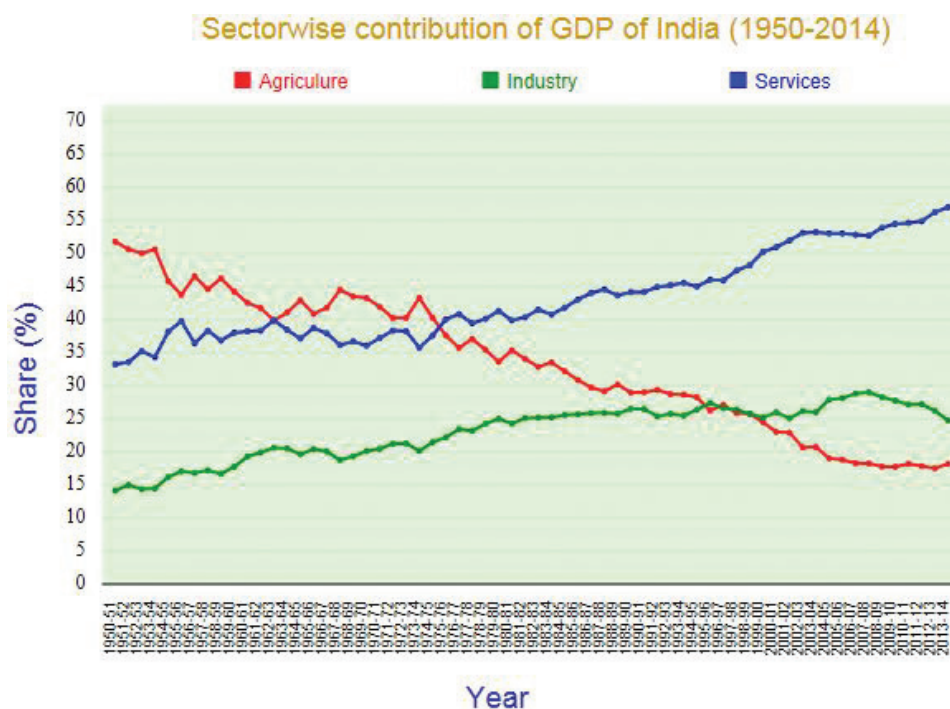


Fig. 4: GDP growth of Indian Economy

Source: Planning Commission, Government of India (2017)

From the above figures authors have been understood that the agriculture sector of India has a down trend from the beginning to at present of Republic India. But the other sector of the economy like industries and services sectors are having the growth trend. The service sector is alone having the significant growth trend during the study period. In the case of industrial sector, it is supposed to recover its previous position or otherwise it seemed as like as agriculture sector of India during 2024. The agriculture export in India is got a significant growth from 2008-09 to 2017-18. It has been evidenced from the following Table No. 1.

Table 1: Performance of Indian Agriculture Export

Year	Quantity In Metric Tonne	Value in Rs. Crore
2008-09	13,158,297.09	35,473.94
2009-10	11,264,982.37	35,349.89
2010-11	11,567,531.24	42,437.19
2011-12	19,810,171.89	83,484.32
2012-13	30,172,963.91	118,250.98
2013-14	30,001,581.55	136,921.20
2014-15	27,134,311.45	131,343.05
2015-16	20,469,770.48	107,431.93
2016-17	21,271,453.89	108,426.73
2017-18	22,293,598.89	119,751.74
Mean	20,714,466.28	91,887.10
Std Dev.	7,076,286.52	40,092.03
Co-variance	0.34	0.44
CAGR	8.19	16.32
t-value	2.365	4.16
p-value	0.046	0.003

Source: APDEA, http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content

From the above table authors have inferred that as per the quantity of exports and gross value of the export in currency Rs in Crore have significantly got its growth (CAGR) 8.19 per cent and 16.32 per cent respectively. The consistency of the growth of the agriculture export is slightly fluctuated after 2013-14. But it has been raised after 2016-17 and recovered the previous position. In future, 2018-19, it may be raised to 24,119,444.64 (MT). Likewise, the value of the export may be Rs.139, 295.22 Crore.

CONCLUSION

The authors have taken efforts to identify the outcome of the agricultural exports of the India during 2008-09 to 2017-18 is identically better position. But still it needs

to be leveraged by the initiatives of the both state and central government to increase the agriculture export in all the long-term and short term crops. However, the situations of poor monsoon and natural hazards to the state and central are totally affected. The government has been periodically investigated the agricultural department and they have been generated the statistical figures of the domestic purchase and sales and it also prepared by the district authorities, mostly it has not been giving the actual fact of the agricultural market.

Ethical Clearance: Completed

Source of Funding: Self

Conflict of Interest: Nil

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An Early Infected Lung Identification And Verification Module Using Neural Classifier

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ABSTRACT

The objective of the work is to identify the infected lung ailments disorders that influence the lungs, the organs that enable us to inhale the smoke through active and passive smokers and it is the most well-known therapeutic conditions analyzed so far. The diseases, for example, pleural emission and characteristic lung are distinguished and considered in this work. The incentive behind the work is to identify and characterize the lung sicknesses by powerful component extraction through CT image, Arterial blood gases, minute invariants, it include choice through hereditary algorithm and the outcomes are ordered by the Navie Bayes and optimal tree classifiers. The condition classifier strategies will expel the clamors and the element extraction are done to separate the helpful highlights in the lung image and the portion optimal system will enhance the best positioning highlights that are applicable for the lung image and the classifiers are utilized to arrange the image and the execution measures are found for the equivalent image extraction. The consequence demonstrates the optimal tree classifier which brings the effective results with high quality image extraction.

Keywords: Arterial Blood Gas, Optimal Tree Classifier, Computed Tomography

INTRODUCTION

In the recent past day's lung infection and related disease are the most common disease found in human physique. The survey expellees that the Computed Tomography (CT) is the most as of late utilized indicative imaging examination for chest infections, for example, lung malignant growth, tuberculosis, pneumonia, and aspiratory emphysema. A review result uncover reality that more than 10 million individuals worldwide die annually from chest related diseases ^[1]. Similarly the most common lung infection was found that out of all lung Cancer is the main cause of mortality worldwide amongst all types of lung infections. Main reason behind high rate of mortality due to lung cancer is that it is not easily detected in the initial stage and it is very difficult to overcome this disease at later stages of cancer^[2]. If lung lumps can be identified precisely at an early stage, the patient's survival rate can be increased

by a significant percentage. In the recent days, the field of automated diagnostic systems plays crucial role in the diagnosis of any disease. Image Processing is one such field where automated diagnostic system designed especially for medical diagnosis leads to solution which will help in decreasing the mortality rate and these medical diagnostics systems helps in detecting the disease at initial filed which significant in the field of bioinformatics^[3]. Correspondingly a method based upon the, Gabor filtering to extract texture features, from the infected image results, the accuracy of delimitation was seen to be above 95%. The accuracy of image pattern is diagnosing the segmented regions automatically, an average sensitivity of 91.05% was attained by conjoining, shape position-based features and cortex-like feature in a Simple tree classifier. The quantity of images to be examined is at an riotous level, especially in populated countries with infrequent medical professionals. While examine the X ray image by the radiologists, they need to recognize the two lungs and then find any obvious abnormality ^[4]. An infected lung can cause a disease of atypical cells swelling and growing into a tumor. Cancer cells can be conceded away from the lungs in blood, or lymph liquefied that ambiances lung tissue.

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Lymph drifts through lymphatic vessels, which groove into lymph nodes positioned in the lungs and in the Centre of the chest. Lung cancer habitually spreads toward the Centre of the chest since the usual flow of lymph out of the lungs is in the direction of the Centre of the chest. Metastasis occurs when a cancer cell greeneries the site where it initiated and moves into a lymph node or to every part of the body over and done with the blood stream^[5]. There are three main types of lung cancer specifically small cell lung cancer, Non- small cell lung cancer and lung carcinoid tumour. Non-small cell type of lung cancer is considerably more common than small cell lung cancer^[6]. The Most well-known instances of lung disease are a result of smoking. Lung growth is one of the main sources of death for a large portion of the patients enduring with lung disease, there are no treatments available currently for curing cancer. However there are number of diagnostic tests available for detecting cancer like sputum testing, Bronchoscopy, Needle biopsy and thoracentesis tests are very painful which requires physical contact with the body. So to avoid these painful test methods segmentation can be done for the obtained CT image of the patient ^[7, 8]. Relevant works on lung disease also focused on Lung segmentation which performed on number of methods like thresholding based methods where grayscale input image is converted to bi-level image by either of two available thresholding algorithms namely Global thresholding type algorithm and Local/adaptive type thresholding algorithms but the drawback of this method is it doesn't work good with attenuation variations and it is not good in pathologic classification^[9].

As far as image classification technique the controlled classification technique involves the preparation statistics set in order to communicate the classifier to define the verdict lung nodule boundary. It identifies the illustration of the required information in the image, which are known as grey value sets ^[10]. This is then used to enlarge a statistical sketch for the reflectance of information for each set, which is known as 'Signature Analysis'. The last step is to classify the image by searching the reflectance for each pixel and evaluating the resemblance to the signatures.

Infected lung nodule identification module: Lung nodule is similarly termed a spot on lung respiratory nodule. It is typically outlined in round or oval in nature. It is usually very are easy to discover however it is very hard to diagnose. An infected lung nodules are found frequently 1out of every 6 chest CT scans. In order to find the sequential benign of infected lung nodules which can be caused by earlier infections or old surgical treatment scars.

Every time a nodules need to be observed and inspected meticulously because there might be a small infection which causes cancer. Discovering it early when it is in minimum size is curable but it is very difficult to notice. Inappropriately humans with maximum size lung cancer consume a lesser persistence rate. An early detection is possible with powerful component extraction through CT image and its classified output by implementing in hereditary algorithm as shown in figure 1.

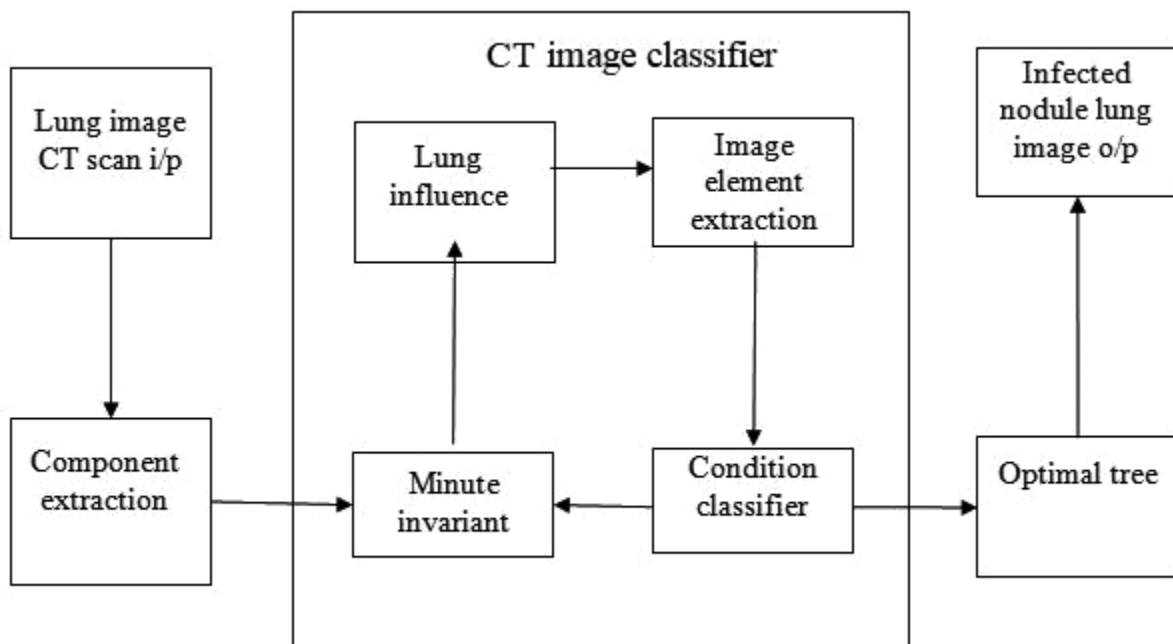


Figure 1: Infected lung influence and its optimal image extraction

The extraction procedure of the respiratory parenchyma can be delimited by eradicating the circumstantial as an initial finding, that the image with the same grey level as the lungs but positioned external part of chest from the image to avoid misperception. Initially the input of CT scan has been mounted to find the compound image extraction. The sequence continues to extract the exact lung influence for infected element in lung with condition classifier to check the gray scale image resolution. If the gray scale image resolution found to be better than the existing input then the image extraction are tested with optimal tree in various aspects. This is projected, due to the high correspondence amongst the grey intensities of the lungs and the image background, which cannot be just applied by using a thresholding technique. As an alternative minute variant, preliminary starts from the four turnings of the image, moves laterally from four directions recognizing as background pixels, those pixels whose grey level is within a pre-fixed range.

Lung Image Extraction with Optimal Image Classifier: The extraction methodology in image classifier with original CT lung image are implemented in compound extraction. The optimal classifier are focused in image and its pixel value with original value and extracted value with respect to gray scale. Uncertainty of the pixels consume values within the assortment then equally these pixels and the output then it marked as contextual pixels and the examination energies to be constant. If not, the X-ray is sporadic along to track under the image inspection and the consecutive row where the specific column are analyzed and it will continue in a comparable technique. These images produced by the classifier are transformed to binary descriptions by means of some detailed performance like Thresholding technique that uses whichever is changeable or non-changeable threshold be contingent on the lung region with non-removable background images. As shown in figure 2a representing lung image with background and 2b with threshold dispensation.



Figure 2a: Lung image with background



Figure 2b: Lung image with threshold dispensation

The most specific terms of image extraction are explicitly, after removing the major few original and previous portions of a CT scan that do not comprehend lung images that enduring portions are categorized into different sectors conforming to the superior, internal and inferior portions of the lung size. In order to focus on the sets of the lung image signifies a slighter proportion are infected than in the subsequent lung set as shown in figure 2a and 2b respectively. Consequently a dissimilar thresholding method is functional contingent on the sets of lungs which is specified portion fits to it. Through by using a dynamic threshold an infected point of lung is exactly identified through an iterative technique which is specifically done in the portion of the lung, a threshold value show casts its originally determined for all part of the lungs.

Flow of image extraction and granular identification,

Lung image → Nodule Point → Specific location

*Lung background removal → Non-linear abstraction
→ Blurred image*

*Lung threshold dispensation → linear abstraction
→ Infected image identification.*

Dynamic threshold → significantly infected lung portions as output

Image classification using fuzzy C-means clustering algorithm: The progression of categorizing image into predetermined set of individual portions based on their data values can be applied through classification. The pixel is assigned to a particular sets in lungs, if it fulfils the convinced infected image as an output to fit in a particular class. The image classes can be recognized or indefinite. If the exact image nodule center is able to separate the modules based on the training data, then the modules are recognized, else they are indefinite. Similarly the image classification techniques can

be considered as parametric and non-parametric, or managed and unsubstantiated or neural classifiers. An image categorization are been implemented to find the exact nodule center for infected image using C-means clustering algorithm where V_{ii} noted as image validation to measure boundary points with initial value K . Inner layer visualization end points are represented as X_i with respect to $C_{j,k}$ with N number of image input verification, M module validation matrix as shown in equation 1.

Image classification vectors initialization,

$$v_{ii} = \frac{1}{\sum_{k=1}^c \left[\frac{x_i - c_j}{x_i - c_k} \right]} 2 / m - 1 \quad \dots(1)$$

$$c_j = \frac{\sum_{i=1}^n v_{ij} - xi}{\sum_{i=1}^n v_{ij}^m} \quad \dots(2)$$

Then C-means clustering image verification (V) and validation matrix (M) vector algorithm implemented as follows,

Step 1: Initialize image verification input as V

Where $V = [V_{ii}]$ with matrix, $M^{(0)}$

Step 2: To calculate center image vectors initialize K

$C^{(k)} = [C_j]$ with V^k :// (nodule image boundary)

$$v_{ii} = \frac{1}{\sum_{k=1}^c \left[\frac{x_i - c_j}{x_i - c_k} \right]} 2 / m - 1$$

Mat-lab code for image segmentation and to identify infected lung:

```
Binary Image (:1) = true;
Binary Image (: end) = true;
Binary Image (1 :) = true;
Binary Image (end, :) = true;
// the province between the border of lungs
Binary image = imfill(binary image, 'dumps');
// imclear border to produce clear and consent in the lung boundaries
Binary image = imclear border (binary image);
// to grow the lungs filled.
Lungs mask = imfill (binary image, 'dumps');
```

Step 3: Concatenate the updated value with one other $V^{(k)}, V^{(k+1)}$

$$V_{ii} = c_j = \frac{\sum_{i=1}^n v_{ij} - xi}{\sum_{i=1}^n v_{ij}^m}$$

Step 4: If image validation model M doesn't reflects then

If $\| V^{(k+1)} + V^{(k)} \| > \sum$ then start //

(Where $\sum$ dissolution image condition more than 1)//

Step 5: If image validation module M and verification representation applies

Where $\| V^{(k+1)} - V^{(k)} \| < \sum$ then stop

// (Where $\sum$ dissolution image condition between 0&1)//

Else return to step 2

Step 6: End if condition satisfied

Lung image segmentation methodology: Segmentation of an image involves the separation of lung nodule from other part of the CT scan images and then enhancement of the resultant image to get details. This procedure includes sequence of steps to find image segmentation and infected part of lungs. Basically it includes an input image which is transformed to gray image and non-local mean filter is applied to remove Gaussian noise where threshold values are used with mat lab code for infected lung from lung CT scan image as shown below,


```

I=dicomread('F:\DOI\LIDC-IDRI-00001\1.4.7.1.5.1.12513.5.2.1.6279.6001.298806137288633453246975630178\
1.3.6.1.4.1.14519.5.2.1.6279.6001.179049373636438705059720603192\000003.dcm');
Info = dicominfo('F:\DOI\LIDC-IDRI 0001\1.5.6.1.4.1.14519.5.2.1.6279.6001.2988061372886334
53246975630178\1.3.6.1.4.1.14519.5.2.1.6279.6001.179049373636438705059720603192\000003.dcm');
I=dicomread(info);
Imshow(I,'Show volume',[]);
Title('original image');
% image_gray=rgb2gray(j);
image_resize=imresize(I,[256 256]);
image_resize=im2double(image_resize);
%clarifying
% B=medfilt2(j,[8 8],'symmetric');
% figure,imshow(B);
gamma=0.2;%aspect ratio
psi=0;%phase
theta=40;%orientation
bw=3.5;
lambda=3;%wavelength
pi=180;
for x=1:246
for y=1:246
    x_theta=image_resize(x,y)*cos(theta)+image_resize(x,y)*sin(theta);
    y_theta=image_resize(x,y)*sin(theta)+image_resize(x,y)*cos(theta);
    gb(x,y)=exp(-(x_theta.^2/2*bw^2+gamma^2*y_theta.^2/2*bw^2))
    *cos(2*pi/lambda*x_theta+psi);
end
end

```

Infected lung hole identification output:

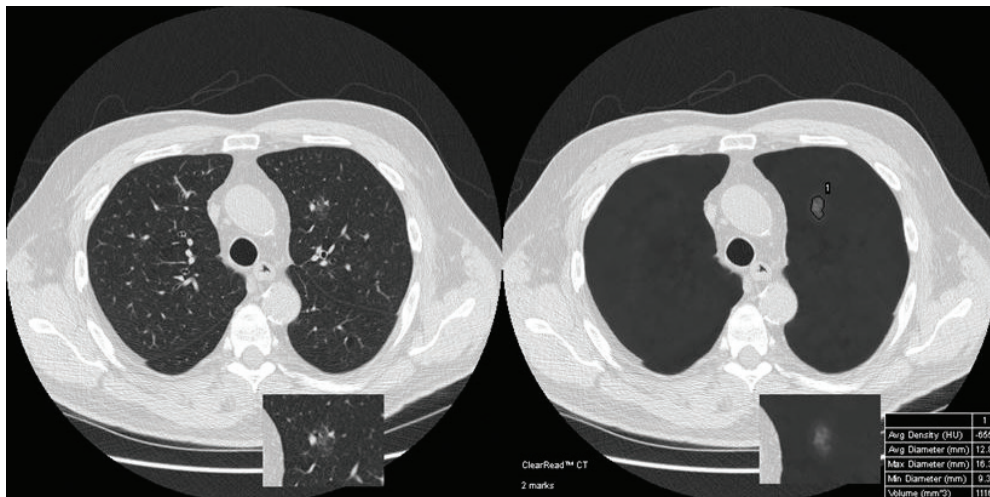


Figure 3: Mat-lab code execution for infected lung hole segmentation and identification

Finding lung infection through alveolar wall:

Initial finding in infected sector is based on the image preprocessing technique the optimal classifier optimized with various images extracted as a sample data/images with respect to image moderation and reflection. The principal function of the lung alveolar is gas alteration. It is consequently always unprotected to the smoky situation counting particulate biological substantial sequence, such as bacteria, viruses and microorganisms in internal position of lung. Even though the complete lung tract is frequently exposed to air intake, mainstream of elements are filtered out in the proboscis. In epiglottis most of the sequence its closure impulse and the cough impulse are will reduce the risk of microorganisms reaching the lower lung region. Elements are insignificant to reach the trachea and bronchi stick to the lung secretion lining on alveolar walls and also impelled in the direction of oropharynx by the action of mucociliary escalator. Based on the present scenario infected position of lungs can be visibly identified with respect to increase in wall thickening in internal alveolar of lungs (thickening of the alveolar walls (left) (decreased thickness of alveolar walls (right) with various aspects as shown in figure 3.

Notwithstanding superior filtration capability of N95 filtering facepiece respirators measured in vitro, unsatisfactory medical evidence has been published to determine whether normal surgical masks and N95 filtering facepiece respirators are equivalent with respect to preventing respiratory infections in healthcare workers. An early detection may save numerous humans from the source of death and it is identical imperative to know the symptoms which is related to lung infection caused namely,

1. Recognize which geographies indicate that explicit area of the lung tract is infected
2. Distinguish in what way to consider breathing negotiation
3. Identify how to recognize the pathogen.
4. Distinguish the major infections of the breathing tract
5. Identify the influences subsidizing to their incidence
6. Recognize the basis features of lung medical organization.

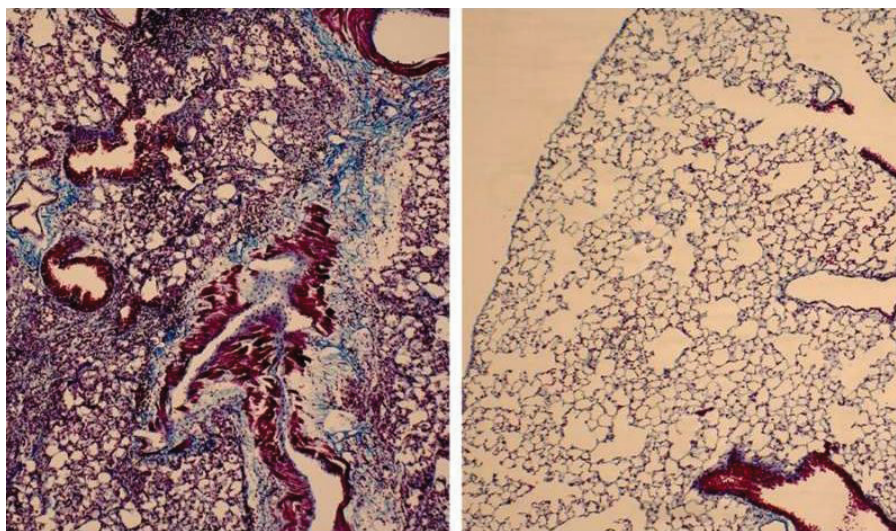


Figure 4: Early detection beside infected lung (thickening of the alveolar walls (left) (decreased thickness of alveolar walls (right))

CONCLUSION

An image enhancement and performance technique is developed for earlier stage in infected lung and its recovery procedures. The time period influence remained to find the sequence of anomaly issues in lung images. The essential features of this work is to identify and find lung infection through alveolar wall and

the quality image using optimal tree classifier. The accuracy is absolutely clear in different stages of image quality assessment as well as enhancement stage where it is adopted on low pre-processing techniques based on fuzzy c-means algorithm.

The proposed technique is well-organized with respect to infected lung image identification and

segmentation principles with various input images and classification procedures for future image extraction finding. The motivation behind the work is to identify and characterize the lung sicknesses by powerful component extraction through CT image through hereditary algorithm and the outcomes are ordered by the Navie Bayes. The methods and technique used in this work produces an identical and auspicious results in early detection on infected lungs comparing with existing methodologies.

Ethical Clearance: VISTAS

Source of Funding: Self

Conflict of Interest: Nil

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Assessment of Inflammatory Markers in Hemolytic Crisis with Special Reference to Sickle Cell Anemia

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ABSTRACT

As a global health problem sickle cell anemia affects many world populations. It is an autosomal recessive disease, commonly found in tropical countries. It is the most common single genetic mutation in human and abundantly present in large part of the world. The present study was done in the Department of Biochemistry, Chhattisgarh Institute of Medical Sciences, Bilaspur. The work comprised of two different groups consisting 50 sickle cell patients with hyperhemolytic crisis, including 50 age and sex matched control subject. In the present study namely, Homosysteine, IL-6, TNF- α , and CRP as an inflammatory markers measured in normal and sickle cell disease patients. We found significantly increased mean level of all three parameters (IL – 6 Group I V/s Group II $p < 0.001$, TNF- α Group I V/s Group II $p < 0.001$, CRP Group I V/s Group II $p < 0.001$). when compared to control and subject group.

Keywords: Sickle Cell Anaemia, Hemolytic Crisis, Inflammatory markers.

INTRODUCTION

Millions of people worldwide affected by sickle cell disease, the most commonly observed Hemoglobinopathy poses significant challenges for clinician and scientist. Treatments for the symptoms and complication of the condition are available, but in most cases there is no cure.

It is an autosomal recessive disease, commonly found in tropical countries. It is the most common single genetic mutation in human and abundantly present in large part of the world i.e. Africa, Mediterranean countries, Middle East and parts of South American countries, India and others parts of the globe where people originating from these countries have settled. In India the Sickle Cell belonging to the same haplotype and is stated to have evolved independency. Clinical and hematological also the sickle cell disease prevalence in

India is deferent from the rest of the world¹. Four major types of crises are recognized in sickle cell anaemia: aplastic, acute sequestration, hyper-haemolytic, and vaso-occlusive crises. Hyperhemolytic crisis to be a major problem among patients with sickle cell anaemia where the natural history of the disease is somewhat complicated with recurrent episodes of malarial infection^{3,4}. Hyperhemolytic Crisis is a term used to describe the occurrence of episodes of accelerated hemolysis characterized by decreased blood hemoglobin, increasing reticulocytes, and other markers of hemolysis like hyperbilirubinemia, increased LDH.

Several cytokines and tumor necrosis factor- α (TNF- α), are associated with the activation of leukocytes, particularly monocytes and neutrophils in SCA. Several other cytokines are also involved in the chronic inflammatory state that is present in SCA.⁴. Recently, the involvement of several other cytokines, such as IL-18, IL-17, IL-23, IL-12 and IL10, in inflammatory responses in SCA patients has been described.^{5,6}.

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MATERIAL METHOD

The present work was done in Dept. of Biochemistry at Chhattisgarh Institute of Medical Sciences, Bilaspur.

The study included 50 subjects with Homozygous Sickle cell Disease (Hb SS), and 50 age matched healthy controls (Hb AA). Informed consent was taken from all the subjects, in case of children, the filled informed consent was taken from their parents. Hyper-haemolytic crisis was defined as significant change in blood picture characterised by a precipitous fall in the haemoglobin level associated with jaundice, marked reticulocytosis, and polychromasia on the blood smear, increased unconjugated hyperbilirubinaemia, and increased urobilinogen content in urine above the steady state level for each individual patient. Inclusion criteria includes Subjects with sickle cell disease, who were confirmed by solubility test and then Cellulose Acetate Electrophoresis.

All subjects aged between 0 years to 20 years of both male and female. Patients with splenic sequestration crisis, transfused blood within last 3 months, steroidal and anti inflammatory drug therapy, UTI, all paediatric patients with sickle cell anaemia (Hb SS) who showed features consistent with hypersplenism were excluded. First Solubility test followed by Electrophoresis was done for identification of SCD. All routine biochemical and hematological tests were done by biochemical and hematological Auto analyzers respectively. CRP, IL-6, TNF and Homocysteine were estimated by enzyme immunoassay. Data were presented within lower and higher ranges with standard deviation.

RESULTS

Table 01: Values of Inflammatory Markers in Control

[Total 50 (26 Male, 24 Female)]

Sl. No.	Parameter	Range	Mean $\pm$ SD
1.	CRP	0.40–4.20	1.78 $\pm$ 0.91
2.	IL-6	74.87–107.45	89.94 $\pm$ 9.26
3.	Homocystein	4.50–12.40	6.99 $\pm$ 1.78
4.	TNF- α	50.56–85.78	71.62 $\pm$ 7.48

Subjects with Hyperhemolytic Crisis: Total 50 subjects (28 Male, 22 Female) were included in this group who were suffering from SCD with hyper hemolytic crises. The observation seen in this group are depicted below:

Table 02: Values of Inflammatory Markers in Group - II (SCD with Hemolytic Crisis)

Sl. No.	Parameter	Range	Mean $\pm$ SD
1.	CR-P	90.00 – 130.00	114.02 $\pm$ 9.76
2.	IL-6	120.00 – 280.00	204.28 $\pm$ 49.39
3.	Homocystein	13.87 – 32.68	26.13 $\pm$ 4.42
4.	TNF- α	64.00 – 93.00	81.96 $\pm$ 7.12

Table 03: Comparison between study groups

Sl. No.	Parameter	Normal Mean $\pm$ SD	Hemolytic Crisis Mean $\pm$ SD	P-Value
1.	CR-P	1.78 $\pm$ 0.91	114.02 $\pm$ 9.76	<0.001
2.	IL-6	89.94 $\pm$ 9.26	204.28 $\pm$ 49.39	<0.001
3.	Homocystein	6.99 $\pm$ 1.78	26.13 $\pm$ 4.42	<0.001
4.	TNF- α	71.62 $\pm$ 7.48	81.96 $\pm$ 7.12	<0.001

In the present study Proinflammatory cytokine levels in serum, namely, IL-6, TNF- α , and CRP with homocysteine as a inflammatory marker measured in normal and sickle cell disease patients. We found significantly increased mean

level of all three parameters when compared to control and within the sub groups (IL – 6 Group I V/s Group II p <0.001, TNF- α Group I V/s Group II p < 0.001, and homocysteine Group I V/s Group II p <0.001).

DISCUSSION

In the present study Proinflammatory cytokine levels in serum, namely, IL-6, TNF- α , and CRP as a inflammatory marker measured in normal and sickle cell disease patients. We found significantly increased mean level of all three parameters when compared to control and within the sub groups (IL – 6 Group I V/s Group II $p < 0.001$, TNF- α Group I V/s Group II $p < 0.001$, CRP Group I V/s Group II $p < 0.001$).

Many other studies including Crpziat et al⁷, Taylor SC et al⁸, Bourantas KL⁹ Raghupathy R et al¹⁰ have shown increased levels of cytokines in serum even during the steady state of SCD. It is believed that there are significant subclinical microvascular occlusions in steady state due to ongoing local tissue ischemia with necrosis. It is now clear that local patterns of cytokine regulate lymphocyte effectors mechanisms¹¹. It is postulated that the rise in the acute-phase proteins minimizes tissue damage caused by the microvascular infarctions. Increased levels of acute-phase proteins in plasma have been reported even during the steady state of SCD^{7, 12-15}. In our study, we observed that. Serum levels of CRP increase when the inflammatory stimulus is of low-grade intensity and of short duration, such as the subclinical microvascular occlusions in steady state. This process is further augmented in crisis. In the positive agreement with Lowenthal et al¹⁶, the present study we also found significantly increased level of homocystein when compared to control subject. It is known that patients with sickle cell disease present activation of the blood coagulation and fibrinolytic systems, especially during vaso-occlusive crises, but also during the steady state of the disease¹⁷. Due to decreased erythrocyte half-life, individuals with homozygous sickle cell disease have increased erythropoietic demands for folate. Subjects with inadequate folate status might be expected to manifest higher blood levels of homocysteine. It is possible therefore that raised homocysteine levels in SS disease predispose to the development of thrombosis through inhibition of the protein C anticoagulant pathway.

CONCLUSION

Both extravascular and intravascular hemolysis appears to contribute to the pathogenesis of hemolytic anemia in sickle cell disease, although the precise contribution of each has not been defined. we report here that SCD patients showed a significant elevation in TNF- α , IL-6, CRP and homocystein in anemic crisis state, when compared to normal controls.

Ethical Clearance: Taken from Institutional Ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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Correlation of Foot Length and Gestational Maturity in Neonates—A Study from Coastal Karnataka

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ABSTRACT

Introduction: The degree of maturity is a major contributor to neonatal mortality and morbidity. Early identification of preterm babies can prevent life-threatening complications. This study was carried out to determine whether postnatal foot length could accurately identify the gestational age in a specified South Indian neonatal population.

Material and Method: This hospital-based cross-sectional study included 320 neonates within 72 hours of life. The study was approved by the Institutional ethics committee. After obtaining the informed consent, neonatal foot length was measured using a sliding plastic Vernier caliper. Neonatal anthropometric parameters like weight, crown-heel length, head circumference were also recorded. The data were analysed using SPSS version 11.5.

Results: In preterm neonates correlation of foot length with weight, head circumference, crown-heel length and gestational age by Ballard's score were statistically significant. From receiver operating characteristic curve, cut off value obtained for prediction of prematurity was 7.35 cm which had sensitivity and specificity of 80% and 78 % respectively.

Conclusion: Neonatal foot length can be a good surrogate measure in predicting prematurity

Keywords: neonate, prematurity, foot length

INTRODUCTION

Neonatal period is a major determinant for morbidity and mortality in childhood. As per Global health observatory data, neonatal deaths contribute to 45% of all the under-five deaths¹. Prematurity, sepsis, and birth asphyxia are the leading causes of neonatal mortality worldwide¹. The degree of maturity is a major contributor to neonatal mortality and morbidity². Early identification of immaturity among babies is therefore of paramount

importance to prevent life-threatening complications³. Neonatal units in developing countries may use last menstrual period method or neonatal scores to assess neonatal maturity, however; both of these methods are inaccurate². Hence, there is a need for an alternative method, which can predict birth weight and gestational age. This measurement should be simple, reliable, have good correlation with birth weight and gestational age. This study was carried out to determine whether postnatal foot length could accurately identify the gestational age in a specified South Indian neonatal population.

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MATERIAL AND METHOD

This cross-sectional study was conducted in the tertiary care teaching hospitals affiliated to Kasturba Medical College (Manipal Academy of Higher Education) Mangalore, a Coastal city in Southern India, between August and October 2017. Approval

was obtained from the Institutional Ethics Committee (IEC) of Kasturba Medical College, Mangalore after which permission was obtained from the Authorities of concerned hospitals for conduction of the study. Three hundred and twenty inborn neonates aged less than 72 hours, who were admitted in the study hospitals during the study period were included in the study. Babies with skeletal deformities of the foot and babies whose maternal last menstrual period date was unknown were excluded. During the study, study objective/ purpose was explained to the mothers of the babies in a language known to them. After obtaining their written informed consent, a semi-structured proforma with demographic details, maternal last menstrual period date, date of birth of the neonate, etc. were filled, and physical examination was conducted by the investigator. Based on gestational age, babies were grouped as preterm and term babies. Following anthropometric measurements were recorded – foot length, crown-heel length, and weight, head circumference, and gestational age. Foot length was measured with a plastic Vernier's sliding caliper. The measurement was taken within 72 hours of postnatal age. The neonatal foot was estimated from the midpoint of the heel to longest toe. The heel was placed against the platform, the sliding bar of the caliper was moved until it came in contact with the tip of the big toe. The scale was read after withdrawing the instrument. Crown-heel length was measured using an infantometer, weight of the baby was measured using an electronic weighing scale, gestational age assessment was done using modified Ballard's scoring and maternal Last menstrual period. Babies were classified into preterm and term babies. Head circumference was measured using a non-stretchable measuring tape

The collected data were coded and entered into Statistical Package for Social Sciences 11.5 (SPSS Inc., Chicago, Ill., USA). Results were expressed as mean with standard deviation, median with interquartile ranges and percentages using appropriate tables. Receiver Operating Characteristic (ROC) curve was generated with neonatal foot length as a test variable to predict preterm births. Optimum cut off value was obtained from the ROC curve. Sensitivity, specificity, positive predictive value and negative predictive value were calculated for the cutoff score. Pearson, correlation coefficient test, was used to determine the relation of neonatal foot length with anthropometric parameters like weight, crown-heel length, head circumference. $p < 0.05$ was considered as statistically significant.

RESULTS

Out of 320 babies, 159 were male (49.7%), and 161 were female (50.3%). In this study 264 (82.5%) babies were term and 56 (17.5%) were preterm. Table 1 depicts the median with interquartile values of foot length of the neonates as per their gestational age. Comparison of the median and interquartile values of foot length, head circumference, crown-heel length, weight and gestational age by Ballard's score between the preterm and term neonates is presented in Table 2. The difference in the values is statistically significant.

Correlation of neonatal anthropometric parameters with foot length among preterm and term neonates is depicted in Table 3. In preterm neonates correlation of foot length with weight, head circumference, crown-heel length and gestational age by Ballard's score were statistically significant whereas in term neonates statistically significant association of foot length was found with weight and head circumference.

Receiver Operating Characteristic (ROC) curve generated with neonatal foot length as a test variable to predict prematurity is shown in Fig 1. The area under the ROC curve was 0.772. Optimum cut off value obtained for prediction of prematurity was 7.35cm. A cutoff score of 7.35 had sensitivity and specificity of 80% and 78 % respectively in predicting prematurity.

Table 1: Distribution of gestational age in weeks with the corresponding median values of foot length and IQR

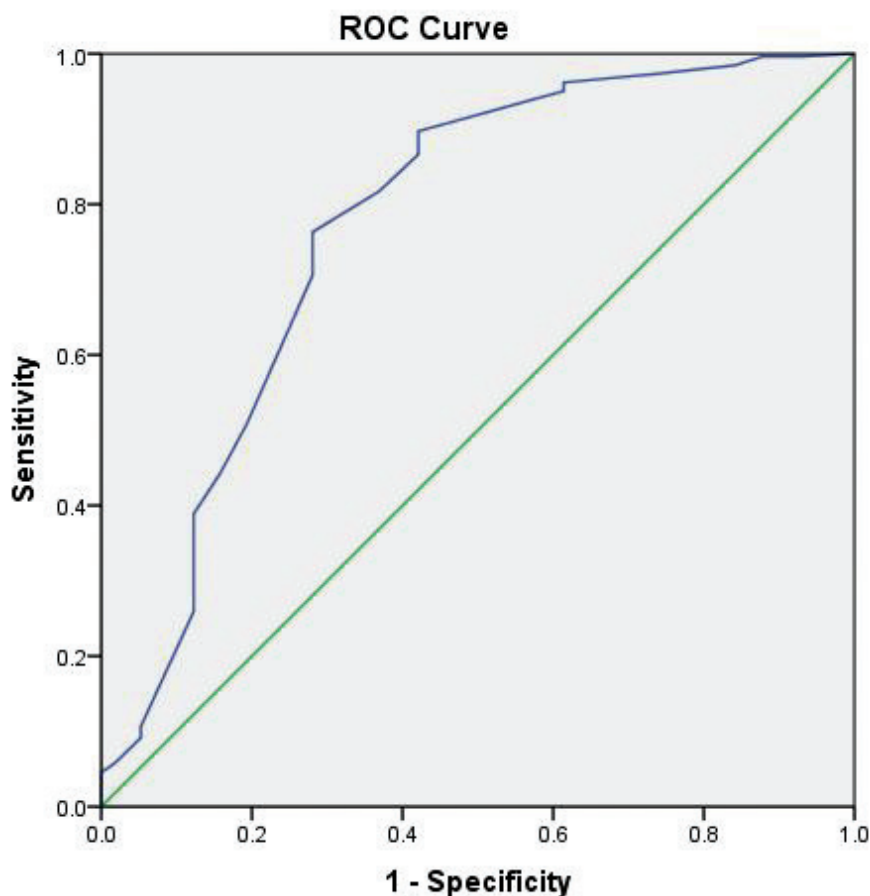
Gestational age in weeks	Foot length median(IQR)
28 (n=2)	7.2 (6.8)
30(n=1)	6.4 (6.4)
31(n=2)	7.6 (7.0)
32(n=3)	6.6 (6.6)
33(n=10)	6.8 (6.1-7)
34(n=6)	7.1 (6.475-7.75)
35(n=18)	7.0 (6.6-7.225)
36(n=15)	7.5 (7.3-8)
37(n=58)	7.5 (7.2-7.725)
38(n=85)	7.6 (7.4-7.85)
39(n=78)	7.6 (7.4-8)
40(n=36)	7.75 (7.5-8.075)
41(n=3)	7.8 (7.5)
42(n=3)	8.2 (7.8)

Table 2: Median and IQR of the study parameters in pre term and term neonates

Characteristic	Preterm neonates (N= 57) Median(IQR)	Term neonates (N= 263) Median(IQR)	P value
Foot length (cm)	7.0(6.6-7.5)	7.6(7.4-8.0)	<0.0001*
Head circumference (cm)	32(31-34)	33(33-34)	<0.0001*
Crown heel length (cm)	44(41.5-47.5)	47(45-50)	<0.0001*
Weight (kg)	2.5 (1.74-2.9)	2.9(2.7-3.2)	<0.0001*
Gestational age by Ballard's scoring	35(33-36)	38(38-39)	<0.0001

Table 3: Correlation coefficient of foot length with neonatal anthropometry

Parameter	Preterm neonates (N= Correlation coefficient (p value)	Term neonates (N= Correlation coefficient (p value)
Crown heel length	0.671 (<0.0001)	0.083 (0.18)
Weight	0.771 (<0.0001)	0.151 (0.01)
Head circumference	0.599 (<0.0001)	0.480 (<0.0001)
Gestational age by Ballard's scoring	0.274 (0.04)	0.088 (0.15)



Diagonal segments are produced by ties.

Figure 1: ROC curve of the neonatal foot length in predicting prematurity in the study population

DISCUSSION

Over the last two decades the childhood mortality rate and infant mortality rate have shown a rapid decline. However, the reduction in neonatal mortality rate is not satisfactory. Addressing the leading cause of neonatal mortality like prematurity, birth asphyxia, and neonatal infections will bring out a decline in the neonatal mortality rate. Early recognition of preterm babies and prompt initiation of supportive measures improve the neonatal survival⁴. In poor resource settings where the incidence of home deliveries is high, identification of high-risk neonates is missed⁵. Anthropometric data by the peripheral health workers have shown to be more reliable in identifying the preterm babies than the new Ballard's score⁶. Hence there is a need for simple and easy anthropometric measurement to identify the preterm births.

Neonatal anthropometric assessments have shown varied results for gestational age assessment^{2,3,7,8}. A study by Lee et al. showed that new born clinical assessment by community health workers was inaccurate for gestational age determination compared to the ultra sound dating³.

A hospital-based cross-sectional study by Hadush et al. concluded that head circumference and chest circumference as better surrogate markers in identifying low birth weight neonates compared to the foot length⁸.

A study by Otupiri et al. in Ghana showed that birth weight had the highest correlation with chest circumference, mid-upper arm circumference, and calf circumference. They concluded that these anthropometric measurements could be used as a surrogate marker for identifying the low birth weight babies when the weighing scale is not available to check the birth weight in resource-poor settings⁹.

A cross-sectional hospital-based study by Srinivas et al. in Southern India opined that the foot length had 97% sensitivity and 87% specificity in identifying preterm and low birth weight babies. They also observed that the foot length had a significant correlation with anthropometric measures like weight, length, head circumference and chest circumference¹⁰.

The present study showed similar results of foot length being a good surrogate marker in identifying the preterm births. The cut-off value of 7.35 obtained from ROC curve showed a sensitivity of 80% and specificity

of 78% in identifying the preterm babies. We observed, that, a significant correlation of foot length with weight, head circumference, crown-heel length and gestational age by Ballard's score in preterm neonates. However, a statistically significant correlation of foot length was found with weight and head circumference in term neonates.

A hospital-based study used a plastic ruler method to measure the foot length. They identified 7.2cm as a cut-off to predict the low birth weight babies and 7.8cm as a cutoff to predict the preterm births. They showed that the foot length measurement by plastic ruler was a better predictor for low birth weight than prematurity¹¹.

Limitations: This study was a hospital-based study in a tertiary care referral hospital, hence the results may not be reflective of the community. The study population comprised of mainly term babies and less number of preterm babies. Larger sample size, community-based study may increase the strength of the study

CONCLUSION

We observed that the neonatal foot length had a significant correlation with anthropometric parameters like birth weight, length, and head circumference in preterm neonates. The value of < 7.35cm can be used a cut off to identify preterm neonates in poor resource settings where weighing scale may not be available at birth.

Conflict of Interest: None

Source of Funding: Manipal Academy of higher education student grant

Ethical Clearance: Obtained from Kasturba Medical College Mangalore ethics committee

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Clinical Profile of Children with Autism Spectrum Disorder: A Study from Coastal Karnataka

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ABSTRACT

Introduction: Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by deficits in verbal and nonverbal communication and reciprocal social interaction. The present study aimed to describe the clinical characteristics of ASD and analyze the possible risk factors in the coastal city of Karnataka.

Material and Method: This descriptive study included 30 children diagnosed with ASD. The study was approved by the Institutional ethics committee. After obtaining the informed consent, a structured interview was conducted to get details on symptomatology and possible risk factors followed by a clinical examination. Childhood autism rating scale scoring was used to quantify the severity of autism. The data were analysed using SPSS version 11.5

Results: The observed male to female ratio was 1.3:1. Mean age of presentation was 2.8 years. Speech delay was the predominant symptom on reporting, seen in 70% children. Impaired peer group interaction was the most common social impairment seen in 24 (80%) subjects. Mild, moderate and severe autism was seen in 5(16.7%), 12(40%) and 13(43.3%) subjects respectively. Among the risk factors, forceps delivery and maternal age were significantly related to autism. There was no significant relationship between the severity of autism and gender, birth order or working pattern of parents.

Conclusion: Autistic children presented with varying clinical features. There is a need for increased awareness about ASD to facilitate early diagnosis and intervention. The risk factors which predispose to ASD are not clearly understood, hence require further elucidation.

Keywords: Autism spectrum disorder, child, mental health, risk factors

INTRODUCTION

Autism spectrum disorder (ASD) is a heterogeneous, neurodevelopmental disorder^{1, 2}. The reported prevalence of this condition is as high as 1 in 65 Indian children in 2-9 year age group¹. ASD is characterized by deficits in verbal and nonverbal communication and reciprocal social interaction. Various comorbidities like

motor deficits, genetic conditions, delayed acquisition of self-help skills, sleep problems and catatonia are associated with ASD³. Though symptoms of ASD are present in early, they are recognized commonly in the second year of life. Various risk factors like genetic, infections, environmental factors have been implicated in ASD⁴. The present study aimed to describe the clinical characteristics of ASD and analyse the possible risk factors in the coastal city of Karnataka.

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MATERIAL AND METHOD

This descriptive study was conducted in the tertiary care teaching hospital affiliated to Kasturba Medical College (Manipal Academy of Higher Education) Mangalore and Chethana child development centre, Mangalore over a period of 18 months. Approval was

obtained from the Institutional Ethics Committee (IEC) of Kasturba Medical College, Mangalore after which permission was obtained from the Authorities of the concerned hospital and Chethana child development centre for conduction of the study. Children diagnosed to have autism spectrum disorders according to DSM-IV criteria were included in the study. Children with chronic illness were excluded. A structured interview was conducted to collect data on chief complaints, time lag, behavioral abnormalities, and possible risk factors, followed by a general and systemic examination. Childhood autism rating scale (CARS) scoring was used to quantify the severity of autism. Age and sex-matched controls were taken, and risk factors were analysed. The collected data were coded and entered into Statistical Package for Social Sciences 11.5 (SPSS Inc., Chicago, Ill., USA). Results were interpreted with frequency tables and statistical significance computed by Chi-square, unpaired student t-test, Kruskal-Wallis test, and Mann-Whitney test. $p < 0.05$ was considered as statistically significant.

RESULTS

Out of 30 children, 17 were male (57%), and 13 were female (43%). The observed male to female ratio was 1.3:1. Twelve (40%) study subjects were less than five years old. Mean age of presentation was noted to be 2.8 years in our study. Speech delay was the most predominant complaint on reporting, seen in 21 (70%) children. Table 1 depicts the chief complaints on reporting in the study subjects. Minimum age of presentation was six month, in which case autism was suspected due to poor eye contact. Most of the parents sought expert opinion within the first year of presentation. Diagnosis made on the first consultation is depicted in Table 2. The time lag for diagnosis from the first consultation is shown in Figure 1. Developmental examination revealed speech delay in 96% of patients and gross motor delay was observed in 70% subjects. Impaired peer group interaction was the most common social impairment seen in 24 (80%) subjects. Clinical features of the study subjects are depicted in Table 3. The severity of the autism was assessed with childhood autism rating scale (CARS). Mild, moderate and severe autism was seen in 5(16.7%), 12(40%) and 13(43.3%) subjects respectively. Out of the risk factors studied, forceps delivery and age group of mothers were significantly related to autism. There was no significant relationship noted between severity of autism and gender, birth order or working pattern of parents.

Table 1: Chief complaints on reporting in the study subjects

Chief Complaints	N = 30, n (%)
Poor eye contact	13 (43)
Speech delay	21 (70)
Hyperactivity	10 (33)
Developmental delay	2 (7)
Emotional disturbance	1(3)
Self-injury	2 (7)

Table 2: Diagnosis made on the first consultation in the study subjects

First diagnosis	N = 30 n (%)
Autism	15 (50)
Speech delay	9 (30)
Mental retardation	4 (14)
Behavioral disturbance	2 (7)

Table 3: Clinical features in the study subjects

Parameter	N = 30, n (%)
Social Deficits	
Impaired peer group Interaction	24(80)
Hyperactivity	10 (33)
Emotional disturbances	16(53)
Impaired nonverbal behavior	23(77)
Communication Deficits	
No communication	15 (50)
Echolalia	3 (10)
Difficulty in initiating conversation	12 (40)
Restricted Activities	
Stereotyped movements	9 (30)
Insistence on routines	26 (87)

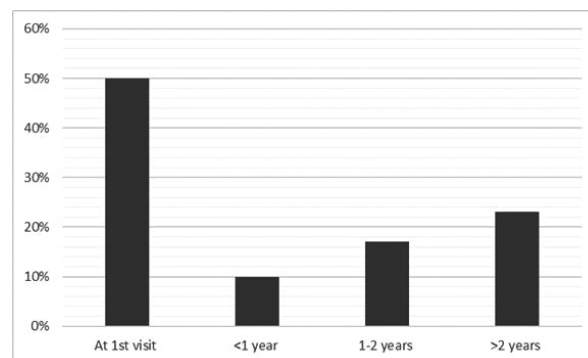


Figure 1: Time lag from first consultation to diagnosis

DISCUSSION

The observed male to female ratio was 1.3: 1. Studies conducted by Sharma et al. and Prathiba Singhi noted ratios of 2.2: 1 and 1.3:1 respectively^{5,6}. The most common complaint was speech delay accounting for 70% cases. Other main complaints were poor eye contact (43%) and hyperactivity (33%) Children less than two years of age presented mostly with poor eye contact and lack of social smile, corresponding to the study conducted by Sharma et al.⁵. In the present study, the average age of presentation was 2.8 years corresponding to 2.6 years in a study by Barbaresi et al. and Coplan et al.^{7,8}. The study by Sharma et al. showed the average age of 3.28 years⁵. The minimum age of presentation was six months wherein child presented with poor eye contact. This finding correlates with a study by Charman et al. where children less than one year of age presented with problems of social interaction like poor eye contact⁹.

Autism was the first diagnosis in the present study compared to 7 % in the study by Sharma et al.⁵. This improvement in the diagnosis can be explained due to the increased awareness about the disease. Other diagnoses made on the first consultation were speech delay (30%), mental retardation (14%) and behavioural disturbance (7%) the mean time lag between the clinical presentation and diagnosis was one year. Children with the time lag of more than 2 years were treated as speech delay or mental retardation. In the study done by Sharma et al., Prathibha Singhi et al. and Barbaresi et al., most of the children were referred to as mental retardation and attention deficit hyperactivity behaviour⁵⁻⁷. Maternal age was found to be a significant risk factor in our study.

The incidence of most of the clinical features was comparable with the study by Prathibha Singhi et al.⁶. Emotional disturbances (53%) and stereotyped movements (30%) were found to be lower in our study whereas difficulty in initiating conversation was higher (40%). The severity of autism was assessed with CARS. Most of the children belonged to severe category. There was no significant gender difference in the severity of cases in contrast to previous studies which showed male preponderance in severe cases^{10,11}.

CONCLUSION

Autistic children presented with varying clinical features. The most common complaint was speech delay.

A mean time lag of 1.8 years for the diagnosis of autism was noted. Out of the risk factors studied, forceps delivery and maternal age were significantly related to autism.

Conflict of Interest: None

Source of Funding: None

Ethical Clearance: Obtained from Kasturba Medical College Mangalore ethics committee

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A Study on the Nutritional Status of the School Going Adolescents of East Sikkim, North East India

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ABSTRACT

Malnutrition arises either from deficiency or excess or imbalance of nutrients in the body. It is a term comprising all states of underweight & overweight. Adequate data on the nutritional status on the age group of adolescents, defined by WHO as individuals in the age group of 10-19yrs, is lacking.

Method: A Descriptive Cross sectional study using Multi-stage random sampling was carried out among adolescent students in Co Educational Senior Secondary Schools (Co-Ed SSS) of East Sikkim.

Sample size: Considering a Prevalence of malnutrition as 40%, relative error of 10% and using formula: $4 PQ/L^2$, Sample Size calculated to be 600.

Results and Conclusions: Private/Public and Government schools were covered to get a representative sample from all socioeconomic classes. Total 616 study subjects were included in the study. 27.4% of the school going adolescents were found to be malnourished in this present study. Both extremes of malnutrition are seen in the adolescent students of East Sikkim. The prevalence of Overweight/Obesity or Thin/Extreme Thinness among study subjects were observed to be 12.8%/2.8% and 8.4% /3.4% respectively.

Keywords: adolescents; malnutrition; overweight; undernutrition, north east India, Sikkim

INTRODUCTION

Malnutrition is a term which denotes deterioration of health, arising either from deficiency or excess or imbalance of nutrients in the body. It is a term comprising all three states of underweight, overweight and obesity. This nutritional problem is well prevalent even in the adolescent group defined by World Health Organisation(WHO) ^[1] as belonging to the age group of 10-19 years. Adolescence literally means “to emerge” or “achieve identity”. Its origin is from a Latin word “Adolescere” meaning, “to grow, to mature”^[2]. Significant transition from childhood to adulthood, takes place during this period of adolescence. This period provides an opportunity to prepare for a healthy

productive and reproductive life. Imbalance in nutrition in this phase can potentially retard growth and sexual maturation, although these are likely consequences of chronic malnutrition in infancy and childhood being carried over. It can put them at high risk of nutrition-related chronic diseases, which has now become the new age epidemic of diseases, particularly if combined with other adverse lifestyle behaviours.

Adequate data on the nutritional status of adolescents is lacking globally, nationally or locally. WHO factsheet states that many boys and girls in developing countries enter adolescence undernourished, making them more vulnerable to disease and early death^[1]. The estimates in developing world, states that approximately 146 million children are underweight, and out of these 57 million children live in India^[3]. The other spectrum of Malnutrition, Overnutrition among adolescents is also seemingly increasing in both in developed and developing countries^[1]. The secondary analysis of National Family and Health Survey (NFHS) 1, 2 & 3 on the nutritional status of adolescents, estimated on the basis of their body mass index (BMI), revealed that 49%

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of girls and 60% of boys in the age group of 15-19 years are malnourished^[4].

Adolescents however have been the most neglected age group in public health. It is, in reality, a timely period to shape and inculcate healthy eating and lifestyle behaviours, thereby preventing or postponing the onset of nutrition-related chronic diseases in adulthood. The World Health Organization has identified India as one of the nations that is going to have most of the lifestyle disorders in the near future. The Younger Population, including the adolescents are being affected by these newer lifestyle disorders. Hence, the population at risk shifts from 40 plus to 30 plus or even younger^[5]. This nutrition transition occurring worldwide is characterised by changes in diet and activity patterns, leading to the development of a double burden of malnutrition that is undernutrition and overnutrition.

MATERIALS AND METHOD

Study Setting: East Sikkim

Study Design: Descriptive Cross sectional study

Sampling Technique: Multi-stage random sampling

Inclusion Criteria: Students within the age group of 10-19 yrs from Class V – XII

Study Population: Boys and Girls within the age group of 10-19yrs studying in Co-educational Senior Secondary Schools(Co-Ed SSS)

Study Period: Feb 2013 – Nov 2014

Sample Size: Considering a Prevalence of Malnutrition as 40%^[6] relative error of 10% and using the formula $4PQ/L^2$, sample size was calculated to be 600.

$$\frac{4 \times 4 \times (100 - 40)}{(10\% \times 40)^2} = 600$$

Data Collection Procedure: The Protocol was submitted to the Institutional Review Board(IRB) and Institutional Ethics Committee(IEC) of Sikkim Manipal Institute of Medical Sciences (SMIMS) and clearance obtained.

Permission was taken from Human Resource and Development Department (HRDD), Government of Sikkim to carry out the study in Co- Ed SSS of East Sikkim.

First Stage: A List of Co-ed SSS in East Sikkim was taken from the HRDD department. For operational feasibility, only 25 % of the listed schools (total 6 schools) was chosen by lottery method.

After selection, the schools were visited and permission from the Principal taken to start the study in the selected schools.

Second Stage: A list of the students studying from Class 5 till 12 was taken from the principals office.

One section from each class was selected using lottery method.

Third Stage: Number of students to be taken from each school and each class was calculated according to systematic random sampling.

The participants informed about the study and Informed consent taken from the guardian. Only those students present on the day of the study and willing to give assent were included in the study. For every selected student not giving consent, the next roll number student was enrolled till the number required fulfilled from the school.

The participants were then called to a fixed allocated examination area given by the school authorities, each interviewed individually and the anthropometric measurements recorded using standard protocols.

Height Measured using a Stadiometer and weight measured using a standard calibrated mechanical weighing machine.

Body Mass Index(BMI) was calculated and plotted using WHO recommended BMI for age and sex charts.

RESULTS

Both Private/Public (3) and Government schools (3) were covered to get a representative sample from all socioeconomic classes.

Table 1: Distribution of study subjects in relation to the type of school they attend:

Variables	Private/Public SSS N = 276 Number (%)	Government SSS N = 340 Number (%)	Total N = 616 Number (%)
Students	276(44.8)	340(55.2)	616(100)
Male	133	148	281(45.62)
Female	143	192	335(54.38)

Religion			
Hindu	137 (49.6)	171 (50.3)	308 (50)
Muslim	0(0)	5 (1.5)	5 (0.8)
Christian	14 (5.1)	58 (17.1)	72 (11.7)
Buddhist	125 (45.3)	106 (31.2)	231 (37.5)
SES Acc TO BGP*			
CLASS 1	212(76.8)	11(3.2)	223(36.2)
CLASS 2	44(15.9)	33(9.7)	77(12.5)
CLASS 3	12(4.3)	49(14.4)	61(9.9)
CLASS 4	8(2.9)	120(35.3)	128(20.8)
CLASS 5	0	127(34.7)	127(20.6)
Fathers Educational Status			
Illiterate	4(1.4)	74(21.7)	78(12.66)
Primary	7(2.5)	110(32.4)	117(18.99)
Secondary	15(5.4)	112(33)	127(20.61)
High School	47(17)	37(10.9)	84(13.64)
Graduate	182(65.9)	6(1.8)	188(30.52)
Post Graduate	21(7.6)	1(0.3)	22(3.57)
Mothers educational status			
Illiterate	5(1.8)	125(36.8)	130(21.1)
Primary	11(4)	115(33.8)	126(20.45)
Secondary	32(11.6)	81(23.8)	113((18.34)
High School	85(30.8)	17(5)	102(16.56)
Graduate	126(45.7)	2(0.6)	128(20.78)
Post Graduate	17(6.2)	0(0)	17(2.76)

*BGP = B G Prasad socioeconomic scale

Total 616 study subjects were included in the study. The Demographic Parameters have been divided according to the type of school attended (Table 1).

Table 2: Distribution of the study subjects according to their BMI for age in association to the type of school which they attend

	Private/Public SSS N = 276 Number (%)	Government SSS N = 340 Number (%)	Total N = 616 Number (%)
Obese	15(5.4)	2(0.6)	17(2.8)
OW	48(17.4)	31(9.1)	79(12.8)
Normal	174(63)	273(80.3)	447(72.6)
Thin	26(9.4)	26(7.6)	52(8.4)
Ext Thin	13(4.7)	8(2.4)	21(3.4)

NB: OW=Overweight

The prevalence of Overweight/Obesity and Thin/Extreme Thinness in the study subjects were observed to be 12.8% & 2.8% and 8.4% & 3.4% respectively. (Table 2)

Table 3: Distribution of malnutritional status with relation to various variables

Variable	Obese/Overweight		Underweight	
	P value	Chi square,df	P value	Chi square,df
Type of school	0.000	$X^2 = 22.903$, df = 1	0.020	$X^2 = 5.455$, df = 1
father's educational qualification	0.000	$X^2 = 46.067$, df = 1	0.030	$X^2 = 12.392$, df = 1
mother's educational qualification	0.000	$X^2 = 23.036$, df = 1	0.076	$X^2 = 9.972$, df = 1
SES	0.000	$X^2 = 36.332$, df = 4	0.138	$X^2 = 6.967$, df = 4
Frequency of intake of vegetables	0.000	$X^2 = 19.709$ df = 3	0.013	$X^2 = 10.748$ df = 3
Frequency of intake of fast food	0.000	$X^2 = 22.327$ df = 4	0.785	$X^2 = 1.733$ df = 4
Duration of sleep in 24 hours	0.009	$X^2 = 9.358$ df = 3	0.929	$X^2 = 0.147$ df = 3
Duration of sedentary habit in 24 hours	0.001	$X^2 = 16.966$ df = 3	0.236	$X^2 = 4.251$ df = 3
Awareness of free time by their parents	0.001	$X^2 = 19.661$ df = 4	0.027	$X^2 = 10.971$ df = 4
Perception of their own weight	0.000	$X^2 = 18.159$ df = 3	0.001	$X^2 = 16.976$ df = 3
Perception of maintenance of their bodyweight	0.000	$X^2 = 31.348$ df = 3	0.201	$X^2 = 4.626$ df = 3

P value of <0.05 is taken to be statistically significant.

X^2 = Chi square, df= degree of freedom

Obese/overweight or thinness/extreme thinness was seen more in the public schools as compared to the government schools (Figure 3). Statistically significant association was seen between the BMI of the study population to the type of school. p value= 0.000 ($X^2 = 30.395$, df = 4)(Table 3)

Age, Sex, Religion, Caste, Type of diet were found to be statistically not significant with both extremes of malnutrition.

DISCUSSION

In the present study, the prevalence of overweight/obesity was 12.8% and 2.8% respectively. This is comparable to studies done in Midnapore, Kolkata^[7] and Kerala^[8] which reported the prevalence of overweight/obesity in adolescents to be 14.9% and 3.8% and 12%/8.3% respectively.

The prevalence of undernutrition in this study was 14% with prevalence of thin/extreme thinness of 8.4% and 3.4% respectively. Similar findings was found in a study in Midnapore^[7] where the prevalence was found to be 20%. The prevalence found in studies in Chetla^[9] and^[6] in west Bengal was more than half the findings of this study where the prevalence was found to be 47.93% and 40% respectively. Apart from the differences in the sociocultural behaviours of the different areas, some differences in prevalence may be also because of the different methods of reference categories used in different studies for adolescents.

The proportion of overweight/obesity (65.6%) was high in study subjects who were from public schools. The odds of becoming overweight/obese was 2.99 times more among those from public schools. Similar finding was found in a study done in Wardha^[10] where the prevalence of overweight/obesity was significantly higher among children from Public/private school with odds of 3.04. Similarly a study done in Puducherry^[11] showed overweight/obesity was significantly high among public school students. The prevalence of undernutrition in public schools was 18.3% and the difference found to be statistically significant with odds of 1.8 times more in public schools. Similar findings were found in a study in Lucknow^[12].

In this study, the prevalence of overweight/obesity was found more in girls (11.90%) as compared to boys (6.80%) with the odds of overnutrition in girls to be 1.85 times more as in boys and the difference was found to be statistically significant. Similar finding was reported from studies done in Puducherry^[11] and in Saudi Arabi^[13]. In contrast to the above findings, the prevalence of overweight/obesity was found high in boys as compared to girls in other studies^[6]^[14]. In a study in Nagpur no difference in sex was observed^[10].

The relationship between prevalence of overweight/obesity and Socioeconomic status was statistically significant (p= 0.000) with high proportion of overweight/obesity seen in class 1 (61.5%). Similar results were seen in studies done in Belgaum^[15] (using similar scale.)and others^{[16][17]}.

The prevalence of overweight/obesity in this study was high in study subjects whose father and mother were graduates (46.9% and 28.1% respectively). A study ^[16] mentions that parents' educational status has an effect on children's obesity. Another study ^[17] showed low parental educational status was significantly associated with childhood overweight/obesity.

CONCLUSION

This study thus showed that 27.4% of the school going adolescents were malnourished. A Double Burden of Undernutrition as well as OverNutrition is thus seen prevailing among the adolescent students in East Sikkim, A state in North east India where research has been a grey area till a few years ago. Thus such findings among the people in this part of the country may help the decentralised policies in the next few years.

Conflict of Interest: Funding: the study received no research grants or funds from any research body.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: A Blanket Informed consent was first obtained from the HRDD department to perform the study in the school students.

Informed consent was then obtained from all consenting parents of the individual participants included in the study. Assent was also obtained individually from the individual participating adolescent.

Ethical Clearance: The Protocol was submitted to the Institutional Review Board (IRB) and Institutional Ethics Committee (IEC) of Sikkim Manipal Institute of Medical Sciences (SMIMS) and clearance obtained.

Permission was taken from Human Resource and Development Department (HRDD), Government of Sikkim to carry out the study in Co- Ed SSS of East Sikkim.

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The Combined Effect of Continuous Run, Alternate Pace Run and Fartlek Training on Selected Physiological Variable among Male Athletes

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ABSTRACT

The study aims to determine the effect of continuous run, alternate pace run and fartlek training on the selected physiological variable (Resting Pulse Rate) among the male athletes of Alagappa University affiliated colleges. The research involved a random subject selection of fifty athletes with age ranging from 17-25 years and had five equally divided groups namely experimental groups A, B, C, D and control group E with 10 athletes each. The groups endured the training activities for twelve weeks with a schedule of thrice a week whereas the control group remained with no activities. The data procured in prior and after the training programme was examined with the application of Analysis of Covariance and the fixation of level of significance at 0.05. Scheffe's test was applied at the significance of 'F' ratio in order to evaluate the differences that occur significantly between the paired means. The study revealed that the selected physiological variable of the combined group with the three endurance trainings outperformed the other groups.

Keywords: Continuous running, Alternate Pace Run, Fartlek Training, Resting Pulse Rate, ANCOVA

INTRODUCTION

A mission for perfection is often confronted with numerous difficulties. To improve the sports performance the athlete needs to take part in systematic training by the way of scientific method of training. Therefore athletes or players need proper systematic training to improve their performance through different kinds of training.¹ Significant improvement in VO₂ max may not be possible when the runner reaches a plateau. It is, therefore, suggested that more emphasis should be given to improve the anaerobic threshold level of athletes.² Actual effect of training depends upon several factors such as training loads, means of recovery, assessment of load and performance capacity, sports equipment, nutrition, psychological characteristics and method adopted for imparting theoretical instruction.³ The tendency of the systems of heart and blood vessels, lungs, body temperature regulators, body constituents, and the function of muscles and skeleton upon the capacity of an athlete leads to the enhancement of sports performance.⁴

Continuous Run: Continuous running boosts the heart rate to the vicinity of 130 and 160 thumps for a

given period of time at a relentless pace or power. The average time span of such running will be more than 30 minutes for a youthful competitor and from 60-120 minutes for an adult. Continuous training structures the reason for all other preparing techniques both anaerobic and aerobic.⁵ Ernst Van Aaken, German physician and coach, is credited with introducing and popularizing this system of training. Ernst Van Aaken's work in this area started in 1920's but received widespread support at the later. Continuous training differs from maximum force constant action of slow time span to minimum-force action of a broadened span, long-slow distance, or "LSD" method. The long distance sprinter keeps up a pace that is simply beneath his dashing pace, despite the fact that this will rely upon the overall distance and the distance of preparation runs.

Alternative Pace Run: Running for long time at a speed with a variation in progressive stretches in accordance with a plan is Alternative pace run. In general, for a person at slow pace for 1.0 km, the heart rate ranges from 130 to 150 beats per minute while considering fast pace for 0.5 km, the heart rate ranges from 170 to 180 beats per minute. The maximal oxygen intake at a subsequent

distance of 1.0 km is stirred up. The alternative pace run supports the consumption of oxygen and the ability of varying speed.

Fartlek Training: Fartlek Training involves the fluctuation of force indicated by the necessity of the athlete and the wavy surfaces and edges of landscape. It strengthens the endurance by maintaining proper balance in ankle, knee and hip. It involves the fluctuation of pace during the run, switching between quick and slow runs that are more unordered. No prefixed time laps and pace makes fartlek training stand out from other training methods. Fartlek conditioning lets oneself to explore his/her ability and aerobic capacity levels. Further, it can encourage oneself to train longer and hard by improving anaerobic threshold levels. Main difference of fartlek training from regular is that the participant can work out by altering the intensity levels.⁶

Resting Pulse Rate: Normal pulse measures the beats every minute at rest. It signifies the general wellbeing of the heart and the level of fitness. Well trained adult athlete's normal pulse rate values between 60 and 40. It could be measured through palpation method.

Statement of the problem: The purpose of the study was to find out the Effect of Continuous Running, Alternate Pace Run, Fartlek Training on Selected physiological variable (Resting Pulse Rate) of male athletes.

METHODOLOGY

The research was designed to discover the effect of continuous run, alternative pace run and fartlek training

on physiological variable (Resting Pulse Rate) by using Alagappa university college's athletes. For this purpose, fifty athletes from the college were chosen randomly as subjects for the study and their age ranged between seventeen and twenty five years.

Test Administration of Resting Pulse Rate

Purpose: The test aimed to evaluate the rate of resting pulse of the subject.

Equipments: Stop clock, paper, pencil.

Procedure: The pulse of the subject on the radial artery in the fore arm and the carotid artery beneath the neck was checked by placing the index and middle fingers. The pulse of the subject each minute for 3 minutes in the morning at rest before the training was recorded. It helped the subject to keep up the optimal zone during the training session.

NORMAL RESULTS AND DISCUSSION

The normal rate of resting pulse for an adult is from 60 to 100 beats a minute. It varies based on the age and physical condition of an individual. The analysis of data on Resting Pulse Rate has been examined by ANCOVA for variables separately in order to determine the differences if any among the group at pre and posttest when the differences was found to be significant by ANCOVA, the Scheffe's post hoc test was applied to assess the significant differences between the adjusted mean.

Table 1: ANCOVA for the data extracted from the pre and post tests of the training groups of Continuous, Alternate Pace Run, Fartlek, Combined and Control methods on Resting Pulse Rate (Manual Method means count beat per minute)

Test	CNG	APG	FTG	CMG	CTG	Source of Variation	Variation in Sum of Squares	Df	Squared Mean	‘F’ Ratio observed
Pre test										
Mean	72.9	72.3	73.1	72.9	72.6	Between	3.92	4	.980	.032
SD	7.21	4.57	6.62	4.70	3.77	Within	1379.2	45	30.649	
Post test										
Mean	66.3	65.5	64.9	63.2	73.1	Between	580.0	4	145	14.002 *
SD	1.70	4.30	2.84	2.09	4.22	Within	466	45	10.356	
Adjusted post test mean	66.26	65.62	64.811	63.16	73.14	Between	588.547	4	147.137	17.39*
						Within	372.293	44	8.461	

*Required table value with significant level at 0.05, degree freedom 4 and 45 and 4 and 44 are 3.20 and 3.21 respectively.

B.M., W.G, B.S, W.S are Between Means, Within Groups, Between Sets , Within Sets respectively.

(Manual Method means count beat per minute)

The data from the above table I indicates that the means of pre-test measures of the training groups of continuous, alternative pace running, fartlek, combined and control methods are 72.9, 72.3, 73.1, 72.9 and 72.6 respectively. The value of F ratio .032 for the pre-test was lesser than 2.58 of table value for degree of freedom 4 and 45 necessary for significance level at 0.05. The means of post-test of the training groups of continuous, alternative pace, fartlek combined, control methods were 66.3, 65.5, 64.9, 63.2 and 73.1 respectively. The ratio of F 14.002 for the pre-test was lesser compared with 2.58 table value of for degree of freedom 4 and 45 necessary for a level of significance at 0.05 fixation. The means of adjusted post test related to the training groups of continuous, alternative pace running, fartlek, combined and control methods were 66.26, 65.62, 64.81, 63.16 and 73.14 respectively. The F ratio 17.39 obtained for post-test was greater than 2.58 of table value for degree of 4 and 45 necessary for significance level at 0.05.

The analysis mentioned above shows that the means belonging to the adjusted post-test of the all the five groups differed significantly. For post hoc test Scheffe's test as was used in order to identify which specific group had the significant difference and to find out which paired means showed significance of difference and the produced results are listed in Table II.

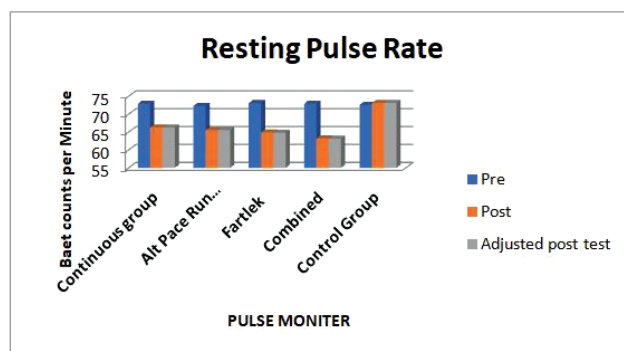


Figure 1: Mean values of adjusted post-test of the training groups of continuous, combined and control methods on Resting Pulse Rate (Manual Method means count beat per minute)
*Significance level at 0.05

The above table shows the results achieved as a result of the Scheffe's Post hoc test. It could also be observed that the difference in means between continuous training group and alternative pace running group was .644 ($P < 0.05$) and the calculated C.I value was 4.18* ($P > 0.05$). The mean difference between the training groups of continuous and

fartlek methods was 1.452 ($P < 0.05$) and the calculated C.I value was 4.18* ($P > 0.05$). The mean difference among the training groups of continuous and combined methods was 3.1 ($P > 0.05$) and the calculated C.I value was 4.18* ($P < 0.05$). The mean difference among the training group of continuous and control methods was 6.87* ($P > 0.05$) and the calculated C.I value was 4.18 ($P > 0.05$). The mean difference between the alternative pace running group and Fartlek training group was .809 ($P > 0.05$) and the calculated C.I value was 4.18* ($P > 0.05$). The mean difference between the alternative pace running training group and combined training group was 2.45 ($P > 0.05$) and the calculated C.I value was 4.18* ($P > 0.05$). The mean difference among the alternative pace run group and control group was 7.52* ($P > 0.05$) and the calculated C.I value was 4.18 ($P > 0.05$). The mean difference among the training groups of Fartlek training and combined methods was 1.64 ($P > 0.05$) and the calculated C.I value was 4.18* ($P > 0.05$). The mean difference among the training groups of fartlek and control methods was 8.33* ($P > 0.05$) and the calculated C.I value was 4.18 ($P > 0.05$). The mean difference among the training groups of combined and control methods was 9.97* ($P > 0.05$) and the calculated C.I value was 4.18 ($P > 0.05$). From that it can be clearly noticed that combined training group showed improvement with the influence of resting pulse rate in comparison with the groups of continuous, alternative pace run group, fartlek training and control training. The training group of fartlek method responded better when compared with continuous training group, alternative pace run group and the control group. The alternative pace run group responded better when compared with training groups of continuous and the control methods. The continuous training group performed better compared to the control group.

Discussing on findings: The current study clearly reveals the significant improvement of the combined training group on the variable of resting pulse rate when compared with the groups of continuous, alternative pace run group, fartlek and control training methods.

Discussion on hypotheses: In the hypothesis it was stated that there would be significant improvement on the selected physiological variable due to the Effect of Continuous Running, Alternative Pace Run and Fartlek Training. The result shows that due to the Effect of Continuous Running, Alternate Pace Run and Fartlek Training on selected performance variable namely resting pulse rate have significantly improved. Hence it proved that the research hypothesis was accepted.

CONCLUSIONS

1. Resting Pulse Rate was significantly improved by the Continuous running group, Alternate Pace Run and Fartlek training group when compared with control group.
2. There is no significant improvement in resting pulse rate between Continuous running group, Alternate Pace Run and Fartlek training group.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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Prevalence of Lifestyle Related Risk Factors for Non-communicable Diseases among Adolescents of an Urban Community in Mumbai

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ABSTRACT

Background: Non-communicable diseases (NCD) have emerged as the leading cause of morbidity and mortality. There are certain lifestyle related risk factors responsible for major NCDs. Lifestyle risk factors can be easily modified if detected early in life. Hence, this study was undertaken to find out the prevalence of such lifestyle related risk factors among adolescents.

Method: A cross-sectional study was carried out among adolescents. Data was collected by interview method using semi-structured questionnaire. Information was asked regarding tobacco and alcohol use, dietary practices, physical activity and family history of NCDs. Physical measurements were recorded using standardised methods. Statistical analysis was done using SPSS version 20.0.

Results: 227 adolescents participated in the study. 55 (24.2%) reported ever use of tobacco, of whom only 9 (3.9%) were females. No significant association was found between tobacco use and monthly per capita income. 23 (10.13%) of ever tobacco users were school dropouts. History of school dropout was significantly associated with tobacco use ($p < 0.001$). Parental use of tobacco was significantly associated with tobacco use among the adolescents ($p < 0.001$). None of the respondents reported alcohol use. Daily fruit consumption was reported by 1 (0.4%) respondent. Daily vegetable consumption was reported by 216 (95.2%) respondents. 36 (15.6%) reported doing vigorous activity for 60 minutes daily. 19 (8.4%) reported family history of NCDs. 15 (6.6%) were found to be overweight and 4 (1.8%) were found to be obese.

Conclusion: The study highlights high prevalence of lifestyle risk factors among adolescents which needs to be corrected.

Keywords: Non-communicable diseases, adolescents, lifestyle, physical activity, tobacco

INTRODUCTION

Non-communicable diseases have shown increasing trends all over the world since last few decades. According to global estimates, mortality patterns have changed since the 1990s, with chronic non-communicable diseases (NCD) exceeding communicable, maternal and perinatal

causes, except in Sub-Saharan Africa. Globally, deaths from non-communicable diseases are expected to climb to 49.7 million in 2020, an increase of 77% in absolute numbers and increase in their share of the total from 55% in 1990 to 73% in 2020.¹

The growing per capita income and resultant raised standard of living in developing countries has brought in the gamut of non-communicable diseases. These developing countries are fighting the menace of both communicable and non-communicable diseases with limited resources. As a result, a great number of premature deaths are happening in these countries. The non-communicable diseases present substantial challenge in present scenario.

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These non-communicable diseases are the consequence of genetic, environmental and lifestyle related risk factors. The major NCDs like cardiovascular diseases, cancer, chronic obstructive pulmonary disease and diabetes mellitus share common, preventable life style risk factors like tobacco use, unhealthy diet and physical inactivity.² The risk factors of today will cause non-communicable diseases tomorrow. Therefore, it is necessary to control the risk factors to avoid future burden of morbidity and mortality.

For the worldwide surveillance of risk factors for non-communicable diseases, the World Health Organisation (WHO) has devised the STEP wise approach to surveillance (STEPS). The WHO STEP wise approach for NCD risk factor surveillance is a sequential process, starting with gathering information on key risk factors by the use of questionnaires (STEP 1), then moving to simple, physical measurements (STEP 2), and only then recommending the collection of blood samples for biochemical assessment (STEP 3).³ A few countries such as Indonesia and Vietnam have reported risk factors for NCDs using the WHO STEPS methodology. These studies did not include the STEP 3 component, which is expensive and logistically difficult to implement in low-resource settings. Moreover, most of the information on major risk factors can possibly be obtained using STEPS 1 and 2, and it is thought that a large proportion of the biochemical risk factors could be predicted. Therefore, the real need for STEP 3 data collection needs to be evaluated in community-based settings in developing countries.⁴

Another such questionnaire designed for school children aged 13-17 years is the global school-based student health survey (GSHS). It uses a standardised scientific sample selection process; common school-based methodology & core questionnaire modules; core-expanded questions and country specific questions that are combined to form a self-administered questionnaire which can be administered during one regular class period. The 10 core questionnaire modules address the alcohol use, dietary behaviours, drug use, hygiene, mental health, physical activity, protective factors, sexual behaviours, tobacco use, violence and unintentional injury.⁵

The knowledge of lifestyle risk factors in adolescence is of utmost importance. It is the time when an individual lays down the foundation of future lifestyle. Imbibing good habits at this time will ensure a healthy lifestyle throughout adulthood. Adolescents are more amenable to changes in lifestyle.

With this in view, the present study was undertaken to find the prevalence of different lifestyle risk factors for non-communicable diseases among adolescents. Also, the adolescents belonging to families of class IV employees presented an opportunity to study an urban population with unique socio-demographic background.

AIM

To find out the prevalence of different lifestyle related risk factors for non-communicable diseases among the respondents.

OBJECTIVES

1. To describe the distribution of lifestyle related risk factors among the respondents.
2. To correlate between the prevalence of lifestyle related risk factors and socio-demographic characteristics of the respondents.

METHOD

Research setting and study area: The study was carried out in the campus of Grant Medical College and Sir J. J. Group of Hospitals, Byculla, Mumbai. The study was undertaken after completion of all formalities. The necessary administrative permissions were sought.

Study Design: Cross-sectional study

Study Population: It comprised of the adolescents (10-19 years) residing in the quarters for class IV employees inside the campus of Grant Medical College, Mumbai.

Inclusion Criteria: 1. All adolescents (10-19 years) residing at quarters for class IV employees. 2. Willing to participate in the study.

Exclusion Criteria: 1. Adolescents with loco motor disability. 2. Adolescents who are diagnosed cases of endocrinological disorders.

Sample Size and Sampling Method: For this study, the universal sample was considered, i.e. all the adolescents (10-19 years) were included. The information regarding the location and number of class IV employee quarters was procured from the Public Works Department of the Grant Medical College, Mumbai. Door to door visits were made, enquiring about presence of adolescent (10-19 years) in the family residing in that particular quarter.

Adolescents were included in the study after obtaining their written consent along with their parents' consent wherever required. If the adolescent was not present at time of visit, suitable timing was sought and then interview conducted in following visit.

Data Collection: The interview was conducted inside the quarter after ensuring privacy. The respondents and their parents were introduced to the topic and purpose of study was explained to them in the language they understood. The data was collected with help of a structured questionnaire based on WHO STEPS and GSHS (Indian version) questionnaire. The physical measurements were made by the investigator after the interview. The questionnaire assessed following variables:

Socio-demographic and lifestyle related questions

1. Socio-demographic information
2. Tobacco use
3. Alcohol consumption
4. Dietary practices like fruit, vegetable intake & junk food consumption⁶
5. Physical activity⁷
6. Family history of chronic non-communicable diseases.

Physical measurements (using standardized methods)

1. Blood pressure
2. Height
3. Weight
4. BMI⁸

Statistical analysis: It was done using SPSS version 20.0. Results were depicted in tabular form and graphs were made wherever necessary. Mean and standard deviation were calculated. Chi square test was applied to test significant difference between two groups. A 'p' value of less than 0.05 was deemed statistically significant.

RESULTS

The total number of respondents was 227. Age ranged from 10-19 years (mean 14.07, SD $\pm$ 2.849). Of the total respondents 93 (41%) were females and 134 (59%) were males. Educationwise, 164 (72.2%) were studying in school, 20 (8.8%) were studying in

college and 43 (18.9%) were school dropouts. All the respondents belonged to lower socio-economic class according to modified Kuppaswamy's classification. Monthly per capita income varied from Rs. 1334 to Rs. 5000 (mean 2614.98 & SD $\pm$ 786.9).

Table 1: Distribution of Respondents with respect to Gender and Tobacco Use

Gender	Ever Used Tobacco		Total
	Yes	No	
Female	9 (3.96%)	84 (37.1%)	93 (40.9%)
Male	46 (20.2%)	88 (38.8%)	134 (59.0%)
Total	55 (24.2%)	172 (75.8%)	227 (100%)

Chi square= 18.171, d.f. =1, p<0.001, highly significant

In this study, 55 (24.2%) adolescents reported ever using tobacco products. Maximum tobacco use was seen in 17-19 year age group: 32 (58.18%). Tobacco use was found to be significantly higher in males as compared to females {46 (83.6%) vs 9 (16.3%).}

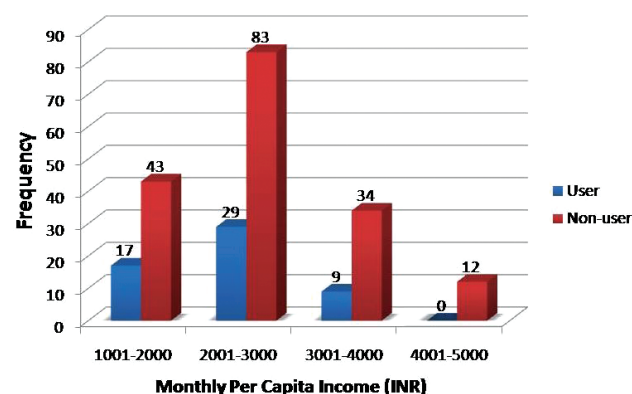


Figure 1: Distribution of Tobacco Users with respect to Monthly Per Capita Income

Table 2: Association between Tobacco Use and History of School Dropout

Category	Ever Used Tobacco		Total
	Yes	No	
Dropout	23 (10.13%)	20 (8.82%)	43 (18.95%)
Regular Students	32 (14.09%)	152 (66.96%)	184 (81.05%)
Total	55 (24.23%)	172 (75.77%)	227 (100.0%)

Chi square = 24.738, d.f.=1, p<0.001, highly significant

Majority of the ever tobacco users belonged to income group of Rs. 2001 to Rs. 3000. No significant association was found between per capita income and tobacco use. (Likelihood ratio= 7.620, d.f.=3, $p=0.055$, not significant)

Tobacco use was significantly associated with history of school drop-out.

Parental use of tobacco was found to be significantly associated with tobacco use in respondents. (Chi square = 69.756, d.f. = 1, $p<0.001$, highly significant).

12 (5.2%) acknowledged having experimented with smoking, 4 tried cigarette and 8 tried bidi; but none continued it regularly. 29 (12.8%) acknowledged having experimented with gutka (smokeless form of tobacco)

and 8 (3.5%) reported using it daily. 14 (6.16%) reported use of mishri (a smokeless form of tobacco), of whom 9 (64.2%) were females.

None reported ever consumption of alcohol.

Daily fruit consumption was reported by only one respondent. 37 (16.2%) reported consumption of fruit once a week. Daily vegetable consumption was reported by 216 (95.2%).

96 (42.3 %) reported consumption of junk food. Out of these, 33 (34.4%) reported consuming it more than thrice a week.

Only 36 (15.6%) of the respondents met the WHO recommendation for physical activity, of which 2 (2.2%) were females.

Table 3: Distribution of Respondents with respect to Body Mass Index

Categories Based On BMI	Gender		Total
	Male	Female	
Severe Thinness	12 (9.0%)	4 (4.3%)	16 (7.0%)
Thinness	13 (9.7%)	14 (15.1%)	27 (11.9%)
Normal	99 (73.9%)	66 (71.0%)	165 (72.7%)
Overweight	9 (6.7%)	6 (6.5%)	15 (6.6%)
Obese	1 (0.7%)	3 (3.2%)	4 (1.8%)
Total	134 (100.0%)	93 (100.0%)	227 (100.0%)

19 (8.4%) reported having family history of non-communicable diseases.

Table 4: Age Vs Body Mass Index, Systolic Blood Pressure and Diastolic Blood Pressure

Age	Body Mass Index	Systolic Blood Pressure	Diastolic Blood Pressure
Pearson's correlation value	0.527	0.670	0.674
P value	<0.0001	<0.0001	<0.0001
Significance	Significant	Significant	Significant
Total	227	227	227

None of the respondents were found to have raised blood pressure.

Age was found to be significantly associated with body mass index, systolic blood pressure and diastolic blood pressure.

DISCUSSION

In a study done by Akil Kant Singh et al, 50.5% boys and 48.5% girls said that they had a family history of hypertension. Also, 22.9% boys and 29.9% girls stated

that they had a family history of obesity.⁹ In our study, only 8.4% reported family history of non-communicable diseases. Such low proportion can be attributed to the lower socio-economic status of the population studied.

In our study, 24.2% adolescents reported ever using tobacco products. This is much higher than the prevalence of 10.59% reported in a study done by Faizur Rahman and V. N. Tripathi among male adolescents.¹⁰ The difference can be due to the inclusion of adolescents with diverse background in the latter study. In another such study done by Akil kant Singh et al, 3.6% boys

and 1.3% girls said they smoked more than once in the last one month.⁹ C. Malhotra et al conducted a study on street children from Delhi and found that ever use of tobacco was 56.7%, much higher than that found in present study.¹¹

Tobacco use in adolescents is due to their experimental and curious nature. Also they are ignorant about tobacco hazards. Such experimenters are prone to developing tobacco-related disorders at an early age. They have a greater probability of transforming themselves to regular and addictive users.

In our study, 12 (5.2%) experimented with smoking. 29 (12.8%) experimented with gutka (smokeless form of tobacco), of which 8 (3.5%) reported using it daily. 14 (6.16%) reported use of mishri (a smokeless form of tobacco), of whom 9 (64.2%) were females. Lesser proportion of females using tobacco may be due to the fact that females spend most of their time in domestic environment and so are less likely to be influenced by their peer group.

Tobacco use was significantly associated with history of school drop-out in our study. The greater use of tobacco in drop-outs may be due to deprivation of education and recreation which brings about a feeling of insecurity in them, leading them to take up addictions.

Another important factor found to be significantly associated with tobacco use among adolescents was parental use of tobacco. This association emphasizes the fact that parents are role models for their children. Such children take up the habit of tobacco assuming it to be normal and right.

Our study reported very low fruit consumption. This finding is reflective of the harmful dietary practices among the respondents. Similar finding was reported in a study among 6-11 year old children done by Mushi-Brunt et al. They observed that 78% of the children failed to meet the ideal fruit intake recommendation.¹² Another harmful dietary practice observed was consumption of junk food. In the present study, 96 (42.3 %) reported regular consumption of junk food.

CONCLUSIONS

The present study depicts high prevalence of lifestyle related risk factors responsible for non-communicable diseases among the adolescents. Harmful practices

observed among the adolescents include tobacco use, inappropriate dietary practices and physical inactivity.

RECOMMENDATIONS

Behaviour change should be brought about among the adolescents. They must be encouraged to follow healthy lifestyle. Also, the adolescents must be made aware of the consequences of unhealthy lifestyle. This may be done in following ways- 1. Health education regarding importance of healthy lifestyle can be given by arranging sessions inside the campus by the doctors of concerned tertiary hospital. 2. Posters can be displayed in the locality with the objective of serving as a reminder to target population that they ought to reconsider their harmful habits. 3. Skits can be performed by the medical students with an objective to clarify the prevalent superstitions and misconceptions about lifestyles. 4. Recreational facilities may be improved by formation of youth clubs and sports groups. Physical activity can be encouraged by formation of outdoor games club. Health promotional measures, focussing not only the adolescent but the family as well, should be advocated in the community. Through proper initiative by the administration, parents-doctors meetings can be arranged. The hazards of lifestyle factors can be explained. The parents may be motivated to give up their habit of using tobacco and alcohol by making them realise that they are pushing their children towards such harmful habits. The persons willing to give up tobacco can be referred to the tobacco cessation clinics such as the one in Tata Memorial hospital.

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“Role of Curcumin in Chemoprevention of Oral Cancer: A Review”

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ABSTRACT

Chemoprevention is defined as the inhibition or reversal of carcinogenesis, a phenomenon that starts with alteration of normal cellular structure and terminates with cancer. There are many chemopreventive agents which are under trial for therapeutic use. Long-term use of most of the synthetic agents is associated with significant dose-related toxicity. Thereby the use of natural chemopreventive agents is desirable. This paper reviews one such natural agent curcumin which is used in chemoprevention of oral cancer.

Keywords: chemoprevention, cancer, curcumin

INTRODUCTION

Chemoprevention is defined as the inhibition or reversal of carcinogenesis, a phenomenon that starts with normal cellular structure and terminates with cancer. The chemicals that inhibit the process of carcinogenesis are called as chemopreventive agents.

The main action of chemopreventive agents lies towards reversal of the process of potentially malignant disorders and inhibiting second primary tumors (SPT). This process of reversal of early precursor lesions and inhibiting second primary tumors will serve as an ideal approach for the treatment of oral cancer.

Pharmacological prevention of cancer is a newer approach in oncology, but it represents a very positive approach in the treatment of oral cancer¹.

Chemopreventive agents are tried in several different malignancies, with some remarkable successes.

In the large randomized prospective trials, tamoxifen has shown promise in the treatment of breast cancer².

Unlike other malignancies, oral cancer serves as a positive model to study chemopreventive agents for various reasons. It has well-established etiologic agents, namely tobacco, alcohol, betel nut chewing, and human papillomaviruses. Differences in the predisposing factors influence only the site prediction and do not affect the overall clinical picture. Oral cancer has known early precursor lesions such as leukoplakia, erythroplakia, and oral submucous fibrosis. Oral cancer has a conventional molecular progression model in which carcinogenesis is a multistep process from normal epithelium to dysplastic epithelium to carcinoma in situ and frank malignancy. The oral precursor lesions are easy to examine periodically for any morphologic alteration and can be confirmed by histopathologic examination. Several agents have been tried in various chemopreventive therapies. Since the earlier chemopreventive agents like retinoids were not considered safe and their low efficacy narrowed their use as a preventive agent. Because of long-term administration of chemopreventive agents, it is crucial to determine regimens that provide the greatest efficacy with least risk of adverse effects. The treatment of oral cancer is associated with the potential long term complications and hence, chemopreventive agents are regarded as a major therapeutic alternative. This review aims to encompass one such promising agent in the form of curcumin and discuss its role as a chemopreventive agent.

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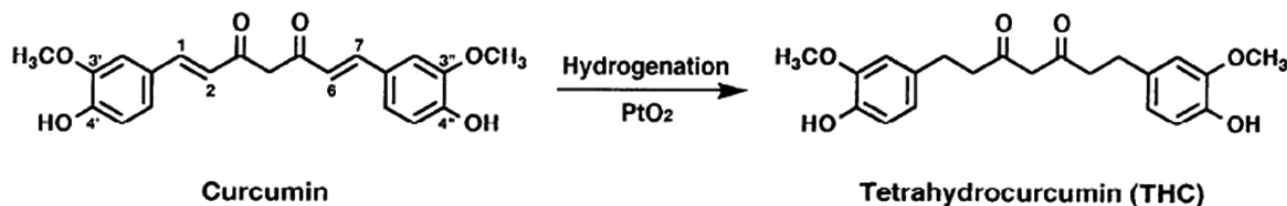
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Curcumin is a highly safe natural antioxidant with many possible biological properties. It has a wide array of applications and is considered a breakthrough in the management of oral cancer and various other malignancies.

Tetrahydrocurcuminoids: There are various metabolic products of curcumin. One of the most important metabolized by product is Tetrahydrocurcuminoids (THC). THC is the main agent involved in biological properties of curcumin.



Several studies on the absorption and metabolism of curcumin are reported in the literature. According to Holder et al.³, one of the main metabolites of curcumin is Tetrahydrocurcuminoids. Sugiyama Y et al.⁴, in their study, showed that THC had enhanced the inhibitory effect on lipid peroxidation than curcumin.

Curcuma longa: Natural plant products are home remedies for various common ailments since ages. However, their role as possible chemopreventive agents is still in its initial phase. In the recent decade, many trials are underway to explore the mechanism of plant products as a chemopreventive agent.

Curcumin (diferuloylmethane), a polyphenol, is an essential ingredient of the herb *Curcuma longa* (Commonly known as turmeric).

Curcuma longa is the main crop grown in Asians and tropical countries. This herb has a short stem measuring up to 1 metre height and tufted leaves. The parts used in therapeutics are the rhizomes.

Chemical composition of turmeric: The main curcuminoids existing in turmeric are:

- a. Demethoxycurcumin (Curcumin II)
- b. Bisdemethoxycurcumin (Curcumin III)

Physical properties of curcumin: Curcumin is insoluble in water but soluble in organic solvents. Primarily Curcumin exists in two forms as enol and β -diketone^{5,6}. The enolic form of curcumin has a major role in the antioxidant ability. Curcumin is stable in gastrointestinal tract because of its slow degradation at pH 1-6. However one of metabolite of curcumin, Tetrahydrocurcumin, or THC is even stable at neutral pH⁶.

Ancient applications of curcumin: Historically, curcumin has been used as a food condiment and also carries therapeutic applications. In ancient medicine, curcumin and its metabolites are used in alternative medicine since ages. Ayurveda has laid special emphasis of curcumin in the treatment of asthma, allergy and upper respiratory tract infections.

In Chinese literature, it is mainly used to treat gastrointestinal diseases. The main therapeutic effect of curcumin and its products is because of its anti-inflammatory properties. The key aspect in its long-term use is extreme safety.

Mechanism of action of curcumin: The main interaction of curcumin at molecular level include various growth factors and regulatory genes of cell proliferation and apoptosis.

- (a) **Interacts with various receptors:** The main action of curcumin lies in its ability to inhibit tumor invasion and angiogenesis⁷. It attaches to multiple receptors and causes enzymatic inhibition.
- (b) **Inhibition of transcription factors:** Various transcription growth factors are responsible for carcinogenesis, cellular proliferation, and invasion⁸. Curcumin inhibits various transcription factors and inactivates the expression of genes that lead to cancer.
- (c) **Curcumin down regulates the activity of multiple kinases:** Curcumin's anti-proliferative activity is attributed to its inhibitory effect on many protein kinases⁹. Curcumin downregulates the expression of bcl-2 and thus suppress carcinogenesis.

- (d) Curcumin downregulates genes expressing growth and metastases:** Curcumin inhibits the metastatic activity of tumor cells by inhibiting the expression of matrix metalloproteinase (MMP-9) and MMP-2¹⁰. Curcumin is able to exert anti-inflammatory and growth-inhibitory action on tumor cells by inhibiting the activity of interleukin 1 β (IL-1 β), interleukin 6 (IL-6), and TNF - α and cyclin E^{11, 12}.

Preclinical studies of curcumin

- (A) Curcumin as a chemopreventive agent:** The role of curcumin in chemoprevention of cancer has been examined in rodent models¹³. It has been proposed through these studies that curcumin can reportedly suppress the process of carcinogenesis in different cancers of the gastrointestinal, hematopoietic and oral cavity.
- (B) Anti proliferation of tumor cells:** Curcumin can inhibit various cancer cells including head and neck in vitro.
- (C) Curcumin exhibits antitumor activity in animals:** Kuttan et al.¹⁴ first reported antitumor activity of curcumin in mice. Also, the effect of curcumin is enhanced by the simultaneous oral administration of green tea¹⁵.

Clinical studies of curcumin: To evaluate Curcumin's invitro and invivo chemopreventive and pharmacological efficacy, clinical trials have addressed the pharmacokinetics, safety, and efficacy of curcumin in humans.

- (A) Curcumin is extremely safe and well tolerated:** There are many studies which have evaluated the safety profile of curcumin as a chemopreventive agent.
- Deodar et al. (1980)** performed a short – term, double-blind, crossover study in 18 patients (age 22 to 48 years) to compare the antirheumatic activity of curcumin and phenylbutazone. They administered 1200 mg curcumin/day or 300 mg phenylbutazone/day for the duration of fourteen days. They concluded that curcumin was well tolerated with no side effects, and showed antirheumatic activity¹⁶.
- (B) Curcumin has anti-inflammatory and antirheumatic activity:** Satoskar et al. (1986) studied the anti-inflammatory attribute of curcumin

in patients with post-operative inflammation. They evaluated 46 male patients (between the ages of 15 and 68 years) having an inguinal hernia and hydrocele. These patients were prescribed either curcumin (400 mg) or placebo (250 mg lactose) or phenylbutazone (100 mg) thrice daily for 5 days from the first postoperative day. Curcumin was found to be safe, and phenylbutazone and curcumin produced better anti-inflammatory response than placebo¹⁷.

- (C) Role of curcumin in cancerous skin lesions:** Kuttan et al. (1987) evaluated curcumin's efficacy when applied as either an ethanol extract of turmeric or as an ointment to an external cancerous lesion in 62 patients. Regardless of the application, curcumin provided remarkable symptomatic relief that was in many cases relatively durable (lasting several months) and in all cases extremely safe¹⁸.
- (D) Curcumin is efficacious and safe in patients with inflammatory orbital pseudotumors:** Lal et al. (2000) evaluated the clinical effectiveness of curcumin in the treatment of patients with inflammatory orbital pseudotumors. In four out of five patients, complete recovery was observed. They concluded that curcumin was safe and efficacious drug in the management of inflammatory orbital pseudotumors¹⁹.
- (E) Role of curcumin in premalignant lesions:** Curcumin safely exerts chemopreventive effects on premalignant lesions.
- Cheng et al. (2001)** evaluated the pharmacological properties, safety and effective limiting dose in humans. This study examined patients with cancer of the urinary bladder, uterine cervix, skin, gastrointestinal and oral cavity. In 25 patients curcumin was administered orally for 3 months. Pre and post-treatment biopsy was undertaken to evaluate the histological improvement. This study concluded that curcumin is safe to humans at doses as high as 8000mg/day. The histological improvement seen in some cases also suggested a possible role of curcumin in chemoprevention of cancer²⁰.
- (F) Curcumin modulates biomarkers of colorectal cancer:** Sharma et al. (2001) in their pilot study evaluated the pharmacological properties of curcumin. In this curcumin extract was given at

dose range from 440 and 2200 mg/day in fifteen patients. All the patients were diagnosed cases of advanced colorectal cancer and were given curcumin extract for 4 months. The end product measured were lipid peroxidation products and prostaglandins in blood. They found that curcumin was highly efficacious and safe. No curcumin residues were observed in urine or blood sample²¹.

CONCLUSION

Curcumin has a likely role as a chemopreventive agent in the prevention of various malignancies. Its role in chemoprevention of oral cancer is still under trial. However various studies have pointed towards curcumin as an alternative in the management of oral cancer. Current treatment modalities are associated with significant dose-related toxicity, thereby necessitating the use of curcumin.

Ethical Clearance: Review article

Source of Funding: Nil

Conflict of Interest: Nil

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Breast Feeding Practices-An Exploratory Survey among Mothers of Infants

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ABSTRACT

Introduction: Knowledge of breastfeeding is essential for every mother to ensure proper nutrition to their infants. In order to explore the feeding practices of mothers a survey was undertaken. The objective of the study was to find the breastfeeding practices of infants among the mothers attending a selected tertiary care unit of Udupi district.

Method: Research approach used for this study was quantitative survey with exploratory survey design. Hundred mothers selected using purposive sampling method were interviewed regarding the breastfeeding practices. The instruments used for the data collection were demographic proforma and a semi structured interview schedule. The setting of the study was a tertiary level hospital at Udupi District. This research protocol was approved by the Institutional ethical committee.

Results: Mean age of the mothers were 28.5 years and mean birthweight of the children were 2.53 kgs. Majority of the mothers delivered by caesarean section (63%). Only 46% of the mothers received information regarding breastfeeding before the delivery and health professionals were the main source of information to the mothers. Lactation counselling in the antenatal and postnatal areas carried out regularly by the health professional helped the mothers to receive the information from health professionals. Study showed that 65% of the mothers gave colostrum to their children. Only 33% of the mothers initiated breastfeeding within one hour of delivery.

Conclusion: Exclusive breastfeeding has advantage for the mother and the child. Lactation counselling by the health professional will help the mothers regarding breastfeeding. Continued support from the health professionals in postnatal period in the paediatric setting need to be reinforced. Mothers of infants need to be motivated for exclusive breastfeeding to their children.

Keywords: *breastfeeding, practices survey, infant, mother, south India*

INTRODUCTION

Breastmilk is considered as the most appropriate and adequate nutrition for the infant till six months. Hence exclusive breastfeeding for the infant up to six months is

advised to the mothers. In reality there are infants who receive formula feed even from birth.

According to National Family Health Survey-3 data, about 20 million children are not able to receive exclusive breastfeeding (EBF) for the first six months, and about 13 million do not get good, timely and appropriate complementary feeding along with continued breastfeeding ¹.

The optimal and appropriate infant and young child nutrition practices and strategies recommended to practice reported in the Infant and Young Child Feeding Guideline of 2016 (IYCF) are a) Exclusive Breast Feeding (EBF) should be practiced till end of six

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months (180 days); b) After completion of six months, introduction of optimal complementary feeding should be practiced preferably with energy dense, homemade food; c) Breastfeeding should be continued minimum for 2 years and beyond; d) Mother should communicate, look into the eyes, touch and caress the baby while feeding. Practice responsive feeding; and e) WHO Growth Charts recommended for monitoring growth ².

Even though there are guidelines regarding IYCF, mothers do not follow exclusive breastfeeding is not followed in many countries ^{3,4,5,6}

The result of the cross sectional descriptive study carried out in Tamil Nadu showed a prevalence of the early Initiation of breast feeding as 97.5% and the prevalence of exclusive breast feeding in the study population was 68%. Inadequate exclusive breast feeding and the lack of hygienic feeding practices among the mothers were significantly associated with an increased incidence of upper and lower respiratory tract infections and gastro intestinal infections in the infants and the children ⁷.

Breastfeeding and Immunization is an effective way of reducing child and maternal mortality. The results from study carried out in tertiary care hospital in Southern India showed that many participants had lacunae in knowledge and attitude and adequate health education should be given to the pregnant women ⁸. In India, some of the barriers to exclusive breastfeeding reported from research include are lack of awareness regarding proper technique of breastfeeding and benefits of colostrum; breast abnormality like inverted/retracted nipples; obstetric/neonatal complications requiring specialised care; and cultural practices like giving pre-lacteals and gender discrimination ⁹. Certain customs and beliefs also makes the mothers delay the initiation of breast feeding. Colostrum is considered as indigestible and not a good food for the baby ¹⁰.

In order to understand more about the breastfeeding practices, an exploratory survey was carried out.

MATERIAL AND METHOD

To identify the feeding practices of mothers of infants, a quantitative research method with an exploratory survey design was carried out in a tertiary care hospital of Udupi district. Mothers were selected based on purposive sampling. The data collection instruments included a demographic proforma and a semi structured interview schedule on infant feeding

practices. The content validity of the data collection instruments was established by seeking suggestion from five experts. After the validity, data collection instruments were pretested on three mothers. The reliability of the semi structured interview schedule was carried out by administering to 20 mothers and reliability coefficient was calculated by split half method. ($r=0.86$). The data collection instruments were modified based on the pilot study carried out among ten mothers. The data for the main study was collected from October 2014 to July 2015. Mothers were informed about the purpose of the study and consent was taken. The information was collected among hundred mothers who attended the outpatient and inpatient department of Kasturba Hospital Manipal.

ETHICS

The study protocol was approved by the Institutional Ethical committee of Kasturba Hospital Manipal. Written permission was obtained from the Paediatric department of Kasturba Hospital Manipal. Mothers were informed about the study and written informed consent was obtained before collecting the data.

Statistics: Data collected were analysed using SPSS version 16.0. Analysis was done by Chi square. The frequency and percentage was calculated for the variables related to sample characteristics and the demographic variables (**Table 1**)

RESULTS

Table 1: Sample characteristics of the mother and the children (n = 100)

Variable	n & (%)
Mother's age (in years)	
20-30	72
31-40	27
41-43	01
Occupation of the mother	
Housewife	24
Working	76
Type of family	
Nuclear	74
Joint	26
Type of delivery	
Normal	37
Caesarean	63

Conted...

Birthweight of the child	
Less than 1 kg	05
1-2 kg	23
More than 2 kg	72

Mean age of the mothers were 28.5 years and mean birthweight of the children were 2.53 kgs. Majority of the mothers delivered by caesarean section (63%). Only 46% of the mothers received information regarding breastfeeding before the delivery and health professionals

were the main source of information to the mothers. Lactation counselling in the antenatal and postnatal areas carried out regularly by the health professional helped the mothers to receive the information from health professionals. Study showed that 65% of the mothers gave colostrum to their children. Only 33% of the mothers initiated breastfeeding within one hour of delivery.

Information regarding breastfeeding: Number mothers received information regarding breastfeeding was more (n=75) compared to before delivery (n=46). It was interesting to note that the main source of information was the health professions even in nuclear family. (Table 2).

Table 2: Information received by the mother on breastfeeding based on family type (n = 100)

Information received	Type of family			Total (%)
	Source	Nuclear	Joint	
Before delivery (46%)	Family members	07	01	08
	Health professional	29	09	38
After delivery (75%)	Family members	08	01	09
	Health professional	48	18	66

Initiation of breastfeeding: Out of 100 mothers, only 33% of the mothers initiated breastfeeding within half an hour of delivery and 65% of the mothers gave colostrum to the baby. Chi square test confirmed that timing of initiation of breastfeed was significantly associated with type of delivery ($\chi^2=22.590$, $P=0.000$). The reasons given for not initiating the breastfeeding was caesarean section (27%), baby kept in NICU (8%) and 32% reported that they gave

the feed within 2 hours of delivery. Colostrum was not fed by 29% of the mothers who delivered by caesarean section compared to 6% of the mothers who delivered by normal delivery. Chi square test showed a significantly association between feeding colostrum to the baby with the type of delivery. The reasons for not giving colostrum were colostrum is dirty (3%), 15% felt that it is not good for baby and 17% said they do not know the reason (Table 3).

Table 3: Initiation of breastfeeding by the mother based on type of delivery (n = 100)

		Type of delivery		Total (%)	Chi ²	p value
		Normal (%)	Caesarean (%)			
Breastfeeding within one hour	Yes	23	10	33	22.590	0.000
	No	14	53	67		
Feeding colostrum to the baby	Yes	31	34	65	9.108	0.002
	No	06	29	35		

Reasons for giving the colostrum: Mothers who gave colostrum to the baby were asked the reason why they gave colostrum to their babies. Majority of them expressed that colostrum is good for the baby (n=29; 44.62%) and helps in preventing infection (n=18; 27.69%) (Fig 1).

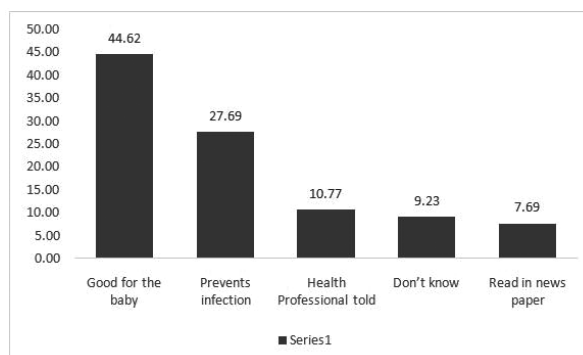


Fig. 1: Reasons for giving Colostrum n = 65

DISCUSSION

A descriptive exploratory survey was carried out to find the feeding practices of mothers of infants in a tertiary care hospital of Southern India. This study showed that mothers received information regarding breastfeeding from the health professionals and the family members. This could be related to the lactation counselling in the maternal and children settings carried out by the nursing faculty who were trained in Infant and Young Child Feeding (IYCF) by Breast feeding Promotion Network of India (BPNI).

Infant and Young Child Feeding (IYCF, 2006) guidelines, recommends that initiation of breastfeeding should begin immediately after birth, preferably within one hour. This study showed that only 33% of the mothers breastfed the baby within one hour after the delivery. The similar findings were reported by a study carried out in coastal Andhra Pradesh (40.46%)¹¹. This finding is lower than the study carried out in rural health training centre in Tamil Nadu where 97.5% of the mothers initiated breastfeeding within one hour of birth⁷ and the NFHS-4 of Karnataka (56.4%)¹². This finding is also similar to the findings in other country^{6,13,14} as the institutional deliveries have increased, the responsibility of early initiation of breast feeding lies in the health care professional in the maternal and child health care centres. These findings indicate that the health professionals need to be aware of the IYCF guidelines and help mothers in following the guidelines.

Colostrum is good for the baby and to be recommended to be given to the babies. In this study, 65% of the mothers fed the colostrum to the babies within 2 hours after the birth. This finding is similar to the findings in the nearby state⁷. It is good to note that mothers were aware of the importance of giving colostrum to their baby. Out of 65%, 47% of the mothers gave the reason as good for baby and prevents infection. This shows that the mothers were able to understand the benefit of colostrum to the baby's health.

CONCLUSION

Importance of creating awareness among the health care professionals to be emphasized as there is increased number of deliveries in the health care settings. Health care professional should give importance to teach the mothers regarding all the recommendations given in

IYCF regarding breastfeeding. Exclusive breastfeeding has advantage for the mother and the child. Lactation counselling by the health professional will help the mothers regarding breastfeeding. Mothers have knowledge about the importance of giving colostrum to the babies. However, support from the health professionals in maternal and paediatric setting need to be emphasized. Mothers of infants need to be motivated for exclusive breastfeeding to their children.

Ethical Clearance: Taken from Institutional Ethic Committee (IEC) Kasturba Hospital, Manipal.

Source of Funding: Self

Conflict of Interest: Nil

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Comparative Study to Assess the Stress of Mothers of Preterm and Low Birth Weight Baby Admitted in NICU vs Postnatal Ward

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ABSTRACT

The birth of a sick or premature baby is an acute emotional crisis for the parents. Many parents feel anxious guilty and also blaming themselves for the sick of their baby. In very preterm infants parental anxiety is often heightened by the appearance of the tiny and vulnerable baby. The potential uncertainty regarding the survival and ultimate health of very sick babies leads to intense distress with the level of depression experienced by parents. The present study is aim to assess the stress level of mothers of preterm and low birth weight baby admitted in NICU and post natal ward. This study was conducted at Retna hospital, marthandam. A sample of 60 mothers were selected using purposive sampling technique. Stress was assessed by using parental stress scale. Data were gathered by structured interview method. Data analysis was done by using descriptive and inferential statistics. the finding of the study stated that Mean value in NICU mother was 50.92 and in post natal mother it was 27.68, pair t test was 11.89. NICU baby mother had more stress compared with post natal ward mother.

Keywords: Preterm, Low birth weight baby. Neonatal Intensive Care Unit, Stress

INTRODUCTION

Preterm birth and low birth weight baby remains a significant problem in maternal child health.¹ During pregnancy parents develop anticipatory set on the images of the child regarding sex, size and shape, condition, appearance and behavior. If there is a discrepancy between parental expectation and the reality of the appearance and behavior of new born such as prematurity and low birth baby, it may impair parental perception of newborn. Parents of preterm experience multiple stressor related to preterm birth, NICU admission in addition transition process to parenthood. Preterm birth and low birth weight baby remains a significant problem in maternal child health²

³Globally prematurity is the leading cause of death in children under the age of 5. Inequalities in survival rate around world are stark. Across 184 countries the rate of preterm birth ranges from 5% to 18%. More than 60% preterm birth occur in Africa and south Asia. In the lower- income countries, on average 12% of babies are born too early compared with 9% in higher- income countries. Preterm and low birth weight babies are 3-4 times greater risk of morbidity and mortality than the normal babies.

⁴The underlying causes of preterm birth are poorly understood, although stress hormone also involved in preterm delivery. Women with a previous premature birth, a multiple pregnancy (twins, triplets, or more), certain cervical or uterine abnormalities, and a number of medical conditions are at increased risk of preterm birth. Lifestyle factors also can elevate risk: these include late or no prenatal care, cigarette smoking, alcohol and illicit drug use, domestic violence, high stress levels, and prolonged work hours. The use of fertility medication that stimulates the ovary to release multiple eggs and of IVF with embryo transfer of multiple embryos has been implicated as an important factor in preterm birth.

⁵The environment of the neonatal intensive care unit (NICU) serves as a significant source of stress for parents. Neonatal units are often burdened with loud sounds, unpleasant sights and procedures, and crowds of health care professionals. Other sources of stress for parents of NICU infants have been found to be alterations in the parental role, uncertainty of the infant's outcome,

⁶After childbirth, women start to experience the postpartum period, which is the period in which the female body changes caused by pregnancy is returns to its

pre-pregnancy state. This period demands physiological and psychosocial care. Therefore women can foster self-care and at the same time parenting the preterm and low birth weight baby admitted in post natal ward are susceptible to postnatal emotional distress.

⁷Stress is a condition in which the human system responds to change in its normal balanced state. Stress results from challenges from environment. Stress affects the whole person in the entire human dimension. The perception of stress and response is highly individualized not only from person to person, but also from one time to another time. In addition each person's perception and response to stress are structured by his or her culture, family, genetic and life experience.

⁸Ronda PH et al., (2005) conducted a longitudinal cohort study to assess the maternal psychological stress and distress as predictors of LBW and prematurity. The findings of the study shown that maternal distress was associated with LBW and prematurity. There was an interaction between distress and smoking in the second interview. The study confirmed that distress is associated with low birth weight and GA.

Mothers of infants with preterm birth may experience increased stress related to feelings of helplessness, exclusion, and alternation and lack of sufficient knowledge regarding parenting and interaction with their infants. Additionally, prolonged hospitalization and infant complications associated with preterm birth may aggravate the mother's feelings of helplessness and further increase her level of stress.⁹ The increased level of stress may thus impact a woman's ability to adjust or transition to motherhood, increasing her likelihood of experiencing postpartum depression. Health personnel working in NICU and post natal ward must address their level of stress and provide intervention to the mother based on their level of stress. It alleviate their stress and feel more confident to tackle the situational stress and enhance self esteem.

OBJECTIVES OF THE STUDY

- To assess the level of stress among the mothers of preterm and low birth weight baby in NICU and post natal ward
- To compare the stress level of mother of preterm and low birth weight babies in postnatal ward and NICU.

- To find out the association between the stress level of preterm and low birth weight baby mothers in NICU and postnatal ward with their selected demographic variables.

Hypotheses: There will be a significant difference between the level of stress among mothers of preterm and low birth weight baby admitted in NICU and postnatal ward.

METHODOLOGY

Research approach: Research approach of this present study is descriptive in nature.

Research design: Research design of this study is non experimental research design.

Research setting: Retna hospital Marthandam, KanyaKumari district

Sampling and sampling technique: Sample were selected using purposive sampling technique. Totally 60 sample, 30 NICU mothers of preterm and low birth weight baby and 30 mothers in post natal ward.

RESULTS AND DISCUSSION

Assessment of the stress level in the study group in NICU revealed that (40%) had moderate stress and (60) % had severe stress. The mean score of NICU mother mean score 50.92 and standard deviation was 7.31. Where as all the mothers of preterm and low birth weight baby in postnatal ward (100%) had mild stress and the postnatal ward mother mean score was 27.68 with the standard deviation of 6.78. So it indicated that mothers of preterm and low birth baby admitted in NICU, were suffer high and moderate level of stress than post natal ward mothers. The observed paired 't' test value was 11.89 at the level of p value $p < 0.05$ level.

The demographic variables like education, occupation, weight of baby and health status of baby in postnatal ward of preterm and low birth weight were associated with the level of p value $p < 0.05$ level. In regards to demographic variables of NICU, mothers of preterm and low birth weight only education of mother was associated with the p value of $p < 0.05$ level. All the other demographic variables are not associated with stress

CONCLUSION

The study findings revealed that there was highly significant difference in the level of stress among NICU and post natal ward mother. So NICU mothers need some kind of intervention to reduce the stress. Health personal working in NICU must assess the stress and provide adequate psychological support or coping strategic will help them to overcome their problem and lead quality life.

Ethical Clearance: Taken from Rethna hospital, Swamiyarmadam, Marthandam

Source of Funding: Self

Conflict of Interest: Nil

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Eat Out Habits of Individuals With Reference to Ernakulam Metro City

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ABSTRACT

Economy is growing at a tremendous pace. The rising disposable income of the population has totally changed the consumption pattern of tasting foods from various eateries. This has absolutely affected the health as well as the wealth of the population of Ernakulam Metro city. Present study analyses the eat out habits of the people belonging to Ernakulam metro district.

Keywords: *Eat outs, Cultural Influence, Fast food, Consumer behavior, consumption pattern.*

INTRODUCTION

Kerala's eating habit is closely associated with its history geography culture etc. Kerala food offers a wide variety of vegetarian and non vegetarian food patterns. Muslim and Christian community has offered unique non vegetarian dishes to Kerala cuisine. Meat eating habits were limited by religious taboos especially Hindus. Previously this was the situation but presently most of Hindus prefer to eat non vegetarian too. But Muslims don't consume pork and other items which are banned by Islamic law.

Fast food chains are quite common in Kerala. Though Kerala has maintained its traditional uniqueness, it is also modern in its own manner. Most popular fast food joints in Kerala are found along with the local ones that offer their own array of fast food and other snacks. Apart from the fast food joints, number of bars, pubs and coffee joints are mostly found in various cities of Kerala. Eating out at least once a week has become an accepted standard, said cardiologist Jaideep Menon, practicing in Angamaly¹.

To eat out means to spend time with friends and families by sharing food in restaurant or food court. Number of new restaurants is being opened in various parts of cities and towns. This itself will create urge among people to have food from outside. The city and towns seem to be fully crowded all the time irrespective of rural and urban area. Previously if a guest arrives in a family the common practice was to prepare food at home but presently the situation is totally different.

People prefer to eat food from outside with friends, relatives and all. Thus it is affecting the culture of the economy. People are adopting western culture of eating which does not suit our environment. The change in the standard of living and income level of people may be the reason for this changing consumer behavior. To maintain healthy balance, adolescents, should practice eating regular meals, engage in doing compulsory daily physical activity, and eating a wide variety of foods².

Statement of the Problem: The eating out habits of people is increasing day by day. Huge money is invested for the same. Because of this continuous eating habit has affected the family relationships and even health hazards have been increased. So a study relating to the eating habits of people belong to Ernakulam city is found to be important.

OBJECTIVE

Present study aims to analyze the eat out habits of people belonging to Ernakulam district and also to understand factors responsible for the same.

MATERIALS AND METHOD

Research Methodology: The study is descriptive in nature. Primary and Secondary data is used for the study. Questionnaire and discussion with the respondents was the major source of collecting Primary data. Various Secondary sources like research articles and other references also form part of the study. For the purpose of analysis a sample of 76 individuals was chosen based

on convenience sampling method from the Ernakulam district. For the purpose of deriving output various analytical tools like frequency, correlations and cross tabulation is used for the study.

ANALYSIS AND INTERPRETATION

Majority of the respondents of the study was focused between the age group of 20-30 and the least groups were found between 41-50 and 51-60 years. The data for the study was collected from students, professionals, self employed and house wives category. Nearly 47 percent was students and 36.8 percent was professionals and 15.8 percentages was self employed. Only 2.6 percentages was house wives. Male category was more constituted which comes nearly 77.6 percentages. From this 75percentage were single and 25 percentages were married. The study shows that about 69.7 percentages used their own vehicles to travel for eat out purpose.

While considering the various meals of the day preferred to eat outside, it is found that the highest score is for Dinner and the least preferred is breakfast. This proves that people mostly goes out to eat dinner rather than lunch and breakfast.

Study also explains that while people taking a decision to eat out the most preferred factor is the taste of food after that they are bothered about the payment options offered, brand perception, presentation of food, menu item variety etc. The least concerned factor is promotional offers, price of food, cleanliness of the restaurant etc. So from this it is clear that the main

intention behind eating out is to eat tasty and variety food with friends and families. Price of food is given least importance. Thus money is not a matter here.

While counting the number of times people going for eat outs in a week it is found that nearly 59.2 percentages are going 1-3 times in a week and nearly 22.4 percentages are going out 4-6 times in a week for eat outs. This shows that the frequency of going out to have food is very high. They prefer more to eat food from restaurants and fast food corners rather than home delivery and dhaba. People prefer to eat food with family (42 percent) and friends (39.5 percent) more rather than others.

The spending habits of the sample shows that nearly Rs 300 to Rs 1200 are spend weekly for eat out purpose. This shows a huge investment of money for eating out among students and professionals. While analyzing the reason for eats outs it was found that the main reason was to spend time with friends and family and also as to engage the leisure time and also because of no option of home cooked food. This is mainly followed by students and working professionals. Their preference to eat outs is any day irrespective of weekends or weekdays. Thus it is not limited to any occasions.

While considering factors they prefer more while deciding to eat out, it is found that more preference is given to the brand, then the friends circle, then the location and the service provided.

Hypothesis tested

H0: There exist a relationship between categories of eateries they visit and availability of own vehicle.

Table No. 1: Own Vehicle * Categories of Eateries Visit Most

Own Vehicle * Categories of Eateries Visit Most Crosstabulation							
Count		Categories of Eateries Visit Most					Total
		Restaurant	Fast Food	Food Court	Dhaba	Home Delievery	
Own Vehicle	Yes	26	14	6	3	4	53
	No	8	11	0	2	2	23
Total		34	25	6	5	6	76

Table No. 2: Own Vehicle * Categories of Eateries Visit Most

Chi-Square Tests			
	Value	Df	Asymp. Sig. (2-Sided)
Pearson Chi-Square	5.821 ^A	4	.213

Conted...

Likelihood Ratio	7.423	4	.115
Linear-By-Linear Association	.164	1	.685
N Of Valid Cases	76		

Table No. 3: Own Vehicle * Categories Of Eateries Visit Most

Correlations			
		Categories of Eateries Visit Most	Own Vehicle
Categories of Eateries Visit Most	Pearson Correlation	1	.047
	Sig. (2-Tailed)		.688
	N	76	76
Own Vehicle	Pearson Correlation	.047	1
	Sig. (2-Tailed)	.688	
	N	76	76

The study shows that Chi square value of 5.821(df =4, N 76), $P>0.05$ is not significant at 4 degree of freedom, showing that there exist a relationship between own vehicle and categories of eateries visit. Thus the null hypothesis is accepted. The bivariate correlation is undertaken between the respondents and it is hypothesized that a relationship exists between availability of vehicle and categories of eateries visit. The results show a negative relationship between the variable ($r=.047, P>.05$). Based on the availability of vehicles people prefer to eat food outside.

H0: There exist a relationship between spending per week on eating out and number of times going out for eat outs.

Table No. 4: Spending Per Week on Eating Out * Number of Times

Spending Per Week on Eating Out * Number of Times Crosstabulation						
Count		Nnumber of Times				Total
		1-3	4-6	7-9	10-12	
Spending Per Week on Eating Out	0-300	8	0	0	0	8
	301-600	14	3	1	3	21
	601-900	10	3	1	1	15
	901-1200	8	3	3	3	17
	1201-1500	1	5	0	0	6
	1500+	4	3	1	1	9
Total		45	17	6	8	76

Table No. 5: Spending Per Week on Eating Out * Number of Times

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.589 ^a	15	.056
Likelihood Ratio	24.621	15	.055
Linear-by-Linear Association	3.549	1	.060
N of Valid Cases	76		

Table No. 6: Spending Per Week on Eating Out * Number of Times

Correlations			
		Spending Per Week on Eating Out	Nnumber of Times
Spending Per Week on Eating Out	Pearson Correlation	1	.218
	Sig. (2-Tailed)		.059
	N	76	76
Nnumber of Times	Pearson Correlation	.218	1
	Sig. (2-Tailed)	.059	
	N	76	76

The study shows that Chi square value of 24.589 (df =15, N 76), $P>0.05$ is not significant at 4 degree of freedom, showing that there exist a relationship between spending per week on eating out and number of times going out for eat outs. Thus the null hypothesis is accepted. The bivariate correlation is undertaken between the respondents and it is hypothesized that a relationship exists between availability of vehicle and categories of eateries visit. The results show a negative relationship between the variable ($r=.047, P>.05$). Majority are prefers to eat out nearly one to three times per week and spending more than 1000 rupees per week.

FINDINGS

Majority of the respondents of the study was focused between the age group of 20-30 and the least groups were found between 41-50 and 51-60 years. The data for the study was collected from students, professionals, self employed and house wives category. Nearly 47 percent was students and 36.8 percent was professionals and 15.8 percentages was self employed. Only 2.6 percentages was house wives. Male category was more constituted which comes nearly 77.6 percentages. From this 75percentage were single and 25 percentages were married. The study shows that about 69.7 percentages used their own vehicles to travel for eat out purpose.

While considering the various meals of the day preferred to eat outside, it is found that the highest score is for Dinner and the least preferred is breakfast. This proves that people mostly goes out to eat dinner rather than lunch and breakfast. Table explains that while people taking a decision to eat out the most preferred factor is the taste of food after that they are bothered about the payment options offered, brand perception, presentation of food, menu item variety etc. The least concerned factor is promotional offers, price of food, cleanliness of the restaurant etc. So from this it is clear that the main intention behind eating out is to eat tasty and variety food with friends and families. Price of food is given least importance. Thus money is not a matter here. While counting the number of times people going for eat outs in a week it is found that nearly 59.2 percentages are going 1-3 times in a week and nearly 22.4 percentages are going out 4-6 times in a week for eat outs. This shows that the frequency of going out to have food is very high. They prefer more to eat food from restaurants and fast food corners rather than home delivery and dhaba. People prefer to eat food with family (42 percent) and friends (39.5 percent) more rather than others.

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While considering factors they prefer more while deciding to eat out, it is found that more preference is given to the brand, then the friends circle, then the location and the service provided. The study shows that Chi square value of 5.821(df =4, N 76), $P>0.05$ is not significant at 4 degree of freedom, showing that there exist a relationship between own vehicle and categories of eateries visit. Thus the null hypothesis is accepted. The bivariate correlation is undertaken between the respondents and it is hypothesized that a relationship exists between availability of vehicle and categories of eateries visit. The results show a negative relationship between the variable ($r=.047, P>.05$). Based on the availability of vehicles people prefer to eat food outside.

DISCUSSION AND CONCLUSIONS

Present study shows that the habit of eating food from outside has increased tremendously irrespective of gender, education, profession, income etc. This routine habit will lead to a deadly and nutrients deficiency diseases like non communicable diseases, obesity among men and women, increased number of heat diseases because of the consumption of fatty and junk foods, deep fried items by reusing the oils may lead to cancerous diseases. Taking food from outside may even lead to premature hypertension, lipid and diabetic problems in early stage of life.

Continuously taking food from outside with friends and colleagues may even affect the family relationship and the environment. Since Kerala has a good tradition of culture and values which were followed by the ancestors need to be considered and should be preserved and protected. So the changing habits of youngsters will definitely hamper such belief. Occasionally having food from outside is considerable good but more than 3 to 4 times a week is not good and safe. A healthy body needs a wealthy habit of taking food prepared in homely environment.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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Harnessing the Differentiated Model of HIV-AIDS Care as an Enabling Factor for Successful HIV-AIDS Programme Management

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ABSTRACT

UNAIDS estimates that 37million individuals are infected with HIV-AIDS⁶. Traditional modes of service delivery cannot meet the needs of those infected and affected by HIV-AIDS. This has led to the development of several service delivery care models of care. One such model is Differentiated care. “Differentiated care is a responsive, client-centred approach that simplifies and adapts HIV services across the cascade to better serve individual needs and reduce unnecessary burdens on the health system”¹. This is fast growing concept that is being utilised in both the developed and developing world allowing better care, wellness and treatment to HIV-AIDS sufferers across the globe. This paper explores the use of the differentiated care model across the various multi sectoral responses to HIV-AIDS and assesses the benefits of the model as an enabling factor for successful HIV-AIDS programme management both locally and globally.

Keywords: *HIV-AIDS, Differentiated care*

INTRODUCTION

Differentiated care, or differentiated service delivery, has been defined as “a client-centred approach that simplifies and adapts HIV services across the cascade, in ways that both serve the needs of PLHIV better and reduce unnecessary burdens on the health system”⁵. With regard to differentiated care, less stable patients require fewer services than critically ill patients therefore allowing for better resource allocation⁴.

Differentiated care can be applied across the continuum of care for HIV-AIDS². The differentiated care framework includes variability in the service delivery, providers and locations. The WHO defines specific care packages based on care needs such as the type of services delivered; the location of service delivery; the provider of the services and the frequency of the services⁷. In order to accommodate this model several service providers, clinics and partnerships have exhibited buy in to the model to ensure its viability and success. Decentralisation of service is key to the process together with partnerships. Decentralisation allows more task shifting from larger central clinics and health facilities situated in towns and central localities to more rural smaller clinics and health facilities on the

peripheries. This in turn increases the reach of the health facilities resulting in more patients being encountered, tested for HIV-AIDS and encourages more health seeking behaviour. Partnerships with local vendors and community based pharmacies allow for decentralisation of services where patrons can fetch medications at smaller closer rural locations as opposed to travelling long distances to reach central healthcare facilities.

METHODOLOGY

A retrospective review was done across public, private and ngo based South African HIV-AIDS management programmes. Given the relatively new concept of differentiated care it was not expected for extensive literature for implementation and operational research to be available. A review was undertaken of fall private HIV-AIDS management programmes, selected ngo HIV-AIDS management programmes and the state run national HIV-AIDS management programme.

RESULTS

The review revealed that no HIV-AIDS management programmes in private healthcare sectors have been implementing the differentiated care model to date.

Selected ngo HIV-AIDS management programmes have embarked on implementing aspects of the differentiated care model. Some of these have been in tandem with the state run national HIV-AIDS management programme.

CONCLUSIONS

The differentiated care model when applied to HIV-AIDS programmes will ensure an efficient and safe approach to management of HIV-AIDS patients. The key to the differentiated care model for HIV-AIDS is that careful eligibility criteria should be undertaken to the entry into the programme. This will allow for careful evaluation of patients in terms of pathology and disease progression. Since not all patients will be requiring the same level of care and effort, the strain on the healthcare workers will be minimal. This will allow for more intensive efforts on high risk patients with less intensive time and resourcing on medium and low risk. This model will also allow for a more accommodating and efficient resourcing requirements allowing healthcare workers to remain engaged to deliver their best at all times. A model correctly run on the differentiated care principles can be a sustainable model for delivery for role out across multi-sectoral HIV-AIDS programmes.

Adherence to ARVS has historically been a pivotal issue in HIV-AIDS management programmes as patients have to ensure daily medication ingestion. The differentiated care model when applied to HIV-AIDS programmes can result in more compliant and adherent cohorts thereby allowing a better clinical response in patients with optimal outcomes. This can also contribute to better quality outcomes in the programme resulting in better monitoring and evaluation outputs from the programme.

Ethical Clearance: gained from the Faculty Research Committee of the Durban University of Technology as part of the primary author's doctoral thesis.

Source of Funding: Durban University of Technology as part of the primary authors doctoral thesis.

Conflict of Interest: NIL

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Can Artificial Intelligence be Used as an Enabler for Anti-Retro-Viral Medication Adherence in HIV-AIDS Management Programmes?

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ABSTRACT

HIV-AIDS is a highly prolific disease and public health concern affecting the globe with developing countries more affected than developed countries. The mainstay of efforts to control the epidemic has been emphasised on HIV prevention, HIV treatment and HIV wellness. With established HIV-AIDS programmes and stable less toxic drug regimens, a strong focus has been enrolment onto Anti-retroviral combinations with strong adherence and medication compliance. Adherence to medication across all different types of disease entities has been difficult and ARV adherence is no different. As such, the clinical fraternity is in constant search of novel advances to enhance and optimise ARV adherence. On such approach is the use of artificial intelligence modelling as a tool for adherence enhancement. This paper reviews the available data on artificial intelligence use as an adherence enabler in HIV-AIDS programmes.

Keywords: *HIV-AIDS, adherence, artificial intelligence*

INTRODUCTION

HIV-AIDS is the largest disease burden across the world with the highest prevalence being found in South Africa. UNAIDS estimates that there is an adult disease prevalence of 18, 9% with 270000 new infections occurring every year⁴. There are also almost 100 000 HIV related deaths annually. The mainstay of clinical management of this disease is monitoring and sustaining the use of ant-retro-virals aimed at halting disease progression in all affected individuals. To date 7.1 million people are on ARVs in South Africa. About 56% of all adults are on ARVs while 55% of all children are on ARVs¹. This implies that just under half the adult and children affected populations require urgent Ant-retro-virals. On 30 September 2015, the WHO announced that: "Anyone infected with HIV should begin antiretroviral treatment as soon after diagnosis as possible," WHO announced Wednesday. With its "treat-

all" recommendation, WHO removes all limitations on eligibility for antiretroviral therapy (ART) among people living with HIV; all populations and age groups are now eligible for treatment." This new Test and Treat WHO new policy could help avert more than 21 million deaths and 28 million new infections by 2030⁷. This is a phenomenal move for all clinicians and healthcare workers who have worked in the field of HIV-AIDS care and who have initiated and managed patients onto ARV. The goals of any ARV programme is to ensure clinically appropriate use of ARV's, ensure adherence to the ARVS and finally to preserve first line effectiveness and prevent patient morbidity and mortality. One cannot exclude the effect that TB has on HIV and the pill burden and the combined TB-HIV epidemics. HIV is driving the TB epidemic in South Africa, with a TB/HIV co-infection rate of above 60% it is clear that the war against TB will never be won unless we win the war against HIV."⁵ South Africa has a well define National Strategic plan (NSP) addressing the HIV epidemic. The NSP 2012–2016 is driven by a long-term vision for the country with respect to the HIV and TB epidemics. It has adapted, as a 20-year vision, the Three Zeros advocated by UNAIDS. The vision for South Africa is: „ Zero new HIV and TB infections; „ Zero new infections due to vertical

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transmission; „ Zero preventable deaths associated with HIV and TB; „ Zero discrimination associated with HIV and TB. In line with this 20-year vision, the NSP 2012-2016 has the following broad goals: „ Reduce new HIV infections by at least 50% using combination prevention approaches; „ Initiate at least 80% of eligible patients on antiretroviral treatment (ART), with 70% alive and on treatment five years after initiation; „ Reduce the number of new TB infections as well as deaths from TB by 50%; „ Ensure an enabling and accessible legal framework that protects and promotes human rights in order to support implementation of the NSP; and „ Reduce self-reported stigma related to HIV and TB by at least 50%⁴.

Adherence to lifelong ARVs can be a challenge and the question is how to ensure adherence is maintained and sustained throughout an HIV positive individual's life?

METHODOLOGY

A retrospective review of available data on adherence of ARVS was conducted to assess enablers and barriers to ARVs resistance in ARV programmes. Selected barriers are discussed next.

FINDINGS

Many patients attending ARV clinics verbalised that the high pill burden is an issue and prevented them from taking meds daily. In addition, the pills were large and difficult to swallow and could pose a problem to those patients who have selected swallowing issues or dysphagia. This resulted in patients not taking their medication. South Africa has a very large HIV epidemic and in the initial days not every Department of Health clinic provided ARVs. Selected clinics with the necessary staffing, clinical resources and medications were often the only places to get ARVS and clinical management of care. Often these were the centrally based large clinics often situated near district or provincial hospitals. Very often this meant that many clinic patrons have to travel long distances for care, this means that this also prohibited taking up of care and referrals to care. Selected ARV side effects also prevented patients from taking their pills as required however they need more Arv counselling to assess that side effects usually get better within the first 30 days of use thereby allowing a better patient experience. There are also cultural barriers to use and adherence. This can be due to patient set of

knowledge, belief and religious practises which prohibit the ingestion of medications at selected times in addition to when they are fasting or abstaining from food.

Socio-economic circumstances have also a role to play as a barrier to ARV adherence. Often positive patients do not even have food or sustenance and have to take medication, these results in occurrence of more side effects. At one stage various departments of health used to offer food hampers to families in need of food often in the programmes to assist with ARV adherence but this has since changed.

As HIV positive individuals are living longer, they are also prone to develop other co-morbidities and other non-communicable diseases. This contributes to a greater disease burden with combined pill usage and contributes to multiple pills for use. TB and HIV is a common synergistic issue in South Africa which further adds to the pill burden and often the dual side effects. This is a further inhibitor to care and uptake of care with minimal referral to care resulting in poor adherence.

So the question then is: what are the enablers for enhancing ARV adherence and how can this be utilised in real life settings to ensure maximum patient benefit?

Medical futurist² believes :”that we are experiencing the Fourth Industrial Revolution, which is characterized by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human. Healthcare will be the lead industrial area of such a revolution and one of the major catalysts for change is going to be artificial intelligence”. Artificial intelligence (AI) in healthcare uses algorithms and software to approximate human cognition in the analysis of complex medical data. The primary aim of health-related AI applications is to analyse relationships between prevention or treatment techniques and patient outcomes³

Artificial intelligence has a huge role to play in the HIV-AIDS clinical arena and in the clinical management of patients. By utilising artificial intelligence in an ARV clinic setting, one could assess all the data that has been collated over time for that specific clinic and if inputted correctly could yield very important information. The data will be able to provide clinical information on all patients but the highest risk of patients would be of most interest or value. This will create a high, medium and

low risk of patients which will require the same amount of care including high, medium and low level of care. This can also dictate the level care required by the patient with the highest clinical resource dedicated to the highest risk of patients.

AI can revolutionise the way medicine is conducted. Based on medication data and how members collect medication every month, one will be able to predict who needs be acted upon the poor adherers and non-adherers are. This will allow for a pro-active, pre-emptive action to allow for defaulters to be picked up in real time and actioned on accordingly. This will in turn provide lesser burden on the ARV clinic staff and resources.

DISCUSSION

Adherence will continue to be an issue in ARV programmes across the globe if significant tools and processes are not instituted. While adherence to medication can occur to all types of medication, it is more possible for non-adherence to ARVS more specifically as result of this being life- long therapy. Various models of AI can be instituted to assist with planning of clinical co-ordination of staff to assign to high risk members who are defaulters and such provide timely interventions. AI is a novel new technique that if applied in the correct context can result in successful results. Appropriate interventions for implementation are required and should possibly be explored in smaller ARV clinics for first mover advantages. It is important to note that a careful monitoring and evaluation plan should also be implemented taking into account the impact of AI on adherence to unleash the full potential and value of this adherence initiative.

CONCLUSION

A great deal can be gleaned from ARV programmes. The utilisation of AI as a Best practices clinic should be developed to enhance and improve approaches to care and referral to care. ARV programmes can only grow

from strength to strength if supported by similar tools, frameworks and approaches toward holistic integrated care.

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Recommendations for HIV-AIDS Programme Management Indicator Development

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ABSTRACT

HIV-AIDS continues to grow as the largest emergent epidemic across the world with some of the highest disease burdens prevailing in developed and developing countries. UNAIDS estimates 36.7 million people living with HIV-AIDS in 2017⁶. 20.9 million people were living with HIV-AIDS on antiretroviral therapy and 1.8 million people newly infected with HIV in 2017⁴. These global statistics demonstrate the major global public health issue that HIV-AIDS is. In response to the epidemic, HIV-AIDS programmes have sprung up almost instantaneously across global and local private, public and non-governmental sectors in efforts to curtail the epidemic. This fragmented approach has culminated in various levels of HIV-AIDS programme management; with a sectoral view to indicator development. This paper reviews current HIV-AIDS programme management indicators and proposes recommendations to enhance smart practices.

Keywords: *HIV-AIDS, antiretroviral therapy, indicators*

INTRODUCTION

HIV-AIDS has become the leading health concern in South Africa since its discovery almost thirty years ago. UNAIDS estimates almost 270 000 new infections per year in an epidemic that is growing at a fast pace⁶. Most newly acquired infections occur in young females of child bearing age which appear to bear the brunt of this disease. This is also impacting the rate of transmission from mother to child. The current HIV-AIDS strategic plan aims to reduce mother-to-child transmission of HIV rates to under 2% at six weeks after childbirth and less than 5% at 18 months¹. In order to meet the prevention and treatment needs of the HIV-AIDS epidemic, South Africa took great strides to pride itself on the development of the largest HIV-AIDS treatment programme globally. The programme boasts almost 7 million adults on the programme receiving lifesaving ARVs. This programme is provided by the South African public health sector. The Non-governmental

sector and the private sector also boast similar HIV-AIDS programmes but not of the same magnitude. These are seen predominantly as complementary programmes for other sectors. The growth in number of HIV-AIDS programmes across the various sectors has resulted in many patients being enrolled and being managed on the programme, however accurate statistics in terms of reporting for monitoring and evaluation remain at large. It is important that consistent indicators are utilised across multisectorial programmes to harness the best practices for HIV-AIDS management.

Indicators are integral markers of monitoring and evaluation for HIV-AIDS programmes. These allow managers to track and evaluate the programme performance and allow the programme to be compared over time and to other similar programmes. Programmatic indicators are intended to monitor key interventions to ensure that the programme can be monitored and evaluated.

METHODOLOGY

A retrospective review was undertaken of the South African HIV-AIDS local and global regulatory frameworks to assess current indicators in place for management of HIV-AIDS programmes. The review

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revealed that several indicators exist but these are sector specific. These indicators are valid, reliable and are free from bias but cannot be applicable beyond the sector they were intended for use in. It is therefore appropriate that a set of core indicators be developed applicable for use across multiple sectors.

RECOMMENDATIONS

Data reviewed revealed a paucity of a single indicator measure which may be applicable to public, private and non-governmental sectors. It is thus recommended that key measures be developed per management category to enhance the management of HIV-AIDS programmes. These will include indicator development for clinical, laboratory, pharmacy, budget and, administration. Other indicators will include education, awareness and advocacy. Clinical indicators to be considered should be divided in to clinical indicators for HIV prevention, HIV treatment and HIV related mortality and morbidity ⁷. These are important as they provide concise data which can inform if the programme is being managed optimally or not. Patients managed in a clinically appropriate manner on the programme tend to progress less quickly to poorer outcomes, it is therefore imperative that these clinical indicators are highlighted to ensure ill patients are prioritised for care and wellness.

Laboratory indicators should entail the following key focus areas covering HIV testing rates for new infections, rate of uptake of HIV testing in the communities, compliance to real time disease monitoring testing as required together with clinical appropriateness and cost effectiveness³. Laboratory indicators are important as they provide factual evidence based information for disease monitoring, disease progression and disease prognosis. Clinical appropriateness of testing is also an important consideration in that it determines the clinical acumen of clinical staff resulting in areas for training and improvement for learning and development. Cost effectiveness of testing is critical especially in resource limited settings, so HIV-AIDS programmes must ensure that all requested laboratory testing is done in accordance with testing protocols in order to optimally manage budgetary constraints.

Pharmacy indicators should cover all aspects of good pharmacy practices of the programme. These include monitoring the uptake of adults and paediatrics on antiretroviral therapy, monitoring the uptake of

adults on HIV pre-exposure prophylaxis, use of other complementary medications and effective stock control indicators. These indicators are important as they inform statistics from the community, district to national level. Stock control indicators and measures thereof are vital to ensure efficiently run HIV-AIDS programmes⁸. Ensuring HIV-AIDS programmes have pharmacies with adequately stocked medications is a critical step to ensure continuous supply of the lifesaving monthly medication.

Budgetary and administrative control is important to ensure that appropriate and accurate indicators are devised ⁵. Indicators for input costings and previous funding's should be evaluated on a monthly, quarterly and annual basis and should be reflected in the programme's financial reports. Salaries and consumables over current funding's would also be evaluated. Administrative support is integral to ensure that the financial and budgetary indicators are evaluated timeously. Education, awareness and advocacy indicators are perhaps the most important and valid across the public, private and non-governmental organisation managed HIV-AIDS programmes. These indicators would explore the amount of community outreach undertaken in communities, districts and national regions in terms of HIV-AIDS education and awareness. These are important as this translates into the uptake for HIV testing and uptake of treatment as well.

CONCLUSIONS

Efficient monitoring and evaluation of HIV-AIDS programmes with suitable and appropriate indicators will allow for accurate resource allocation and timeous stock control to allow for cost effective outputs. Clinical, pharmacy laboratory and budgetary indicators applicable to public, private and non-governmental sectors will allow for a consistent and standardised approach to patient health and community wellbeing.

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Prospective Lung Transplantation In Indonesia: Lung Donor Preparation, Preservation, and Allocation

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ABSTRACT

The development of lung transplantation centers in a developing country like Indonesia is challenging. Increased morbidity and mortality of end stage pulmonary disease necessitates the availability of lung transplant facilities. Prior the programmes, an effective donation system should be developed to ensure the availability of organ donors. We propose an effective organ donation system for Indonesia, especially for lung transplantation. In building the National organ donation system, the beliefs of diverse cultures and religionsshould be considered. Credible human sources is the key to succeed in the development of an effective organ donation system.

Keywords: Lung transplantation, organ donation, organ donation system, organ donor preservation, ethical issue.

INTRODUCTION

Following the many advancements in lung transplantation, recipients today are able to obtain satisfactory improvements in survival rate and quality of life.¹ Unfortunately, the number of health care facilities that provide lung transplant services does not fulfill the current demand.² One major problem reported by all lung transplant centers is the shortage in lung donors.^{3,4,5} In general, there are two types of lung transplant donations: deceased organ donation and living lobar donation.⁶ The latter hasn't attained much popularity as compared to first, primarily due to complexity of the procedure involved.^{7,8} On the other hand, not every country has the capacity to develop a deceased organ donation system. To build this system, a country should have a well-developed infrastructure; sufficient financial support; supporting ICU; and strong legal support to declare brain death, and consent for organ donation.⁹ The preparation, preservation, and allocation of donor lungs are challenging processes, will be the same in a

developing country like Indonesia. Therefore, this script aims to assess a suitable organ donation system for lung transplantation in Indonesia.

Donor for Lung Transplant: Developing a good donation system plays a significant role in a transplantation center.^{10,11} To ensure the lungs have suitable quality, donors should fulfill the standard donor criteria, as described by Erasmus ME, et al.

Therefore, an extended donor criteria has been suggested. However, the standard criteria is still used as preparation of suitable organs, as determined by the extended donor criteria, requires advance preservation techniques which is not available in all transplantation facilities.⁷

Living lobar donation: A donor should be in excellent health with adequate pulmonary reserve for lobar donation. Furthermore, they may be parents, siblings, or extended family members of the recipient, or even unrelated individuals who have an emotional attachment to the patient, and are willing to accept the risks associated with organ donation, without coercion.⁷

Deceased organ donation: Deceased organ donors include brain-dead or cardiac arrest patients.¹² Organs from a brain-dead patient is called donation after the determination of brain death (DBD),¹² whereas donation

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following circulatory death or cardiac arrest is known as donation after the determination of cardiac/circulatory death (DCD/DCDD). For simplicity, DCD is more commonly used than DCDD.¹²

DBD: Brain death is clinical diagnosis of an irreversible coma.^{13,14} However, reversible brain death after cardiopulmonary arrest induced by hypothermia has been reported in 2011 by Webb AC, et al. The reversal was transient and did not impact patient prognosis.¹⁵ Hence, the study suggested that in patients with hypothermia induced brain death, confirmatory testing should be considered, and a minimum observation period after rewarming should be completed before brain death testing is conducted.¹⁵

Guidelines for brain death determination varies among countries. Some countries use only the clinical examination, while others use ancillary tests, such as EEG, MRI/CT angiography, or other blood examinations.¹³ Some countries in Europe and America even implement a repeat confirmation test with a 6-hour interval.^{14,16} The confirmatory test is reported to be suitable for patients where specific components of the clinical tests do not deliver a reliable result. In contrast, the others countries state that an additional confirmatory tests would only damage the organ used for donation, but have no benefit for the donor as a patient.^{14,16}

DCD: The concept of using DCD donors for lung transplantation remains controversial due to concerns over specific lung injuries that usually occur during the warm is chemic time (WIT), the time between circulatory arrest, and the organ preservation procedure.⁸ For predicting the possibility of injuries, DCD may be classified based on the chronology of death by using a system, such as the Maas tricht classification.

In the practice of deceased organ donation, a well-established network among hospitals is required to provide information about the availability of potential donors.¹⁷ Potential donors are reported to an organization that is responsible for organ preservation and distribution, which is known in many countries as the Organ Procurement Organization (OPO). For every prospective donor, the procurement organization will search for evidence of organ donation status. If the donation status is not known, if possible the procurement organization then seeks the consent of donation from an authorized individual.^{10,17}

When organ donation status is confirmed, the OPO will coordinate with the Organ Procurement and Transplantation Network (OPTN), an organization responsible to make a prioritized list of potential recipients from the national organ waiting list. OPO would inform the OPTN about the potential donors, and the OPTN would then provide information to the OPO regarding the type of organs required for transplantation, based on the available wait-list.¹⁷ Organs or tissues that will be donated are procured by taking the necessary screening, testing (for the availability), processing, storing, and distributing steps, as required for transplantation, or in some cases for research and education purposes. All processes must be done expeditiously.¹⁷

Donor preparation

Donation consent: Consent for organ donation is ideally made by the correspondence during his/her life time. It may be facilitated by several organizations or healthcare agents according to the laws in the country. Some countries use hospitals, organ procurement organizations, government organizations, etc, as an agent for collecting organ donation consent.¹⁷ A witness is required when obtaining oral consent.¹⁷ For a deceased individual who made no lifetime choice regarding donation, the authorization for providing consent is referred to a list of possible persons. The list of authorized individuals should be regulated by the laws of the respective country. For example, the "anatomic gift act" implemented in the United States authorizes a variety of possible individuals to provide consent on behalf of the deceased.¹⁷ For a living donor, consent should be collected from the donor-self. The donor may be parents, siblings, extended family members, or unrelated individuals with an emotional attachment to recipient.⁷ If the donor is found to feel pressurized regarding donation after careful consultation and explanation, the donor status is denied, even though the consent has been given. The reason would be defined as "unspecified" to avoid any conflict between the family, recipient, and potential donor.⁷

Lung preservation: There is a difference in the preservation process for brain death donors and circulatory death donors. The main principle is to start the organ preservation immediately after the death is determined to prevent any additional injury during the critical time. As brain death is determined, the patient has no right to receive further therapy, except for the purposes of organ preservation.

Organ distribution: Organs are distributed based on the recipient listing. Each recipient should have equal opportunity to access organs available for transplantation. The ISHLT has suggested to make the recipient listing based on the Lung Allocation Score (LAS) system for lung transplantation purposes.²¹ However, if the national system for lung transplantation is not well-prepared, the transplantation maybe done electively.²²

Principle of the LAS system is giving priority to recipients with higher transplant urgency and benefit.^{6,21,23,24} Transplant urgency is the expected number of days lived without transplant, whereas transplant benefit is the expected number of days lived in the first year post-transplantation. Factors associated with transplant urgency and benefit prediction within one year are calculated to produce a number on a scale from 0 to 100. The calculator can be accessed in <http://optn.transplant.hrsa.gov>. Higher urgency and benefit is represented by a low score.²³

Other than urgency and benefit, donor lungs should be distributed based on the recipient suitability. Conventionally, ABO and HLA compatibility alone are used as the validating criteria for organ matching. However, many studies have reported that size, gender, and race mismatch has significant impact on transplantation outcome.^{5,25} Matched race increases survival rate within CF, IPF and single lung transplants, but no change in rejection rates. African-american lungs donor are associated with higher risk of mortality, regardless of the recipient race.⁵

World donation system: Each country has different regulations regarding organ donation. Some use the “option in” system, while others use the “option out” system. In the “option in” system, organ donation is permitted only when an individual has agreed to donate their organs. In contrast, in the “option out” donation system, every individual has given “presumed consent” to donate their organs, unless refusal to be a donor is evident by a legal statement.^{16,26} In the Western Pacific and in Africa, the donation system varies depending on the laws and agreements in the associated country.¹⁷

Ethical issues: Similar to other medical practices, the transplantation and organ donation system should abide by the prevailing bioethics values. Addressing the urgent and growing controversies in illegal organ sales, transplant tourism, and trafficking of organ donors, the Istanbul

meeting was held, and the Declaration of Istanbul was made, an International agreement with regard to organ donor and transplantation.^{27,28} Every country has the authority to decide the organ donation system, though the system should be consistent with international standards, as stated in the Declaration of Istanbul.²⁸

The practice of organ trafficking, transplant commercialism, and transplant tourism are now considered unethical and definitely prohibited.²⁷ The practice of organ trafficking include all processes related to organ transfer from a living or deceased donor by means of the threat, force, or other forms of coercion, abduction, fraud, deception, abuse, power, or of the giving to, or the receiving of third party payments or benefits to achieve the transfer of control over the potential donor, for the purpose of organ exploitation for transplantation.²⁸ Transplant commercialism refers to the policy or practice in which an organ is treated as a commodity, including its purchase, sale, or use for material gain.²⁸ Transplant tourism is the provision of transplant to patients from outside a country, involving the practice of organ trafficking and/or transplant commercialism.²⁸

Another important ethical issue is transplant corruption. Transplant corruption refers to any illegal action in every process of organ distribution and allocation, with the intention of personal gain. Therefore, transparency of organ distribution is required.

In addition to the Declaration of Istanbul, the WHO has developed the Guiding Principles for organ transplant and donation in 1991.²⁸ The guide has been updated in 2004 with regard to the issues and challenges in organ transplantation, as described above. In the WHO Guiding Principles, deceased organ donors are preferred over living organ donors due to the potential practice of unethical organ utilization of living organ donors. A clear definition and determination of death is needed to avoid any legal threats.²⁷ Genetic related donors are preferred over unrelated living donation, an effort to increase the willingness of relatives or individuals close to the recipient to donate their organs.²⁷ The system should ensure the presence of informed consent for all deceased and living donors, as a practice in the principle of autonomy. Informed consent can be attained from the donor-self, or an authorized individual, as per the prevailing regulations in the country.^{9,27}

Indonesia potentiation: Indonesia has the capacity to declare brain death since 2009.²⁹The laws stated in: (1)Health Legislation No. 36 in year 2009 part 18 subsection 117-123 on cadaveric surgery for education and transplantation purpose;²⁹ (2) Ministry of Health regulation No. 37 in year 2014 on the declaration of death, and organ utilization.³⁰Brain death maybe declared following the examination of at least 3 doctors, including one neurologist and one anesthesiologist in the ICU. ²⁹Unfortunately, in Indonesia, only a few hospitals have capacity to declare brain death due to the lack of facilities, including the absence of an ICU and unavailability of the required specialists. Moreover, some hospitals refuse to declare brain death despite availability of the required facilities, primarily because physicians are unfamiliar or not confident with their ability to declare brain death.

Less in infrastructure: independent organizations like OPO and OPTN; advanced program for recipients listing and organ distribution; local hospital networking, supporting human sources; advanced organ procurement facilities; and organ transportations. Financial support is needed to build the supporting infrastructure, including the supply and maintenance of such facilities; for conducting meeting, training program, and workshop for involved human resources; building internal and external network system; funding donor organ removal and distribution processes before paid by the recipient/ health insurance. Within the supporting infrastructure, the availability of appropriate human resources is the most important aspect of a success organ donation system, as reported in a retrospective study by McVicar JP, et al (2003).¹⁰

In conclusion, the major challenge in developing a lung transplantation program is the shortage of organ donors. Therefore, a good organ donation system is needed prior to the development of lung transplantation program. Deceased organ donation is preferred to living organ donation for lung transplantation purposes. Besides supported financial and infrastructure, credible human sources is the main factor to succeed the development of an effective organ donation system.

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Factors Causing Infant Mortality in Surabaya

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ABSTRACT

Infant Mortality Rate (IMR) is an indicator of reference in the *Sustainable Development Goals* (SDGs) set by the *United Nations* and has become the goal of health development to be achieved all over the world. The infant mortality rate that needs to be achieved is the decreasing rate of infant mortality to 12 per 1000 births. Based on the data from East Java Provincial Health Office in 2010-2016, it is known that there has been a declining mortality rate from 29,9 per 1000 births to 23,6 per 1000 births. Meanwhile in Surabaya, infant mortality seems to be fluctuative from 2013 until 2016. Under cases taken from 30 respondents taken in some Health Care Center Service in Surabaya, it was found that the factors that led infant mortal cases to happen was the mother and the infant itself. In the case where mother as the factor of infant death relate directly to the knowledge, behaviour, distance, and also income that affect the frequency of healthcare visit to check the pregnancy. There are 46,6% low knowledged mothers and do not check the pregnancy routinely experience infant death during delivery. Meanwhile, in the case where infant as the factor is the case of Low Birth Weight where 56,6% infants experiencing Low Birth Weight did not survive during the delivery.

Keywords: *infant mortality, knowledge, behaviour, distance, income*

INTRODUCTION

Infant Mortality Rate (IMR) is an indicator of refference in the *Sustainable Development Goals* (SDGs) set by the *United Nations* and has become the goal of health development to be achieved all over the world. The infant mortality rate that needs to be achieved is the decreasing rate of infant mortality to 12 per 1000 births. Based on the data from East Java Provincial Health Office in 2010-2016, it is known that there has been a declining mortality rate from 29,9 per 1000 births to 23,6 per 1000 births¹.

Efforts to lower the mortal rate done by the health department was *Making Pragnancy Safer* (MPS) started from 2000 to 2010 which focuses on ases to healthcare services, service to routine *antenatal care*, and supports from related stakeholders² Infant death can happen due to the lack of mother's awareness of healthy pregnancy. Many factors affect infant death, one of them is; mothers rarely check their pregnancy. According to several researches, why do mothers rarely check their pregnancy is because they lack knowledge of healthy pregnancy. Appropriate to the research done by⁶, it is said that why mothers rarely check their pregnancy is because they lack of pregnancy knowledge.

Pregnancy check on pregnant mothers should be done 4 times since the start of pregnancy untill the delivery³. Other factor causing infant deaths is underaged pregnancy, and access to healthcare services. In indonesia, 69,7 millions of women get pregnant by the age of 15 to 49 years old, and in the East Java province, 10,45 millions of women get pregnant by the age of 15 to 49 years old.

Besides, the unhealthy condition during the pregnancy can also affect the infant like physical factor, psychological factor, environmental factor, social, and culture⁴. the general purpose of research is to analyze the cause of infant mortality in Surabaya. This research expects to be an input in planning and implementation of programs in future times.

RESEARCH METHOD

This research categorizes as observational research. Considered by time, this research is *cross sectional* because it was a one-time observation. This research was conducted on kecamatan Sememi, kecamatan Wonokusumo, kecamatan Pucang Sewu, kecamatan Jagir, and kecamatan Wiyung where all the respondents of the research settle in Surabaya.

The population of research are all mothers with death infants in puskesmas with 30 samples of mothers with death infants. The variables and operational definitions of this research are:

- (a) Infant mortality is defined as baby less than a year who dies.
- (b) Age during pregnancy is the living period until prenatating the baby dies in one year time.
- (c) Education is the process of changing last formal behavior that others do.
- (d) Knowledges are thing that are kn own to mothers about pregnancy and infants.
- (e) Expenditure is the income earned by the respondent each month in Rupiah units.
- (f) BBLR is low birth weight babies under normal that is <2500gr
- (g) Distance is far away residency in kilometers to get health service
- (h) Ttransportation is a vehicle used to obtain health services
- (i) Attitude is the thinking and decision-making of respondents to health services
- (j) Antenatal frequency is the number of mothers coming to health services to obtain maternal and infant health services.

Data were analyzed using quantitative approach using data processing application.

RESEARCH RESULT

1. Maternal Factor

Table 1: Characteristics of some mothers that influence infant mortality are education, knowledge, attitude, distance, transportation and antenatal frequency

Maternal Factor	Amount	
	N	%
Education		
Low	16	53,4
High	14	46,7

Conted...

Knowledge		
Bad	26	86,7
Good	4	13,3
Behaviour		
Negative	17	56,7
Positive	13	43,3
Distance		
Near	18	60
Far	12	40
Transportation		
Private	18	60
Public	12	40
Frequent	12	40
Unfrequent (<4 times during pregnancy)	18	60
Income		
Minimum Wage (Rp. 3.583.312)	26	86,7
Above Minimum Wage (>Rp. 3.583.312)	4	13,3

2. Baby Factor

Table 2: Infant mortality resulting from the infant factor is low Birth Weight (LBW) or BBLR.

BLR Case on Infant Death	Amount	Percentage (%)
BBLR	17	56,6
Non BBLR	13	43,3
Total	30	100

DISCUSSION

1. Maternal Factor: Deaths in infants occurring in Surabaya are most prevalent in mothers with a high education level seen in 46.7% of mothers in infant cases. While mothers with low education level as much as 53.4%. It can be concluded that the level of education is a major factor in maternal factors that cause death in infants. The provisions embedded by the research undertaken by⁵ in the definition that education level is one of the factors that make up mortality in infants.

The level of education of mothers should be balanced with the level of information about pregnancy care and infant care. It is seen in the

results of research on pregnancy and infant care as much as 13.3% of mothers have a high knowledge of pregnancy and infant care. While mothers who with low level of knowledge as much as 86.7%. Maternal knowledge is one of the factors that cause death in infants. Directly related to attitudes and behaviors, the frequency of mothers performing antenatal care also with distance and income of the mother. It is seen as many as 60% of mothers have a long home distance from the health care services. While as many as 40% of mothers have short home distance

with health services. With 86.7% of mothers have Regional Minimum Wage income of Surabaya (Rp 3,583,312) and 13.3% mothers have income exceeding Regional Minimum Wage income of Surabaya (Rp 3.583.312).

56,7% mothers showed positive response and 43,3% mothers showed negative response with antenatal frequency counted 40% routine mother 4 times during pregnancy and as many as 60% of unroutine mothers do the antenatal <4 times during pregnancy. After analyzing the relationship between attitudes and frequency it is seen:

Table 3: Relationship Between Mother's Attitude With Frequency of Antenatal Occurrence

Response	Antenatal Frequency				Total	
	Routine	Percentagw (%)	Unroutine	Percentage (%)	Amount	Percentage (%)
Positive	4	13,3	9	30	17	56,6
Negative	3	10	14	46,6	13	43,3
Total	7	23,3	23	76,6	30	100

It is seen from table 1.1 the positive response of the mother does not affect the decision making to perform the antenatal care. A total of 46.6% of mothers with positive response did not routinely perform antenatal care. Regulation from the Ministry of Health Number 97 of 2014 Concerning Pre-Pregnancy Health Services, Pregnancy, Labor and Delivery Period, Contraceptive Services, and Sexual Health Services which states that mothers normally perform antenatal care 4 times during pregnancy starting from the beginning of pregnancy. Reinforced by a pregnancy manual released by² which explains that antenatal care in pregnant women is important to prevent the occurrence of infant mortality at delivery of funds after delivery.

Habits of mothers who consider that pregnancy is an event commonly experienced by all women in the world makes the willingness of mothers to find information about health and pregnancy health in infants after birth is reduced. It is seen that the mother's knowledge is as low as much as 50%. This lacking of knowledge affects attitudes that directly affect maternal behavior in antenatal care. Mothers who perform antenatal care less than 4 times during pregnancy is a strong potential derived from mothers who will cause death in infants at birth and after birth.

2. Baby Factor: Baby factors that cause the occurrence of infant mortality in Surabaya is mostly due to Low Birth Weight (LBW) than infants who are not LBW. The percentage of infant mortality with BBLR was 56.6% while those who were not affected by LBW were 43.3%. The results show that the greatest infant mortality occurring as a result of LBW was in fact consistent with many studies in various countries. WHO writes in the WHA Global Nutrition Targets 2025: The Low Birth Weight Policy Brief of more than 20 million births worldwide died of LBW with 1.1 million LBW deaths occurring in the first few hours of early birth.

Food intake, lifestyle, pregnancy during youth and mother's behavior to get pregnancy care services are most influential so that the baby factor is found when the baby's death occurs.

CONCLUSION

1. Infant mortality factor that occurred in Surabaya City caused by factor that happened because of maernal and baby factor.
2. Infant mortality factors that occur due to maternal factor, including; level of education, level of knowledge, response, distance, and the amount of expenditure that mothers do during pregnancy

that affect the behavior of mothers seeking care services of pregnancy. As many as 46.6% of pregnant women are lacking of knowledge who do not routinely check their pregnancy. Pregnancy care in accordance with what should be obtained by the mother during pregnancy is as much as 4 times of pregnancy care during pregnancy until childbirth. Regulation of the importance of pregnancy examination should be enforced by the government so that the examination of pregnancy is considered to be a necessity by pregnant women. Enforcement of the regulations should be monitored for implementation and evaluated periodically. Supervision during the implementation can be done by health center midwives in charge of the area or mothers cadres puskesmas spread over every RT in an area. Evaluations are conducted quarterly with the assumption that infant mortality can be prevented and the case may decrease according to the target set by the SDGs.

3. Infant mortality factor that occurs in most infants happen due to infants born with low birth weight under 2500gram with a total of 56.6% associated with maternal factors. To reduce the infant mortality factor due to LBW, what can be done by each individual (pregnant mother) is to pay attention to lifestyle (nutritional intake during pregnancy, cigarette and alcohol consumption, and excessive drug usage), to pay attention to personal hygiene, and home hygiene, home

environment directly related to sanitation. While what can be done by central and local government is to educate pregnant women related to pregnancy health and infant health at the time of birth.

Ethical Approval: Related departments should be assured about the confidentiality of the result of questionnaires

Conflict Interest: The authors report no conflict of interest.

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The Association Between Short Nap and Memory Performance Using Concise Learning Method and Logical Learning Method among Private University Students in Selangor, Malaysia

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ABSTRACT

In the present high-tech environment, achieving academic goals become competitive among university students. Students are afraid of failing in exams. They are awake for 16 hours or more a day without a nap. Students have programmed their mindset or believe that staying awake for long hours in a day can achieve their goals. This study analyzed the association between short nap and memory performance among private university students in Selangor, Malaysia. Five hundred respondents in two different equal groups were selected randomly to be involved in this study. Concise and logical learning methods were used to achieve the objectives. A short briefing was given to the participants before subjects start the memorizing task that consists of concise and logical learning for one hour. Then, two hundred fifty respondents (sleep group) were sent to the skill lab for nap session, and the other two hundred fifty respondents (awake group) remained in the classroom. After one hour, both groups tested on memory recall for 30 minutes. Data were analysed using one-way MANOVA which revealed a significant multivariate main effect for independent variables group Wilk's lambda = 0.61, $F(12,39.00)=12.0$, $p<0.001$, partial Given the significance of the overall test, the univariate main effects for independent variables were obtained for percentage of concise learning method: $F(11,33)=11.39$, $p<0.001$, and for the logical learning method, $F(23,67)=23.62$, $p<0.001$, and for total scores (22,19)=22.24, $p<0.001$. Significant independent group pairwise differences were obtained in the number of 500 respondents between sleep group and awake group. Mean score number awake group were 3.95 and mean of sleep group 8.23. In conclusion, there is a significant association of memory recall test scores between student intervening short nap and student without intervening short nap using concise and logical learning method.

Keywords: Nap, Memory Performance, Concise, Logical Learning, University Students

INTRODUCTION

Achieving academic goals become competitive among university students and they are awake for long hours without a nap because they have programmed their mindset. Shorter sleep duration led the students to feel sleepy during the day, tired, drowsy, moody and had a

difficult time in getting up in the morning⁽¹⁾. Napping has the potential to enhance people's lives⁽²⁾. Napping helps clear out the brain's inbox and integrates information into our brain memory⁽³⁾.

Short-term or working memory doesn't need to store everything we perceive. Most information is only required for a short time and can then be discarded⁽⁴⁾. Short-term memory holds information for few seconds to a few minutes, and this kind of memory is often referred to as working memory; it allows us to understand information as we were encountering it and then discard it. This system is constantly updating, focused on data we need at that particular moment in time⁽⁵⁾.

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It's important to understand the difference between learning and memory; they are closely linked concepts. As we make our way about the world, we encounter new procedures, ideas, faces, and names and during wakefulness, activity in the brain is fast and chaotic. But during slow wave sleep, the electrophysiological waves of activity where all neurons fire together in a languid rhythm and the sleep's primary function is to consolidate memories or to encode the important parts of your daily learning, so it is stored for the long-term⁽⁶⁾.

There are different types of naps. The 10-20 minutes nap is known as the power nap. It is best for getting straight back to work. The 26-minute nap is known as Nasa nap. It was proven to improve pilot performance 84% and alertness by 54% it is suitable for a day after working hours. The 30 minutes nap also called as the bad nap. It causes sleep inertia (sleep hangover) for up to 30 minutes before restorative benefits kick in. It is best to avoid, if possible. The 60 minutes nap is called a slow wave sleep nap. It helps cognitive memory processing, remembering places, faces, and fact. It is best before a big presentation or important meeting. The 90 minutes nap is the full sleep cycles nap. It boosts creativity, emotional memory, and procedural memory. It is beneficial to an impending project deadline or big test⁽⁷⁾. The ideal nap time is between 1 pm and 4pm⁽⁸⁾. The perfect nap position is slightly upright to avoid deep sleep. The excellent nap light is dim to dark to stimulate melatonin production from the brain's pineal gland⁽⁹⁾. Regular and restful sleep is an essential component of good health maintenance and resiliency⁽¹⁰⁾. Recent studies show even power nap of 20 minutes to 30 minutes can help to feel re-energized, improve mood, alertness and cognitive performance⁽¹¹⁾.

According to the national sleep foundation 2017⁽⁷⁾, Humans are part of the minority of monophasic sleepers⁽¹²⁾. The effect of sleep on memory consolidations has received considerable attention⁽¹⁴⁾. Several experimental studies showed that a short nap is enough to improve learning success significantly. These studies have consistently confirmed that napping during the day improves objective and subjective alertness, memory, cognitive functioning, psychomotor performance and even mood⁽¹⁵⁻²¹⁾.

METHOD

This study was conducted at Management and Science University (MSU) which is a private university located

in Selangor State, Malaysia. Twenty-one beds provided by the University's skill lab. Hence 250 respondents have been assigned to a sleeping group and, another 250 respondents have been assigned to wake group.

Respondents recruiting have begun after the ethical approval of the study proposal from the University Research Committee. A cover letter was attached to each consent in order to assure that the participant's information is confidential. Permission was taken directly from the respondents by filled the consent form then collected data were obtained in the university skill lab.

The participant subjects were selected by random sampling method. A cross-sectional selection method was used according to the study design. This study targeted the university students from different courses. A pre-registration booth opened on 2nd and 3rd August 2016 at the university. A total of 809 students were registered as volunteer respondents for this study.

Among them, 500 respondents were randomly selected to proceed for data collection. The selected 500 respondents were randomly divided into two different groups by giving two different color ribbons. The purple color ribbon was assigned to the awake group, and the green color ribbon was assigned to the sleeping group.

The respondents were given a short briefing on the study procedure as well as the inclusion and exclusion criteria to avoid any bias during the data collection. The exclusion criteria include failure to follow the instructions, those with sleep impairments, those with a history of insomnia, those with typical sleep patterns, drug usage, those on herbal and pain relief medication, using electronic device usage like Smartphone and taking caffeinated drinks on the day of data collection.

After the briefing, memorizing task was given for the 500 respondents (both the awake group and the sleeping group). The memorizing task consists of concise learning and logical learning. Respondents allowed memorizing on both learning method for one hour and then the 250 respondents (sleeping group) were sent to skill labs for nap session. The other 250 respondents (awake group) remain in the classroom for video session (Mr. Bean show). This procedure conducted simultaneously for one hour. After one hour, both groups tested on memory recall. The memory recall test conducted for 30 minutes. The test includes fill in the blanks answering scheme after viewing certain

diagrams to find out the memorizing ability and to mark each correctly memorized item with one mark and to get the total score from such method. The tests used are Standardized Memory Assessment Scoring Scales, which is of two types; first, Woodcock-Johnson III scoring scale and second, Memory Assessment Scale-J. Michael Williams⁽²²⁾.

RESULTS

This study was observational and interventional which was conducted among university students from different departments and different sociodemographic characteristics. The descriptive analysis shows the number of respondents randomly divided into two different groups; sleep group and awake group.

Table 1: One-way MANOVA comparing the short nap group and awaking group using concise learning method and logical learning method

Multivariate Tests (One-way MANOVA)								
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power
SHORT NAP	Wilks' Lambda	0.61	11.98	2.00	39.00	<0.001	0.38	0.99

A one-way MANOVA revealed a significant multivariate main effect for region, Wilks' lambda = 0.619, F (12, 39.000) = 12.0, P<.001, Partial eta squared = 0.38. As a conclusion from the table above, there is a significant association of memory recall test scores between students intervening short nap and student without intervening short nap using concise learning method and logical learning method.

Table 2: The univariate tests for the effects of a short nap on each of the different dependent variables

Source	Dependent variable	Type III sum of squares	Mean square	F	Sig.	Partial eta squared	Observed power
Short Nap	Concise learning method	32.59	32.59	11.39	0.002	0.22	0.90
	Logical learning method	66.88	66.88	23.62	<0.001	0.37	0.99
	Total score Logical and concise	192.85	192.85	22.24	<0.001	0.35	0.99

The above table indicates the univariate tests for the effects of a short nap on each of the different dependent variables. It shows that short nap had a significant effect on the results of concise memory test score (p= 0.002), the result of the logical memory test score (p= <0.001) and the total memory test score (p=0.000).

Table 3: Pairwise Comparisons

Pairwise Comparisons							
Dependent Variable	(I) Sleep Group Or Awake Group	(J) Sleep Group Or Awake Group	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval For Difference	
						Lower Bound	Upper Bound
Concise Learning Method	Awake	Sleep	-1.762 [*]	0.522	0.002	-2.817	-.707
	Sleep	Awake	1.762 [*]	0.522	0.002	.707	2.817
Logical Learning Method	Awake	Sleep	-2.524 [*]	0.519	<0.001	-3.573	-1.474
	Sleep	Awake	2.524 [*]	0.519	<0.001	1.474	3.573
Total Score Logical And Concise	Awake	Sleep	-4.286 [*]	0.909	<0.001	-6.122	-2.449
	Sleep	Awake	4.286 [*]	0.909	<0.001	2.449	6.122

In the pairwise comparison result, the third column gives the difference in mean values between the compared groups. The differences that are significant at 0.05 levels are marked with an asterisk sign. The P-values for the mean difference is given in the column “sig”. The 95% confidence intervals for the mean difference are given in the last two columns. Here in the comparison of concise learning with short nap pair, logical learning with short nap pair and total score with short nap pair shows the significant mean difference with a significant P-value (<0.05). The 95% confidence interval for mean differences does not contain the value of zero. Thus, there is an association between pairwise comparisons.

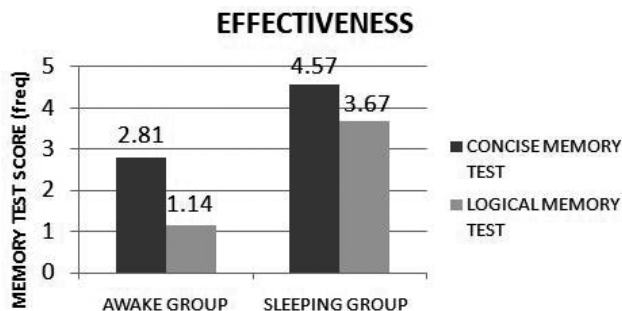


Figure 1: Effectiveness of short nap on the Concise and Logical memory tests.

Figure (1) shows the effectiveness of short nap on memory performance. Respondents intervening short nap able to score higher in both types of learning methods compared with respondents without intervening short nap. Both, respondents intervening short nap group and respondents without intervening short nap group, were able to achieve good scores in concise learning method compared to logical learning method.

DISCUSSION

The mean difference of total Memory test scores revealed that awake group equals to 3.95 scores and the sleeping group equals to 8.24 scores. This result shows that the students in the intervening short nap able to recall better than the students without intervening short nap. Our result is in agreements to those reports by previous studies⁽²³⁻²⁷⁾. Studteet *al.* in 2015 proved that nap sleep preserves associative but not item memory performance and they mentioned: “Those who napped between 45 to 60 minutes after the learning task, performed five times better at remembering word pairs compared to the awake group”. Again, Igloiet *al.* in 2015 showed that post-learning sleep promotes the selectivity of long-

term memory consolidation. They found that memories are better retained when tested three months after initial encoding and also remembered with higher subjective confidence⁽²⁵⁾.

A one-way MANOVA revealed a significant multivariate main effect for region, Wilks’ lambda = 0.619, $F(12, 39.000) = 12.0$, $P < 0.001$, Partial eta squared = 0.381, that shows the short nap had significant effect on the results of concise memory test score ($p = 0.002$). The result of the logical memory test score ($p < 0.001$) and the total memory test score ($p < 0.001$) agreed with previous research findings⁽²³⁾. The scientist at the Saarland University in Germany supervised the study that concluded a short nap at the office or in school is enough to significantly improve learning success and have found that taking a 45 – 60-minute power nap can boost a persons’ memory five-fold.

CONCLUSION

Sleep is necessary and rejuvenating for the human body. This finding supports the importance of memory development with a short nap, training students with concise learning to speed up learning. Needs of a short nap for students to achieve academic score and able to observe memorizing method used by students for recall a task. This study concludes that there is a significant association of memory recall test scores between students intervening short nap and student without intervening short nap using concise learning method and logical learning method.

Apart from the institutional changes effective educational interventions it can increase sleep duration and improve sleep habits among students. Now is the time to translate this research into implementation to provide the colleges and universities with sleep-friendly policies and start times based on the best practice for students. Students have to be aware of all the students who sacrifice sleep into their responsibilities. We would like to recommend sleep pod facilities for Universities in Malaysia to encourage implementation on their daily basis to perform well in terms of academic.

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Swimming Skill Development among Rural Children Under Limited Infrastructure: The Stakeholders' Perspectives

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ABSTRACT

Drowning is one of the most common causes of death among young children in Thailand. Swimming skill and water safety lessons were part of the possible prevention strategies for drowning as they provide children with the required skills and knowledge to keep themselves safe. However, limited study to understand in how children in rural area develop their swimming skill. The qualitative study aims to assess the need of swimming program of primary school students in rural setting of Thailand and explore the opportunity to conduct the program for school children. Group discussion were conducted in three groups of stakeholder; primary school children, teacher, and the community leaders in northern part of Thailand. The field notes were transformed into an organized note for analysis. The findings revealed that school children described their swimming lessons as a life skill which they do not learn in school. Lack of swimming pool, water safety lessons, and instructor were found in school curriculum in primary school level. Majority of children developed their swimming skill in natural water bodies taught by peers, family members. Information gained from school teachers and community leaders indicated their willing to support swimming lessons in the community. Lack of infrastructures in the developing countries is one of the barriers to promote swimming skills among school children in rural setting. The swimming program in the community could be started in collaboration of stakeholders where available infrastructure.

Keywords: Drowning prevention, rural, school children, swimming ability

INTRODUCTION

Drowning is a leading cause of mortality worldwide. An estimated of 372 000 people died each year from drowning, making it the world's third leading unintentional injury killer. Drowning is among the 10 causes of death of children and young people globally. The majority of drowning (97%) occur in low-and middle-income countries (LMIC) and the younger than 15 years are at high risk group⁽¹⁾. Drowning is one of the most common causes of death among young children in Thailand. School-aged children are at high risk of drowning and boys are more than twice as likely as

girls to drown. Similar to LMIC drowning death occur in rural setting, natural water bodies such as pounds, ditched, lakes, rivers or the sea were found to be source of most drowning death⁽²⁾. This is generally attributed to higher exposure to aquatic environments in rural areas where majority of population lives^(1, 3).

Lack of barriers to water bodies, inadequate supervision for infants and young children, and poor swimming skill with less awareness of water danger had been identified as drowning risk in children^(1, 3-5). Previous literatures identified that adult supervision, install barriers controlling access to water, provide safe places away from water, teach school-age children swimming with water safety, strengthening public awareness are recommended as community-based action to prevent drowning⁽⁵⁻⁸⁾. A systematic review addressed that swimming and water safety lessons were part of the possible prevention strategies for drowning as they provide children with the required skills and knowledge to keep themselves safe or remove themselves from

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danger⁽⁷⁾. Some of those used have been successfully adapted in LMIC⁽⁹⁾. Teaching school-age children basic safety and safe rescue skills is recommended as one strategy to prevent drowning^(1, 4, 5, 7).

Brenner et al conducted a case-control population-based study to identify the association of swimming lessons and fatal drowning in children age 1-19 years during 2003-2005 and concluded that participation in formal swimming lessons was associated with an 88% reduction in the risk of drowning in the 1- to 4-year-old children⁽¹⁰⁾. Therefore, basic water safety and swimming skill is highly recommended to prevent child drowning^(3, 4, 7, 11). However, in LMIC still need infrastructure and resource to facilitate swimming lessons. Limited resources were found as main barriers to reduce drowning risk in many developing countries. An evidence has been shown in a community survey in rural guardians which indicated limited of the infrastructure to develop swimming skill in school children were found⁽¹²⁾.

A cross-sectional study on naturally acquired swimming ability in children in Bangladesh was conducted and identified that they begin natural swim learning in natural water bodies and be able to swim. This research study recommended using existing bodies of water to avoid a major constraint to create the basic infrastructure impossible in many developing countries⁽⁹⁾. However, limited study to understand in how children in rural area develop their swimming skill. This paper aimed to address how rural children develop their swimming skill and identify existing community resource to develop their swimming skill.

METHOD

Study area: The study was conducted in rural communities of Chiang Rai province, Thailand. The province is located in the northern most part of Thailand, 820 kilometers from the capital city. Twelve rural communities were selected according to the high drowning incident rate. The selected area has a large pond and many natural rivers which use for agriculture purpose for many generations.

Study subjects: Primary children from four rural schools were purposively selected to explore their basic swimming skill and the need of swimming program. Each school, researcher purposively identify (1) students

who could swim and couldn't swim, (2) teachers, and (3) community leaders. For children group, approximately 5-7 subjects involved in discussion. School teachers and community leaders were interview either in schools or at community venue.

Data collection: The study was approved by the Ethics Review Committee for Research Involving Human Research Subjects, Chulalongkorn University. Verbal consent was sought from each respondent. The recorded discussions were transcribed fully for data analysis. Group discussion and in-depth interviews ended once the researcher feels that the dialogue had sufficiently covered the topics and no more new information was forthcoming.

Data Analysis: Specific issues of discussion were collected from field notes and electronic recordings of discussions. The field notes were transformed into an organized set of notes. Content analysis consisted of reviewing swimming ability, the need for swimming improvement, existing school/community resources and activities to improve swimming ability. The words were coded for participant meaning and feelings and categorized into set themes with meaning associated to the context. Data were then examined and a decision made as to whether conclusions and generalizations were possible.

RESULTS

The findings were presented in accordance with four themes; swimming skill development, barriers of swimming skill development, existing community infrastructure to facilitate swimming skill for children, and potential role of stakeholders in community swimming program.

Table 1: Characteristics of the respondents to informal interview

Group of respondents	Number	Age range (years)
School children		11-15
Boys	28	
Girls	14	
School teachers		48-55
Male	6	
Female	3	

Conted...

Community leaders		39-60
Village leaders	3	
Director of local administrative office	1	
Administrative officer	1	
Leader of village health volunteer	1	
Leader of health service officer	1	

Swimming skill development: Children described their swimming lessons as a life skill which they do not learn in school. Family members, friends were their swimming instructors. Most of boys were trained in existing natural water bodies such as canals, rivers, dams, fish farms and streams in the community. Girls reported their swimming skill development at a standard swimming pool at private school as an extra-curricular during the summer. They described the difficulty to get to the swimming pool and cost related to their swimming lessons. They perceived that swimming in natural water bodies in the community with friends would be more fun. Children explained ways to learn to swim as follows:

“I learned to swim when I was seven in a river near school, a senior girl in my school taught me. She helped me float in water the first time, and then just let me float. The river near our village was our venue.” (11 year old boy) [S4AS1]

“My brother taught me how to swim at my parents’ fish farm.” (11 year old boy) [S4AS2]

Several reasons were found as a motivation to learn to swim such as do not want to be drown, exercise, for fun. They also believed that swimming makes them healthy and builds strong muscles. Boys expressed their feeling that the decision to learn to swim was their own, for fun, and they were not influenced by any family members. For girls, some stated that they have their own motivation to wanted to learn themselves, while few of reported that it was a need of their parents.

Children had naturally good water safety knowledge in some areas. For example, children generally swam with friends or family for fun, even though they did not realize that this is an important safety issue. *“We usually swim together for fun, and if someone gets in trouble we can help”.* (10 year old boy) [S3AS2]

Barriers of swimming skill development: Children who never learn to swim stated that if they had the chance to learn, they would develop their swimming skills. Half had learned swimming with their family members or friends, but had not been able to develop their skills within a few informal lessons.

“We had swimming lessons with a swimming instructor at a private school in the district during our summer time. There were swimming instructors at a pool. Now, we could not go, our parents have to work. There is a high cost and it is inconvenient to swim in the pool.” (12 year old girl) [S1AS1]

School teachers realized that swimming lessons are needed, but most schools do not have a pool. There is not available of clean water where can be a safe place to swim, that’s why almost all of children in their school cannot swim.

“The main reason is that there is no swimming pool for them to learn to swim, another reason is the natural water bodies in our community are too deep then the guardians do not allow the children to swim.” (43 years female school teacher) [S3TF1]

The community leaders stated that now the quality of the natural water has changed; the water is contaminated with some chemical agent from the farm. The children have no swimming venue to play.

“I think that one main cause which can lead to unable to swim children is that their guardians prohibit them from water, they teach the children that water is so dangerous to approach, therefore, the child perceived the danger of water.” (Village leader) [LM3]

Existing community infrastructure to develop swimming skill and role of partners: Even though there was lack of infrastructure such as swimming pool or professional swimming instructors in the community. Children believed that clean water such as rivers, ponds and streams can be used as their swimming venue. The instructors could be family members, friends and teachers. Children preferred instructors with good swimming skills and who were able to teach them continually throughout swimming lessons, they believed that it would be best if they were able to learn to swim when they were young.

The community leaders can identify their roles if there are swimming program in the community based on their functions. In addition, health personnel could support the swimming activities by set up the health volunteer team and prepare wound dressing equipment if there are some injured, or referral system if needed.

DISCUSSIONS

All group of participants agreed that swimming lessons as a life skill which could not find in the school. The school children desired to learn to swim, and some of those who can swim were learnt in natural bodies of water taught by peers. They did not realize that those activities were probably at high risk of drowning if without adult supervision. This was a key reason of higher drowning rate were found in rural setting where available of natural water such as pond, river, lake, etc.^(1, 2). Swimming with water safety education is recommended as a basic lifesaving skill to prevent drowning worldwide^(1, 4, 5, 7, 13). In addition, a systematic review indicated that intervention programs should emphasis the swimming and water safety education rather than just basic swimming lessons⁽¹³⁾. Therefore, improving swimming skill with water safety lessons in rural setting should be considered to be high priority agenda.

Swimming in the natural water could be infected to particular diseases as a consequence. The finding highlighted that inability to swim among rural children was due to lack of infrastructure to facilitate swimming program and water safety lessons. However, children believed that the existing natural water in the community could be their swimming venue. They determined that swimming instructor could be their family members, teachers or friends who can swim which indicated that they accepted available resource. It is possible to conduct a swimming program for children in the community through collaboration of stakeholders within the community with technical support by Thai lifesaving society. There was an example of a successful community-based swimming program in Bangladesh where existing resources were utilized⁽⁹⁾. A previous study proved that it was highly cost-effectiveness of swimming intervention in the community⁽¹⁴⁾. The study also recommended implementing in other rural setting where available resource. In addition, the SwimSafe curriculum was developed in collaboration of local partner in Bangladesh, Vietnam, and Thailand and it was realized to be safety

and effectiveness⁽¹⁾. The curriculum could be adopted to improve swimming skill in the rural area.

The community survey in group of guardians in rural Thailand found that they believed the risk and severity of drowning to be high, had favorable attitude towards swimming ability and its benefits of a swimming program⁽¹²⁾. Guardians realized that there was no curriculum related to water safety knowledge or swimming lessons for children to learn in the schools. However, they were willing to support facilitate children develop their swimming skills if there is a swimming program exist. Sansiritanaweessook et al conducted a study of surveillance system initiative to prevent drowning in Thailand. This study indicated that through local knowledge and community participation could be the key success to prevent child drowning⁽¹⁵⁾. It was recommended that the key partners to prevent child drowning consisted of four sectors; government agencies, community leaders and volunteers, lay persons, and technical advisory team.

Eventhrough natural water environments are plentiful and are common locations of childhood drowning in Thailand⁽²⁾. These natural water environments can be used as swimming venue; modification and use of rivers and ponds for swimming lessons has been successful in Australia, Bangladesh, and Vietnam. Swimming programs that are tailored to and run by the local community are important for long term success.

CONCLUSIONS

Swimming lessons in Thailand are often provided through the schools; unfortunately, this study found that almost school in rural area has no swimming pool. Rural school children do not have the chance to attend formal swimming lessons, putting them at higher drowning risk as a consequence. Lack of infrastructures in the developing countries is one of the barriers to promote swimming skills among school children in rural setting. The findings of this study clearly address rural children in developing countries gain their swimming skill by themselves. The swimming program in the community could be started in collaboration of stakeholders where available resource. Providing the basic swimming skill with water safety education is crucial to reduce drowning mortality as a result of drowning.

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Personality, Perceived about Co-workers Safety Behavior and Unsafe Acts in Construction Workers

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ABSTRACT

Introduction: The main cause of occupational accidents is unsafe acts. Unsafe acts are influenced by internal and external factors of workers. Internal factors that provide influence to workers' unsafe behavior include personalities and workers' perceived about the actions of co-workers. The purpose of this study was to analyze the influence of extraversion and agreeableness on unsafe acts through workers' perceived concerning the acts of co-workers.

Method: The study was observational research with cross sectional design. A questionnaire was administered to building construction worker, and the following results were obtained.

Results: First, agreeableness affected worker's unsafe acts through workers' perceived concerning the acts of co-workers. Second, extraversion, agreeableness, and workers' perceived concerning the acts of co-workers directly affected worker's unsafe acts. These findings showed the importance of agreeableness and extraversion as predictors of unsafe acts.

Conclusions: By identifying grade of agreeableness, extraversion, and co-workers safety behavior, subcontractor can identify worker's unsafe acts and prevent accidents in building constructions.

Keywords: *agreeableness, extraversion, perceived colleagues' safety behavior, unsafe acts*

INTRODUCTION

Unsafe acts describe risky behavior in work. According to Kavarianian (1990), unsafe acts have the same understanding of risky behavior.¹ Lawton (1998) states that risky behavior is an error and violation committed by workers and can lead to work accidents.² In addition, unsafe behavior is a form of deviant behavior in the workplace, can easily spread among workers, and cause harm to both the company and the workers themselves.^{3,4,5}

Unsafe acts by workers can ultimately lead to workplace accidents. Previous studies have shown that unsafe acts are a major cause of occupational accidents.^{6,7-10} Factors affecting unsafe acts include the project management, supervision, contractors, individual factors (attitudes, perceptions, experience, age, use of medication, competence, ability, personality, psychological conditions and competition), working conditions, working groups, organizations, and society.^{11,12}

Unsafe actions are influenced by personal factors of the worker, including the worker's personality. Researches regarding the influence of personality on unsafe acts are still difficult to obtain. However, researches that illustrate the influence of personality on work accidents are sufficient in number such as Cellar et al, Clarke & Robertson, Postlethwaite et al, Rahimi-pordanjani et al.^{13,14-17} Nevertheless, the relationship between Big Five personality dimensions and workplace safety is not fully understood, and Clarke & Robertson suggest that it may be useful to consider variables moderate personality safety relationship.^{15,16}

Trait-based personality theory suggests that action is predicted by understanding the three core components namely basic tendencies (extraversion, agreeableness, conscientiousness, neuroticism, and openness), adaptation characteristics (attitudes, beliefs, and feelings), and self-concept (knowledge, views and self-evaluation). In addition, there are secondary components consisting of biological basis (genes, hormones, and brain structure), objective biographies (emphasizing what

happens in one's life), as well as external influences.¹⁸ In summary according to McCrae and Costa, personality provides influence on one's actions.

The Health Belief Model explains that personality is one of the socio-psychological variables that will affect person's perceived trends about certain symptoms, threats, and benefits of taking precautions against the onset of symptoms.¹⁹ Narwoko and Suyanto defines personality as personal psychological tendency to engage in certain social behaviors whether they are closed behaviors (feelings, intentions, thoughts, attitudes) or open behaviors (daily actions).²⁰ In other words, this definition explains that personality provide influence on person's perceived regarding a particular thing. Jiang et al and Dejoy et al specifically explain that there is an influence of workers' perceived regarding the actions of co-workers on the acts of the worker.^{21,22} Therefore, based on the existing theory and previous studies, this study was conducted with aim to analyze the influence of extraversion and agreeableness to unsafe acts through workers' perceived regarding the actions of co-workers.

METHOD

In this cross sectional study, the study population consisted of all worker in the construction project of a new Provincial Governor Office of NTT, Indonesia, during 2016 (N= 350). After we analyze data normality, outlier multivariate, and multicollinearity, we get 185 respondents that can be used in analyzeof hypothesis. This research used personality questionnaire from International Item Pool Representation (IPIP-NEO) that

developed by Goldberg.²³ Data analyze in this research used Structural Equation Modell (SEM) with Amos.

RESULT

To assess the constructs, confirmatory factor analysis was conducted to analyze the validity and reliability of the constructs. There were 4 constructs and 23 indicators in this study. Convergent validity was verified by standardized factors loadings (FL>0.4) and construct reliability (CR> 0.7).²⁴ Factor credibility was verified, loading factor and construct reliability for all indicators were confirmed above 0.4 and 0.7 (Table 1).

Various fit indexes were used to examine the structural models, including the following: Chi-square(X^2 ; $p < 0.05$), Chi-square/degrees of freedom(X^2/df ; < 3.00), goodness of fit index (GFI > 0.9), adjusted goodness of fit index (AGFI > 0.9), normed fit index (NFI > 0.8), comparative fit index (CFI > 0.9), root mean residual (RMR < 0.1), and root mean square error of approximation (RMSEA < 0.05) verified measurement model validity.^{25,26}

The result of SEM were $X^2 = 148.196$ ($p < .001$), $X^2/df = 1.512$, GFI = 0.914, AGFI = 0.881, NFI = 0.829, CFI = 0.933, RMR = 0.026, and RMSEA = 0.051. This process satisfied conformity and the hypotheses were tested (Table 2). Agreeableness affected worker's unsafe acts through workers' perceived concerning the acts of co-workers. But extraversion did not affect worker's perceived colleagues' safety behavior. Extraversion, agreeableness, and workers' perceived concerning the acts of co-workers directly affected worker's unsafe acts.

Table 1: Confirmatory Factor Analysis

Construct	Indicator	Loading Factor	Critical Ratio	p	Construct reliability
Extraversion	Indicator 1	.571	6.625	.000	.887
	Indicator 2	.429	5.043	.000	
	Indicator 3	.493	5.695	.000	
	Indicator 4	.618	6.912	.000	
	Indicator 5	.718			
	Indicator 6	.620	7.290	.000	
Agreeableness	Indicator 1	.428	4.688	.000	.877
	Indicator 2	.675			
	Indicator 3	.452	5.237	.000	
	Indicator 4	.401	4.372	.000	
	Indicator 5	.594	6.657	.000	
	Indicator 6	.508	5.517	.000	

Conted...

Workers' perceived concerning the acts of co-workers	Indicator 1	.644	7.021	.000	.862
	Indicator 2	.661			
	Indicator 3	.695	7.532	.000	
	Indicator 4	.650	6.882	.000	
	Indicator 5	.463	5.220	.000	
Unsafe action	Indicator 1	.477	5.871	.000	.891
	Indicator 2	.503	6.264	.000	
	Indicator 3	.489	6.173	.000	
	Indicator 4	.725			
	Indicator 5	.653	8.135	.000	
	Indicator 6	.781	9.588	.000	

Table 2: Hypothesis testing results

Hypothesis	Estimate	C.R.	p	Hypothesis testing results
H1. Extraversion → Workers' perceived concerning the acts of co-workers	.108	1.141	.254	Rejection
H2. Agreeableness → Workers' perceived concerning the acts of co-workers	.269	2.690	.007	Adoption
H3. Extraversion → Unsafe action	-.541	-5.656	.000	Adoption
H4. Agreeableness → Unsafe action	-.481	-4.486	.000	Adoption
H5. Workers' perceived concerning the acts of co-workers → Unsafe action	-.295	-3.457	.000	Adoption

DISCUSSION

The higher the value of agreeableness of respondent the better respondents' perceived to the actions of their co-workers. The better the worker's perceived regarding the actions of co-workers, the less unsafe acts performed by the worker. In this study the influence of co-workers was measured by workers' perceived regarding the actions of their co-workers. Respondents were asked to measure their feeling regarding the influence of co-workers for themselves in acting safely, for instance when co-workers utilize Personal Protective Equipment, would respondents feel the need to also utilize and act to use the same thing. The results of this study confirm the results of previous studies conducted by Cellar et al and Sing et al.^{13,27}

Workers' perceived are not solely influenced by what is done by the management, formal rules applied, and work procedures that exist, but also influenced by co-workers in the same division.²⁸ Coworkers could bring influence on a worker in many ways, including acting safely at work. The results of previous studies prove that

high agreeableness in general reflects good perception on a person. An agreeable person does not like to provide negative responses especially in the workplace.²⁹

According to Friedman, people who have high dimensions of agreeableness tend to be friendly, cooperative, believing, and warm.³⁰ This trait which also being called adaptability indicates friendliness, easy to budge, avoiding conflict, and tend to follows. In addition, a person with high agreeableness is helpful, forgiving, and merciful. Conversely, a person with low agreeableness has flat, competitive, selfish, confrontational, and unfriendly characters.

Unsafe action decreases with increasing extraversion value. Individuals with high extraversion dimension tend to be passionate, enthusiastic, dominant, friendly, and communicative. They also remember all social interactions, interact with more people, and take control in relationships and peer groups. In addition, extraversion described as ambitious, hard-working, and getting friendship faster, easy to motivate, easy to challenge, and easy to being bored.³⁰ When the respondent performs

safe action at work and has dominantly extraversion, the respondent will be the one who provide influence to his/ her co-workers in acting safely, because person with high extraversion value is a dominant person and is holding control of relationship in one group.

Co-workers are one of the supporting factors for workers to acting safely. When co-workers do safe action at work, other workers in the same work group will do the same, even more when the co-workers are senior workers in their group.³¹ In addition, Liao explained that communication in group and cognitive from workers are related to unsafe acts on construction work.

The study indicated that workers' perceived regarding the actions of co-workers provided influence on unsafe acts of the workers. This was in line with study conducted by Jiang et al that discovered a new concept of Perceived Co-workers Safety Knowledge/ Behavior (PCSK/B).²¹ The concept explains that safe acts in work are influenced by perceptions about beliefs of safety of co-workers and peers behavior. This is due to the habits of Asian people who easy to follow something viewed (contextual factors) than to comply with existing rules.³² This condition resulted in construction workers being easier to see the actions of their co-workers than to remember existing work rules.

CONCLUSION

Our research shows that agreeableness affected worker's unsafe actsthroughworkers' perceived concerning the acts of co-workers. Additionally, extraversion, agreeableness, and workers' perceived concerning the acts of co-workers directly affected worker's unsafe acts. By identifying grade of agreeableness, extraversion, and co-workers safety behavior, subcontractor can identify worker's unsafe acts and prevent accidents in building constructions.

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Determinant Factors of Work Stress among Teaching and Non Teaching Staff in Indonesia

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ABSTRACT

Background: Work stress could be experienced every worker including teaching and non-teaching staff in the university. The main objective of the present research was to analysis influence intrinsic factors and extrinsic factors to work stress among teaching and non-teaching staff in the one of faculty in the university, Indonesia. Intrinsic factors were age, gender, educational level, marital status, residence status, work motivation and occupational fatigue. The extrinsic factor was workload, work hours and role in the organization.

Material and Method: This study was analytic research with a crossectional design. In this study (N =81), about 75% teaching staff experienced work stress in moderate level and about 71,11% non-teaching staff also experienced work stress in moderate level.

Result: Work motivation, occupational fatigue and role in the organization were significantly affect to work stress. There was no significant affect on age, gender, educational level, marital status, residence status, work hours to work stress.

Conclusion: Role in the organization (role ambiguity, role conflict and responsibility to whom) should be fixed clearly and university should be given more reward and recognition to teaching and non-teaching staff.

Keywords: *Determinant, Factors, Work Stress, University*

INTRODUCTION

Work stress could be experienced every worker including teaching and non-teaching staff in the university. Factors that affect job stress include too heavy workload, lack of rest time, long working hours, shift work, monotonous work, too easy work, no authority, management (less involving workers in decision making, poor organizational communication, etc.), interpersonal relationships, unclear job roles, unclear careers and work environments. The workload referred to above is the workload both physically and mentally. The work environment in question is one of the lighting factors^{1,2,3,4}.

In Indonesia, data on occupational stress are derived from various research and basic health research. In 2013 basic health research results found that about 6% of the population with age above 15 years showed a mental disorder Kemenkes RI, 2013). The prevalence of work

stress in PNS Ministry of Health is 79%. This figure is quite large when compared with other studies⁵. The data above one of the sectors that the ratio was quite high in the education sector. It was due to the high and rapid development of education in the world including in Indonesia. In addition, with the competition between universities could not be denied again to be one cause of the rapid development of universities.

Fast development, tight competition, and quality improvement of the university became one of the causes of stressful work for the civitas academica namely lecturer (teaching staff) and education personnel (non-teaching staff). Lecturers and education personnel must ultimately strive to meet the performance targets of faculty or existing work units. That research which states that the stress on academic staff to be a problem in the world. The academic environment does not always lead to low work stress. Academic staff also experience increased work stress with the rapid development of education⁶.

A professor or lecturer at the college is one of the spearheads in achievement university performance targets. The performance targets set by the university such as the achievement of competency through learning activities, development of science through research and publications and training and their social responsibility linear with research through community service activities. In this study, we aimed to analysis determinant factors of work stress among teaching and non-teaching staff in Indonesia.

MATERIAL AND METHOD

This study was analytic research with crosssectional design. Analysis data using multiple linear regression for examining affect intrinsic factors and extrinsic factor to work stress The population of this research was about 77 people of teaching staff and 90 people of non-teaching staff in one of faculty in Indonesia. The sample size was calculated by simple random sampling formula ($N = 81$). The research instrument used in this study were questionnaires. Measurement of work motivation is measured using the scale on 5 points scale ranging from 1 =strongly disagree to 5- strongly agree. Measurement of subjective occupational fatigue used Subjective Self Rating Test from the Industrial Fatigue Research Committee (IFRC). Measurement of workload used NASA-TLX method (National Aeronautics & Space Administration Task Load Index).

In this study, data retrieval was done 3 times. In the first stage, the data taken were the individual data of respondents such as age, gender, hours of work, length of service, marital status, residence status and work motivation. The second stage of data taken were data on subjective occupational fatigue and roles in the organization (ambiguous roles, the role of conflict and responsibility to whom). The third stage of data taken were data on subjective workload and work stress data.

FINDINGS

Every worker has experienced work stress, excluding teaching and non-teaching staff in the university. In this research, most of teaching and non-teaching staff experienced medium-level work stress (table 1). Medium level stress could be a high level of work stress even very high if not managed properly.

Lecturers also often experience stressful conditions such as poor time management, doing administrative tasks such as making the draft of letters and attending meetings (while teaching staff as a lead in management position such as the head of department and head of study program). Almost teaching staff have repetitive disorders during working on their main job. Teaching staff often interrupted by student guidance appointments, guests, telephones etc. On the other hand, teaching staff also has a lack appreciation compared with the double burden they had.

While the non-teaching staff, especially in the academic and finance who experience a heavy workload because it must serve students and teaching staff of 18 units of work in the faculty. Non-teaching staff compared with the ratio of the number of students clearly not comparable. However, increasing the number of staff is also not necessarily solve the problem. Non-teaching staff (administration in the study program, academic, finance and laboratory staff and other supporting) is an important element in a system that exists in the university other than lecturer that is not the same as lecturers. The increasing workload, especially those that are not related to the main tasks in the work unit, can cause work stress.

With the additional burden given by universities in Nigeria, many staff could not leave or vacation in the last decade. Given this, it turns out that productivity is declining even though there are already additional benefits. In addition, there was a tendency of depersonalization of educational personnel with the male. The tendency for this depersonalization is when an educator behaves negatively like a cynical client. The clients referred to here are students and lecturers⁷.

Job stress has a negative effect on the performance of educational personnel. Individual stress does not have a positive effect on efficiency and work effectiveness for educational personnel. The existence of individual stress reduction proved positive for moral improvement and behavior for educational personnel⁸.

In this study, intrinsic factors such as age, sex, gender, education level, marital status and residence ownership status did not significantly influence the onset of work stress ($\alpha > 0.05$). While the motivation of work and fatigue work of teaching staff and non-teaching staff have an effect on the happening of work stress and subjective fatigue . Extrinsic factors did not affect the occurrence of work stress were work hours

and workload. The role of the organization influences the emergence of work stress among teaching and non-teaching staff (table 2).

A study on work stress on nurses also mentions that there is no significant influence between age, sex, workload of physical work with work stress. On the contrary, mental workload was the dominant factor of work stress.⁹ As nurses, teaching and non-teaching staff are more dominant to get a mental workload than the physical workload.

Motivation can arise because of 2 factors. Factors that make workers feel calm, happy and comfortable as comfortable working conditions, workloads in accordance with capacity, individual growth, and so-called satisfiers. Further factors called dissatisfaction include company policy, relationships or interpersonal, personal life and salary. Sufficient compensation for everyday life then a counselor will be motivated well so that will do a higher job³.

The existence of an imbalance between high performance and low appreciation occurs in conditions when workers have limited choices in the workplace such as low skills, lack of movement and forced labor. In addition, workers think that they will gain improvement in the future (related to career and position). Means that when they work in an organization, they will get something that suits their business. Excessive commitment to the organization and low income, rewards, and promotions contribute to stressful work¹⁰.

As many as 55,56% of teaching and 42,22% of non-teaching staff who experienced subjective fatigue were causing moderate work stress as well. It turns out in educational personnel, low work fatigue can also cause a moderate level of work stress. Fatigue of work on teaching and non-teaching staff affect the occurrence of work stress (table 2). The subjective fatigue that occurs is due to the high workload among teaching and non-teaching staff. This workload relates to the duties and responsibilities of teaching and non-teaching staff.

Excessive workloads of both physical and mental workloads can lead to work fatigue. Excessive work fatigue and accumulate can cause stress. Work fatigue is an accumulation of various reactions such as a headache, muscle pain, anxiety, frustration and so on. According to the combined theory of the effects of causes of fatigue

and refreshment, fatigue is caused by various factors. Intensity and duration of work, mental environment, work environment (including climate, lighting and noise), circadian rhythms, physical problems and responsibilities, health and nutrition conditions^{11,12}.

Lecturers have a great responsibility and important role in the university. Lecturers also have moral and intellectual responsibilities. Responsibility was in the form of renewal of knowledge, technology, and information that will become a teaching material to students. Some lecturers or faculty. The many demands can ultimately lead to depression or work-related stress. The existence of work stress and strong commitment are significantly related to the incidence of depression in lecturers or teaching staff in China¹³.

In addition, data from a nationwide survey of lecturers present at 17 Australian universities indicate that the presence of mental stress and its impact on job satisfaction lies with nearly 9,000 study subjects. It turns out to be related to welfare (salary, investment, lecturer-student ratio and so on)¹⁴. Approximately 75% of teaching staff experience work stress¹⁵.

Roles in the organization of lecturers and educational personnel in this organization is divided into 3 categories namely the role of ambiguity, role conflict and responsibility to whom (superior in the organization). The role of ambiguity and role conflict are two forms of role stress experienced by a worker. But because the role in the organization is low then this variable can contribute low to the occurrence of work stress.

The role of ambiguity or unclear tasks and role conflict in an organization was potentially causing work stress. It is in a study in Pakistan that there is a connection between ambiguous roles, role conflict, job satisfaction stress and organizational commitment. Especially in the role of ambiguous and role conflict, there was a positive relationship with the stress of work experienced by the lecturer. As for satisfaction and organizational commitment showed a negative relationship with work stress. So it is found that there is an ambiguous role and role conflict in lecturers and become one of the causes of work stress¹⁶.

Many other studies have suggested that ambiguous roles and role conflicts are positively associated with work stress. Another study that supports the results of research in managers in Pakistan which states that

significantly there is a difference in job stress between high ambiguity role with low ambiguity role. In addition, work stress also differed significantly between groups of managers with high role conflict and group managers with low role conflict¹⁷.

The ambiguous role or double burden that is burdened or experienced by the teaching staff when the teaching staff has to implement their main job (it is called tri dharma) i.e. teaching, research and community service. However, at the same time, they also have to perform administrative tasks such as quality assurance, database data collection, curriculum compilation and other additional tasks beyond the tri dharma as the main job.

Tabel 1: Description of Work Stress among Teaching and Non-Teaching Staff

Level Stress	Teaching Staff (%)	Non Teaching Staff (%)
Low	8,33	13,33
Medium	75,00	71,11
High	13,89	15,56
Very High	2,78	-
Total	100,00	100,00

Tabel 2 Intrinsic and Extrinsic Factors on Teaching and Non Teaching Staff and Work Stress

Factors	Teaching Staff (%)	Non Teaching Staff (%)	α
Age			
20-30 years old	50,00	35,55	0,555
31-40 years old	11,11	15,56	
41-50 years old	38,89	48,89	
Total	100,00	100,00	
Gender			
Male	27,00	64,00	0,760
Female	73,00	36,00	
Total	100,00	100,00	
Educational Level			
High school	-	11,11	0,709
Diplome	-	4,44	
Bachelor	-	68,89	
Master	91,67	15,57	
Doctoral	8,33	-	
Total	100,00	100,00	

Conted...

Marital Status			
Married	88,89	77,78	0,868
Unmarried	11,11	22,22	
Total	100,00	100,00	
Residence Status			
Owner	58,33	55,56	0,328
Along to parents	22,22	33,33	
Along to the others family members	8,33	11,11	
Rent a house	11,11	-	
Total	100,00	100,00	
Work Motivation			
Weak	-	-	0,003
Medium	44,44	31,11	
Strong	55,56	68,89	
Total	100,00	100,00	
Work Fatigue			
Low	41,67	57,78	0,025
Medium	55,56	42,22	
High	2,78	-	
Total	100,00	100,00	
Workload			
Very low	-	-	0,633
Low	-	-	
Medium	5,56	22,22	
High	72,22	62,96	
Very High	22,22	18,52	
Total	100,00	100,00	
Work Hours			
< 8 hours per day	13,39	-	0,137
8-10 hours per day	86,11	91,11	
>10 hours per day	-	8,89	
Total	100,00	100,00	
Role in Organization			
Very low	22,22	22,22	0,010
Low	47,20	51,11	
Medium	30,50	24,44	
High	-	2,22	0,010
Very High	-	-	
Total	100,00	100,00	

CONCLUSION

Extra burden and high work motivation that was not accompanied by high appreciation from the institution or university can trigger the occurrence of work stress on teaching staff. While the non-teaching staff, the role of ambiguity and responsibility to the “head who” and the additional burden that can trigger the occurrence of stress work. The management of the university needs to conduct an overall job stress assessment in each work unit to map out the main causes of work stress and to exercise control such as rewarding and detailed job description mapping. This is done to decrease job stress and productivity of teaching and non-teaching staff can increase.

Ethical Clearance: Ethical clearance was taken from Health Research Ethics Committee, Faculty of Public Health Airlangga University

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Measurement of Radon Concentration in the Soil of Some Areas of the City of Shatrah Using the Nuclear Impact Detector (Cr-39)

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ABSTRACT

In this study, (CR-39) was used to detect the effects of charge particles of protons, alpha particles and fission fragments. Rn^{222} is an environmental contaminant that causes serious health problems because it is considered One of the main outputs of uranium fission. The samples were collected at a depth of (5.15.25.35.45) cm and the highest value was recorded in the industrial area of $(1666.911 \pm 27.21531) \text{ Bq/m}^3$ and the lowest value in Al-Hurriya district where $(988.99 \pm 21.9631) \text{ Bq/m}^3$ was recorded. The general average was $(1375.7876 \text{ Bq/m}^3)$ These values are higher than the natural exposure limit set by the World Health Organization of (800 Bq/m^3) (WHO), which leads to contamination of all areas of the study.

Keywords: Radon Rn^{222} , Reagents Solid nuclear impact, Radiation activity.

INTRODUCTION

Radon Rn^{222} is a poisonous gas released from the uranium-containing soil. It is colorless, tasteless and odorless and is seven and a half times heavier than the air. It is radiant and half-life (3.82) days long. Its nuclei are emitted by the emission of alpha-nuclei produced by Polonium Po^{218} .

The radon is able to move from one place to another without any obstruction, which causes the process of exposure and radiation occur very high probability of a large number of people and studies have proved that porosity low soil granules are close to each other When the radon atom from the granule, the energy of rebound buried in another granule and thus can escape When the distance between the granules is large, the probability of stopping the radon atoms in the large pores and spreading to the surface is easily confirmed by the United Nations report (UNSCEAR, 1983) on the sources of natural radiation. Radon represents more than 50% of the total exposure to human N Radiation dose resulting from natural Radon radiation¹.

Radioactivity is defined as radioactive radiation². Natural radiation can be arranged as a cosmic or terrestrial radiation and the dose rates vary greatly between them because of their dependence on the places where the measurements were made, as well as the rise

from sea level and the concentration of radioisotopes in the earth is one of the main causes of these differences. All living organisms are exposed to a certain amount of Natural radiation in the form of particles and radiation. In addition to sunlight, all living organisms suffer from cosmic rays coming from space and also suffer from natural background radiation, especially half normal life $(4.49 \times 10^9 \text{ years})$. U238 (99.29%) uranium U235 (0.17%) is a series of anomalies that emit alpha particles, beta particles and gamma rays until they reach the stable lead element³ as in Figure 1⁴. The technique used to determine the concentration of radioactive materials is an important technique in determining the concentration of radioactive materials because of their availability and accuracy. Impact detectors are defined as electrically insulating materials ranging from special resistance (106-1020 ohms) to narrow paths of radiation damage called stable effects when charged particles pass through.⁵ Nuclear reagents are divided into two main sections: inorganic reagents and organic reagents. Do not enter inorganic reagents in carbon and hydrogen. Their atoms are linked to ionic bonds, including mica and glass detectors, which are used to record the effects of neutrons, especially in nuclear reactors, and are characterized by their susceptibility to fission fragments. Reagents in chemical scattering with HF solution at (48%) and temperature (20-25 C)^{6,7}. As for organic reagents, hydrocarbons enter their components, which

are more sensitive to ions than inorganic reagents, because they are sensitive to all ions. Are large molecules consisting of small, repetitive and interrelated units called polymers. Monomers in most plastics consist of atoms linked together by a covalent bond dominated by hydrogen carbonate (HC) that can be easily broken when exposed to radiation.⁸ Because uranium minerals emit uranium gas with radon gas more dangerous than other hard rock mining, adequate ventilation systems are required if the mines are not an open pit.⁹ It has been shown that radon, produced by uranium, not uranium itself, is a carcinogen.¹⁰

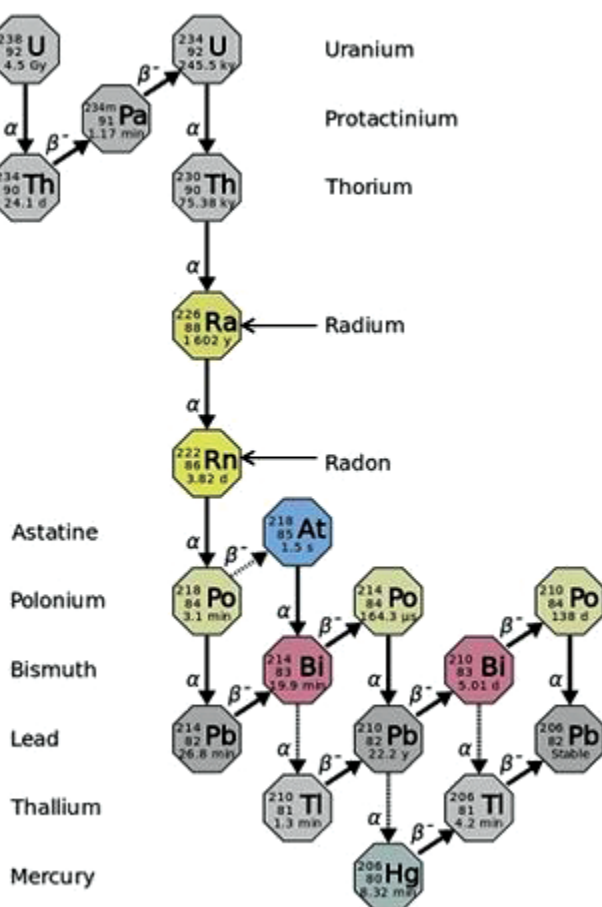


Fig. 1: The radium or Uranium series⁴

Research goal: The study aims at measuring the radiation background spectra, as it acquires an important aspect of environmental protection studies from pollution, monitoring of natural radiation activity and exploring the possibility of radioactive materials.

The theoretical part

1. Radon concentration calculation: Solid-state detectors are used. This method is more efficient in measuring radon concentrations. The detector

(CR-39) was used. A detector is placed in the closed distribution chambers in cylindrical or semi-conical form. For the sample to measure radon concentration and close it tightly to prevent leakage or exchange of air with the ocean and after spreading inside the room, the best distance to the radiant system is when the distance between the threshold surface and the detector is greater than 7cm⁸. Radon and Th234 resemble the same element (belonging to two different melting chains). And can be separated only on the basis of significant difference in decomposition rates. Through the effects that particles form from the alpha emitted because radon diameters are greater than the effects of Th234.2. The mechanism of the effects on the surface of the detector

Particles in solids generated a number of effects during the passage of those substances and can be observed using electronic microscopy or light after treatment with a chemical to show the areas of damage formed. The shape and type of damage zones depend on the mass, energy, charge of the fallen particles and the type of solid material⁹. The theory of ion explosion is the mechanism that can explain how the effect of polymers is formed. Large, repetitive and interrelated molecules, called monomers and others, are linked to each other in most plastics by a hydrogen-carbon-bonded hydrogen bond when exposed to radiation, resulting in small polymer chains with effective ends Free Ionic radicals are called, who have the ability to interact with each other or with other atoms¹⁰. The fall of radiation on these polymers to the irritation and ionization of these molecules and thus the separation of links between them and the damage of polymer and Lysol under normal circumstances and knowledge of the influence of this inventor¹¹. Areas affected by ionizing radiation show greater ability to interact with alkaline solutions such as sodium hydroxide compared to health zones because the affected areas have more energy, so the chemical solution quickly penetrates the radioactive regions, causing an increase in depth and tracking of the diameter with increased skimming time. See the inherent effect of ionizing radiation after being introduced under a microscope.¹²

3. Fixed propagation calculation: The measurement of radon concentration is based on the determination of the propagation constant (K) which can be determined for the propagation chamber used in this study of relationships¹³.

$$P = KCT \quad \dots(1)$$

$$D = P/T = K.C \quad \dots(2)$$

Dependence on dimensions K It is also possible to find a constant propagation of geometry for the diffusion chamber as in the relationship:

$$K = 1/4 r(2\cos \Theta_c - r/R_\alpha) \quad \dots(3)$$

Where r: the current diameter of the tube is 1.19 cm and Θ_c is the critical angle of the detector CR-39, 35°, and R_α The range of alpha particles in the air emitted from Rn²²² and the value of 4.15 cm appears in equation¹⁰.

$$R_\alpha = (0.005 E_\alpha + 0.285) E_\alpha^{3/2} \quad \dots(4)$$

E_α represents the energy of alpha particles in Mev units whose value (K) depends on the geometry of the irradiation chamber. Therefore, when k is calculated from equation (3), its propagation constant value of length units is $K = 0.402$ cm.

4-Calculation of radon concentration in samples: Radon concentration can be determined

$$C_x = \lambda R_n C_\alpha \text{ ht/L} \quad \dots(5)$$

Practical Part:

1. Phase of collection and preparation of samples:

During July 2018, samples were collected for five different areas of the city of Shatrah in Dhi Qar Governorate (Al-Sansi neighborhood, Al-Hussein neighborhood, the followers). Baghdad district, al-Hurriya neighborhood, (5.15.25.35.45 cm) for each area. Samples are sampled to obtain a homogeneous and smooth model ready for examination and analysis.

2. Measurement method: The long-term radiation sensing technique was selected to obtain the effects of the alpha particles emitted from the radon gas from the samples under study. The CR-39 with the thickness of (100 µm) was used with an equal dimension of (1 × 1 cm²). (12 gm) of each sample. The amount to be studied was determined by a sensitivity scale of (0.5 × 10⁻²). The samples were placed in conical irradiation chambers, which are called diffusion chambers and were in diameter (8.5 cm x 5 cm) And the provisions of the closure by rubber payment while

keeping the distance between the surface of the sample and the surface of the bottom payment containing the detector piece¹⁵. Each sample is then given a period (22 days) to obtain an ideal balance of (98%) between radium and its radon counterparts. Without the radon leaking out of the compartments, the charge was quickly removed and replaced with another charge with a bottom piece on the detector. The reagents remain in the irradiation chamber for 60 days after the reagents are removed and prepared for chemical scaling using NaoH solution with purity (98%). This process shows the intensity of the effects of radon on the detector. The temperature associated with this process was (70 ° C). Concentrate solution (6.25 N), (25gm) of NaoH in 100 ml of distilled water to take into account the low water level in the evaporation of the bottle due to the high temperature resulting from the melting process with the addition of water to the bottle after the thermal balance with the ocean and calculate the standard equation:

$$W(g) = N \times V \times W_{eq} \quad \dots(6)$$

For a skimming process in a water bath, heat to (60C) and attach the detector to the inside of the skimming solution for (17 hours) at a rate of (3-4 hours) per day by washing the detector after each time with normal water and then with distilled water and drying¹⁵. Visual microscopy, detection and calculation of the number of effects arising from the interaction between the alpha particles emitted from the radon and the front of the detector. By calculating the radiation background by placing a detector in the sealing cylinder and free of samples at the same time as the reagents used for the samples under study. As in Figure (2.3).

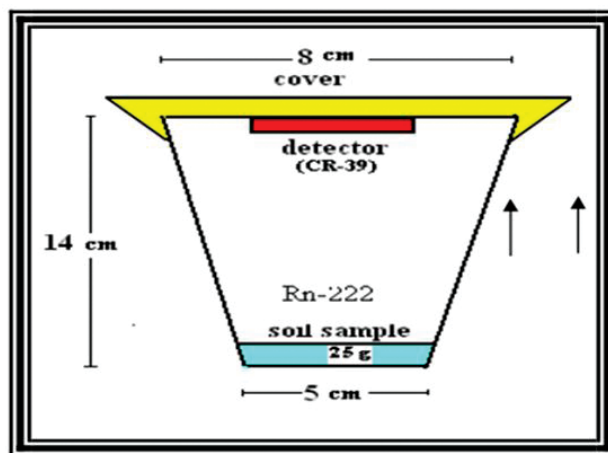


Figure 2: Illustrates the chemical scattering process of the nuclear impact detector (CR-39)

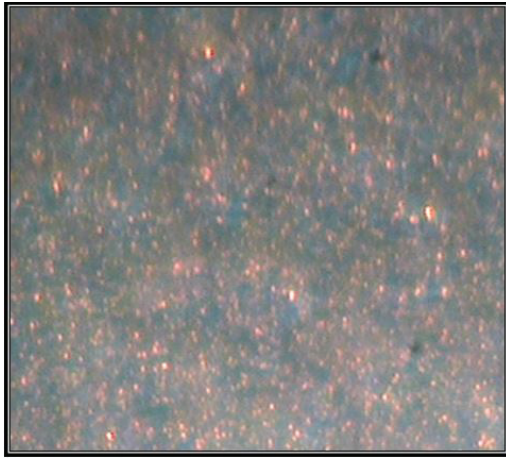


Figure 3: shows the effects of the radon-free alpha particles in the impact detector (CR-39)

RESULTS AND DISCUSSION

Table (1) shows the effect of alpha particles and radon concentration in samples. Was the highest value in the industrial area where it was recorded (27.21531 1666.911)

Bq/m³ and recorded the lowest rate in the freedom zone (988.99 21.9631) Bq/m³ higher than the natural exposure limit set by the World Health Organization (800) Bq/m³ ¹⁶ Radon is the production of natural gas to analyze uranium and soil is the source of most building materials are contained in a certain amount of uranium, thorium and radium emitted by radium, and more radiant than gypsum and calcite, which is saturated with grass, flint, and stones. Fluorescent. The lack of ventilation exacerbates things because they lead to the collection of gases in indoor because the concentration of radon produced in the air varies with the ventilation rate ¹⁵. The results indicate that the radon concentration increased during the Gulf War (1991-2003), resulting in the city being polluted by depleted uranium and its degraded products. Radon is present in the earth's atmosphere ¹⁷ and (10%) of radon leakage from cracks and rock cracks and through soil pores to reach the surface of the soil. ¹⁸ As in figure (4) Table (2). Comparison of current radon concentration and previous local studies

Table 1: Concentration of radon gas in the soil models under dorsal

Table (1) Concentration of radon gas in the soil models under dorsal

The name of the area	The intensity of the effect $\pm$ standard deviation (Track / mm ²)	Concentration $\pm$ error ratio Bq / m ³
(1)Industrial neighborhood	197931.03 $\pm$ 1598.9	1666.911 $\pm$ 27.21531
(2)Doctors' District	91293.1 $\pm$ 1052.28	1553.925 $\pm$ 17.91131
(3)Baghdad district	86206.9 $\pm$ 1442.517	1467.351 $\pm$ 24.55349
(4)Al - Husayn District	70603.45 $\pm$ 1246.279	1201.761 $\pm$ 21.21325
(5)Al-Ameen district	58103.45 $\pm$ 1290.227	988.99 $\pm$ 21.96131
The rate	1375.7876 $\pm$ 22.57094	

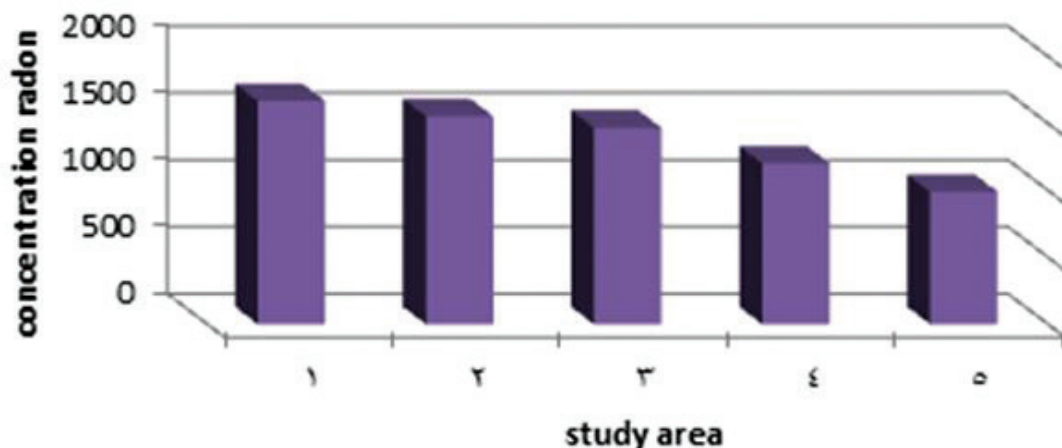


Figure 4: Radon concentration in the study area samples

Table 2: Previous local studies to measure radon concentration

NO	Soil source	Concentration of radon Bq / m ³	Researcher and Year
1	Iraq (Central and Northern Region)	33-100	Dunia(2000)[22]
2	Baghdad-Al-Wardia	697.18	Karim(2004)[23]
	Riyadh district	163.45	
	Tuwaittha	119.17	
3	Taji	229.27-665.56	AL-Baidhani(2006)[19]
	Karbala	229.27-478.94	
	Sight (public)	388.96-607.21	
4	Sulaymaniyah	22.3	Muhammad(2008)[20]
	Erbil	26.17	
5	Karma Bani Saeed	1146.227	H.R Mahasr.(2009)[19]
	Darwishi Station	18329.47	
6	Kut	583.594	Jabbar (2011)[18]
7	Nasiriyah	1386.236	Kadhim (2014)[23]
8	Shatrah	1375.7876	The current study(2018)
	The limit	800	WHO(1993)[16]

Table (2) shows the high concentration of radon in our current study of the records of Jabbar (2011) and the inventory (2009) and the record of AL-Baidhani (2006), Muhammad (2008) and Karim (2004) While the concentration of gas is less than that recorded by a buffer in the south of Iraq - the station Aldroishi and approach to the record KADHIM (2014). The highest concentration of radon gas, mainly in the city of Shatra to missile bombing during the second Gulf War (2003) Radon is the main baby of the products of decomposition Uranium and thorium, in addition to the resulting radiological activity within the buildings resulting from building materials, contains a quantity Data from the natural radioactive elements such as (K^{40} , Ra^{226} , U^{238}), especially when there are cracks in the building foundation and soil.

CONCLUSIONS

The high concentration of radon in our study models, exceeding the global limit of radiation and this indicates the presence of depleted uranium in the sites studied and indicates the continuity of exposure to this polluted gas note that the half-life of depleted uranium ranges from 4 to 5 million years.

RECOMMENDATIONS

Spread environmental awareness among the city's population to show the seriousness of radon and diseases that can result. Use new and different scientific methods

to measure the concentration of uranium and radon for the same areas and compare them with current results.

Ethical Clearance: Obtained from College of Education for women, University of Thi Qar, Ira

Source of Funding: Self-funded

Conflict of Interest: None

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Immunoglobulins Levels in Iraqi Atopic Patients (Asthma, Rhinitis and Urticaria)

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ABSTRACT

One hundred ninety-two patients (82 males and 110 females) with three types of allergic diseases (allergic asthma 60, allergic rhinitis 54, and urticaria 78), and 45 control subjects were tested to determine the levels of IgG, IgM and IgA by using the single radial immunodiffusion technique, and the levels of IgE by the ELISA method. The results revealed an apparent increase in IgE levels and inversely significant decrement for both IgG and IgA in all the three types of the allergies. While there were no substantial differences between IgM levels in allergic asthma, urticaria, and control; only allergic rhinitis showed a significant decrease in the IgM level. The aim of this research is to investigate the relationship between serum level of IgG, IgM, IgA, and IgE in patients with allergic rhinitis, allergic asthma and urticaria. The decreasing level of IgG and IgA, as well as, increasing level of IgE, are associated with the three types of allergies and play an important role in developing the disease.

Keywords: Immunoglobulins, asthma, rhinitis, urticaria

INTRODUCTION

Immunoglobulins (Ig) are glycoproteins synthesized by lymphocytes and plasma cells. They are an essential component of the humoral immune response to remove or destroy any foreign bodies (antigens) such as viruses and bacteria to prevent cell infection. The interaction between B-cells and T-cells are necessary to generate active B-cells, which produces a different class of antibodies: IgA, IgG, IgM, IgE and IgD. Soluble Ab is released into the blood for invading the pathogenic microorganisms¹.

Asthma, rhinitis, and urticaria are the conditions that depend on many causes linked by hereditary and environmental factors, they also share many pathophysiological characteristics². The Ig have an important role in the immune response of allergic conditions, and play a crucial role in their pathological process³.

Immunoglobulin A (IgA) is found in two forms in the human body: secretory IgA, an important first-line defense on the mucosal surface, and serum IgA, that mediates a variety of protective functions during the interaction with specific receptors and immune mediators⁴. The lack or deficiency in this antibody at

the body sites (throat, lung, eye, mouth, genitourinary tract and gastrointestinal tract) cause allergic diseases, autoimmune diseases, chronic diarrhea or recurrent infections⁵. A correlation has been associated with IgA deficiency and the allergic diseases. Around 10% of IgA deficient patients may also be deficient in T-cells, phagocytic cells, sometimes complement⁶ and IgG subclass is deficient in asthma patients⁷.

Allergen-specific IgG antibody plays an essential role in immune tolerance to the allergens⁸. IgG autoantibody against IgE or the FcεR1α receptors is produced by 50% of the patients with chronic urticarial⁹, the cross-link with this receptor-induced activation and degranulation of basophils and mast cells followed by releasing histamine¹⁰.

IgE has been recognized to play an important role in mediating the allergic reaction in asthma; the evidence shows the involvement of IgE in the processing of airway remodeling. It is also linked to allergic rhinitis, sinusitis, food allergy, chronic urticaria, and drug allergy¹¹. IgE antibody is attached to basophils, mast cells, and dendritic cells through the IgE receptor (FcεR1α), which is crucial for the activation of these cells during allergen exposure¹². The effect of IgE is crucial in triggering the

Immune response. It is increased in many conditions such as asthma, allergic rhinitis, eczema, urticaria, atopic dermatitis, and parasitic infection¹³. The highest level of circulating IgE will cause high stimulation surface expression of the FcεR1α receptor in basophils and mast cells¹⁴. The mast cells activation occurs when an antigen crosslinks IgE molecules that are bound to FcεRI on the surface of the mast cell releasing histamine, leukotrienes and other inflammatory mediators causing immediate allergic symptoms¹⁵.

METHODOLOGY

A. Collection of samples: Three types of allergies were induced in this study include 54 of allergic asthma (26 males and 28 females), 60 of allergic rhinitis (24 male and 36 female), and 74 from patients with urticaria (47 males and 27 females) with age ranged between 13-65 years from Al-Rasafa Specialized allergy center in Baghdad City. They were compared with 45 healthy subjects (24 females and 21 males). Five ml of blood samples were collected for estimation of total serum IgE by ELISA kit from EUROLIN (Germany) and serum IgG, IgA and IgM by Single radial immunodiffusion assay.

B. Single radial immunodiffusion assay (SRID):

The (SRID) test was performed by using the LTA Milano kit. The plates were left open at room temperature (25°C) for a few minutes to allow

any condensed water in the wells to evaporate. Then the wells were filled with 5μl of testing sera (patients and control). The plate was left to stay at room temperature after which it was closed and placed in a moist chamber for about 48 hours for IgG, IgA, and 72 hours for IgM. While IgE was tested by ELISA method

C. Statistical data analysis: The data were statistically analyzed by the computer program SPSS version 13. Their data were given in terms of standard errors (S.E.), and differences between means were estimated by ANOVA tests. The difference was considered significant when the probability (P) value was ≤ 0.05 .

RESULTS

Serum levels of IgG and IgA in all three types of allergies, asthma, rhinitis and urticaria (1150.36, 1247.21 and 1122.53 for IgG) and (162.66, 164.95 and 167.51 for IgA) respectively, showed a significant decrement when compared with control group ($P \leq 0.001$). An inverse result in IgE was observed, which revealed a substantial increment in all the types of allergies (213.61, 247.32 and 220.39 IU/ml). There were no differences in IgM level detected, but allergic rhinitis was statically significant ($P \leq 0.05$) Table-1.

It is worth to mention that there were no marked differences in immunoglobulins between males and females for each type of allergy (data not shown).

Table 1: Immunoglobulins (IgE, IgG, IgA, IgM) Levels in Sera of Patients with allergic asthma, allergic rhinitis, urticaria, and Control Group

Patient Groups		IgE IU/ml	IgG mg/dl	IgM mg/dl	IgA mg/dl
Allergic asthma N = 54	Mean	213.61	1150.36	144.17	162.66
	Minimum–Maximum	12.35-496.18	366.90-2664.80	11.40-313.80	27.40- 436.50
	Std. Error	32.35	78.87	11.25	19.22
	Significant	* $P \leq 0.001$	* $P \leq 0.001$	NS.	* $P \leq 0.001$
Allergic rhinitis N = 60	Mean	247.32	1247.21	127.93	164.95
	Minimum–Maximum	14.34-476.52	266.90-2263	14.00-293.80	27.40-490.00
	Std. Error	31.76	77.06	9.49	18.78
	Significant	* $P \leq 0.001$	* $P \leq 0.001$	* $P \leq 0.05$.	* $P \leq 0.001$
Urticaria N = 74	Mean	220.39	1122.53	137.76	167.51
	Minimum–Maximum	19.31-979.60	545.60-1888.20	17.90-284.00	29.80-410.80
	Std. Error	30.52	75.51	7.45	17.38
	Significant	* $P \leq 0.001$	* $P \leq 0.001$	NS.	* $P \leq 0.001$
Control N=45	Mean	28.28	1535.12	158.72	286.39
	Minimum – Maximum	6-71.48	798.80-2606.70	30.70-388.90	81.10-715.70

N= Number, NS= not significant, SE = Standard Error, *= significant with P value ≤ 0.05

DISCUSSION

Immunoglobulin's responses in allergic diseases have an important role in the immune system function and play an effective role in their pathogenesis³.

A definite reverse result was observed in the level of immunoglobulins: IgA, IgG and IgE in all three allergies types as compared to the control. However, no apparent differences have been shown in the level of immunoglobulin IgM; only the rhinitis patients uncovered distinguishable decrement when compared with control groups. The decrement in IgA and IgG were consistent with other studies. A low IgG1, IgG2, and IgG4 were found in preschool asthmatic children¹⁶. A review article in 2015 estimated that IgG, IgA deficiency, and IgM deficiency were associated with rhino-sinusitis patients¹⁷.

A study in Iran revealed decreased in serum level of IgA and increase IgE in patients of asthma and rhinitis³. Similar decreasing in IgA was associated with lung functions in the asthmatic patients¹⁸. It has been suggested that IgA can reduce inflammatory response directly by inhibiting the effector function of inflammatory cells¹⁹. Serum IgA binding on the surface of monocyte induces the anti-inflammatory cytokine IL-10 expression²⁰ and inhibits the inflammatory cytokines (IL-6 and TNF α) (1). The abnormally low level of circulating IgA antibody may explain the pathogenic possibility of these allergic diseases²¹. Allergies may also be more prevalent among individuals with selective IgA deficiency (sIgAD) than in the general population⁶. There is at least one allergic disease among 45.7% of patients with sIgAD, whereas, the prevalence of asthma, allergic rhinitis and eczema is 10.7%, 16.9%, and 2.9%, respectively, in (sIgAD)²².

IgE is an immunoglobulin that has an important role in acute and chronic allergic diseases²³. The significant increase of total IgE in all types of allergies was consistent with previous study that showed that plasma IgE was higher in young adult male than in female with allergic rhinitis and allergic asthma²⁴. Researchers in India have documented that circulating IgE are increased in atopic individuals, including rhinitis, asthma, atopic dermatitis, and urticarial²⁵. Allergic rhinitis patients with or without asthma showed an increase in serum IgE²⁶; it is raised up to 10 times than in normal circulating IgE.²⁷ A study in China showed that hyper IgE was

associated with asthma, severe atopy, and severe eczema during childhood and adolescence²⁸.

Allergic asthma and allergic rhinitis have similar immunological mechanisms, and it is probable that the factors participated in the raising total IgE²⁴. The same elevated IgE level in children was associated with severity of asthma²⁹. Also, a connection was found between the increasing serum IgE and urticaria severity-93% of these patients suffered from mild to severe chronic urticaria³⁰. IgE is believed to be the most important mediator of immediate hypersensitivity reaction among atopic conditions. It has been reported that increasing level of total and specific IgE is associated with severe chronic urticaria³¹.

Mast cells can be activated by binding of IgG autoantibody to the IgE receptors on the surface of this cell. Other activation can also come from type III hypersensitivity through the binding of immunoglobulin IgG and IgM to the FC receptors on the mast cells (10) causing degranulation. However, the increasing number of mast cells, basophils, eosinophils, neutrophils and T-lymphocytes can be seen in chronic urticaria (CU) skin lesions³² in which mast cells causes degranulation and histamine release³³.

CONCLUSION

In conclusion, there was an apparent increase in IgE levels and inversely significant decrement for both IgG and IgA in all the three types of the allergies. While there were no substantial differences between IgM levels in allergic asthma, urticaria, and control; only allergic rhinitis showed a significant decrease in the IgM level. These alterations could provide a potential diagnostic and therapeutic window for allergic diseases.

RECOMMENDATION

We recommend further study on IgG subclasses and secretory IgA in different types of allergy and their effects on disease severity.

Ethical Clearance: Ethical clearance obtained from College of Nursing, University of Baghdad, Iraq

Source of Funding: Self-funded

Conflict of Interest: None

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Role of serum Leptin and Prolactin in Iraqi females' patients with Rheumatoid Arthritis

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ABSTRACT

Leptin is an adipocyte peptide hormone that is important in preventing obesity by affecting the hypothalamus. Recent studies showed that leptin plays an important role in T lymphocyte responses, modulates inflammatory and immune responses.

This study was evaluating serum leptin and correlation between leptin level with disease activity and duration.

Patients were recruited from rheumatology out-patients clinic at Al-Yarmouk teaching hospital from the period from January to November 2017. A 95 subjects were recruited (70 patients and 25 healthy controls). The serum leptin and prolactin level were significantly higher in RA patients compared to control group after adjusting leptin level to BMI. RA patients had a significantly higher serum triglyceride and significantly lower serum HDL compared to control.

Leptin level was positivity correlated with BMI in both patients and controls. Triglyceride was significantly higher in overweight and obese control than in non-obese control.

Leptin concentration was significantly higher in Patients with high disease activity score (DAS more than 5.1) which included 31 patients than in Patients with low DAS (less than 5.1) which included 39 patients. Higher serum Leptin levels were associated with longer disease duration.

Keywords: *rheumatoid arthritis and leptin, rheumatoid arthritis and prolactin*

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic disease that predominantly affects middle age. Early, pain and stiffness are the major manifestations, eventually, irreversible damage to joints will develops.^[1] RA is a chronic systemic disease with high concentrations of proinflammatory cytokines, such as (TNF- α , IL-1, IL-6).^[2]

The synovium is the primary sit affected ^[3].RA causes significant morbidity and disability.^[4] Chronic inflammation triggers energy adjustments in the body which include mobilization of fat, increased gluconeogenesis, high-energy expenditure, catabolism of protein and negative nitrogen balance.^[5]

White adipose tissue (WAT) is an endocrine organ, producing a large number of molecules, as proinflammatory cytokines, as well as the adipocytokines (leptin, adiponectin, resistin and visfatin).^[6] Leptin,

a 16-kDa non-glycosylated anorexia peptide, hypothalamically modulates body weight, food intake, and fat stores.^[7]

Leptin is a hormone with multiple effects like regulation of endocrine function and immunity.^[8] Its circulating levels increase with infection and inflammation, so it's a part of the immune response and host defense.^[9]

Leptin: Leptin is an obese (Ob) gene product cytokine-like 16 KDa peptide produced mostly by white adipose tissue, but other cells can secrete it.^[10] Leptin was primarily act as an-orexigenic hormone which regulates body weight, energy expenditure, food intake, and adipose stores.^[11]

After being released into the circulation it crosses the blood-brain barrier and acts on the hypothalamus via the neuropeptide Y to induce satiety. It also increases energy expenditure.^[12]

Leptin has long been recognized to regulate metabolism, neuroendocrine and other physiological functions. Circulating leptin levels are directly related to adipose tissue mass.^[13]

Leptin plays an important role in the regulation of neuroendocrine function and energy homeostasis.^[14] and other energy-demanding physiological processes, such as reproduction.^[15] hemopoiesis.^[16] and angiogenesis and in the regulation of the immune system in energy or leptin deficient states.^[17]

Leptin is non-glycosylated peptide hormone.^[18] with the tertiary structure of a cytokine that is highly conserved among mammalian species.^[19] Leptin belongs to the class I cytokine superfamily, consisting of a bundle of four alpha helices.^[15]

It is structurally and functionally related to the IL-6 cytokine family. Leptin functions as a signal in a feedback loop regulating food intake and body weight.^[12]

Leptin has recently been recognized as a modulator of inflammatory and immune responses.^[9] by virtue of its interaction with leptin receptors expressed by peripheral blood mononuclear cells, vascular endothelial cells, smooth muscle cells, and osteoblasts.^[13]

Leptin has a dual role in inflammation. It activates monocyte/macrophage cells and potentiates production of the proinflammatory cytokines.^[20] and directs T cell differentiation to Th1 phenotype, expressing interferon and IL-2. On the other hand, it expresses certain anti-inflammatory properties by releasing IL-1 receptor antagonist.^[21]

Circulating leptin concentrations are proportional to total adipose tissue mass and decrease after weight loss. It is also known that leptin levels increase proportionally to glomerular filtration rate (GFR) decrease and are significantly higher in hemodialyzed patients than in healthy subjects.^[22]

Aims of study:

1. Assess the serum level of leptin in patients with RA.
2. The relation between leptin concentrations with disease duration and disease activity in a group of RA patients.
3. assess the effect of RA treatments on leptin concentration.

Patients and Methods: The study was retrospective case –control study included 95 subjects, 70 female patients with Rheumatoid arthritis all don't suffer from other autoimmune disorders or chronic diseases. And 25 female healthy control (10 obese and over Weight and 15 non-obese). from the outpatient's clinic of Rheumatology at Al- Yarmouk teaching hospital for the period from January to November 2017.

DAS28 was calculated for each patient by examining erythrocyte sedimentation rate (ESR). Enzyme-linked immunosorbent assay was used for measuring serum Leptin and serum Prolactin levels (ng/mL).

STATISTICAL ANALYSIS

The Statistical Analysis System- SAS (2004) was used to effect of difference factors in study parameters. Least significant difference –LSD test or T-test was used to the comparative between means in this study.

RESULTS AND DISCUSSION

Leptin level in Rheumatoid Arthritis patients (RA) and control: Table (1) shows that the mean $\pm$ standard error of serum leptin level in Rheumatoid Arthritis (RA) group and in control.

There was a significant ($P < 0.05$) increase in serum leptin concentration in RA patient.

Table 1: Serum leptin and serum prolactin in Rheumatoid arthritis (RA) patients and control group

Group	No.	Mean $\pm$ SE	
		Prolactin ng/ml	Leptin ng/ml
Control	25	14.16 $\pm$ 1.37	32.07 $\pm$ 6.80
RA Patients	70	30.68 $\pm$ 3.59	55.32 $\pm$ 4.63
T-test value	---	9.874 *	17.393*
Significantly different at ($P < 0.05$) *, NS: non-significant			

This result is in agree with Otero (2006).^[11], Targojska-Stdpniak *et al.* (2008).^[23] and Olama *et al.* (2012).^[24] RA characterized by high concentrations of (TNF- α , IL-1, IL-6).^[25]

Serum prolactin (PRL) concentration was significantly higher ($P < 0.05$) in RA patients. Prolactin level in patients was (30.68 $\pm$ 3.59) while in control group was (14.16 $\pm$ 1.37) which agrees with (seriolo *et al.* 2002.^[26] elwakkad *et al.* 2007.^[27]

Lipid profile in patients and in control: Table (2) shows Serum triglyceride and total cholesterol were significantly high, while serum high density cholesterol was significantly lower in patients than in control.

Table 2: lipid profile of patients and control

Group	Mean $\pm$ SE		
	HDL Mg/dL	TG Mg/dL	T-CH Mg/dL
Control	46.64	154.06	188.59
Patients	31.27	204.88	195.74
LSD value	8.488 *	13.815 *	11.225 NS
Significantly different at (P<0.05) *, NS: non-significant			

The majority of patients with RA have increased levels of inflammatory markers, and sustained inflammation. Thus, our findings and others emphasize the importance of interpretation of lipid levels in the context of inflammatory activity in people with RA.

Leptin and BMI: Figure (1) show correlation between serum leptin concentration and body mass index (BMI) in RA patients and in control group.

The data showed that the mean serum leptin concentration was positively correlated with body mass index. Correlation coefficient = (0.59) for patients at P value of (0.01).

Many studies have been done on obese and non-obese human subjects showed a strong positive correlation between serum leptin concentration and body mass index (Pi-sunyer2000^[28], Seufert 2004^[29] and Rosenbaum *et al.* (1996)^[30] demonstrated that serum leptin concentration is increased in obese subjects and closely related to BMI.

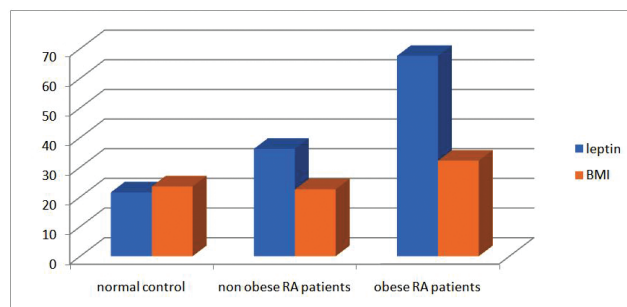


Figure 1: Diagram shows the correlation between leptin Level and body mass index in patients, control and obese patients

Leptin and disease activity score: Table (3) shows mean $\pm$ standard error for serum leptin concentration in RA patients with high DAS (≥ 5.1) and low DAS (<5.1).

Table 3: Shows leptin concentration of leptin in patients with high . DAS and patients with low DAS

DAS28	No.	Liption (ng/ml)
Less than 5.1	39	35.29 $\pm$ 3.05
More than 5.1	31	80.51 $\pm$ 7.65
T-test value	---	15.223 *
Significantly different at (P<0.05) *		

This finding disagrees with Wisniewska *et al.* (2007).^[31] this is may be due to the small sample size which was only 30 patients and those patients had a disease activity score ranging from (4.8-6.2) while the current study included 70 patients with (RA) with disease activity score ranging from (2.4-8.5) which gave as more space to correlate between the two variables.

Targojska-Stdpniak *et al.*, (2008).^[23] agrees with our findings they found that serum leptin levels are significantly higher in patient with high disease activity score than in patients with low disease activity score

A follow up study done by lee *et al.* (2007).^[32] with 16 of the 26 patients with active RA and collected serum samples again when their diseases were well-controlled (DAS28 < 3.2). They found that their leptin levels significantly decreased as their disease improved

Leptin and prolactin: Both leptin and prolactin were significantly higher in patients, the mean for leptin concentration was (55.32 $\pm$ 4.63) while the mean for prolactin concentration was (30.68 $\pm$ 3.59) (figure 2). And this agrees with Ram *et al.* (2004).^[33]

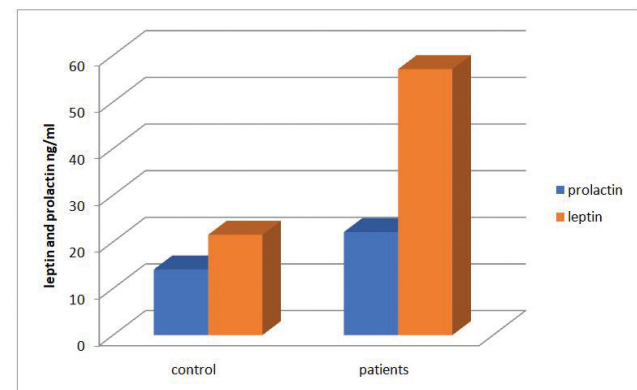


Figure 2: Diagram shows the difference in mean leptin conc., prolactin conc. in patients and control

Disease activity score in rheumatoid factor positive and rheumatoid factor negative: There are no significant differences in the level of leptin and prolactin in rheumatoid factor positive and negative patients. Targojska-

Stdpniak *et al.* (2008).^[23] demonstrated that serum leptin levels were not associated with the presence of rheumatoid factor (RF)

The disease activity score in RF positive patients was (5.72 ± 0.32) which is significantly higher than the mean of disease activity score in RF negative patients which was (4.30 ± 0.24).

Leptin and disease duration: Serum Leptin Level was found to be higher in patients with long disease duration. leptin level for patient who had rheumatoid arthritis for less than 10 years was (42.41 ± 2.97), patients who had rheumatoid arthritis for less than 20 years their leptin level was (44.06 ± 10.44) and in patients with disease duration more than 20 years their leptin level was (116.33 ± 12.32).

This finding agrees with Olama *et al.* (2012).^[24] who found that serum leptin level is significantly correlated with the RA duration.

Many studies reported that serum leptin concentration is not correlated with disease duration (Popa *et al.* 2005.^[34] Wisiowska *et al.* 2007.^[31] Hizmetli *et al.* 2007.^[35] on the other hand, Bokarewa *et al.* 2003.^[36] found that there was a gradual increase in leptin concentrations with the duration of RA.

Leptin and treatment: There was no significant positive correlation between serum leptin concentration and different treatments for Rheumatoid arthritis and this agrees with (Targojska-Stdpniak *et al.* 2008.^[23] and disagrees with Bokarewa *et al.* (2003)^[36] who found Patients treated with DMARDs other than MTX had significantly lower leptin levels in plasma than those having no immune modulating treatment this is may be due to their larger sample size in each group.

CONCLUSIONS

1. A significant increase was observed in circulating leptin and prolactin levels in patients with RA.
2. Serum Leptin levels was positively correlated with RA disease activity, disease duration and BMI

3. RA patients had a significantly higher levels of total cholesterol, triglyceride and significantly lower level of HDL.

RECOMMENDATIONS

1. Future studies should be performed to determine whether therapies interacting with leptin signaling would be of value in the treatment of patients with arthritis and other immune-mediated inflammatory disorders.
2. Perform a follow up studies for RA patients on monotherapies to evaluate the effect of these therapies on leptin level on these patients.
3. study the impact of recombinant leptin and leptin antagonist in induced models of arthritis such as antigen induced arthritis or collagen induced arthritis.

Source of Funding: Self-one

Ethical Clearance: Taken from scientific committee in AL-Mustansiriyia collage of medicine department of medicine-Iraq-Baghdad-AL Quadisyia

Conflict of Interest: Nil

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Peroxisome Proliferator Activated Receptor (PPAR) Delta Genetic Polymorphism in Saudi Normal Population

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ABSTRACT

Background: Peroxisome proliferator-activated receptors (PPARs) are transcription factors that belong to the superfamily of nuclear hormone receptors. Three different PPARs, PPAR-alpha, PPAR- delta and PPAR-gamma, have been characterized. PPAR-delta in humans is encoded by the PPARD gene and has been shown to possess a role in regulating fatty acid catabolism and energy homeostasis. Several polymorphisms have been identified in PPARD as potential functional variants. PPARD +294T > C polymorphism was shown to modify serum lipid concentrations in some ethnic groups.

Aim: The current study aimed to screen the presence of the PPARD polymorphism in the Saudi population.

Method: Blood samples were collected from normal individuals. Genomic DNA was extracted from peripheral blood mononuclear cells and the partial gene of the PPARD was amplified by polymerase chain reaction and subjected to gel electrophoresis. PPARD rs2016520 polymorphism was analyzed by polymerase chain reaction–restriction fragment length polymorphism.

Results: The frequencies of CC, CT, and TT genotypes in normal Saudi population were 9.09%, 14.2% and 76.6%, respectively.

Conclusion: The Saudi nationals seems to have low frequency of the PPARD +294T > C polymorphisms.

Limitations: Relatively small sample size, serum lipid levels were not determined.

Keywords: Peroxisome proliferator-activated receptors, PPARD and polymorphism.

INTRODUCTION

The peroxisome proliferator-activated receptors (PPARs) are a family of ligand-activated nuclear hormone receptors encoded by different genes and act as transcriptional regulators¹. The PPAR family is composed of three different members, PPAR-alpha (PPAR α), PPAR-delta (PPAR δ) and PPAR-gamma (PPAR γ), distinguished mainly by tissue distribution². PPAR α is mostly expressed in brown adipose tissue and liver but also can be found in kidney, heart and skeletal muscles. PPAR γ is mainly expressed in adipose tissue, and to a lesser extent in colon, the immune system and the retina. PPAR β/δ is expressed in many tissues but mostly in the gut, kidney and heart¹. Various researches have

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shown that both PPAR α and PPAR γ play an important role in the regulation of glucose and lipid homeostasis. However, less is known about PPAR δ and its role is still under debate²⁻⁴.

The PPARD gene that encodes human PPAR δ is located in the short arm of chromosome 6 at position 6p21.2-p21.1 with 11 exons spanning around 35 Kbp. It is expressed ubiquitously, thus disturbance in its level or activity may lead to various metabolic traits⁵. Ligand activation of PPAR δ was suggested to increase fatty acid catabolism in skeletal muscle and to modulate insulin sensitivity⁴. In addition, there is an evidence that PPAR δ can also play an important role in modulating gastrointestinal physiology and disease⁶. Studies have also shown that PPAR δ can be of great importance in different vascular processes and this may indicate that PPARD can be a modulator of cardiovascular disease⁷.

Previous studies have identified several polymorphisms as potential functional variants⁸⁻¹³. These variants may have a role in modulating its mRNA and protein levels that may affect other genes regulated by PPARD. The +294 T > C (rs2016520), also named -87 T > C or +15C > T), is a variant that possesses a T/C transition in nucleotide 15 of exon 4 located 87 nucleotides upstream of the start codon. This polymorphism was initially described by Skogsberg et al. (2003) in association with human cholesterol metabolism¹⁴. In this study, homozygous carriers of the rare C allele were shown to have higher plasma LDL-cholesterol concentration than homozygous carriers of the common T allele. It was shown that the rare C allele had higher transcriptional activity than common T allele. Other studies have linked the PPARD +294T > C polymorphism with the modification of serum lipid concentration in the general population and with the risk of coronary artery disease in different clinical scenario including: dyslipidemic women, hypercholesterolemic men and cholesterol metabolites in Alzheimer's disease patients¹⁵⁻²⁴. In contrast, others studies have not found a similar association between PPARD +294T > C polymorphism and serum lipid concentration^{12,20}. This may indicate different effect of this polymorphism in different populations. This study aimed to explore the presence of PPARD +294T > C polymorphisms in the Saudi general population.

MATERIALS AND METHOD

Materials: A total of 154 samples (60 females and 94 males) were randomly selected from a previously obtained convenience sample of Saudi participants.

Blood Samples: Blood samples were collected on sodium citrate containing vacutainer tubes. Blood sample was first diluted v/v with phosphate buffer saline (pH 7.2) and gently layered onto equal volume of Ficoll- Histopaque-1077 (Sigma-Aldrich). The tubes were centrifuged 40 min at 400 x g. The PBMC was separated in another tube and centrifuged at 300 g for 10 min. The supernatant was discarded and the material precipitated was washed with 1 mL PBS and stored at -20C till being used.

DNA amplification: Genomic DNA was isolated from peripheral blood leukocytes using QIAamp DNA Blood extracted kit (Qiagen) according to the manufacturer's instructions. Polymerase chain reaction and restriction fragment length polymorphism (PCR-RFLP) were used to perform genotyping of the PPARD +294T > C polymorphism [reference]. PCR amplification was performed using For 5'-CATGGTATAGCACTGCAGGAA-3' and Rev 5'-CTTCCTCCTGTGGCTGCTC-3' as previously described¹². Each amplification reaction was performed using 100 ng genomic DNA in 25 μ L of reaction mixture consisting of 1.0 μ L of each primer (10 μ mol/L), 6 μ L 5x FIREPol® Master with 12.5 mM MgCl₂ (Solis Biodyne).

After initial denaturizing at 95°C for 5 min, the reaction mixture was subjected to 30 cycles of 30 s denaturation at 95°C, 30 s annealing at 50°C and extension 40 s at 72°C, followed by a final 10 min final extension at 72°C. After electrophoresis on a 2.5% agarose gel with 0.5 μ g/mL ethidium-bromide

Genotyping: Individual PCR amplicons were subjected to enzymatic digestion using 5 U of *Bs*II restriction enzyme (Thermo Scientific) according to the manufacturer's instruction. Briefly, 10 μ L of PCR amplicon, 18 μ L RNase free water, 2 μ L 10x Tango buffer and 1 μ L of the *Bs*II were mixed gently and incubated at 55°C overnight.

The mixture was subjected to electrophoresis using 2.5% agarose gel and visualized with ethidium-bromide staining ultraviolet illumination. A single band of 269 bp indicates the absence of the recognition site denotes homozygous T allele (TT genotype), while the presence of the recognition site indicates C allele which is either heterozygous (bands at 269, 167, and 102; TC genotype) or homozygous (two bands at 167, 102 bp; CC genotype).

Statistical analysis: The statistical differences between the respective PPARD genotypes were determined using Friedman and Chi-Square test in the SPSS 16.0 software (SPSS, Chicago, IL, USA).

RESULTS

Genotyping study revealed that all the previously reported PPARD +294T > C polymorphisms were present in the Saudi normal population (Fig.1).

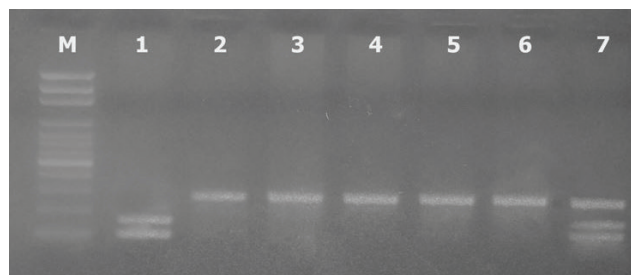


Figure 1: PPARD +294T > C polymorphism among Saudi normal population. Lane M, 100 bp marker ladder; lanes PCR product; lane 1, CC genotype (167- and 102-bp); lanes 2-6 TT genotype (269 bp); and lane 7, TC genotype (269-, 167- and 102-bp).

Of the 154 participants, the T allele was significantly higher (118; 76.6%) than the C allele (14 ; 9.09% for CC and 22; 14.2% for CT) $p > (0.001)$ (Fig. 2) with no relation to sex (data not shown).

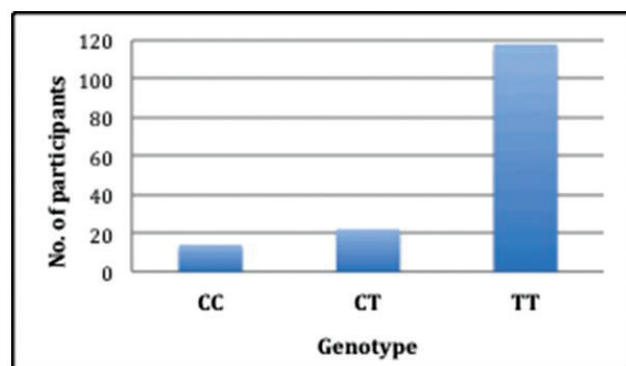


Figure 2: The frequency of the genotype CC, CT and TT among Saudi normal population.

DISCUSSION

Previous studies have investigated the presence and frequencies of PPARD +294T > C polymorphism in different ethnic groups. The possible association of this polymorphism with several health conditions including serum lipid level, obesity, cardiovascular diseases and type 2 diabetes mellitus was also examined. However, the results are inconsistent across ethnic groups.

The PPARD +294T > C polymorphisms were found to be significantly associated with cholesterol metabolism¹⁴. Homozygotes for the rare C allele had a higher LDL-C concentration than homozygotes for the common T allele due to higher transcriptional activity. No association was found with HDL-C levels. Aberle et al. (2006), indicated that the rare C allele was highly associated with low HDL-C levels in dyslipidemic female subjects but not the LDL-C levels¹⁷. Yan et al. (2005) demonstrated that total cholesterol and LDL-C levels were higher in metabolic syndrome patients with CC genotype than those with TT and TC genotypes¹⁶.

Nikitin et al. (2010) showed that the PPARD +294T > C polymorphism was associated with higher LDL-C and increased serum total cholesterol in Russian population¹². In addition, Luo et al (2015) have compared serum level in long-lived population (LG) in Bama region (China) with non-LG and found that CC carriers showed higher LDL-C level in LG but lower TC, TG and LDL-C in non-LG compared to TT carriers. Carriers of the C allele (TC/CC) in LG showed higher TC, TG, and LDL-C levels than in non- LG of the same genotype and the same lipid parameter²⁴.

On the other hand, Gouni-Berthold et al. (2005) reported that there was no association between the rare C allele and either TG, HDL-C, or LDL-C levels in male or female diabetic and non-diabetic German controls²³.

Similarly, no association was found between the rare C allele and serum lipid levels in both CAD patients and healthy controls in the Tunisian population²⁰. Shin et al. (2014) also reported that there were no significant associations between the PPARD +294T > C polymorphism and the risk of type 2 diabetes. However, associations were detected between fasting plasma glucose and BMI and the PPARD +294T > C polymorphisms in nondiabetic control subjects⁸.

Additionally, Wei et al. (2011) reported that the effects of PPARD +294T > C polymorphism on serum lipid levels were different between nondrinkers and drinkers. The levels of total cholesterol in nondrinkers were different among the three genotypes. The rare C allele was shown to be associated with highest serum total cholesterol levels than other genotypes. However, the levels of all seven-lipid traits among the three genotypes in drinkers were similar²⁵.

There are variations as well in the frequencies of the PPARD +294T > C polymorphisms across different

ethnic groups. The frequency of the rare C allele was 18.3% in Russian endurance-oriented athletes compared to 12.1% in controls¹². In the Tunisian population, the frequency of the rare C allele was 32.0% in CAD patients compared to 18.9% in healthy volunteers²¹.

In addition, it was 30.8% in Chinese CAD patients compared to 19.5% in normal controls²⁴. On the other hand, Gouni-Berthold et al, (2005) reported that there were no differences in the frequency of the rare C allele between the patients with type 2 diabetes and the non-diabetic controls (18.7% vs 19.2%)²³.

Similarly, Yan et al (2005) demonstrated that there were no differences in the frequency of the rare C allele between patients with metabolic syndrome, essential hypertension and type 2 diabetes. There was also no significant difference in the frequency of the rare C allele between non-drinkers and drinkers (25.8% and 23.8%, respectively)¹⁶. Lack of differences in the frequency or genotype distribution was also reported among other groups of subjects in other studies^{25,26}.

Finally, the frequency of the rare PPARD C allele in normal Saudi population demonstrated in our study (9.09%) seems to be lower than the frequencies in normal controls of other populations.

It was 12.1% in normal Russian controls¹², 15.6% in normal controls from the northern part of the greater Stockholm area¹⁴, 19.5% in normal controls from Chinese Anhui Province²², 18.9% in normal controls from Tunisia²⁰, 19.2% in non-diabetic controls from Germany and²³; 29.3% and 32.9% in LG and non-LG²⁴, respectively.

This may indicate that the prevalence of the C allele variants may have an ethnic and/or disease specificity. Further studies in the Saudi population with larger sample size to investigate the frequency of the different alleles and their associations with different diseases (if any) are needed.

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Spiritual Resilience Model on Drug Abuse Intensity among Senior High School Students, South Kalimantan: A Path Analysis

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ABSTRACT

Resilience is the way individuals to manage stress in life to reduce negative consequences and relate to health status, resilience is influenced by several factors, spiritual, family support, peer support, self-concept, and coping. As far we know, no study mentioned about spiritual resilience as a mediator between these factors and drug abuse intensity, so the aim of this study was to develop a spiritual resilience model on drug abuse intensity among senior high school students in South Kalimantan with mediators of spiritual resilience. This study used a cross-sectional design and self-report questionnaires. The population in this study was senior high school students in South Kalimantan, and used cluster random sampling technique. Total sample was 243. Data was collected using self-report questionnaires. All questionnaires except spiritual had a Cronbach alpha > 0.5. This study showed that family support, peer support, self-concept, and coping were predictors of drug abuse intensity and spiritual resilience was a mediator between variables, except coping. Model fit indices goodness of fit index (GFI) = 0.988, adjusted GFI (AGFI) = 0.918, comparative fit index (CFI) = 0.985 and root mean squared error of the approximation (RMSEA) = 0.089. Path analysis suggests developing interventions to prevent abuse in senior high school students based on a model of spiritual resilience.

Keywords: *spiritual resilience, drug abuse, senior high school, students, path analysis*

INTRODUCTION

Drug abuse among students is common. There was 1 in 5 students in the Czech Republic, France, Iceland, Switzerland and the United Kingdom which have drug abuse behavior (19-22%) ⁽¹⁾. In Indonesia, there was an increase in the prevalence rate of drug abuse from 2005 until 2015 and most of them were students (22%) ⁽¹⁾. In South Kalimantan there were 1,519 people with drug abuse, and 231 students who were positive drug users⁽¹⁾.

Drug abuse had negative effect on social and occupational functions. Such as bad mood, disrupt in daily activity, and social aggressive ^(1, 2). Many Factors contributes on drug abuse behavior among adolescents, it was related with peer group ⁽³⁾, emotional problems ⁽⁴⁾ and stressor ⁽⁵⁾. Teenagers must be able to manage stressors and problems in their life to reduce negative consequences such as drug abuse behavior ⁽⁶⁾ and it relates to health status ⁽⁷⁾. This situation is called resilience ⁽⁶⁾. In addition religion coping is often used by

drug abusers during rehabilitation. They try to increase spiritual beliefs and pray or meditate when depressed. Drug abusers generally chose to pray and get closer to God due to this condition ⁽⁸⁾. Resilience and spiritual are coping strategies among drug abusers to face their condition ^(6, 8).

There is one model in term of concept of resilience, namely resilience illness model ⁽⁷⁾. This concept explained that resilience was influenced by several factors, such as family support, peer support, self-concept, coping, and spiritual. Our study used spiritual resilience as a mediator on drug abuse intensity ⁽⁹⁾. The aim of this study will understand spiritual, family support, peer support, self-concept, coping and resilience spiritual on drug abuse intensity. Individuals with the ability to resilience could prevent from drug abuse ⁽⁶⁾. Better understanding about this model can educate about how to prevent drug abuse intensity and promote factor related to drug abuse intensity among senior high school students.

METHOD

Participants and settings: This study used a cross-sectional and correlation design. The variables of this study were family support, spiritual, peer support, self-concept, coping, spiritual resilience on drug abuse intention. This study was conducted in five high schools in South Kalimantan, and used cluster random sampling technique. Data was collected from July to August 2018.

This study measured 7 latent variables. The number of parameter was 24 in this model. Each parameter should have 10 subjects⁽¹⁰⁾, thus the sample size 240 adolescents were recommended to test this model. The participants were allowed to withdrawal in this study after looking the questionnaires. We ensure confidentiality of answers.

Instruments: We used self-report questionnaires to collect the data. We used demographic questionnaires to ask age, gender, parent's education, parents smoking status, living with parents or not, and environment with drug abuse.

Spiritual: We used Glock dan Stark (1965) to measure spiritual⁽¹¹⁾. It has 4 domains, belief, practice, experience, and consequence. Total item is 12 items. Cronbach alpha for this questionnaire in this study was 0.382. It had low internal reliability, so we exclude from this study.

Family support: We modified Friedman questionnaire⁽¹²⁾ and Ilmi's questionnaire⁽¹³⁾ to measure family support. It has 3 domains that were emotional dimension, Information dimension, and instrument dimension. Total item was 12 items.

Peer support: We modified questionnaire from Malecki dan Elliott to measure peer support⁽¹⁴⁾. It had 12 items.

Self-concept: We developed self-concept questionnaires from Stuart dan Sundeen (1991)⁽¹²⁾, Tennessee Self Concept Scale⁽¹⁵⁾. Self-concept is 16 items with 4 domains, self-image (body image), self-ideal, self-esteem, and self-rule.

Coping: We used A-Cope (*Adolescent-Coping for Problem Experiences*) (16). It had 10 items with two domains, maladaptive and adaptive coping.

Spiritual resilience: Spiritual resilience was measured using a WHO questionnaire, a questionnaire used to measure a person's ability to recover from stress. The questionnaire consisted of 4 dimensions, protective, resilient behavior coping, protective sources, and personal characters. It had 16 items.

Drug abuse intention: This questionnaire is used to measure drug addiction problems. The questionnaire consists of environmental dimensions, achievement, and learning and it had 12 items.

Statistical analysis: All analyses use the SPSS version 18.0 for Windows computer software (p value of < 0.05 are considered to describe statistically significant differences). Descriptive statistics (means and frequencies) are used for all variables. A Pearson correlation analysis will use to explore the relationship between the scores of family support, peer support, self-concept, coping, spiritual resilience on drug abuse intention. To estimate the hypothesized model fit with the actual data are used AMOS 20.0 (i.e., path analyses). Model fit analysis is assessed using the following fit indices and the cut off points (GFI > 0.90 ; CFI > 0.9) (17) and RMSEA < 0.1 (18).

FINDINGS

Characteristics of Respondents: In term of characteristics of respondents. Most of respondents' age was 16 years (59.7%). The proportion of gender almost equals. Most of respondents living with their parents (89.7%) and 33.3% respondents had friend with drug abuse.

Description of Study Variables: The range, mean, standard deviation, and Cronbach alpha's α were calculated for all variables (table 1). The Cronbach Alpha for all variables were > 0.5 , it was considered acceptable (19, 20) except spiritual, so we exclude this variable.

Table 1: Description of study variables

Variabel	N Total = 243	%	Range	Mean	SD	Cronbach Alpha
Spiritual						
Good	240	98.8	12-48	35.78	3.7	0.382*
Poor	3	1.2				

Conted...

Family support						
Good	239	98.4	12-48	38.55	4.3	0.662
Poor	4	1.6				
Peer support						
Good	242	99.6	12-48	40.5	3.9	0.593
Poor	1	0.4				
Self Concept						
Good	239	98.4	16-64	47.7	4.7	0.627
Poor	4	1.6				
Coping						
Good	221	90.9	10-50	36.54	5.2	0.601
Poor	22	0.1				
Spiritual Resilience						
Good	241	99.2	16-64	53.51	5.3	0.734
Poor	2	0.8				
Drug abuse intensity						
Good	234	96.3	12-48	36.57	4.4	0.613
Poor	9	3.7				

Correlation among variables (Family support, peer support, self-concept, coping, spiritual resilience on drug abuse intention): Table 2 showed that significant positive correlation existed among total score of family support, peer support, self-concept, coping, spiritual on intention of drug abuse (higher score indicate good intention or never doing drug abuse).

Table 2: Correlation among variables (Family support, Peer support, self-concept, coping, spiritual resilience on drug abuse intention)

	Family support	Peer support	Self-concept	Coping	Spiritual resilience	Drug abuse intensity
Family support	1					
Peer support	.474**	1				
Self concept	.487**	.203**	1			
Coping	.271**	.232**	.473**	1		
Spiritual resilience	.384**	.327**	.270**	.352**	1	
Drug abuse intensity	.458**	.425**	.440**	.482**	.476**	1

** p value < 0.01

Summary of Model Graph Results: The final model after excluding path coefficients which are not significant showed goodness of fit index (GFI) = 0.988, adjusted GFI (AGFI) = 0.918, comparative fit index (CFI)= 0.985 and root mean squared error of the approximation (RMSEA) was 0.089.

Table 3: Summary of Model Graph Results

Hypothesis	Coefficient path	Standard error	T-value	p-value	Remarks
Family support → Spiritual resilience	0.246	0.080	3.803	0.05	Supported

Conted...

Family support → Drug abuse intensity	0.135	0.064	2.147	0.032	Supported
Family support → Coping	0.438	0.057	8.182	0.019	Supported
Peer support → Spiritual resilience	0.155	0.089	2.353	0.05	Supported
Peer support → drug abuse intensity	0.200	0.064	3.484	0.05	Supported
Coping → Drug abuse intensity	0.155	0.057	2.595	0.009	Supported
Coping → Resilience	0.003	0.081	0.045	0.964	Not supported
Self-Concept → spiritual resilience	0.253	0.060	4.321	0.05	Supported
Self-concept → drug abuse intensity	0.248	0.048	4.348	0.05	Supported
Spiritual resilience → drug abuse intensity	0.234	0.045	4.241	0.05	Supported

Direct, Indirect, and Total Effects of Dominants Factors on drug abuse intensity: Table 4 showed direct, indirect, and total effects of dominants factors on drug abuse intensity. Based on path coefficient, the strongest total effect, direct, and indirect effect on drug abuse intensity were peer support, self-concept, and family support.

Table 4: Direct, Indirect, and Total Effects of Dominants Factors on Drug Abuse Intensity

Total Effect				
	Self-concept	Coping	Spiritual resilience	Drug abuse intensity
Peer support	0.232		0.214	0.308
Family support		0.438	0.246	0.260
Self-concept			0.253	0.307
Coping				0.155
Spiritual resilience				0.234

Direct Effect				
	Self-concept	Coping	Spiritual resilience	Drug abuse intensity
Peer support	0.232		0.155	0.200
Family support		0.438	0.246	0.135
Self-concept			0.253	0.248
Coping				0.155
Spiritual resilience				0.234

Indirect Effect				
	Self-concept	Coping	Spiritual resilience	Drug abuse intensity
Peer support			0.059	0.108
Family support				0.125
Self-concept				0.059
Coping				
Spiritual resilience				

DISCUSSION

This study showed that family support, peer support, self-concept, coping, spiritual resilience had a significant relationship with drug intention (table 2 and table 3). These findings are consistent with previous studies ⁽²¹⁻²³⁾.

Resilience Spiritual as Predictor on Drug Abuse

Intensity: This study showed that spiritual resilience is a predictor of drug abuse intensity (table 3). Resilience is the way individuals to manage stress and problems in life for reducing negative consequences and relate to a person's health status ⁽⁷⁾. All respondents were high school students in South Kalimantan. Spiritual resilience is mediator between family support and peer support on drug abuse intentions (Table 4). The majority of respondents had good spiritual resilience (table 1) and good drug abuse intentions (never using drugs). Spiritual activity contributes to recovery from drug abuse behavior ⁽²⁴⁻²⁶⁾. Further research is needed to develop spiritual resilience among senior high school students to prevent drug abuse behavior.

Self-Concept and Coping as Predictor on Drug Abuse

Intensity: This study showed that self-concept is a predictor of drug abuse intensity (table 3). The majority of respondents had a good self-concept and good intensity. This finding is consistent with previous study that a good self-concept is needed to prevent abuse, previous studies related with alcohol abuse ⁽²⁷⁾ and this study related with drug abuse intensity. Further research is needed to establish self-concept to prevent drug abuse. Self-concept influences the intention of drug abuse through spiritual resilience (total effect = 0.307, p value <0.05).

Family Support and Peer Support as Predictor on

Drug Abuse Intensity: This study showed that family support was a predictor in drug abuse intensity (table 3). Less communicative, less attention, less sharing affection and lack of respect in family members, tend to make children do drug abuse behavior ⁽²⁸⁾. Further study is needed to develop family support intervention to prevent drug abuse. Peer support is also a predictor of drug abuse intention (table 3). Teenagers are influenced by their group. Adolescents are more vulnerable with negative social influences ⁽²⁹⁾. Further research is needed to develop peer support as intervention to prevent drug abuse.

LIMITATION

Some limitations need to be considered in this study. The causal direction in path analysis must be interpreted

carefully because of the cross-sectional method in data collection. A longitudinal study is needed for further research. Research related to interventions is needed to prevent drug abuse based on this model.

CONCLUSION

Family support, peer support, coping, self-concept, and spiritual resilience are predictors of drug abuse behavior in adolescent through spiritual resilience as a mediator.

Ethical Clearance: All procedure of this study was granted IRB from Health Research Ethics Committee, Universitas Muhammadiyah Banjarmasin, South Kalimantan, Indonesia.

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The Effect of Given Information, Knowledge and Community Participation on Family Planning Village Programs in East Java Province-Indonesia

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ABSTRACT

The achievement of the targets of the Population and Family Planning development sector is not yet reached, it is characterized by the Population Growth Rate of 1.36%, Total Fertility Rate (TFR) 2.4, the Contraceptive Prevalence Rate (CPR) all methods 64%. One of the implementation from the Population and Family Planning and Family Development (PFPPD) program through KB (Family Planning) villages is still weak in terms of knowledge and community participation. So it is necessary to increase the knowledge and participation of the community in the KB village.

This study was an observational descriptive study with a cross sectional design. The population in this study were Fertile Age Couples (FAC) aged from 15 to 49 years old, with 100 people in total consisting of 50 FACs from Tuban Regency and 50 FACs from Malang City with sistematic random sampling method from a list of all FAC in the KB Village. This study was conducted on March 2017 and August 2017.

The results showed that the provision of information had an effect on knowledge with p-value (0.00), knowledge had an effect on the achievement of KB villages with p-value (0.045). But the provision of information does not directly affect the achievement of the KB village. Whereas the staff visit did not affect the knowledge and achievements of the KB village. Respondent characteristics influence the knowledge and achievement of KB villages with p-value (0.00).

The conclusion of this study is that the provision of information influences people's knowledge, and knowledge influences the achievement of the KB family in terms of the number of children. If someone has obtained information about family planning including family planning villages, it will increase their knowledge about the ideal number of children, thus influencing the achievement of the KB family in terms of the number of children desired is enough children.

Keywords: *knowledge, participation, family planning (KB) village*

INTRODUCTION

The Population, Family Planning and Family Development Program (KKBPK) conducted by the National Population and Family Planning Agency (BKKBN) seeks to realize the Indonesian Government's Development Priority Agenda (Nawacita) for 2015-2019 period, especially in the 3rd Priority Agenda "Building Indonesia from the Frontier by Strengthening Regions and Villages in the framework of the Unitary

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State”, for 5th Priority Agenda “Improving the Quality of Indonesian Human Life” as well as the 8th Priority Agenda for “National Character Revolution” through Population and Family Planning Development⁽¹⁾.

Family planning village programs is form of support for the Nawacita program. The launching of the program is a step to provide counseling to the community so that receiving family planning services can be more efficient and faster. Family planning village programs is one of the miniature models of KKBPK Program which involves all sector within the BKKBN and in synergy with Ministries or institutions, work partners, stakeholders of the relevant agencies in accordance with the needs and conditions of the region, and carried out in the lowest level of government (according to the prerequisites for determining the location of KB villages) in all districts and cities in the province of East Java⁽¹⁾.

KB villages are expected to be one of the strategic innovations to implement the KKBPK program priorities and the achievement of the targets of the Population and Family Planning development sector is not yet reached, it is characterized by the Population Growth Rate of 1.36%, Total Fertility Rate (TFR) 2.4, the Contraceptive Prevalence Rate (CPR) all methods 64%⁽²⁾.

Moreover, BKKBN itself has compiled the 2015-2019 Strategic Plan with 6 (six) strategic targets that have been set, namely: (1) reducing the average Population Growth Rate (PGR) from 1.38% per year in 2015 to 1.21% per year in 2019, (2) the decrease in the Total Fertility Rate (TFR) from 2.37 per Woman of Childbearing Age (WCA) in 2015 to 2.28 in 2019, (3) the increase in Contraceptive Prevalence Rate (CPR) of all methods from 65, 2% of the total Fertile Age Couples (FAC) in 2015 to 66% in 2019, (4) the decline in family planning needs is not served by unmet need from 10.6% in 2015 to 9.91% in 2019, (5) the decrease in the Age Specific Fertility Rate (ASFR) of 46 per 1000 women in the age group 15-19 years in 2015 to 28 per 100 women in the same group in 2019, (6) the decrease in the percentage of unwanted pregnancies from WCA from 7.1% in 2015 to 6.6% in 2019⁽¹⁾.

Davis (2001) explains that participation is the determination of the attitudes and involvement of each individual's desire in the situation and condition of the organization so that it ultimately encourages individuals to participate in achieving their organizational goals, as

well as taking part in each shared responsibility. Good development in the activities of implementation planning, utilization, or evaluation, where a person or group of people contribute directly in the form of material and non-material⁽⁴⁾. Community participation in KB program is defined as community support with a measure of community willingness to participate in implementing the program and all activities based on initiatives from individuals and the community. The purpose of the study is to analyze the influence of the level of information provision, knowledge and community participation on the implementation of the program family planning village in East Java.

METHOD

This study was an observational descriptive study with a cross sectional design. The population in this study were Fertile Age Couples (FAC) aged from 15 to 49 years old, with 100 people in total, consisting of 50 FAC from Tuban Regency and 50 FAC from Malang City. They were chosen by systematic random sampling from a list of all FAC in the KB (Family Planning) Village. This research was conducted between March 2017 and August 2017 in KB Village Bulu Meduro Village - Banjar District - Tuban Regency and KB Village of Kota Lama Subdistrict - Kedung Kandang District-Malang City. Data collection method that used were primary data with questionnaires and in-depth interviews, and direct observation. The validity of the data in this study uses source triangulation. Analysis of the data used in this study are data collection, data reduction, data presentation, data analysis and conclusion drawing.

RESULT

The results of the study are as follows:

- 1. Characteristics of respondents:** Characteristics of respondents in this study include age, work, and education.

Table 1: Characteristics of respondents

Characteristics of respondents	n = 100	
	F	%
Age		
15-19	1	1
20-29	21	21

Conted...

30-39	57	57
40-49	21	21
Type of work		
Housewife	82	82
Entrepreneur	12	12
Government Employee	2	2
Employee	4	4
Level of Education		
No Formal Education	3	3
Elementary Student	52	52
Junior High School Student	28	28
High School Student	15	15
Bachelor	2	2

Table 1 shows that the majority of respondents aged between 30-39 years is 57% and employment status as a housewife is 82%. The education level of the majority of respondents graduated from elementary school by 52%.

2. Knowledge: Respondents' knowledge in this study includes knowledge of KB villages, knowledge of Toddler Family Development (BKB), Adolescent Family Development (BKR), Elderly Family Development (BKL), Youth Counseling Information Center (PIKR), Family Income Improvement Business (UPPK).

Table 2: Community's Knowledge about the KB Village Program

Knowledge Variables About KB Village Program	PUS Knowledge Percentage				Total
	With Knowledge		Without Knowledge		
	n	%	N	%	
KB Village	78	78	22	22	100
Toddler Family Development	51	51	49	49	100
Adolescent Family Development	26	26	74	74	100
Elderly Family Development	36	36	64	64	100
Youth Counseling Information Center	10	10	90	90	100
Family Income Improvement Business	21	21	79	79	100

Table 2 explained that the majority of respondents had 78% knowledge of KB villages, 51% knowledge of under-five family development. About 74% of respondents did not have knowledge about adolescent family development, 90% did not have knowledge about adolescent counseling information center and 64% of respondents did not have knowledge about elderly family development. In addition, the majority of respondents did not have knowledge about the business of increasing income incomes by 79%. From these data, it can be concluded that the majority of respondents did not fully know about the village KB program.

3. Community Participation

Table 3: Community's participation in KB Village program

Variable of Community participation	Statement of Respondents				Total
	Participating		Not participating		
	n	%	N	%	
Participating as administrator for KB Village	41	41	59	59	100
Officer visit	64	64	36	36	100
Giving Information	70	70	30	30	100

According to table 3 it can be seen that the community participation in participating in the KB family program was 41% and the visit of officers in providing information on village KB programs was 64% and the provision of information followed by the community was 70%. The following are the results of the variable linear regression test to answer the research objectives.

Table 4: Test Results of Variable Influence on Knowledge and Community Participation

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Significance
X1.Information Giving → Y1.Knowledge	0.650	7.429	0.000	Sig
X1.Information Giving → Y2.Achievement of the program	0.173	1.279	0.202	Not Sig
X2.Officer visit → Y1.Knowledge	-0.061	1.306	0.192	Not Sig
X2.Officer visit → Y2.Achievement of the program	0.045	0.584	0.559	Not Sig
X3.Respondent Characteristics → Y1.Knowledge	0.362	3.522	0.000	Sig
X3.Respondent Characteristics → Y2.Achievement of the program	0.621	3.940	0.000	Sig
Y1.Knowledge → Y2.Achievement of the program	-0.330	2.012	0.045	Sig

According to table 4, it can be seen that the provision of information has an effect on knowledge with p-value (0,00) then knowledge affects the achievement of village KB with p-value (0,045). But the provision of information does not directly affect the achievement of the KB village. Whereas the staff visit did not affect the knowledge and achievements of the KB village. Respondent characteristics influence the knowledge and achievement of KB villages with p-value (0.00).

FINDINGS

The Effect of Information Giving on KB Village Program Knowledge: Based on the results of the study, it is showed that the level of knowledge of respondents about village KB was 78%, knowledge of BKB was 51% and the majority of respondents did not have knowledge about BKR of 74%. In addition, the majority of respondents do not have knowledge about PIKR of 90% and do not have knowledge about BKL of 64% and do not have knowledge about UPPK of 79%. From these data it can be concluded that the majority of respondents did not fully know about the KB village program.

The regression test results indicate that the provision of information has an effect on knowledge with p-value (0.00) then knowledge has an effect on the achievement of KB village with p-value (0.045). This means that the provision of information has an effect on knowledge and knowledge influencing the achievement of KB villages in terms of the number of children. If someone has obtained information about family planning including family planning villages, it will increase their knowledge about the ideal number of children, thus influencing the achievement of the KB family in terms of the number of children desired is enough children.

Ariesta (2011) explains that there is a significant effect between providing information on increasing knowledge of families who have elderly in Kampung Tua Dapur 12, Sei Pelunggut Village, Sagulung District, Batam City. Someone's knowledge is influenced by several factors, one of which is information that is an alternative to convey information both through print media and health workers such as through counseling, counseling and other activities⁽⁴⁾.

This study is in line with the previous researchers conducted by Wadu et al (2016) that the pattern of disseminating information about the Elderly Family Planning program in empowering the elderly runs maximally through interpersonal communication or Family Planning Counselors (FPC). This communication is carried out by the group through service and counseling accompanied by an interactive approach to cadres and home visits⁽⁵⁾.

The results of the study stated that there was an effect of providing information in the form of counseling or counseling about the KB village program, which increased the respondents' knowledge about the KB village program by disseminating information about the KB village program. So that it can be concluded that the provision of information on Elderly Family Development (BKL) is very influential in creating a strong, productive elderly and improving the quality of life of the elderly according to the BKKBN program.

Effect of Community Participation on KB Village Programs: Based on the results of the study, the level of community participation in participating as administrators of the KB village program was still low with achievement of 41%. Davis (2001) defines public participation as feed-forward information and feedback information. The definition of community participation is

defined as a continuous two-way communication process that can mean that public participation is communication between the government as policy holders and the public on the other hand as parties who directly feel the impact of the policy⁽⁵⁾. The lack of activity of cadres is caused by cadre activities because they are actively working. The activities carried out by BKL group only provide guidance to families that have elderly people, but for activities carried out by the elderly themselves it is carried out in the kelurahan. The constraints faced by BKL are the absence of funds used for activities and the decline in activeness of cadres⁽⁵⁾.

Ariesta's research (2011) shows the problem in BKB's development was the limited time and cadres which resulted in less effective implementation. Information about BKL, BKR, BKB is not routinely delivered every month to the community because of limited time in PKK activities and personnel who provide guidance⁽³⁾. The inhibiting factors for the achievement of the KB village program are the lack of active cadres participating in KB family program, the lack of support and responses from the community for KB Village program in Tuban District and Malang City.

Institutional factors that influence the implementation of the KB Village in Tuban and Malang are related to the proportional number of family planning counselors, the availability of the budget for the KKBPK program from the regional budget (APBD) and National budget (APBN) and other funding sources such as the Village Fund Budget (ADD), family hope program (PKH), membership of BPJS, availability of operational facilities, both contraception and other supporting facilities. This is in line with Merrynce (2013) findings in a study in 2013, namely the dominant factors affecting the effectiveness of KB family planning programs are communication factors and resource factors where resource factors emphasize the availability of family planning counseling human resources, budget for implementing programs and facilities for family planning tools owned. Limited human resources is the main obstacle in the effort to convey information to the community⁽⁶⁾.

CONCLUSION

The provision of information influences knowledge with p-value (0.00) then knowledge influences the achievement of village KB with p-value (0.045). But the provision of information does not directly affect the achievement of the KB village program. Whereas the staff visit did not affect the knowledge and achievements of the KB village program. Respondent characteristics

influence the knowledge and achievement of KB village program with p-value (0.00). The inhibiting factors for the achievement of the KB program are the lack of active cadres participating in running the KB family program, the low level of community support, the low response from the community to the KB village program in Tuban District and Malang City.

Conflict of Interest: Authors declare that the information above is correct and the manuscript submitted by us is original. We have no conflict of interest to declare and certify that no funding has been received for the conduct of this study and preparation of this manuscript.

Source of Funding: This research is self-supporting and BKKBN founding

Ethical Clearance: We would like to thank the Ethics Committee for basic science research/clinics at Faculty of Public Health Airlangga University the ethical approval granted for this study. Our gratitude also goes to all the participants involved in this study for their commitment.

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Effect of Bone Morphogenetic Protein-4 on the Expression of BMP-7 In Bone Repair

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ABSTRACT

Background: BMPs play important roles in normal bone development and regulation of bone repair by their ability to stimulate osteogenesis, cell differentiation and apposition of bone matrix.

Aim of study: to find role for the application of BMP4 in bone defect with expression of BMP7 by newly formed bone.

Materials and Method: Twenty male Wistar rats were used to create a drill-hole injury (3mm) bone defects in femur, one in the left side represented the control, while the right side represented the experimental. The study groups include:

- Control group, the bone defect was left without treatment.
- Experimental group, the bone defect treated with 0.5 µl of BMP4.

Bone repair was examined histologically and immunohistochemically for the expression of BMP7 at the postoperative periods 14 and 28 day.

Result: Show increased bone formation with proceeding time postoperatively for both study groups, although experimental group illustrates more bone apposition that filled the defect at 28 day. Moreover intense positive expression of BMP7 by stromal and bone cells were illustrated in experimental group with high significant differences in comparison to control.

Conclusions: BMP4 seems to play an important role in bone repair; induced expression of BMP7 correlates with the bone repair outcome.

Keywords: bone morphogenic proteins, bone repair, bone signals, bone cell, BMP7, osteogenesis

INTRODUCTION

BMPs are a subfamily of the transforming growth factor-β (TGF-β) superfamily with comprising activins and inhibins. The bone-inducing BMPs can be divided into several subgroups, according to their amino acid

sequences^[1,2]. BMP-2 and BMP-4 comprise one of osteogenic subgroup.^[3]

Various animal studies and preclinical trials, that have been performed to demonstrate the efficacy of BMP4 in accelerating bone regeneration and fracture healing.^[4,5]

Bone repair required an adequate cellular environment, sufficient growth factors, a bone matrix and mechanical stability.^[6,7]

BMPs play an important role in bone formation. BMP activities are regulated at different molecular

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levels.^[8] In bone, BMPs are produced by osteoprogenitor cells, osteoblasts, chondrocytes and platelets and cell differentiation and stimulation of bone healing are closely related to family member of BMP.^[9,10,11]

This study was performed to investigate the role of application of BMP4 with expression of BMP7 in repaired bone.

MATERIALS AND METHOD

Animals: Twenty male Wistar rats, weighting (0.25 – 0.30 kg), aged 4-5 months were used and maintained under control conditions of temperature, drinking and food consumption and all experimental procedures were carried out in accordance with the ethical principles of animal experimentation. In each rat, a drill-hole injury 3mm bone defects were created in femur ,one in the left side represented the control ,while the right side represented the experimental. The study groups include:

- Control group,the bone defect was left without treatment.
- Experimental group ,the bone defect treated with 0.5 µl of BMP4

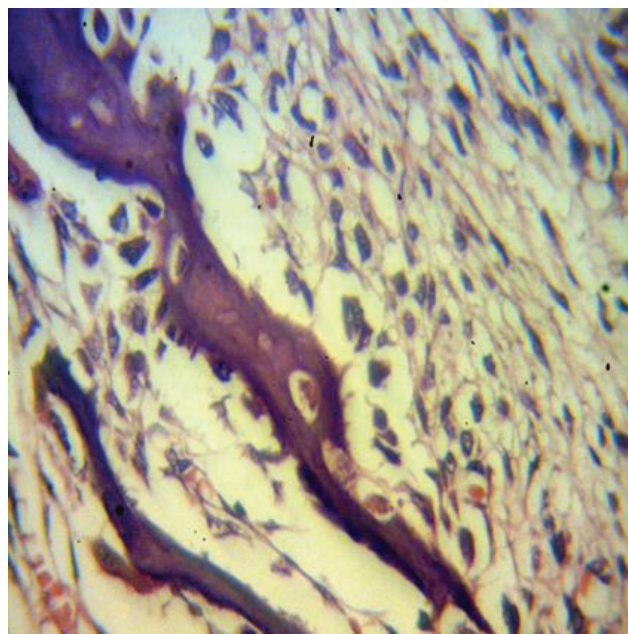
Materials

- BMP4 peptide (ab178442) 100µg was reconstitute in water to a concentration of 0.01 mg/ml and used for experimental group.
- Immunohistochemical Polyclonal Antibodies ,Bone morphogenic protein7 antibody (BMP7) from Abcam Company UK (ab56023).

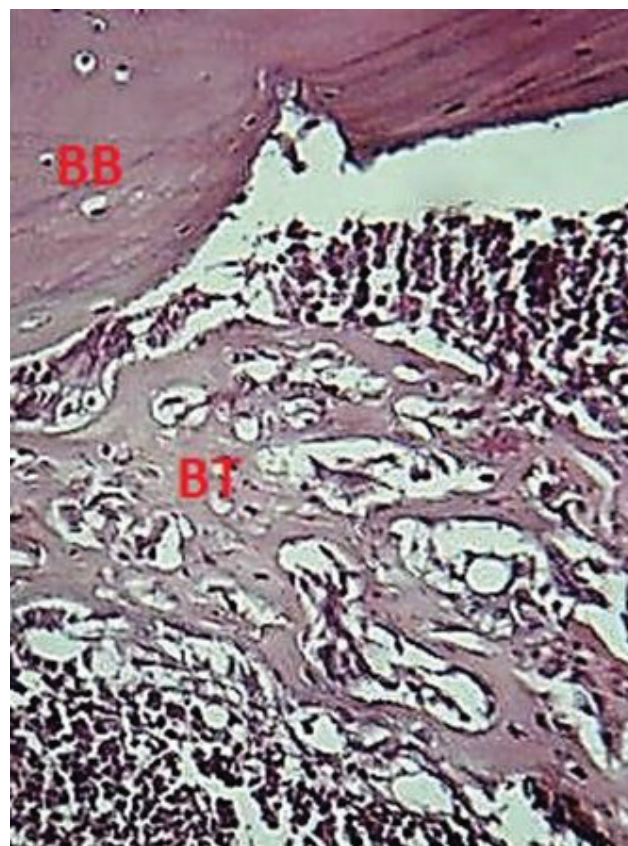
Method: After scarifying the animals at postoperative periods (14,28 days), ten animals for each period .The specimens were fixed by 10% buffered formalin for 3 days.The samples then demineralized, dehydrated, and embedded in paraffin,5µm section was analyzed for immunohisologic evaluation of BMP7.

Immunohistochemical scoring of BMP7: Quantification method of Immuno-reactivity was estimated for positive cell that expressed BMP7 .It was assessed by identifying and scoring 100 cells in five fields (X40) along bone area of different sections ,the scoring is: (Score 0, none; score 1, <10%; score 2, 10-50%; score 3, 51-80%; score 4, >80%).^[12]

RESULTS

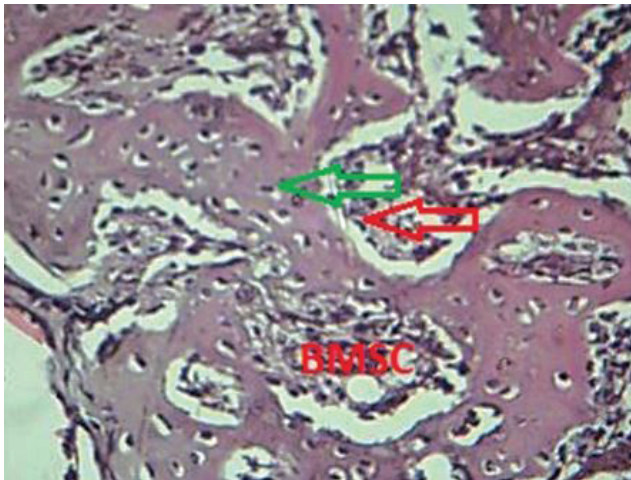


A: Bone trabeculae at 14 day post surgically. H&E x20

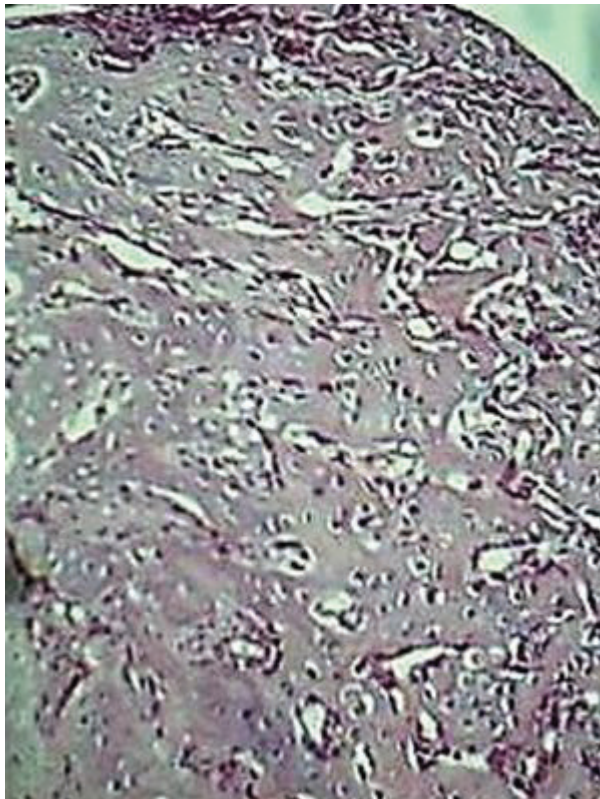


B: Bone trabeculae (BT) coalesce with basal bone (BB) at 28 day postoperative, H&Ex10

Figure 1: Bone healing (control)



A. Bone trabeculae at 14 day post surgically .shows bone mesenchme stem cell (BMSC), osteoblast (red arrow), osteocyte (green arrow) H & E x20.

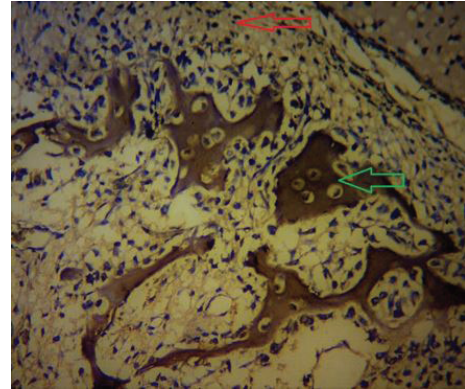


B. New bone filled the defect, at 28 day post operative. H & E x 10

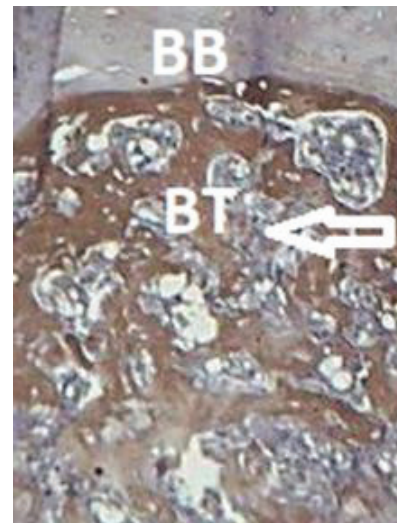
Figure 2: Bone healing (experimental)

- **Histological examination** for both study groups shows formation of bone trabeculae at 14 day postoperative, and with more apposition of bone matrix at 28 day. Although volume of newly bone that apposed in experimental group illustrated to be obviously greater in comparison to control at different study periods. Figures(1,2)

- **Immunohistochemical investigation** for the positive expression of BMP7 by stromal cell, bone mesenchymal stem cell, bone cells (include osteoblast, osteocyte) were evaluated, as counting and scoring of positive cells.

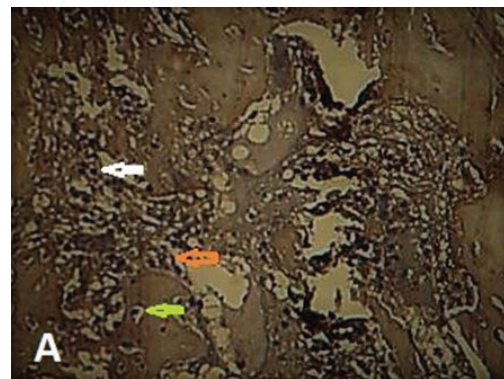


A. At 14 day, bone mesenchymal stem cell (red arrow); osteocyte (green arrow). DAB x 20

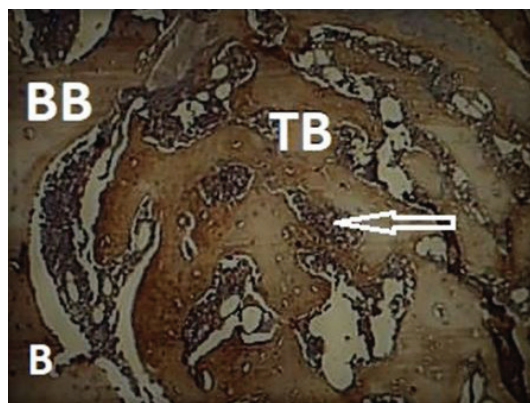


B. At 28 day, bone mesenchymal stem cell (white arrow), bone trabeculae (BT). DAB x 10

Figure 3: Positive expression of BMP7 by (control).



A. At 14 day, bone mesenchymal stem cell (white arrow); osteocyte (yellow arrow), osteoblast (orange arrow). DAB x 10



B. At 28 day, bone mesenchymal stem cell (white arrow), bone trabeculae (BT) coalesce with basal bone (BB). DAB x 10

Figure 4: Positive expression of BMP7 by (experimental)

Figure(3,4) show intense positive DAB stain by newly bone tissue in experimental group in comparison

to control. The results confirmed by statistic analysis of the data, which revealed a high significant difference in the mean of positive cells specifically at day 28 postoperative. Tables(1,2,3)

Table 1: Observed Frequencies of the Studied immunohistochemical scoring of BMP7 in different groups by different (S.O.V.) BMP7 Score

Groups Score	14Days	28Days
Control Score-1	4	4
Score-2	1	1
Score-3	0	0
Score-4	0	0
Exp. Score-1	2	3
Score-2	2	2
Score-3	1	0
Score-4	0	0

Table 2: Summary Statistics of the Studied No. of Positive Cells expressed BMP7 in the Studied Groups

Groups	Periods	Mean of +ve cell	Std. Dev.	Std. E.	95% for mean		Min.	Max.
					L.B	U.B		
Control	14 day	23.8	1.6	0.7	22.2	25.5	22	26
	28 day	16.5	0.6	0.3	15.3	16.7	15	17
Exp.	14 day	49.0	2.6	1.1	44.6	51.0	45	50
	28 day	26.9	1.0	0.4	25.6	27.8	26	28

Table 3: Multiple Comparisons by (LSD Method) of Positive cells count for BMP7 Parameter According to different Groups in compact form

LSD test					
Periods	Groups		Mean Difference	Sig.(*)	C. S.
14 day	Control	Expem.	-0.20	1.000	NS
28 day	Control	Expem.	-0.94	0.918	HS

(*) HS: Highly Sig. at $P < 0.01$; Non Sig. at $P > 0.05$

DISCUSSION

The osteogenic function of BMPs had been examined by many past researches, mainly using osteoblasts culture with exogenous treatments of BMPs [13]. Based on their potent osteogenic abilities, many experimental and clinical trials have been initiated to use BMP2 and BMP7 to improve fracture repair [14,15].

Genetic, biochemical, and pharmacological studies have identified and characterized, factors involved in the

conversation between BMPs and bone cells during both bone formation and repair [16]. Our results illustrate an enhancement of bone formation after local application of BMP4 in bone defect. BMP4 also acts to recruit and activate osteoblast chemotaxis, differentiation, and matrix mineralization. Positive expression of BMP7 in experimental group that combined with osteogenic activity confirm the importance of these two BMP 4 and 7 in acceleration of bone healing. Several BMPs are expressed in distinct temporal and spatial patterns during

bone repair^[17]. Of these, bone morphogenetic protein 7, and is of particular interest because of its ability to induce osteogenesis. Suggesting a functional role for BMPs in bone repair and formation.

CONCLUSION

The role of the Bone morphogenetic proteins 4 with 7 (BMP4, BMP7) that both are recognized as candidate growth factors with significant potential in bone tissue engineering as well as bone repair.

Ethical Clearance: All work of this study had done according to the National Council's guide for the care of laboratory animals.

Source of Funding: By ours

Conflict of Interest: Nil

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Measuring *Escherichia Coli* in foods and Beverages towards Certification of Cafeteria in Campus

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ABSTRACT

Aims: To measure *Escherichia coli* in foods and beverages sold by cafeterias in a campus.

Method: This research used cross-sectional design using the structured questionnaire in June-July 2011. The number of samples was 230 food and beverages taken from 13 locations consisting of 42 vendors. Analysis of *E. coli* conducted in the Laboratory of Environmental Health Faculty of the Public Health University of Indonesia used Membrane Filter Method with CFU (Colony Forming Units) as a result. Analysis of certification of hygiene and sanitation performed using instruments or the form of Ministry of Health Decree Number 715/MENKES/SK/V/2003.

Results: The contamination more than 50 %, showed in food (79.5) was higher than the drinks. Only 5,74 % cafeterias allow the score of Ministry of Health Decree Number 715/MENKES/SK/V/2003 standard for Hygiene and Sanitation.

Conclusions: *E. coli* contamination in foods was higher compared with beverages. Most of the cafeterias on campus did not allow the standard. It needed the training to improve the knowledge of food handlers, owner, and manager concerning the hygiene and sanitation cafeterias and do assessment and development the instrument which proper to all cafeterias.

Keywords: cafeteria, *Escherichia coli*, hygiene, sanitation, food handler, beverage

INTRODUCTION

All of the cafeterias in the university are visited by many students, lecturers and academic staff every day. Foods must be free of bacteriological contamination. University is very concerning about food processing and immense influence in support of nutrition students. Even though, there are relatively affordable price, food vendors still have to pay attention to personal hygiene and the environment in which sales of food, or better known as food hygiene and sanitation^[1]. Based on research conducted Suleman, that only 28% of the 100 food handlers have received training on hygiene and sanitation, and the calculation of hygiene only obtained 10% from 72 canteens, and have not a certificate of physical feasibility of hygiene and sanitation^[2].

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It is necessary to build mechanisms or procedures for certificate hygiene and sanitation for food vendor in Cafeteria in University. With the certification that refers to the street vendors Regulation of Health Minister Number 715/MENKES/SK/V/2003, then the vendor in the cafeteria at the university will get a certificate of "Hygiene and Sanitation" that would be a model for other vendors or merchants in the University in Indonesia. Also, It's would like Vendor in Singapore, France, Japan has a certificate. The instrument is obtained from these assessments will be registered by a patent certification.

METHOD

This study was cross-sectional, which consisted of an interview survey using instruments on food handlers and managers, observations (checklist) to sanitation facilities, laboratory examinations of food and beverages as well as the source of water in the cafeteria/restaurant at the UI extension, the questionnaire interviews and

observations in the handlers/renderer of food as well as sampling the food sold University of Indonesia Depok campus cafeteria in June-July 2014. Identification of *E. coli* on food and beverages and water was done by the Membrane Filter Method, the resulting unit is the CFU (Colony Forming Units). Analysis of the hygiene and sanitation performed using instruments or the form of Ministry of Health Decree Number 715/MENKES/SK/V/2003.

RESULTS

Number samples were 230 samples, 186 samples were food (80.9%) and 44 samples was drinks/juices (19.1%). Samples were taken from 13 locations consisting of 42 vendors. Based on Laboratory analyses, 230 samples (foods and drink) that is sold in the cafeteria on campus most of the contaminated *Escherichia coli* (61.7%). Neither food nor drink, more than 50% contaminated with *E. coli*, but contamination of food is greater (79.5) than in drink (57.5%).

Table 1: Laboratory analyses Contamination of *Escherichia coli* on samples (186 foods and 44 drinks)

Samples	Escherichia coli				Total	
	Negatif		Positif			
	n	%	n	%	n	%
Foods	79	42,5	107	57,5	186	100,0
Drinks	9	20,5	35	79,5	44	100,0
Total	88	38,3	142	61,7	230	100,0

Note:

Positif, if laboratory analyses for *Escherichia coli* > 0

Negative, , if laboratory analyses for *Escherichia coli* = 0

Table 2: Score Hygiene and Sanitation Assessment

Result	Number of Vendors	%
Qualify (score < 65)	10	5,74
Not Qualify (score ≥ 65)	164	94,26
Total	174	100,0

Score Hygiene and Sanitation Assessment was based on the 715/2003 Ministry of Health Decree's scores. There are 28 points about Hygiene and sanitation

statement that the vendor has to answered. This score show qualification in Hygiene and sanitation of Vendor. The result is 94.26% not qualified for hygiene and sanitation. It shows a very bad condition and must be managed properly.

DISCUSSION

Identification of contamination of *E. coli* is one indicator of bad or good management of food and drink, therefore it is necessary to improve the condition of food and drink management. Improved management can be done by doing repairs on the variables contained in the instrument assessment of hygiene and sanitation qualification. If this can be done, it is expected to reduce the possibility of contamination of *E. coli*, which means increasing the ability to manage food/drink hygiene and sanitation. In fact, this is not entirely due to hygiene and sanitation facilities that do not qualify, possibly also due to the instrument used does not fit the area. This is what needs to be done in order to obtain an assessment instrument in accordance with the cafeteria on campus.

Many factors influence the occurrence of diseases transmitted by food and many other factors that cause the contamination of *E. coli* in foods, it still required further analysis or research to improve the quality of food and beverages sold in the cafeteria and the campus environment for the development of a standardized instrument certification.

Overall this study shows that 13 locations in the campus cafeteria still a high level of contamination of *E. coli* in foods (57.5%) and beverages (79.5%). Almost all drinks are served by mixed between sugar/coconut milk and its contents, such as the mixed ice, ice cantaloupe, fruit soup, coconut ice, grass jelly ice, ice 'cendol', ice seaweed, all of them positive *E. coli* although in varying amounts. The cafeteria is not qualified in hygiene and sanitation (95%).

The management of canteen must be organized to find out where the possibility of contamination in every product, both food, and beverages. Knowing the location/ process/ instrument potential contamination will facilitate the manipulation for the improvement/enhancement to ensure the management/management of the physical-worthy beverage food hygiene and sanitation. If the assessment or evaluation can be standardized, it will be used as a method of evaluation (certification) for the management of the canteen or similar nature to assess the risk of contamination that can be made into rules for managing the canteen or the like.

Measuring of food contamination in the same area also done^[3]. Food contamination could be caused by many factors. Many studies claimed that the largest percentage of foodborne diseases caused due to poor handling procedures^[4-6]. Shigella, Hepatitis A, and other infections can be all easily transmitted to the restaurant's customers through improper hand washing the infected food handlers^[7]. The most factors claimed makes a role in enteric viruses transmission is food handler contamination^[8]. Those all because of the food handlers have poor knowledge about hygiene and sanitation.

According to the Ministry of Health Decree Number 715/MENKES/SK/V/2003, training is needed to make knowledge and practice better. The training not only addressed to food handlers only, but also to the owner and manager. Generally, however, training is evaluated through a standardized test and give a certificate^[9]. The impact of food handler training was measured by comparing rates of total and critical violations from routine inspections of food services establishments before (2001-2004) and after (2005-2007)^[10].

CONCLUSION

As a conclusion, that a large percentage food quality served cafeterias around campus was under standard quality by Ministry of Health Decree Number 715/MENKES/SK/V/2003 both in *Escherichia coli* standard and hygiene and sanitation. It is needed training to improve the knowledge and practice for food handlers, owners and managers of cafeterias. Certification of Hygiene and Sanitation for each cafeteria would be a guarantee for food contamination.

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Ethical Consideration: All respondents agreed and fill out the inform consent provided by team research and signed on it. The information given by respondent assured to be kept confidentially and used for research purposes only.

Competing Interests: The authors declare that there are no competing interests.

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Consumption of Salted Fish and Hypertension in the Area of Salted Fish Industry

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ABSTRACT

In Indonesia, South of Sumatera province is the second position of the highest prevalence of hypertension for Sumatera region after Bangka Belitung province the first. Palembang City is the quite big fish producer city, such as home industry producing salted fish. This study aimed to analyse the association between consuming salted fish and hypertension incidence. The cross-sectional design was conducted in 5 Ulu Subdistrict, Palembang City, South Sumatera Province in April – June 2016 and involved 90 subjects as sample taken by using cluster method. Systole and diastole blood pressure measurement used sphygmomanometer brand ABN and stethoscope conducted by trained nurses. Sample taking of salted fish sold in 5 Ulu Subdistrict that was most consumed from each neighbourhood/RT selected as sample was then taken as much as 250 gram, further samples were sent to and the NaCl level was to be checked at Faculty of Fisheries Product Technology, Bogor Agricultural Institute. Variables that would be examined were variable salted fish consumption with hypertension. Data was analysed with chi square test. There was not association between consuming salted fish with high level of NaCl and normal level to suffer hypertension in the area of salted fish production (p value > 0.05). People who consumed salted fish and in the area of salted fish production have the risk to suffer hypertension with those consume salted fish in normal.

Keywords: Hypertension, salted fish, fish industry, NaCl

INTRODUCTION

Cardiovascular disease, which one of its causes is hypertension, is the major cause of death globally in which there are more people died because of cardiovascular disease than other causes. About 17.5 million deaths occurred due to cardiovascular disease in 2012 as by 31% of deaths globally. Based on this data, there are approximately 7.4 million people died because of coronary heart disease and 6.7 million deaths due to stroke¹.

Prevalence of hypertension in Indonesia on the group age ≥ 18 years according to National Basic Health Research was 25.8%. Results of Basic Health Research

also showed that proportion of people aged ≥ 10 years who consumed food risky of hypertension was 26.2% (salty food) and 77.3% (seasonings)². Hypertension in Asian countries relatively more attacks younger population because of genetically interaction and environment as well as unbalanced nutrition at toddler age.

Difference of any preventive act dynamics can be seen in each country. Preventive programs of cardiovascular disease in developing countries start at the time when epidemic of cardiovascular disease exist and people more aware of effects of cardiovascular disease. Counseling concerning on modification of lifestyle to reduce risk of this disease is already accepted among people. However, Asean countries are facing multiple problems, which are problems before and after the change of disease and people's vigilance to effects of cardiovascular disease are not yet quite high³.

The National Institute for Health and Clinical Excellence (NICE) explains that hypertension is the increase of blood pressure that is 140/90 mmHg or

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higher. Hypertension is non-infectious disease generally related to lifestyle and mostly could be prevented, also a disease which mostly causes deaths and generally related to aging⁴. There was any increase of blood pressure in line with the older age and as a result of the high level of salt consumed⁵. Risk of hypertension incidence for people who consumed more than 6 gram per day was 5 – 6 times higher than those who consumed salt less than 3 gram per day⁶.

South Sumatera with Palembang City as the capital city is one of provinces as the quite big producer of fish commodity in Indonesia. This is supported by Musi River flowing along Palembang City. Fish cultivation business in Palembang City continuously develops including intensive fish cultivation. Beside fishing production in Palembang City is to be consumed in fresh, some of fish are preserved and processed to be salted fish, by fermentation (*bekasam* fish) and by fogging (*salai* fish). Several kinds of freshwater fish are mostly processed to be preserved fish products such as *salai* (by fogging), salted fish such as fish from *gabus* type, *sepat siam*, *baung*, *lais* in which this industry of salted fish processing are mostly located in Musi riverbanks where 5 Ulu Subdistrict is the largest area of salted fish home industry⁷.

Palembang City is the quite big fish producer city, such as home industry producing salted fish, especially 5 Ulu Subdistrict area that is a quite large home industry. Besides selling salted fish to traditional markets, most of local people consume the salted fish. 5 Ulu Subdistrict is one of subdistricts selected to be location of Integrated Service Post of Non-Infectious Diseases (*Pos Binaan Terpadu Penyakit Tidak Menular/Posbindu PTM*) by *Balai Teknik Kesehatan Lingkungan dan Pengendalian Penyakit/BTKLPP* of Palembang. Of 6 Posbindu PTM developed by BTKLPP of Palembang, most of respondents' blood pressure checking results in 5 Ulu Subdistrict was higher than normal limit. The high people's blood pressure in this area is suspected as a result of any dried fish industry around the area⁸.

Based on early information digging results, most of respondents often consumed salted fish, so study concerned on relation between sodium content in salted fish and hypertension incidence in Palembang City. Posbindu PTM itself had been conducted since September 2014 as performed quarterly, however, there was no any blood pressure change found yet based on such regular checking results. Most of the local people's blood pressure was still high. Moreover, any similar study has not been conducted yet in this region. Therefore, a further study to determine relation between

salted fish consumption and hypertension incidence in Palembang City is considered important in order to take concrete actions for handling such problems.

METHOD

The study design was cross-sectional as conducted on April – June 2016 in 5 Ulu Subdistrict, Palembang City, South Sumatera Province. Population in this study was all people domiciled in 5 Ulu Subdistrict, Palembang City, South Sumatera Province. Sample was taken by using cluster method. This method was selected because survey study used to use large population, so sample was not possibly taken in random that is the best sample taking method. The study used 95% Confidence Interval (CI) and formula used in this study was for estimation of population average.

Based on formula above, total of sample was 41 persons. Sample was multiplied by two because there would be two groups namely group of hypertension sufferer respondents who consumed salted fish containing high level of NaCl and group of hypertension sufferer respondents who consumed salted fish containing low level of NaCl. So that, total of sample needed was 82 persons. To avoid the drop out of the subjects, therefore the subjects added 10% so the total became 90 samples. To determine level of salted fish sodium on 3 samples taken from location of study, laboratory test was conducted by Faculty of Fisheries Product Technology, Bogor Agricultural University.

Data concerning risk factors of hypertension quoted some of instruments of Health Ministry's Integrated Service Post of Non-Infectious Disease (Posbindu PTM). Systole and blood pressure measurement used sphygmomanometer merk ABN and stethoscope as conducted by nurse.

FINDINGS

The existence of sodium (sodium) in salted fishes samples shows in Table 1 below.

Table 1: Analysis of NaCl in salted fishes

Parameter of Analysis	Code of Analysis	Code of Sample	NaCl (%)
NaCl	054 A	Salted <i>bilis</i> fish	17.77
	055 A	Salted <i>pare</i> fish	18.94
	056 A	Salted <i>kepala batu</i> fish	21.06

Based on Table 1, the highest level of NaCl was found in salted *kepala batu* fish by percentage 21.06%. This total of percentage exceeded normal level of NaCl as regulated by National Standard Agency that is < 20%.

Relation between consumption of salted fish and hypertension incidence could be seen at the following table:

Table 2: Consumption of Salted Fish Containing NaCl and Hypertension Incidence among People in Area of Salted Fish Industry 5 Ulu Subdistrict Palembang City in 2016

Salted Fish Consumption	Hypertension		Non Hypertension		OR	p value
	N	%	n	%	(95% CI)	
Consumption of salted fish with high level of NaCl (salted <i>kepala batu</i> fish)	36	65.5	19	34.6	2.25 (0.946-5.353)	0.067
Consumption of salted fish with normal level of NaCl (salted <i>pare</i> and <i>bilis</i> fish)	16	45.7	19	54.3		
Total	52	57.8	38	42.2		

Based on Table 2, in conclusion, respondents consuming salted fish with high level of NaCl had same risk to suffer from hypertension than those consuming salted fish with normal level of NaCl (p value > 0.05).

DISCUSSION

This study used cross sectional design in which data of dependent variable (effect variable) and independent variable (risk factor) were taken simultaneously, so it was unknown which variable occurred earlier or the major cause of effect occurrence. This design had several weaknesses such as condition of respondents was seen only once at the time of observation and measurement was conducted at the time of check only. In case of hypertension, a person's blood pressure tends to change appropriate with the person's condition and environment at that time. Therefore, this study made measurement standards namely measurement was conducted twice, but if the first and the second measurement were different more than 10 mmHg, the third measurement was then conducted⁹.

Proportion of respondents who consumed salted fish with high NaCl level (salted *kepala batu* fish) in this study was 61.1% (55 persons). This was because most of local people's occupation was salted fish sellers. 5 Ulu Subdistrict is quite known as canter of home-made salted fish industry. Beside selling salted fish, they also consumed the salted fish as daily food.

This study found that respondents who consumed salted fish containing high level of NaCl (salted *kepala batu* fish) had the same risk to suffer from hypertension with those who consumed salted fish containing low

level of NaCl (salted *bilis* and stingray fish). This result of study was not in line with study conducted by Rawasiah that found relation between salted fish consumption and hypertension incidence¹⁰. In addition, intake of sodium and fatty food had relation with incidence of hypertension¹¹. Also, relation between salted fish consumption and hypertension among elderly at Manado Ranomut Primary Health Care¹². The high number of hypertension in this area was because of the high consumption pattern among respondents in 5 Ulu Subdistrict. Beside selling salted fish, most respondents consumed the salted fish as daily food. The total of sodium intake suggested was 2,300 mg/day¹³.

In this study, after checking level of NaCl contained in salted fish most consumed by people in 5 Ulu Subdistrict, there was found that salted *kepala batu* fish contained the highest level of NaCl (21.06%). This is not in accordance with standards made by National Standard Agency in SNI 2721-1:2009.

Handling, production, storage, distribution and marketing of dried salted fish used media, ways and equipment in accordance with terms of sanitation and hygiene in unit of fisheries management. Sanitary was in accordance with guideline book of sanitation and hygiene instructions in Fisheries Production Unit both terms of building and equipment hygiene and employee hygiene. High level of NaCl could be influenced by shape of fish, habitat and production ways⁹. Fish production and preservation itself are already arranged in SNI 2721-1:2009. However, not all of salted fish industries know this regulation, especially home industries as in location of study.

The high level of NaCl (salt) contained in fish could affect consumers' health level. Salted fish are fish preserved by salting process. This preservation actually consists of two process, namely salting and drying process. The main aim of salting is similar to the aim of preservation or other production ways, which is to extend durability and savings of fish¹⁴. (Yundini, 2006) Salted fish industries in Indonesia are many from the big scale to the small scale. NaCl is commonly used in food industries. Salt with low concentration is functioned as flavour, meanwhile in quite high concentration is able to be preservative. Salt would be ionized and draw a number of water molecules as this incidence is called ion hydration.

In body metabolism process, most of consumed salt will be absorbed by intestines and redispersed by the kidney through urine. However, if level of salt consumed exceeds capacity of kidney to redispense it, level of sodium in blood will be increasing. Then to renormalize it, intracellular water should be drawn out, so that extracellular water volume increases. The increasing volume of extracellular water causes the increasing blood volume, which affects the emergence of hypertension¹³. (CASH, 2014) Sodium/sodium that is already processed in food sold in restaurants further will make someone who bought the food difficult to reduce sodium level in a day. There should be limitation wisely in the use of salt while cooking¹⁵.

In hypertension degree I, the reduction of salt intake and effort to reduce body weight could be used as the early stage of hypertension treatment. Advise for the reduction of salt intake should consider eating habit by taking types of certain food containing much salt into account. Limitation of salt intake to 60 mmol per day means not adding salt while eating, cooking without salt, avoiding salted food and using unsalted butter¹⁶.

Patience, (2013) wrote a review of the epidemiological literature demonstrates that the relationship between salt and hypertension is unequivocal. Since all the subjects in this study were those who ate salted fish, then there is no reason not to reduce the consumption of salted fish, because this salted fish could be the cause of hypertension¹⁷. However, further research needs to be conducted with different subjects who eat salted fish and no eat salted fish in the same area.

CONCLUSION

There was not association between consuming salted fish with high level of NaCl and normal level to suffer hypertension in the area of salted fish production (p value > 0.05).

By finding of test results on salted fish containing high level of NaCl by percentage 21.06% (> 20%) found in type salted *kepala batu* fish, Palembang City Health Agency in cooperation with Drug and Food Monitoring Agency (BPOM) should collaborate to make a socialization to salted fish sellers concerning salted fish processing based on SNI standards. The subjects maybe those are who eat salted fish and not eat salted fish. Further study should be conducted with better methods, one of which is cohort method or case control, and use additional form Food Frequency Questionnaire (FFQ) to determine causality of relation between salted fish consumption and hypertension.

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Conflict of Interest: Author declare that there is no competing interest both in financial and non-financial interests.

Ethical Clearance: The ethical clearance approval for this research received from the Committee of Public Health Research Ethics of Faculty of Public Health-Universitas Indonesia. Each participant gave written informed consent.

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Spousal Communication on Family Planning and Contraceptive Adoption in Indonesia

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ABSTRACT

Background: This study assesses the degree of spousal communication on family planning associated with contraceptive adoption in Indonesia.

Method: The analysis of this study was derived from the 2012 Indonesia Demographic and Health Survey (IDHS). This study utilizes both bivariate and logistic regressions.

Results: Findings indicate that 53.3% of respondents had never communicated family planning with their spouses while 46.7% of respondents had communicated before. About 31.3% male respondents were more likely to use contraception if they had discussions on family planning with their spouses. Multiple logistic regression analyses revealed that spousal communication is highly associated with region of residence (OR=1.5; 95% CI=1.4-1.8), exposure of family planning message through television (OR=1.8; 95% CI=1.6-2.0), and contraceptive use (OR=1.8; 95% CI=1.5-2.0).

Recommendation: Family planning discussion appears to increase mutual agreement regarding childbearing and contraceptive use among couples. In Indonesia, an intensive effort to target men is needed to both enhance the spousal communication and adopt contraception.

Keywords: Spousal communication, family planning, contraception adoption, Indonesia.

INTRODUCTION

Many studies in reproductive health, family planning and contraceptive issues have focused on women. Since the 1994 International Conference on Population and Development (ICPD) which held in Cairo, it has been extensively known that decisions regarding family planning and childbearing issues do not purely rely on women, but rather with both spouses.¹

Communication on family planning (FP) represent mutual responsibility between husbands and wives in reproductive health behaviour.^{2,3} If couple discuss family planning issue more frequently, they will produce better reproductive decision.^{3,4} the decision on contraceptive methods, time to use contraception, and the number of children.⁵⁻⁷ Couples who discuss family planning matters have better understanding the advantages and disadvantages of each contraceptive methods.⁸ Some researchers argued that the spousal communication depends on the knowledge and perception of males towards family planning.⁹⁻¹³ The others suggest that marital duration and education may influence the spousal

communication.^{8,14-16} Moreover, the access towards media e.g. television (TV), radio, and newspaper/magazine are associated with the increasing frequencies of family planning discussions among couples.¹⁷ Therefore, this study attempts to examine patterns and determinants of family planning communication among couples and contraceptive adoption in Indonesia.

Communication regarding family planning is still less popular to be discussed among couples in Indonesia. The contraceptive issue in Indonesia is still considered as women's domain because of their natural capabilities to be pregnant and childbearing. As the result, only one man compares to twelve women in Indonesia use contraception.¹⁸ The prevalence rate for male sterilization had steady in 0.2% from 2007 to 2012.^{18,19} Condom prevalence rate had increased slowly from 1.3% in 2007 to 1.8% in 2012.^{18,19} The rate for periodic abstinence decreased from 1.5% in 2007 to 1.2% in 2012 while withdrawal has also dropped from 2.1% in 2007 to 1.3% in 2012.^{18,19} Therefore, this study attempts to examine patterns and determinants of family planning communication among couples and contraceptive adoption in Indonesia.

METHOD

The 2012 IDHS had included both men and women as their respondents. Thus, this study utilizes data which are drawn from the 2012 IDHS.¹⁸ The couple dataset has data for married or living together men and woman who both declared to be married (living together) to each other and with completed individual interviews. There are 8,225 couple in which both partners were successfully interviewed. This reported study is based on unweighted data because the sample weights are available only for men or women, not for couple.²⁰

The dependent variable was spousal communication, coded 0 if husbands and wives had never discussed family planning and 1 if they have discussed family planning during a year preceding the survey. The response options in the survey were “never”, “once or twice” and “more often”. The available data on spousal communication on family planning were collected from wives’ responses. The independent variables of this study were region of residence (Java Bali and Outer Java Bali Islands); husband’s and wife’s age; husband’s and wife’s education; husband’s and wife’s knowledge on contraception; husband’s and wife’s exposure of family planning from radio, television (TV), newspapers/magazines, contraceptive use, number of living children, and duration of marriage.

The Statistical Package for Social Science (SPSS) version 23 was employed to analyze the data. Univariate analysis was used to reveal the frequency distribution of each variable. Bivariate analysis was applied to see the association between frequencies of spousal family planning communication and selected independent variables. In multivariate analysis, the logistic regression was conducted in measuring the effect of several significant independent variables towards spousal communication on family planning. Only the final model will be discussed in the study.

RESULTS

The result of the bivariate analysis showed that couples living in Java-Bali islands were found significantly to communicate family planning more often than couples living in outer Java-Bali islands (49% compared to 45.8%). A little more than half of the couples 53.3% had never discussed family planning with their spouses. Only 34.3% of respondents reported

spousal communication once or twice and 12.5% of them reported frequent spousal communication in family planning. Communication of family planning was often (50.9%) when the couples had married between 5-14 years. Spousal communication was often high among couples currently using any contraceptive method (68.7%) than couples who were not using any contraceptive methods (14.8%). About 49% of couples whose husbands heard family planning on television communicated about it with their spouses. Family planning communication revealed higher on couples whose husbands know modern contraceptive methods (47.9%) than couples whose husbands do not know any modern contraceptive methods (13.4%).

Results from the multivariate models of spousal communications on family planning are presented in Table 1. Region of residence, wife’s education, marital duration, husband’s contraceptive use, and family planning exposure towards husband through television had been considered as strong predictors toward spousal communication. Among those variables, husband’s exposure on family planning message through television had a significant correlation towards spousal communication than other variables (OR=1.8; 95% CI= 1.6-2.0).

Table 1: Logistic Regression Predicting Spousal Communication on Family Planning in Indonesia, 2012

Variables	OR [†]	[95% CI] ^{††}
Region of living (r: Outside Java Bali) [‡]		
Java Bali	1.543***	[1.36, 1.76]
Wife’s education (r: No education and primary)		
Secondary	1.163**	[1.003, 1.35]
Higher	1.488***	[1.20, 1.84]
Marital duration (r: more than 15 years)		
0-4 years	1.508***	[1.26, 1.80]
5-14 years	1.635***	[1.41, 1.89]
Contraceptive use reported by husband (r: No)		
Yes	.581***	[.51, .67]
Hear family planning on TV: husband (r: No)		
Yes	1.822***	[1.59, 2.09]

* p≤.10 **p≤.05 ***p≤.001

[†] OR = Odds ratio.

^{††} CI = Confidence Interval.

[‡] r = Refers to reference category

The couples who lived in Java Bali islands were more likely to discuss family planning (OR= 1.5; 95% CI=1.4-1.8) than those couples lived in outer Java Bali islands. The wife's educational level strongly increases communication on family planning, and it was consistent with previous research.²¹ The odds ratio of spousal communication increased with the increase of wife's educational level. Couples whose wives had higher education (OR=1.2; 95% CI=1.003-1.35) and secondary education (OR= 1.5; 95% CI= 1.2-1.8) had greater odds to communicate family planning than their counterparts. The likelihood of spousal communication on family planning who had married 0-4 years (OR= 1.5; 95% CI, 1.3-1.5) and 5-14 years (OR=1.6; 95% CI= 1.4-1.9) were higher than those who had married more than 15 years. The couple whose husband's reported using contraceptive were 0.6 more likely to communicate family planning than those whose couple whose husbands' not reported using any contraceptive methods.

DISCUSSION

This study examined patterns and determinants of family planning communication between husbands and wives in Indonesia based on the 2012 Demographic and Health Survey (DHS).

Compared with the couple living outside of Java Bali islands, the couples living in Java Bali islands were more likely to discuss family planning with their spouses. This is because the initial program of family planning had been promoted in Java Bali islands, therefore, the information and services on family planning in those areas had been spread out rapidly than the outer Java Bali islands.²²⁻²⁴

The higher educated women revealed positive effect on family planning communication between husbands and wives. The educated women are well informed about various contraceptive methods that suit for their bodies, and more openly in discussing the ideal number of children, and timing of childbearing with their husbands.²⁵ Those educated women are more conscious regarding the cost and benefit of childrearing and childbearing.²⁶

The probabilities of spousal communication on family planning showed reserved u-curved. Couples who had married 0-4 years had lower odds ratio than couples who had married between 5 to 14 years because lower

marital duration had not yet achieved the desired family size and are not free with talking about sexual matters compared with those with longer marital duration.²⁶ Moreover, couples who had married more than 15 years tend to had lower probabilities to speak family planning because they had perception that older persons could not pregnant anymore thus there were no need to discussed family planning.²⁷

Most studies have revealed that the frequency of spousal communication on family planning is positively associated with contraceptive adoption.^{28,29} Spousal communications may reduce the disapproval of contraceptive or disinformation of contraception if one partner conveys a favorable attitude towards contraception. Women is also recognized as good transmitters of information about male methods to their husbands which may increase men's probabilities to initiate contraceptive use. Communication regarding desired family size may enable a couple to reach agreement about limiting fertility. Moreover, spousal communication may enable husbands and wives to exchange practical information related to contraception.²¹ Spousal communication helps couples to be aware on each other's perspective about family size so there will be mutual understanding and decision-making process in fertility and contraceptive preferences. Spousal communication allows shared decision making and more equitable gender roles related to family planning.⁶

Television had been found as an effective instrument to spread information regarding family planning for both husbands and wives. The majority of households in Indonesia have television in their houses.³⁰ Television have advantages on family planning visualization by figures and sounds that make couples easier for understanding the message.¹⁷ Knowledge provided by television may make people aware and initiate behavioral change but only among those couples who are already motivated to accept the contraceptive methods.^{29,31}

CONCLUSION

In conclusion, this study reveals that less than half of the couples discussed on family planning issues with their spouses. Findings also indicate that spousal communication on family planning is a key element of contraceptive adoption in Indonesia. Spousal communication promotes mutual agreement in the preferences of family size and contraceptive adoption among spouses.

This study has recommended that intensive effort is needed to reach the country's targeted family planning coverage by involving men in reproductive health endeavour to enhance the discussion and agreement on family planning usage, thus, family planning activities are not left solely for women. Therefore, it is mandatory to continue ongoing information as well as education through various media to increase couple's awareness on family planning.

The study has several limitations. Firstly, the 2012 Indonesia Demographic and Health Survey is a cross-sectional data that have potentially limitation on the direction of causality. Secondly, the amount of information available to measure spousal communication was inadequate because only one question available, "how often husband-wife talks about family planning in the past 12 month?"²⁶

Policy makers should have taken for granted that women and men play the primary role in making contraceptive decision. If the policy makers neglect of men and marital interactions has hampered the ability of programs to increase contraceptive prevalence and reduce fertility rate.

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Epidemiology Character of Tuberculosis among Internally Displaced Persons in Tikrit City

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ABSTRACT

Background: Many factors may influence host susceptibility to tuberculosis (TB) infection, and increase the risk of developing the disease.

Objective: The present study screened the residents of seven camps to determine the prevalence of tuberculosis (TB) infection and disease among internally displaced persons residing in Tikrit city. Using a suitable questionnaire where filled for this purpose.

Materials and Method: The number of participant in the study was (n=164), the convenient sampling was used to choose the sample, they were 25 (15.2%) below 16 years old, while 52 (31.7%) from 16-30 years old, and 87 (53%) above 30 years. The mean age was 37

Results: Signs and Symptoms, were (59%) cough, (37.6%) sputum, (33.4%) coughing up blood, (40%) fever, and (35%) were fatigue and weight loss. Of these we found 56 (34.1%) case had extra pulmonary TB, the majority 24(42.9%) with plural effusion, 7(12.5%) lymph node involvement, only 4(7.1%) skeleton, and 21(37.5%) others. The prevalence of TB in 2015 was 40/100.000, while in 2016 150/100.000, and in 2017 was 193/100.000 per year compared with 62/100,000 in 2000, 74/100.000 in 2011, and 73/100,000 per year in 2012, following years of armed conflict.

Conclusion: Only about 69 (42%) of patients in this survey were sputum smear-positive. Around 159 (97%) of patients in the current study either cured or completed treatment (successful treatment), While 28(17%) of these was treated for second or third time, 2(1.2%) had treatment failure and one patient (0.6%) was defaulted, 2(1.2%) cases has drug resistance.

Keywords: Tuberculosis, Epidemiology, Tikrit city, case study

INTRODUCTION

Nearly one third of the global population i.e. two billion people are infected with *Mycobacterium tuberculosis* and at risk of developing the disease. More than eight million people develop active TB and about two millions die every year. More than 90% of global TB cases and deaths occur in the developing world mainly Asia and Africa ⁽¹⁾. Tuberculosis pleural effusion is the second most common extra-pulmonary manifestation of active *Mycobacterium tuberculosis* (MTB) infection after lymph node TB ⁽²⁾. In 2013 alone, it is estimated that 50 million people, including both refugees and IDPs, were displaced because of violence and conflict and more than 20 million were displaced due to natural disasters ⁽³⁾. Emergencies such as natural disasters, conflict-

related humanitarian crises and migration crises result in disruption of the capacity of public health systems to meet the health care needs of affected populations. Forced displacement often results in relocation to camps or other temporary settlements where risk factors such as overcrowding, malnutrition, substance abuse, social exclusion, disruption of regular health care and poor health seeking behavior make affected populations more vulnerable to TB. IOM's TB in emergencies program is based on extensive experience with TB prevention, diagnostic and treatment services under its Migration Health Assessments and Travel Health Assistance program for immigration and refugee resettlement and TB REACH programs worldwide. Guided by the World Health Organization (WHO) Global Strategy and Targets for TB Prevention, Care and Control after

2015 and the WHO End TB Strategy, IOM supports National TB Program (NTP) systems under the Ministry of Health in non-crisis and crisis situations. Activities are coordinated and consistent with national protocols and regulations to ensure accountability to national health authorities. IOM TB activities in emergencies aim to reduce avoidable morbidity and mortality through awareness, preventive and curative services in line with NTP and recognized humanitarian priorities and in close coordination with the World Health Organization and health cluster coordination mechanisms. In 2011, a total of 9,248 cases of TB were reported, giving Iraq the 8th rank among the countries belonging to the Eastern Mediterranean Region Organization (EMRO) with an incidence of 45/100,000 population and a prevalence of 74/100,000 population. In addition, in 2010, the estimates of multidrug-resistant (MDR) cases were 2.9% among new cases, and 35.8% among re-treated cases, and the estimated number of MDR cases among all incidence cases was 820 ⁽⁴⁾. According to the 2012 report of the Ministry of Health (MOH), the incidence rate of TB in Iraq was 45/100,000, with 13,860 new TB cases and 1140 of previously treated cases ⁽⁵⁾.

PATIENT AND METHOD

A descriptive cross sectional study performed between 25th December/2017-1st March/2018 in 7 camps in Tikrit and at consultant clinic of the respiratory and chest disease in Tikrit City (Centre of Salahaddin Governorate) where the guidelines of the NTCP are followed which based on the DOTS strategy as per WHO guidelines for the management of TB patients

The data related to last three years (2015, 2016, and 2017). The number of participant in the study was (n=164), the convenient sampling was used to choose the sample. All patients had been interviewed by questionnaire contained mixed simple questions about signs, symptoms, demographic, social characteristics, and investigations.

RESULT

According to demographic data, A total of 164 cases, they were 25 (15.2%) below 16 years old, while 52 (31.7%) from 16-30 years old, and 87 (53%) above 30 years. The mean age was 37. Their gender was 94 (57.3%) male. And 70 (42.7%) female.

Their marital status; 71 (43.3%) was married and 93 (56.7%) was unmarried. Their educational level was 98(59.7%) literate while 66 (40.3%) illiterate. Their economic state, the majority 139(84.7%) were poor and 25(15.3%) were intermediate results were given in table 1. Their residence as shown in the table (2), duration of staying in camps (months) we have large number 114(69.5%) stayed for 18 months, 40(24.4%) stayed 12months, 9(5.5%) stayed 6months, and 1(0.6%) stayed 5months. Signs and Symptoms, were (59%) cough, (37.6%) sputum, (33.4%) coughing up blood, (40%) fever, and (35%) were fatigue and weight loss. The duration of symptoms before diagnosis (weeks), One week 6(3.7%) cases, Two weeks 2(1.2%), Three weeks 1(0.6%), Four weeks 14(8.5%), Six weeks 8(4.9%), Eight weeks 5(3%), Twelve weeks 2(1.2%) (Figure 1).

Degree of relation of index case, there was 122(74.4%) unknown, while 25(15.2%) relative, 14(8.6%) house hold, and only 3(1.8%) work place.

The ways of prevention of TB, 73(44.5%) through covering mouth and nose when cough and sneeze, 64(39%) through ventilation of room, 14(8.6%) through avoiding sharing of dishes, and 13(7.9%) through good nutrition (Table 3). Regarding the investigations of sputum smear there was 69(42%) smear positive and 95(58%) smear negative. All cases with smear negative had done chest X-ray and majority of smear positive. Regarding the treatment of TB, number of cases who had duration completed or cured (success rate) was 159(97%), while 28(17%) of these was treated for second or third time, 2(1.2%) had treatment failure and one patient (0.6%) was defaulted. Only 2(1.2%) cases has drug resistance, and 162(98.8%) were susceptible (table 4)

We found 56 (34.1%) case had extra pulmonary TB, the majority 24(42.9%) with plural effusion, 7(12.5%) lymph node involvement, only 4(7.1%) skeleton, and 21(37.5%) others than. The housing condition, there was 47(28.7%) case living in one room, 93(56.7%) were living in two rooms, and 24(14.6%) were living in three rooms.

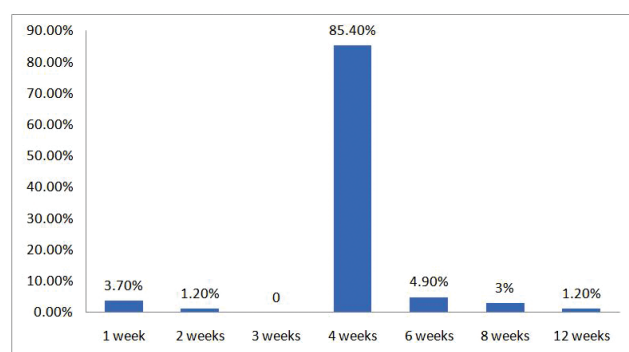
Number of family members was 10 in 107(65.2%), and 13 member in 32(19.5%), and 7 member in 16(9.8%), and 15 member in 9(5.5%). Regarding the number of windows there was 119(72.6%) has no windows, and 45(27.4%) has at least one window (table 5)

Table 1: Different socio-demographics

	Variety	Number	%
1.	Gender		
	Male	94	57.3
	Female	70	42.7
2.	Marital state		
	Married	71	43.3
	Unmarried	93	56.7
3.	Educational level		
	Literate	98	59.7
	Illiterate	66	40.3
4.	Economic state		
	Poor	139	84.7
	Intermediate	25	15.3

Table 2: List of the residence of participants

	Camp's name	Number	(%)
1.	Alam (Rubaida)	47	(28.7)
2.	Dream city	38	(23.2)
3.	Al(Souq)	23	(14)
4.	Moujamaa Qadissiya	40	(24.4)
5.	Tikrit (IDP)	13	(7.9)
6.	Moujamaa Al(Shahama)	2	(1.2)
7.	Hay Al(Qala)	1	(0.6)

**Figure 1: The duration of symptoms****Table 3: The ways of prevention**

Ways of prevention	Number	(%)
Through covering mouth and nose	73	(44.5)
Through ventilation of room	64	(39)
Through avoiding sharing of dishes	14	(8.6)
Through good nutrition	13	(7.9)

Table 4: Lists treatment category

Category	Number	(%)
Completed or cured and those whom treated for second or third time	159	(97)
Treatment failure	2	(1.2)
Defaulted	1	(0.6)
Drug resistance	2	(1.2)

Table 5: Lists the housing conditions

Housing conditions	Number	(%)
Number of rooms:		
One room	47	(28.7%)
Two rooms	93	(56.7%)
Three rooms	24	(14.6%)
Number of family members:		
Seven persons	16	(9.8%)
Ten persons	107	(65.2%)
Thirteen persons	32	(19.5%)
Fifteen persons	9	(5.5%)
Number of windows:		
No windows	119	(72.6%)
Windows are present	45	(27.4%)

DISCUSSION

Tuberculosis has re-emerged as a serious public health problem, with increasing rates of tuberculosis disease in Iraq over the past decade. The number of people displaced and moving to the areas of Samara from Tikrit and Daur, Salahadd in governorate has reached 28,000. We found a high prevalence of active tuberculosis in the last three years (2015, 2016, and 2017) among internally displaced persons living in refugee camps in Tikrit. The prevalence of TB in 2015 was 40/100.000, while in 2016 150/100.000, and in 2017 was 193/100.000 per year compared with 62/100,000 in 2000, 74/100.000 in 2011, and 73/100,000 in 2012, following years of armed conflict^{[6],[7]}. In general TB is more frequent among male patients 94 (57.3%) versus female patients 70 (42.7%), and this agree with Marzook and Hashim DS, and Liberato I R et al.^{[8], [9]}

Gender differentials exist in reporting and diagnosing of TB cases, and passive case finding likely leads to failure to diagnose TB in women. The stigma associated with TB causes women to be divorced or to

be unlikely to become married. A study in India found that male patients with TB expected their wives to take care of them but infected wives rarely received care. Thus, married women may try to hide their symptoms instead of seeking help. ^[10]

The age distribution showed an increase in numbers of cases in age 21-40 years old and those between 41-60 years old (34.7% and 26.7% respectively) and this agrees with Al-Sulaimaniya study while Aleppo study shows increase in numbers of children under 10 years old which was (25.9%) and agrees in those between 21-40 years old which was (34.8%) ^{[11][12]}

The economic state, the majority 139(84.7%) were poor and 25(15.3%) were intermediate, and this is agreeing with study in New York City which reveals an association between poverty and TB is well documented: ^[13,14]. In relation to signs and symptoms, the most common were cough(59%), sputum (37.6%), coughing up blood (33.4%), fever (40%), fatigue and weight loss(35%). The classic symptoms used in the simple case definition of TB (cough, fever and weight loss) were present in 31% of all cases and 45% of cases with pulmonary TB.

The ways of prevention of TB, 73(44.5%) through covering mouth and nose when cough and sneeze, 64(39%) through ventilation of room, 14(8.6%) through avoiding sharing of dishes, and 13(7.9%) through good nutrition. We had lower practice in comparison to survey of South African metropolitan over two-thirds (68.4%) of patients reported good TB infection control practices, such as covering the mouth and nose with tissues when sneezing, disposing of used tissues in waste bins or washing of hands after contact with respiratory secretions, whether at home, at work, or in the PHC facility ^[15]. Only about 69 (42%) of patients in this survey were sputum smear-positive. This indicates that the diagnostic capacity of the program needs further work through training, provision of better materials and equipment, in addition to inclusion of other diagnostic methods, e.g. culture services. Our sputum smear positivity rate was similar to previous study Salahaddin which was 42%. Rate was lower than that reported from Sulaimaniya (45%), Spain (50.7%) and Nigeria (59.1%), culture services are limited in use because it needs prolonged duration. ^[16-18]

Around 159 (97%) of patients in the current study either cured or completed treatment (successful

treatment), While 28 (17%) of these was treated for second or third time, one patient (0.6%) was defaulted and 2 patients(1.2%) had treatment failure. In Sulaimaniya study there was (59%) of patients were reported as having recovered, (30%) as having completed treatment, (7%) died and (3%) defaulted ^[11]

There was 56 (34.1%) case had extra pulmonary TB, of them 24(42.9%) with plural effusion, 7(12.5%) lymph node involvement, only 4(7.1%) skeleton, and 21(37.5%) others rather than mentioned above. While in study in Salahaddin governorate The EPTB it affects lymph nodes in 35 case (30.4%) and this is higher than our study and mostly due to over diagnosis and in refugee camps the patients mostly restricted in camps, and 44(38.2%) case was pleural effusion, while and bone in 5 cases (4.3%). Other sites in body affected by EPT were in 31 case (26.9%)^[25]. Regarding housing condition, there was 47(28.7%) case living in one room, 93(56.7%) were living in tow rooms, and 24(14.6%) were living in three rooms.

Number of family members was 10 in 107(65.2%), and 13 member in 32(19.5%), and 7 member in 16(9.8%), and 15 member in 9(5.5%) and this agrees with Special Report of the Canadian Tuberculosis Committee that reveals in communities where persons with TB disease live, crowded housing leads to an increased risk in terms of exposure to M. tuberculosis. The risk of exposure is also increased if there is limited air movement in an enclosed space. ^[19-21]

CONCLUSION

- The prevalence of TB in the province was higher in the years following of armed conflict.
- We found a high prevalence of active tuberculosis among internally displaced persons living in refugee camps in Tikrit. We should not forget the bad economic and nutritional state for these people during terrorist occupational period and inadequate with bad treatment of TB cases before liberation action.
- Displacement play a major role in the epidemiology of tuberculosis.
- Risk of infection was greatest for adults suggesting high rates of transmission among this group since their displacement

Ethical Clearance: All ethical considerations and obligations were duly addressed and the study was conducted after the approval of the consultant Clinic of the Respiratory and Chest Disease Centre (CRCDC) of the Salahaddin Governorate, Tikrit, Iraq. Informed written consent was obtained from participants before data collection.

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The Relation of Physical Air Quality and Occupancy Density with the Existence of *Streptococcus sp* Bacteria in Air at Sarijadi Urban Village Sub district of Bandung

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ABSTRACT

Streptococcus sp beta-hemolyticus Group A is the most common bacterial cause of upper respiratory tract infections, namely pharyngitis. The case of pharyngitis in the world because of this bacteria reaches 616 million cases each year, One of the high-potency spaces for the presence of *Streptococcus sp* bacteria in the air is a flat, because of the same building area and building characteristics as well as susceptible to the occurrence of indoor air pollution. The purpose of this study was to determine the relationship between physical air quality and occupancy density with the presence of *Streptococcus sp* bacteria in the air.

The type of research is observational analytical with cross sectional approach. The sampling technique is purposely conducted by Purposive Random Sampling with the criterion of permanent residents for 5 years and status as citizens of Bandung. Population in this research is all residential unit on long block type Flat D Sarijadi Flats. Analysis of data using univariate analysis, and bivariate analysis using correlation test.

The total of identified *Streptococcus sp* bacteria ranged from 4 CFU/m³ – 38 CFU/m³ to an average of 18.92 CFU/m³. The results showed that there was a correlation between indoor humidity level (p value=0,000), natural lighting intensity (p value=0,004), and number of occupants (p value=0,042) and no relation between room temperature level (p value=0,327), and respondent behavior (p value = 0,212) with presence of *Streptococcus sp* bacteria in air at Sarijadi Village Flats.

Keywords: *Physical Air Quality, Indoor air quality, Occupancy Density, Streptococcus sp, Flats*

INTRODUCTION

Air quality in a room is air inside a building that is inhabited or occupied for a period of at least 1 hour by people with a variety of different health conditions. According to the Environmental Protection Agency of America (EPA), placing indoor pollution in the order of three environmental factors is risky to human health, with indoor air quality 2-5 times worse than outdoor air⁽¹⁾.

The emergence of problems that interfere with indoor air quality is generally caused by several things, namely lack of air ventilation (52%), the presence of sources of contamination in the room (16%) contamination from outdoors (10%), microbes (5%), material buildings (4%), others (13%) CDC-NIOSH (National Institute of Occupational Safety and Health)⁽²⁾.

Air in a closed room contains fewer bacteria of the same type than those found in the open air. The bacteria are mostly saprophytes and are non-pathogenic, but with the addition of non-pathogenic bacteria in relatively large amounts can be potentially the same as pathogenic bacteria⁽³⁾. At first the air rarely contained pathogenic bacteria, but in its later development became the target of transmission of a number of major species which caused infection in the respiratory tract⁽⁴⁾. The presence

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of bio-aerosols in the air in the house (indoor air) can threaten the health of its inhabitants because some microorganisms can be pathogenic and cause disease in humans if inhaled or contaminate the air in the house.

One of the pathogenic bacteria is *Streptococcus*. *Streptococcus sp* beta-hemolyticus Group A is a normal flora in the human throat. As many as less than 10% of humans have these bacteria as upper respiratory tract commensal bacteria⁽⁵⁻⁶⁾. These bacteria easily spread in dense residential environments. Bacteria are also more spread at the turn of the season and in the rainy season. Bacteria spread through the air, transmitted through nasal mucus, for example through spitting of saliva when talking, coughing, or sneezing⁽⁷⁾.

One of the rooms with high potential for the presence of *Streptococcus sp* bacteria in the air in the room is the flats. Because in the room with an area of 36m², inhabited by more than 4 people, there are many household appliances, the walls of each wall are plywood. In addition, the construction of the flats is inadequate, such as setting up a room ventilation system. Such conditions will make the concentration of dust in the room. Together with these dusts is *Streptococcus sp*, which is one type of microbial pollutant in the air that is often associated with the incidence of pain in humans. Health problems caused by fungi in the house are used by people who have activities inside.

MATERIAL AND METHOD

This study uses an observational analytic research design using a cross sectional approach. In this study independent variables and dependent variables were assessed simultaneously with measurements at one

time. The population in this study were all residential units at Flat D in Sarijadi Flat, Bandung City. Sampling Technique was carried out by purposive sampling with consideration of the occupants of the flat units who were willing to be made as respondents by the criteria: recorded as residents of Sarijadi flats, residing or settling down for a minimum of 5 years and functioning all rooms inside the house⁽⁸⁻⁹⁾.

Measurement of physical air quality is carried out using a room temperature and humidity measuring device as well as lighting intensity measurement devices in the room. The total assessment of *Streptococcus sp* bacteria is carried out by bacterial isolation or culture using blood agar media or blood agar plate, where the airborne samples are taken using a Microbial Air Sample. Occupancy density is assessed by observing using a questionnaire about the number of permanent residents who live in the residential unit. Respondent's behavior was assessed by observing or observing respondents' behavior using questionnaires related to microbes in the air such as routine cleaning of the house and furniture, routine cleaning of windows and ventilation.

RESULTS AND DISCUSSION

Research Location: Sarijadi Village is part of Sukasari District, Bandung City which is included in the Bojonagara development area. Has an area of 157.06 Ha. Sarijadi Village consists of 11 RWs and 100 RTs.

The population of Sarijadi Village reaches 24,485 people with a population density of around 155.9 people/Ha. The Sarijadi Flats complex consists of two different types of residential blocks, namely 11 Long Type Blocks built on the east and 5 Short Type Blocks built on the west with different types of time structures.

Univariate and Bivariate Analysis

Table 1: Descriptive Variable Test Results

No.	Variable	Min	Max	Mean	SD
1.	Level of Room Temperature(⁰ C)	28.1	31.0	29.33	± 0.87
2.	Level of Room Humidity (%)	51.0	71.8	59.33	± 5.87
3.	Natural Lighting Intensity (lux)	8.0	528.0	238.1	± 156.6
4.	Occupancy Density	2	5	3.29	1.04
5.	Respondent Behavior (%)	22.2	88.9	64.83	± 16.29
6.	<i>Streptococcus sp</i> colonies (CFU/m ³)	4	38	18.92	± 8.4

Table 2: Recapitulation using Correlation Test Relationship between Physical Air Quality, Occupancy Density, and Respondent Behavior Score with the Presence of *Streptococcus sp* Bacteria in the Air

No.	Variable	p-value	R	Direction of Relationship	Information
1.	The relation of total <i>Streptococcus sp</i> with room temperature level	0,327	0,209	Positive	Not significant
2.	Relation of Total <i>Streptococcus sp</i> with Room Humidity Level	0,000	0,763	Positive	Significant
3.	Relation of Total <i>Streptococcus sp</i> with Natural Lighting Intensity	0,004	-0,568	Negative	Significant
4.	Relation of Total <i>Streptococcus sp</i> with Occupancy Density	0,042	0,417	Positive	Significant
5.	The relation between total <i>Streptococcus sp</i> and Respondent Behavior	0,212	-0,264	Negative	Not significant

The relation of total *Streptococcus sp* with room temperature level: Variations in the level of air temperature obtained when the measurement and total variation of *Streptococcus sp* bacteria do not show a significant difference or direction of the relationship that is directly proportional, this is due to the air temperature values obtained below the optimum temperature for the proliferation of *Streptococcus sp* bacteria and other environmental factors that affect such media or particles attached to bacteria such as dust and water particles. Like the situation in the field which states that the temperature is optimum enough for the proliferation of *Streptococcus sp* bacteria but low humidity below 85% indicates that the media of water particles that are attached to the bacteria are less than the room which has humidity above 85%.

The results of this study are not aligned with the research conducted by Wulandari (2013) which states that there is a significant relationship between room temperature and the presence of *Streptococcus sp* in the air, but the results of this study are consistent with Aris (2011) research which states that there is no meaningful relationship between room temperature and pathogenic bacteria that cause pneumonia in toddlers⁽¹⁰⁻¹¹⁾.

Relation of Total *Streptococcus sp* with Room Humidity Level: The relationship between humidity and the presence of *Streptococcus sp* bacteria is caused by several houses that have little chance of sunlight entering the house such as houses on the ground floor and the behavior of respondents who rarely open windows and ventilation is permanently closed so that air circulation does not run well and levels water in the air or moisture is concentrated in the room, causing the

growth of bacteria in the air to increase because the humidity of the room becomes an ideal environmental factor for the proliferation of bacteria.

The results of this study are in line with the research conducted by Wulandari (2013) which states that there is a significant relationship between room air humidity and the presence of *Streptococcus sp* bacteria in the air, and research conducted by Mareta (2013) which states that there is a significant relationship between air humidity and bacteria that cause tuberculosis, as well as research by Kamila (2016) which states that there is a significant relationship between air humidity and the number of bacterial colonies in the air⁽¹⁰⁻¹²⁾.

Relation of Total *Streptococcus sp* with Natural Lighting Intensity: The results of the lighting measurements at the flats' residential units showed a value of 8 lux - 258 lux where several houses had natural lighting intensity below the minimum quality standards set based on Regulation No. 1077 of 2011 which states that the minimum lighting is 60 lux.

In general, microorganism cells are damaged by light, especially in microbes that do not have photosynthetic pigments. Shortwave rays will adversely affect microbes. While the light with long waves has photodynamic power and biophysical power, such as sunlight. When the energy of radiation absorbed by microorganism cells will cause ionization of cell components so that it will inhibit the growth and metabolism of cells⁽¹³⁾.

The tendency of more residential units to enter the sun at houses on the upper floors is supported by the habit of homeowners who often open their windows and

doors to reduce humidity caused by leakage of house construction above it so that sunlight entering the house greatly influences the survival of *Streptococcus sp* in the room air in the house.

This is consistent with research conducted by Wulandari (2013) which states that there is a significant relationship between natural lighting intensity and the presence of *Streptococcus sp* bacteria in the air, and research by Mareta (2013) which states that there is a significant relationship between the intensity of natural lighting with pathogenic bacteria causes of tuberculosis, as well as research by Kamila (2016) which states that there is a significant relationship between the intensity of natural lighting and the number of bacterial colonies in the air^(10, 12).

Relation of Total *Streptococcus sp* with Occupancy Density: A narrow building with a suitable number of occupants will reduce the reduction of O₂ in the room so there is no increase in CO₂. If CO₂ levels increase, there will be a decrease in indoor air quality. Because basically organisms that take their energy by photosynthesis or by oxidizing inorganic compounds can use CO₂ as the main carbon source. Bedrooms that are less than 8m² in size and inhabited by more than 2 people can increase CO₂ levels in the air and can increase the proliferation of pathogenic bacteria in the air and one of them is *Streptococcus sp*.

This is not in line with the research by Wulandari (2013) which states that there is no relationship between the density of occupancy with the presence of *Streptococcus sp* in the air, but this study is in line with the research by Mareta (2013) which states that there is no significant relationship between density occupancy with pathogenic bacteria that cause tuberculosis disease^(10, 12).

The relation between total *Streptococcus sp* and Respondent Behavior: Adequate room cleanliness of the environment will be maintained and will reduce the risk of *Streptococcus sp* in the air. But if the room sanitation is bad, it will cause the room to become dirty and dusty. Dust that sticks to the furniture and carpet will make the air inside it moister. If the humid air will cause an increase in temperature in the room and the condition of this humid and high temperature room, *Streptococcus sp* and other bacteria can multiply⁽¹⁴⁾

The insignificant relationship was caused by the score of the behavior of respondents with the total

number of *Streptococcus sp* bacteria in the air which did not have a significant difference. The average respondent has a good behavior score and respondents who have bad behavior tend to have the same bad habits as never cleaning windows and ventilation and rarely cleaning carpets. If the respondent's behavior is bad and at risk of increasing the concentration of dust particles in the air where dust becomes one of the media that is attached to bacteria, it is likely that the bacterial media to breed become many, but the proliferation of bacteria is strongly influenced by environmental factors such as temperature, humidity and lighting, size and specific gravity of dust particles also affects the length of time the bacteria are in the air. If the media attached to the bacteria has a size of > 5 microns, the media and bacteria will fall down and the bacteria will not last long on the floor because the respondent has a habit of cleaning the floor using disinfectants that can kill bacteria so even though the respondent has habits that can increase dust concentration in the air, Other factors can cause bacteria to not survive long in the air if the environmental factors are not optimum for bacteria to grow and multiply.

This is not in line with the research by Wulandari (2013) which states that there is a significant relationship between respondents' behavior in terms of room sanitation and the presence of *Streptococcus* bacteria in the air^(10, 15-16).

CONCLUSION

- a. There is no relationship between the levels of room temperature and respondent behavioral score with the presence of *Streptococcus sp* bacteria in the air in the residential unit of the Sarijadi Village, Bandung City, with a p value > 0.05.
- b. There is a relationship between the level of air humidity in the room, natural lighting intensivity, the number of occupants of the house with the presence of *Streptococcus sp* bacteria in the air in the residential unit of the Sarijadi Village, Bandung City, with a p value < 0.05.

Conflict of Interest: The authors have no conflicts of interest to declare

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Ethical Clearance: Taken from Unit Penelitian dan Pengabdian Masyarakat (UPPM) Committee Bandung Health Polytechnic.

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The Policy of Reproductive Health Education for the Adolescence with Intellectual Disability in Indonesia: A Qualitative Study

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ABSTRACT

Adolescence with disabilities are one of Indonesia's human resources whose quality must be improved to make them play the role as the subjects in health development. The result of the National Socio-Economic Survey in 2012 shows that there are 2.45% of Indonesian people are disabilities. According to the Social Protection Program (PPLS) in 2012, the number of people with disabilities is 3,838,985. This research was a qualitative research with case study design carried out in June - July 2018. The total informants were 27 people coming from different stakeholders related to the reproductive health education for young people with mental retardation. The results of this study show that not all of the relevant stakeholders formulate the policies regarding the reproductive health education for young people with mental retardation. It is only the Ministry of Education and Culture that has formulated a specific policy in the form of reproductive health guidelines for adolescence with intellectual disability. The implementation of these policies is not optimal and is expected to be included in the special education curriculum.

Keywords: *Education, Mental Retardation, Reproductive Health, Adolescence*

INTRODUCTION

Teenagers with disabilities have the same tendency as normal young people in doing the risky sexual behavior.¹The research carried out in the Special Junior High School and Special Senior High School in East Jakarta in 2013 showed that 69.5% of students have risky sexual behaviors such as kissing on the cheeks, masturbation, and others.²

The reproductive health will affect the children's lives in the future including the children with disabilities who need special treatment and control.³There is a commitment to uphold the Convention on the Children's Rights (KHA) and the Convention on the Rights of People with Disabilities (KHPD) which demands the governments around the world to be responsible in ensuring that the

children with disabilities have the equal rights as other children including the right to obtain information related to reproductive health.⁴ In order to realize these demands, a public policy of reproductive health is required for the young people with intellectual disabilities.

Based on the above-mentioned statement, the researchers attempted to examine the extent to which reproductive health education policy for young people with mental retardation in Indonesia.

MATERIALS AND METHOD

This research was a qualitative study using case study design on reproductive health education policy for young people with disabilities. The design of this study was chosen to obtain the immediate and in-depth information related to the reproductive health education policy for young people with mental disabilities; therefore, they can obtain in-depth information.

This research was carried out in 2 months from June to July 2018 consisting of data collection, data processing and analysis, and research activities evaluation stages. In

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qualitative study, the informants are determined based on the principle of appropriateness and adequacy. The informants in this study were:

1. Government Agencies from the Ministry of Health, Ministry of Education and Culture, Ministry of Women's Empowerment and Child Protection, and the Ministry of Social Affairs.
2. Implementers of Teachers or the educators in Special School
3. Other related stakeholders, such as NGOs (Advocacy center for Women with Disabilities and Children/SAPDA) and Rutgers WPF)

RESULTS

Knowledge and Perception: Most of the key informants have good knowledge about the reproductive health of young people with mental retardation. From the aspect of reproductive health, it was explained that those related to reproductive health are things related to sexual organs, hormonal changes, puberty signs, and so on.

The stakeholders' views related to the urgency of the government in formulating the policies about reproductive health education for young people with mental retardation is that reproductive health education policies for young people with mental retardation are essential and necessary to be made. The informant explained that there were many problems related to reproductive health that occurred due to the lack of knowledge and information of the teachers, parents, and young people with mental retardation. The teachers in special schools have not yet carried out the routine programs related to the reproductive health because they were not in the special education curriculum.

Agenda Setting Stage: The agenda setting is the first stage in preparing the policy. In this stage, an effort to raise the problem to the public was done to make this issue to be considered as the important problem that requires the action of public policy. The implementation of agenda setting was carried out by the stakeholders who have an interest in the issue of reproductive health education of young people with mental retardation. All of the key informants have duties and functions related to young people with mental retardation including their reproductive health problems.

Policy Formulation Stage: The policy formulation stage includes informant activities in designing relevant

actions (policies) to overcome the problems related to reproductive health education of young people with mental retardation.

Some informants have carried out the policies formulations related to the reproductive health education of young people with mental retardation, even though not all of them are specifically designing the reproductive health education policies of young people with mental retardation.

Policy Adoption Stage: The policy adoption referred in this study is the informants' activities in adopting policies related to the reproductive health education of young people with mental retardation including the initial step in informing the policies and implementing the policy socialization. Most of the informants have carried out the policy adoption stage.

Advocacy: Advocacy has various meanings. Advocacy is an effort or a process to obtain the commitments made persuasively by using accurate and precise information. All of the informants stated that advocacy is an important stage in formulating policies. Advocacy is conducted to get the superior's support as well as the budget support.

Policy Implementation Phase: Aspects of policy implementation include informant activities in realizing the goals of reproductive health education policy for young people with mental retardation that has previously been declared. In the implementation stage, there are 3 aspects that were examined, namely the program, objectives, and impacts. This stage needs to be well-prepared in the stage of formulation and policy making.

Policy Assessment Stage: The policy assessment stage is the final stage of policy formulation. At the policy assessment stage, monitoring and evaluation were conducted to find out the extent to which the policy has been implemented. The formulation of the specific reproductive health education policy for young people with mental retardation was carried out only by the Ministry of Education and Culture in the form of reproductive health guidelines for mental retardation.

DISCUSSION

Knowledge and Perception: Good knowledge from the informants would certainly influence their behavior in arranging the formulation as an intervention in overcoming the problem. It is based on the theory of

knowledge which states that one level in knowledge is a synthesis process in which one will form new formulations of pre-existing formulations at this stage.⁵ Perception is one's view at an event that is formed by one's hopes and experiences.⁶ When the perception is formed, a person's behavior will be determined which leads to the interpretation of the reality.⁷ Rushbrooke, Craig, & Samantha also state that positive perception will encourage oneself to sexuality education for young people with mental retardation.⁸

Agenda Setting Stage: The policy preparation process is a complex thing that involves many processes and variables that must be studied. There are 5 stages in the public policy preparation,⁹ namely the preparation of policy agendas, policy formulation, policy adoption, policy implementation, and policy assessment or often referred as policy evaluation stages. The first stage in the policies formulation is agenda-setting. It becomes a key step that must be passed in order to put the problem in the government's agenda.

According to Barbara Nelson, the definition of an agenda-setting is the government activities in learning new things, deciding to pay attention, and mobilizing organizations to respond. All informants have formulated the problems that are associated with reproductive health education of young people with mental retardation although it is not specific. Public policy is formulated as a decision that is aimed to resolve particular problems through certain efforts in order to achieve certain objectives carried out by the government agency having the authority to carry out nation duties for the development of the nation.¹⁰

Policy Formulation Stage: One of the important things in the public policy cycle is the arrangement or formulation of the policies. At this stage, the policy analysts frequently find it difficult to propose a policy plan that can overcome the public problems that currently occurred. The Ministry of Health has prepared the Guidelines for the Implementation of Reproductive Health Services for Adults with Disabilities and the Draft of Minister of Health regarding to the Functional Disorders Control. Meanwhile, the Ministry of Education and Culture has compiled the Reproductive Health Guidelines for young people with mental for teachers and parents. The Ministry of Social Affairs has also compiled guidelines, namely the guidelines for the persons with intellectual Disability Persons with Social Rehabilitation although it does not specifically address the reproductive health of retardation.

So far, only the Ministry of Education and Culture that has been assisted by Rutgers WPF, which has formulated the policies related to the reproductive health education of mental retardation in the form of manuals. Meanwhile, the SAPDA institution in Yogyakarta has also compiled a Guide to Sexual and Reproductive Health for young people with mental retardation.

Policy Adoption Phase: In the early stages of adoption, a policy is chosen as a solution to the public problems that occurred. Of the many policy alternatives shown by policymakers, in the end, one of those policy alternatives was adopted.⁹

The aspect of this stage is the availability of the socialization as the initial step in policy adaptation. Based on the interview, it can be known that all of the informants conducted the socialization as the introduction of the policy to the target.

Advocacy: Advocacy is important in developing public policy. It is consistent with the results of the research conducted by Cempaka Rini¹¹ which states that advocacy will arouse the stakeholder awareness to pay attention to the health problems of young people with intellectual disability.

The reproductive health program for young people with intellectual disabilities is very important since everyone has the equal rights related to his or her health. It is in line with the research conducted by Kucuk, Nurgun, & Emine showing that young people with mental retardation who were given the sexual education have the effort to have high self-protection against sexual abuses.¹²

Policy Implementation Phase: The policies that have been formulated will not succeed if the policy implementation stage is not carried out properly. Based on the information obtained through in-depth interviews, it is known that the government (in this case is the Ministry of Education and Culture) has compiled a Reproductive Health Education Policy on Young People with Mental Retardation in the form of guidelines. The implementation of its policies is by conducting trials, training for teachers, and providing assistive devices such as videos. Before the guidelines were established, the reproductive health material is only provided incidentally if the cases occurred at school. The results of the study state that sexuality education is not included in the Special Education (PLB) curriculum.¹⁴

According to Jannah's research, sexuality education in SLB Yogyakarta is only given incidentally, because schools do not have a curriculum on sexuality education.¹⁵ Thus, the teachers do not have guidelines in providing sexuality education to children. Based on the above-mentioned statement, it will be very important to make reproductive health education into the special school curriculum. According to Taiwo, the government is responsible for developing sexual education for special schools.¹⁶

Policy Assessment Stage: In the policy assessment phase, monitoring and evaluation of policy implementation must be carried out. According to the information from the Ministry of Education and Culture (as the only government stakeholder who has formulated policies related to reproductive health education specifically), evaluation activities have not been carried out as the implementation has not been finished.

Special reproductive health modules or guidelines for young people with mental retardation will make the implementation run more systematic and directed. According to UNESCO, a teacher may experience several conflicts while delivering sexuality education. Some teachers may be less confident and confused when experiencing the issues related to sexuality. Insecurity arises since there are no manuals or guidelines which are related to reproductive health in order to explain it to the students with mental retardation. Therefore, teachers really need guidelines to provide a clear overview of what to teach and how to teach it.¹⁶

In addition to the need for reproductive health manuals or guidelines, a curriculum related to the reproductive health in special education is also required. Reproductive health education has not yet become a separated curriculum or has not been included in the special education curriculum in Indonesia. Its implementation, up to this time, is done by integrating several related subjects such as Biology, Science, or Physical Education. The results of this study are in line with the previous studies in which the material related to sexuality and reproductive health in schools is usually given in science, religion, and physical education subjects.¹⁷

At the end of this research, the recommendations that need to be conveyed to the stakeholders as policymakers are to be able to incorporate reproductive health education for young people with mental

retardation into the special education curriculum. Thus, the implementation will later be more systematic. Taiwo states that a separated curriculum on reproductive health is needed in the educational curriculum of children with disabilities.¹⁶

CONCLUSION

1. The policy on reproductive health education has been made by several relevant stakeholders, such as the Ministry of Health, the Ministry of Social Affairs and the Ministry of Education and Culture although it is specifically discussing reproductive health issues.
2. The Ministry of Education and Culture has formulated the reproductive health guidelines for people with mental disabilities that are expected to become a guide for special school teachers and parents in providing the reproductive health education for young people with mental retardation in all provinces in Indonesia.
3. The content of reproductive health in young people with mental retardation is expected to be included in the special education curriculum to optimize the implementation process.

Conflict of Interest: There was no conflict of interest of this study

Source of Funding: by PITTA, Indonesia

Ethical Clearance: Ethical review was conducted in accordance with the procedures at the Faculty of Public Health of the Universitas Indonesia and was approved by the Health Research Ethics Committee of the Faculty of Public Health of the Universitas Indonesia

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Artificial UV Radiations Emitted from Different Types of Lamps

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ABSTRACT

UV-rays produced in two ways natural and artificial; there are some difficulties in determined the first because it created from the sun in various types of UV-rays therefor it's not easy to study its effects on human body. In the present study selected a different lamps (18,40,60) watts and also a halogen lamp used in the thermodynamic Laboratory in physic department, college of science university of kerbala to calculate the intensity of emitted rays and determined the wavelength of radiation from its lamps in any region of UV-rays. The results show that the radiation is located within regions of ultraviolet rays, according to the radiated intensities and wave length from spectra of the lamps. The conclusion can be explained that the lamps emit ultraviolet radiation; so that they pose a health hazard to the population.

Keywords: Electromagnetic spectrum, Artificial UV Radiation, Ultraviolet (UV) Light Spectrum, emission of UVA and UVB rays by lamps.

INTRODUCTION

UV is the short wavelength radiation and the most energy of non-ionizing radiation in the electromagnetic spectrum lies within the wavelength range (100 - 400 nm) see Figure 1. The short wavelength of the UV region is often taken as a boundary between the ionizing radiations spectrum that its wavelengths less than 100 nm and the non-ionizing spectrum that its wave length larger than 400nm. UV can be classified into three regions UVA (315 - 400 nm), UVB (280 - 315 nm) and UVC (100 - 280 nm) regions

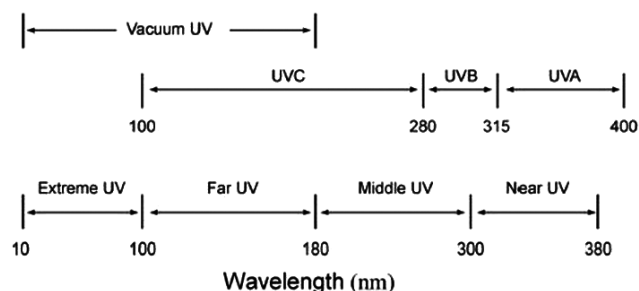


Fig. 1: Ultraviolet (UV) regions of the electromagnetic spectrum

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Exposure to UV radiation occurs from natural and artificial sources. The sun is the main source of exposure for most people. Solar UV is subject to large absorption of the atmosphere. With the depletion of the stratospheric ozone layer, the environment will be exposed to higher ultraviolet radiation. A fluorescent lamp is a gas discharge source that contains mercury vapor at low pressure, with a small amount of inert gas to start up. Once the arc is created, mercury vapor is emitted from ultraviolet radiation. Fluorescent Powder (Phosphor) Interior Wall Paint The glass bulb responds to this ultraviolet radiation. It is generally believed that the long UV effects on human skin are harmless. Responses to UVA alone, UVA plus sunlight, sunburn, and single sunburn radiation were evaluated both clinically and microscopic, the results showed that there were no effects on the skin but the effect on DNA metabolism occurs ^[1]. The distribution of the spectral power SPD, used to compare the light emitted by the flaming wick, has a smooth continuous SPD across the visible spectrum, and the light from a fluorescent lamp has a low-level SPD with separate screws at specific wavelengths. The light emitted by the LED is distributed smoothly but in a narrow area near one wavelength. The type of gas discharge of the lamp is classified into two sets of high or low pressure. Low pressure gas discharge sources are low-pressure sodium fluorescent lamps and Mercury vapor. High pressure gas discharge sources are sodium lamps and halogen

lamp^[2]. A study examining the emission of UVA and UVB radiation by lamps and electronic screens has been measured to determine the safe distance between the emitted source and the individual. The conclusion that lamps and electronic devices does not emit ultraviolet light, so as not to pose a health hazard to the population^[3]. Lamps are studied and their applications; a lamp is a device that produces visible light due to the flow of electric current. It is the most common form of artificial lighting and is essential for modern society, providing interior lighting for buildings and outdoor light for evening and night activities. Types of lamps also have many applications in various sciences. Fluorescent lamps are a special class of gas discharge lamps where the electricity often produces an invisible UV light that turns into visible light by a special phosphoric coating on the inner part of the tube^[4]. The effects of artificial light exposure on insect behavior were studied. The ultraviolet component of artificial lighting can greatly reduce its attractiveness, providing a powerful ability to control the impact on insects. Traditionally, the gravity of an insect lamp is calculated using a luminous efficiency spectrum of insect rhodopsin. This has enabled the development of lamps emitted by radiation with less visible wavelengths for insects (i.e., yellow lamps). After testing the number of insects attracted to the lamp is disproportionately affected by the emission of ultraviolet radiation. UV radiation stimulates the approach to light independently of the amount of UV radiation emitted. Thus, even small amounts of ultraviolet radiation should be controlled in order to develop bug-free lamps^[5]. UV exposure is one of the most important environmental health risks, which clearly explains age-related skin changes such as wrinkles, melanomas, laminations and carcinogenesis due to complex societal factors such as professional and recreational activities. New methods are designed to exploit these signaling pathways to delay or even prevent the symptoms of free radical radicalization of aging using natural extracts^[6]. The fundamental objective of this work is to investigate the emission of artificial UV-Radiation from lighting lamps, UV-VIS Spectroscopy and Spectra wiz program are used to determine the type of UV accompanied with radiations of lamps, The testing contains lamps of different power working under the electric discharge phenomena, also used a halogen lamp in testing. In this work the distance between source(lamps) and the sensor is constant because the effects of electromagnetic radiation depend on the distance between source and target according to inverse-square law.

Gas discharge lamps: The principle of the gas discharge lamp depends on the conversion of electrical energy into radiation by an electric discharge in the gas in the lamp. In these lamps the plasma is created weak or moderately moderate. Plasma is ionized gas consisting of electrons, ions and neutrality. In general, gas is found in a discharge tube with two electrodes; after the plasma is created the UV probe is investigated. Lighting lamps produce light by passing the electric current through a gas that emits light when ionizing from the current. Two general categories of discharge lamps are used to provide illumination: high intensity discharge and fluorescent lamps. High-pressure mercury vapor lamps and high-pressure sodium lamps are produced by electrical discharge, the first by electrical discharge through gaseous mercury and the second by common vapors of mercury and sodium, mercury, usually with argon gas, contained within the quartz arc tube, which surrounds .It has an external bulb of borosilicate glass. Xenon lamps do not contain mercury vapor. They contain xenon gas, kept in the pressure of many atmospheres. Xenon lamps are available in panels from 5 to 32000 watts. Fluorescent lamp is a gas discharge source containing mercury vapor at low pressure, with a small amount of inert gas to start. Once the arc is created, mercury vapor is emitted from ultraviolet radiation. Fluorescent powders that cover the inner walls of the glass bulb respond to this ultraviolet radiation by transmitting the wavelengths in the visible region of the spectrum. In a glass tube, a small drop of mercury is placed and a small amount of argon gas to start discharge. The pressure, voltage and current are adjusted until 253.7 nm lines are stimulated. This re-radiates the longer wavelength. Typically a 40W lamp requires 2-3g of phosphorus. The maximum sensitivity is about 250 - 260 nm^[7].

However, predilection of the emissions and risk of mercury from fluorescent lamps reported by^[8] to both humans and the environment during the production and disposal, mercury was highly toxic mercury binds to cell walls or microorganisms .The basic process that occurs in the discharge can be described as the electrons are accelerated by an electric field imposed from the outside. Their velocity will be scattered in random directions by a flexible and inflexible collision with heavy particles. The result of this thermal heating is high electron temperature. In the case of an inflexible collision, the kinetic energy of the electrons is converted to the inner energy of the atoms. These intrusions are essential for chemical processes, such as excitation, ionization, disintegration, and radiation generation. When the pressure is average or high (generally from hundreds of

Torr to many environments, such as HID lamps), there are enough inert gas molecules in the elastic and inelastic collisions. More energy can be transferred to the plasma gas, making the discharge near the arc discharge system, and the heat makes physical or chemical changes to halide metal or metal happen^[9].

Experiment Part: In this work, different lightning lambs were selected with different power (18, 40 and 60) watts to estimate ultraviolet emission. Using spectral UV spectra with Spectra wiz program to determine the spectra of the rays emitted by the lamps (see Fig. 2), the original 8 is useful in drawing the results, the spectral analysis shown in the image of peaks of colored peaks due to the difference in the wavelength of each line of the other



Fig. 2: UV-Visible Spectroscopy (SV2100, K-MAC)

This experiment can be briefly summarized as a luminance source (lamps) and a detector sensor is created in a straight line in order to reduce the dispersion of radiation at a fixed distance according to the fact that the radiation intensity of the inverse square law is adjusted (see Figure 3). The relationship between wavelength and intensity obtained using the wiz spectra and the original 8 programs after connecting the computer with the spectral analysis. The last step is the spectral analysis.



Fig. 3: Photograph of a halogen lamp experiment

The spectra of lamps with different powers (18, 40, 60) watt was determined by using the UV-Visible spectrometer (SV2100, K-MAC) referred to in Figure 2. We were able to analyze the spectrum by determining the high intensity and wavelength values of the lamps using the Origin 8 software to explain the spectrum after Spectra wiz was installed on the lap top. The spectrum shows that these lamps and a halogen lamp emit ultraviolet rays.

RESULTS AND DISCUSSION

It is widely known that electromagnetic radiation greatly affects living organisms, including humans. Exposure to ultraviolet radiation may be natural, artificial and for long periods have serious and chronic health effects on the skin, eye and immune system of the body, also see ref. ^[10]. lamps of different power produce ultraviolet radiation by ionizing mercury vapor with a low-pressure atmosphere. The phosphorus powder that encapsulates the inner part of the tube absorbs that radiation and converts it into visible light. The wavelength of the main mercury emissions is in the ultraviolet range. It is dangerous to expose the eyes or skin directly to the illumination of the mercury arc, which does not contain the converted phosphorus. Mercury illumination is often determined at wavelengths; other sources of ultraviolet light are xenon lights, deuterium, xenon-mercury lighting, metal halide lamps and finally tungsten halogen lamps. Figures (4, 5, 6 and 7) show the spectrum of lamps (18, 40 and 60) watts and halogen lamp respectively.

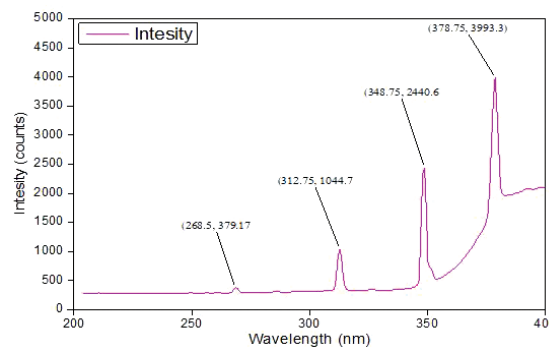


Fig. 4: Spectrum of a (18watt) lamp

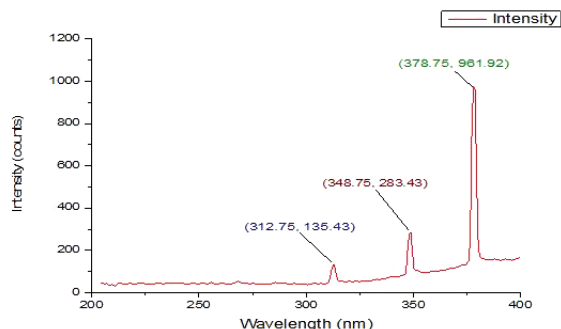


Fig. 5: Spectrum of a (40 watt) lamp

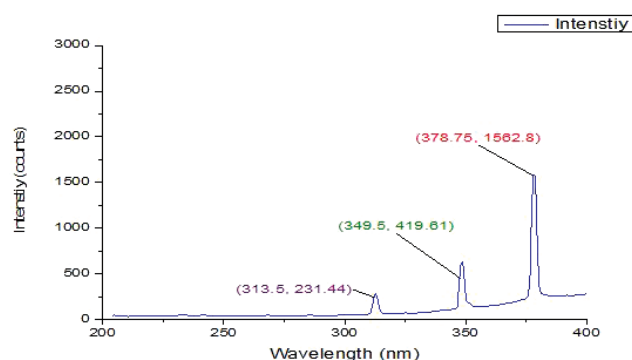


Fig. 6: Spectrum of a (60 watt) lamp

It is clear from figures (4,5, and 6) that the luminescent intensity of the lamps depends on the amount of energy it consumes. Fig.4 shows the peak intensity value (3993.3) appears at wave length 378.75 nm this means the lamp emitted UV-ray at UVA region, at the same way peak value(2440.6)at 348.75 nm but peak value (1044.7) at 312.75 nm at UVB region and (379.17)at 268.5nm at UVC region.Fig.5 and 6 illustrated all the peak intensity values Located at UVA region approximately(see the table below).

Table 1: shows the peak intensity value and wave length for different power lamps

Lamp power watt	intensity	Wave length nm	UV-region
18	3993.3	378.75	UVA
	2440.6	348.75	UVA
	1044.7	312.75	UVB
	379.17	268.5	UVC
40	961.92	378.75	UVA
	283.43	348.75	UVA
	135.43	312.75	UVB
60	1562.8	378.75	UVA
	419.61	349.5	UVA
	231.44	313.5	UVB

Table.1 shows the peak intensity value not only depends on energy consumption but also on the manufacture company such as 18 watt emitted intensity 3993.3 at wave length 378.75nm while 40 and 60 watts emitted intensity 961.92 and 1562.8 respectively at 378.75 nm

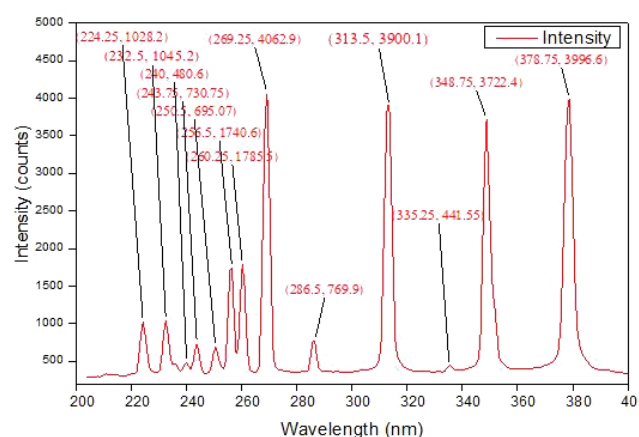


Fig. 7: Spectrum of a halogen lamp 18 watt

Spectrum of halogen lamp illustrated in fig.7 show the high peak value intensity appears at UVA region(378.75 nm) and the peak intensity value 1028.2 appears at UVC(224.25 nm), it is clear that the spectrum of halogen lamp emitted radiations at all regions of UV-ray.

CONCLUSION

All lightning lamps emitted UV-rays at different wavelengths; the effects of UV emitted from lamps depend on the manufacture company, energy consumption, distance from source and the exposure time. Street vendors who use mobile vehicles use lamps in a manner that is not reliable in terms of the number of lamps and the distance of the source is one meter away from the seller. Students and staff at the Thermal Lab at the Physics Department of the Faculty of Science were directed not to look directly at the halogen lamp that used in the experiments of the thermal laboratory of the second stage for its effects.

Significant Statement: It is well known that electromagnetic radiation has an effect on humans and other living organisms, one of our radiations is ultraviolet rays, because of difficulty on measuring the ultraviolet rays coming from the sun, therefore we determine the artificial UV-rays emitted from lightening lamps which are used commonly by many people.

Ethical Clearance: In fact, the research was done in the laboratory of thermodynamic at Department of Physics, Faculty of Science, University of Kerbala within the plan of the annual research, the aim is to explain the effects of UV-radiation emitted from using halogen lamps on students during perform the experiments, and there is no conflict or contradiction with any government or private

sector and there was no external funding, researchers used laboratory apparatus of the College.

Source of Funding: Self-funding

Conflict of Interest: Nil

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Accuracy of Ultrasound in Comparison to Magnetic Resonance Imaging in Diagnosis of Meniscal Tears

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ABSTRACT

Background: Meniscal tears has significant impact on patients quality of life so early diagnosis by a simple cheap non invasive investigations is important.

Objective: To assess accuracy of ultrasound (US) in comparison to magnetic resonance imaging (MRI) in diagnosis of meniscal tears.

Patients and Method: This diagnostic accuracy study involved 50 patients with clinical features of meniscal tears. Ultrasound and MRI were done for each patients. US was read by a single radiologist blinded to the result of MRI and its diagnostic accuracy was measured.

Results: No significant difference between US and MRI in detecting meniscal tears. Diagnostic accuracy of US was 70%, sensitivity 91.4 %, specificity 20%, Positive predictive value (PPV) at pretest 50% was 53.3% and PPV at pretest 90% was 91.14% , Negative predictive value (NPV) at pretest 10% was 95.4%, Likelihood ratio positive (LR+)= 1.04 , Likelihood ratio negative (LR-) = 0.86, Diagnostic Odds ratio (DOR)= 1.21 95% confidence interval (CI)=0.2589 - 5.64.

Conclusions: US has good diagnostic accuracy compared to MRI in detecting meniscal tears. This may suggest that US can be used instead of MRI in clinical practice. It is simple and relatively cheap investigation.

Keywords: Meniscal tears, Ultrasound, Magnetic resonance imaging, diagnosis

INTRODUCTION

Meniscal injuries are common with significant morbidity and impact on patients activity of daily living and quality of life⁽¹⁾. The diagnosis of meniscal pathology is mostly by clinical assessment, magnetic resonance imaging (MRI) and or arthroscopy. Early and accurate diagnosis is vital for determining a precise suitable and correct treatment in addition to accurate prognosis of the patients to return to function in short time⁽²⁻⁵⁾.

Although MRI is the gold standard imaging for diagnosis of meniscal pathology, however its performance may take time of weeks to months in

addition to other drawbacks like being costly, not available in all centers, misdiagnosis of 14-47% of cases and claustrophobia⁽⁶⁻⁸⁾. Ultrasonographic examination is a promising simple, portable, safe, less cost, and effective tool for diagnosis of meniscal injury⁽⁹⁻¹¹⁾. Yet, there were limited studies on the use of ultrasound in diagnosis of meniscal pathology⁽¹²⁻¹⁴⁾. This study was designed to evaluate the accuracy of US in comparison MRI in diagnosis of medial meniscal tears

PATIENTS AND METHOD

Study design: This observational cross sectional diagnostics accuracy study was conducted at Orthopedic and Rheumatology Units at Baghdad Teaching Hospital from August 2013 to August 2014.. We compared US with MRI for diagnosis of meniscal injury and assessed the diagnostic accuracy of US.

Participants: Eligible Patients with age >18 years and had knee pain were included in this study. Exclusion

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criteria included patients who other comorbid systemic diseases, taking medications like corticosteroids and diuretics or evidence of loose bodies on plain radiographs, or any prior surgery that may cause knee pain.

Measurements: Data collection included age, sex, history of trauma, knee pain, tender joint line, positive McMurray's test, and positive Apply test for meniscal injury performed by an orthopedist. Ultrasound (Netherland, Phillips, HD 11XE, transducer L12-3) and MRI of the affected knee joint was performed using extremity coil with Philips Achieva 1.5 tesla MRI device using a standard imaging protocol in sagittal, coronal and axial planes. No contrast media were administered. A single expert radiologist performed the US and read it and another expert radiologist read MRI scans who was blinded to the result of US reading.

STATISTICAL ANALYSIS

Statistical software (SPSS version 23, IBM, USA) was used for data input and analysis. Kolmogorov-Smirnov test was used to assess the normal distribution of continuous variables. Normally distributed continuous variables were presented as mean $\pm$ standard deviation (SD) and categorical variables were presented as numbers and percentiles. Sensitivity, specificity, positive

predictive, negative predictive values and accuracy, LR + , LR - , DOR were calculated using the 2 $\times$ 2 table. P-value < 0.05 was considered statistically significant.

RESULTS

A total of 50 patients involved in this study. Of those Males were 36 (72%) Mean age of the patients was 35.44 $\pm$ 12.09 years.

Meniscal tear diagnosed by US was detected in 35 (70%) patients and was absent in 15 (30) patients. While in MRI medial meniscal tears were detected in 44 patients (88%) and were absent in 6 (12%) patients. There was no statistical significant difference between US and MRI ($p=0.35$) as shown in Table 1. Percent of agreement between US and MRI was 70% and Krippendorff alpha was= 0.11

Diagnostic accuracy of US was 70% in comparison to MRI with sensitivity 91.4 %, Specificity 20%, and PPV at pre test probability 50% was 53.3%, and PPV at pretest probability 90% was 91.14%, and NPV at pretest probability 10% was 95.4% , LR+ = 1.04, LR - = 0.86, DOR (95%CI)=1.21 ([0.2589 - 5.64] as in shown in Table 2 so US was a valid and a reliable test to discriminate and diagnose Meniscal injury

Table 1: Comparison between ultrasound and magnetic resonance imaging in detecting medial meniscal tears

Variables	Ultrasound	Magnetic resonance imaging	P value	Percent of agreement	Krippendorff alpha
Meniscal tear present	35 (70%)	44 (88%)	0.35	70%	0.11
Meniscal tear absent	15 (30%)	6 (12%)			

Table 2: Validity parameters of Ultrasound in diagnosis of medial meniscal tears in comparison to magnetic resonance imaging

Test	Validity parameters
US for diagnosis of Meniscal tear	Sensitivity = 91.4 % Specificity = 20% Accuracy = 70% PPV at pretest probability 50% = 53.3% PPV at pretest probability 90% = 91.14% NPV at pretest probability 10% = 95.4% LR positive = 1.04 LR negative = 0.86 Diagnostic odd ratio (95%CI)=1.21 ([0.2589 - 5.64])

PV, positive predictive value, NPV, negative predictive value; LR, likelihood ratio

DISCUSSION

This study evaluated US imaging in comparison to MRI for diagnosis of meniscal injury. It showed that US imaging was not significantly different from MRI and has a good percentage of agreement and was a valid reliable measure to differentiate meniscal injury cases from those who were normal. In addition, US has good accuracy with excellent PPV at pretest probability of 90% and Excellent NPV at pretest portability of 10%.

These findings are clinically important because it will help for early diagnosis and treatment with subsequently better prognosis and response of patients with simple, easy, relatively cheap and more applicable tool compared to MRI.

The current study agreed with other studies which reported that US was a valid and accurate tool to diagnose meniscal injuries. Cook et al evaluated MRI versus US to assess meniscal abnormalities in acute knees and demonstrated that US examination of the knee was effective diagnostic tool for meniscal pathology with potential advantages over MRI. Based on these data and available portable equipment, ultrasonography could be considered for use as a point-of-injury diagnostic modality for meniscal injuries ⁽¹⁵⁾.

Mahdy et al determined the clinical usefulness of ultrasonography for diagnosis of meniscal pathology in patients with acute knee pain and compared its diagnostic accuracy to MRI in a clinical setting and concluded that ultrasound was useful for the screening of meniscal tears but detection of the morphology of meniscal tears seems insufficient ⁽¹⁶⁾. Akatsu et al assessed the accuracy of high-resolution ultrasound in the diagnosis of meniscal tears compared with arthroscopic examination and suggested that US examination may be suitable for screening of meniscal tears ⁽¹⁷⁾. Muresan et al evaluated the accuracy of US examination for the identification of meniscus injuries, in comparison with magnetic resonance imaging (MRI), using the arthroscopy as reference and concluded that US was able to identify the medial and lateral meniscus injuries with an accuracy comparable to that of MRI examination ⁽¹⁸⁾. Anatolia et al investigate the role of Ultrasound (US) in the diagnosis of meniscus degeneration and tears as compared to Magnetic resonance imaging (MRI) and arthroscopy ⁽¹⁹⁾.

This study has some limitations: 1st: cross sectional with small sample size. 2nd short duration of study, and the sampling was convenient. However, these can be solved by a prospective large cohort study. In spite of these limitations, the current study is the first study in Iraq that assessed US compared with MRI for diagnosis of meniscal injury with strict inclusion and exclusion criteria and blinded evaluation for comparison between US evaluator and MRI assessor.

CONCLUSION

Ultrasound has good diagnostic accuracy compared to MRI in detecting Medial meniscal tears. This indicates that US may be used as alternative to MRI in clinical practice. It is simple, valid, reliable, and relatively cheap investigation.

Conflict of Interest: The authores declare that there is no conflict of interests between them.

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Ethical Clearance: Ethical approval was obtained from the Ethics Committee of University of Baghdad, College of Medicine, Medical Department and Informed consent was obtained from each participant included in this study.

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The Different Intake of Energy and Macronutrient on Weekdays and Weekend among Adolescent in Urban City

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ABSTRACT

Background: Prevalence of over nutrition in adolescents has increased every year in the world. Over nutrition in adolescents can impact on metabolic syndrome, mental health problems, and decreased academic achievement. Over nutrition caused by various factors including food intake. During weekends some people use more time to relax and not control their food intake. Increasing food intake on weekends contributed to cause an increasing body weight at the weekends.

Objective: To analyze the differences energy and macro nutrient intake during weekdays and weekends in adolescents.

Method: The design of this study was cross sectional on students of senior high school aged 16-18 years with total sample was 82 people. Data were obtained using a recall questionnaire to determine food intake and anthropometric measurements of weight and height to determine the nutritional status.

Results: In boys and girls there is an increasing of energy and macro nutrients intake on weekends compared to weekdays. A total of 46 students were gain their body weight on the weekend. In girls energy intake increased 35.04 kcal, carbohydrate 11.82 grams, fat 0.03 grams and protein 3.15 grams. Whereas in boys energy intake increased 34.33 kcal, carbohydrate 11.02 grams, fat 10.25 grams and protein 2.85 grams. The average weight gain in girls was 0.35 kg and 0.31 in boys. Adolescent with the increased of energy intake on weekend risked higher 4.133 to gain the body weight on weekend day

Conclusion: To prevent weight gain and over nutrition, adolescents better to pay attention of their food intake on weekends both in terms of quantity and quality.

Keywords: macronutrient, obesity, weekend, weekdays

INTRODUCTION

Obesity was a condition that caused a negative effect on health. In the world obesity more common in women with a prevalence 15% and men 11%.¹ Adolescent female had more risk of obesity than adolescent male. Adolescent female saved more excessive energy as stored fat, while adolescent male use excessive energy to

synthesize protein. When physical maturity occurs, the number of body fat in adolescent female usually twice more than adolescent male. This accumulation fat occurs in the area around the pelvis, breasts, and upper arms.²

Obesity adolescents with BMI above 95 percentile had greater risk of emotional stress compared to their peer who have normal status. Obesity and overweight in adolescents had an impact on the occurrence of metabolic syndrome problems, mental health, and decrease in academic achievement.^{3,4,5} Adolescents obese who had a few friends were more likely to isolate theirselves from their social environment and had higher risk of depression than normal adolescents.⁶

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The NHANES (National Health and Nutrition Examination Survey) data from 2001-2004 and 2009-

2012 showed that there was an increased prevalence of over nutrition in children and adolescents aged 2-19 years in United State and Canada from 16.6% to 17.5% and from 12.4% to 13%.^{7,8} In Indonesia based on data from the Basic Health Research in 2013 found that prevalence of adolescents with over nutrition aged 16-18 years was 7.3% and prevalence in east java was 8.2%.⁹ This research was conducted at 5 Senior High School in Surabaya because in the previous research study showed a percentage of students who were overweight was 33.1% and obese 8.9%, this percentage value exceeds the value of Province.¹⁰

Obesity is influenced by many factors, including factors genetic, energy intake, physical activity, environmental and emotional.^{11,12} In several literature studies shown that in adolescents male and female there was an increased in energy and macro nutrients intake on weekends compared to weekdays. Longitudinal studies conducted in the United States using NHANES survey data showed that at the weekend the average of total energy intake increased 82 calories higher than weekdays.¹³ Protein intake in girls was 10-15% higher on weekends than in weekdays and boys' average protein intake also increased at the weekend. On weekends the average of fat intake for boys was 7-15% higher and in women increases more than 20% compared to weekdays. Whereas carbohydrate intake for girls was increased 12-15% and boys 7% on weekend compared to weekdays.¹⁴

Longitudinal studies in the United States divided subjects into reducing calories group and increasing physical activity group showed that there was an increases of energy intake and body weight 0.077 kg per week. Although relatively small increasing but could have an impact of 4 kg increases in one year if the pattern of increased food intake on weekend continued.¹⁵ The purpose of this study was to analyze the differences of energy and macronutrients intake during weekdays and weekends in adolescents who live in urban areas.

METHOD

This study was an observational study with cross sectional study design. The location of the study was at 5 Senior High School in Surabaya. The study population was adolescents aged 16-18 years both male and female. This study was performed in April - September 2018. Students who were willing to take part in the study will be measured anthropometry body weight using digital scales with a precision level of 0.1 kg, height measurements using a stadiometer with a precision level of 0.1 cm, and filling questionnaires characteristic data. Body weight was measured in morning before starting studied in 3 times. The study did not conducted during the exam period, students who were athletes and who still programming diet will be excluded from this study. The number of samples in the study was 82 students and randomly selected. Respondents' food intakes were measured using food recall 24 hours in 4 times that were 2 times on weekdays and 2 times on weekend. Food recall data will process using the Nutrisurvey application to determine the amount of energy, carbohydrate, fat, and protein intake. Then the average energy and macronutrients intake on weekdays will be compare to weekend. While the nutritional status of respondents was determined using application of WHO Anthro Plus for aged 6 to 18 using weight, height, and respondent date of birth data.

RESULTS

From the results of the study on 82 respondents in 5 Senior High School Surabaya, the distribution of nutritional status of respondents who were classified as underweight was 2.4%, normal 69.5%, overweight 9.8% and obesity 18.3%. Table 1 told about the characteristic of respondents showed that most of respondents were in class XI (65.9%), the average age of respondents was 16.33 ± 0.47 years and male adolescent got more average pocket money (Rp. 23094) than female (Rp. 21740).

Table 1: Characteristic of subjects

Variable	Male (n = 32) Mean $\pm$ SD	Female (n = 50) Mean $\pm$ SD	Total (n = 82)
Aged	16.38 $\pm$ 0.49	16.30 $\pm$ 0.46	16.33 $\pm$ 0.47
Class			
XI	20	34	65.9%
XII	12	16	34.1%
Pocket money	23093.75 $\pm$ 11453.58	21740 $\pm$ 14688.34	22.268.29 $\pm$ 13.459.63

Conted...

Nutrition status			
> 1SD	19	40	72%
≤1 SD	13	10	28%
Physical activities (met)			
Heavy	5	7	14.6%
Light-moderate	27	43	85.4%

Table 2: Energy and macronutrient intake on weekdays and weekend

Food Intake	Male (n = 32) Mean ± SD	Female (n = 50) Mean ± SD	Total (n = 82)
Weekdays			
Energy (kcal/day)	2035.96 ± 141.43	1888.60 ± 115.78	1946.11 ± 144.89
carbohydrate (gr/day)	229.61 ± 23.89	212.68 ± 29.77	219.29 ± 18.49
Fat (gr/day)	88.05 ± 14.06	81.71 ± 15.13	84.18 ± 14.35
Protein (g/day)	78.17 ± 13.48	77.19 ± 16.71	77.57 ± 15.45
Body weight	66,21 ± 16,26	54,57 ± 13,43	59.11 ± 15.58
Weekend			
Energy (kcal/day)	2070.29 ± 161.10	1923.64 ± 146.19	1980.87 ± 167.46
carbohydrate (gr/day)	240.63 ± 31.92	224.49 ± 33.85	230.79 ± 33.85
Fat (gr/day)	85.19 ± 14.06	78.56 ± 15.13	81.15 ± 14.98
Protein (g/day)	88.42 ± 26.03	77.16 ± 11.28	81.55 ± 2.11
Body weight	66,45 ± 16,28	54,66 ± 13,50	59.26 ± 15.66
Difference in food intake			
Energy (kcal/day)	34.33 ± 131.60	35.04 ± 132.35	34.76 ± 131.24
carbohydrate (gr/day)	11.02 ± 41.77	11.82 ± 46.88	11.51 ± 44.69
Fat (gr/day)	10.25 ± 30.55	-0.03 ± 20.81	3.98 ± 25.39
Protein (g/day)	-2.85 ± 13.57	-3.15 ± 21.01	-3.03 ± 18.36
Body weight	0,31 ± 0,16	0,35 ± 0,17	0,15 ± 0,36

Table 2 showed that there were differences in energy and macronutrients intake both in male and female adolescent on weekdays and weekends. Overall, the average male adolescent intake was significantly higher than female adolescent, except for protein intake during weekdays. However, it was found that there was no significant difference in changes of food intake between weekdays and weekends in male and female adolescent.

Table 3: Energy and macronutrient intake on weekends and the association with weight gain

Asupan Makan	Kasus (Mean ± SD)	Kontrol (Mean ± SD)	P value	OR
Weekdays				
Energy (kkal/day)	1929.62 ± 139.84	1967.18 ± 150.44	0.246	
carbohydrate (gr/day)	215.98 ± 29.99	223.51 ± 26.78	0.241	
Fat (gr/day)	84.53 ± 15.9	83.74 ± 12.30	0.807	
Protein (g/day)	74.98 ± 12.85	80.89 ± 17.88	0.086	
Weekend				
Energy (kkal/day)	2031.76 (1720.05 – 2495.4)	1915.84 (1704.7 – 2153.3)	0.005	
carbohydrate (gr/day)	234.09 ± 38.45	226.58 ± 26.82	0.429	
Fat (gr/day)	84.30 ± 16.11	77.12 ± 12.52	0.039	
Protein (g/day)	82.18 ± 16.59	80.75 ± 22.22	0.553	

Conted...

Difference in food intake Energy				
Increased (People)	40	5	0.002*	4.133
Decreased (People)	6	31		
Carbohydrate				
Increased (People)	30	22	0.702	1.193
Decreased (People)	16	14		
Fat				
Increased (People)	22	12	0.186	1.833
Decreased (People)	24	24		
Protein				
Increased (People)	27	16	0.200	1.776
Decreased (People)	19	20		

*significant, $p < 0.05$

Based on table 3 showed that there was a significant association between increasing energy intake and weight gain on weekends with p value score 0.002 and odds ratio 4.133, it means that respondents who increased intake of energy on weekend 4.133 risked gained their weight on weekends.

DISCUSSION

Carbohydrate, fat and protein nutrients were source of energy for the body that was needed for daily activities.¹⁶ Consumption excessive macronutrient will be stored in form fat reserves. Excessive accumulation of fat in fat tissue causes individuals being over nutrition. The prevalence of over nutrition (overweight and obesity) in this study was 28% that occur in 20% of female adolescent and 40.6% of male adolescent. The results showed that in adolescent male and female during weekdays there were significant differences in energy, carbohydrate and fat intake. However, on weekend energy and all of macronutrient intake were significant difference. When energy intake greater than the energy released, it causes energy imbalances in the body and can be impact to an increase of body fat mass.¹⁷

The results of this study show that there was an increased energy intake on weekend both in adolescent male and female with an average increased 35.05 kcal in adolescent female and 34.33 in adolescent male. This was in line with the cross-sectional study in children aged 10 years and over, who showed that intake of energy on weekend increased 8% compared to energy

intake during weekdays.¹⁸ nutrients, and food groups intake between days of the week and weekend days in the Brazilian population. METHODS We used data from the first National Food Survey (2008-2009 Longitudinal studies conducted in America also stated that the average intake energy on weekend increased 82 calories higher than weekdays.¹³

Carbohydrates were the main energy source for the body. Excessive carbohydrate intake will be stored in form of glycogen in liver and muscle tissue, and some of it will be converted into fat and stored in fat tissue.¹⁶ In this study there was an increases carbohydrate intake on weekend 11.82 grams in female adolescent and 11.02 grams in male adolescent. In line with longitudinal studies conducted in high school student in Netherlands stated that carbohydrate intake of female adolescent was 12-15% higher on weekends, while male adolescent increased 7% higher. In male adolescent, carbohydrate intake increases with age, whereas in women decrease with increasing age.¹⁴ In addition, research in Brazil also stated that the contribution of carbohydrates to daily energy intake on average 4% lower on weekdays than on weekends.¹⁸ nutrients, and food groups intake between days of the week and weekend days in the Brazilian population. METHODS We used data from the first National Food Survey (2008-2009

Excessive accumulation of fat in fat tissue causes individuals being over nutrition. In this study the average fat intake on weekends increased 3.15 grams in female adolescent and 2.85 grams in male adolescent.

Longitudinal research in adolescent high school students in the Netherlands stated that compared to fat intake during weekdays the average fat intake on weekends increased 7-15% in male adolescent and increased more than 20% in female adolescent.¹⁴ In addition, cross sectional studies in Brazil also showed a higher percentage of total fat, saturated fat and trans fat intake on weekends than weekdays. In this study showed that in female adolescent increased of fat intake on the weekend had relation with body weight gain.

Protein was a nutrient that has various important functions in the growth and maintenance of body cells, hormone formation, regulating water balance, antibody formation, transporting nutrients, and energy sources.¹⁶ Excessive protein intake will stored in form of triglycerides and can causes an increased fat tissue which affected to nutritional status.¹⁹ The results of this study showed that the average protein intake at the weekend increased 0.03 grams in female adolescent and 10.25 grams in male adolescent. Longitudinal studies in high school student in Netherlands school also stated that female adolescent have 10-15% higher protein intakes on weekends than on weekdays. Whereas in male adolescent also showed a high average protein intake on weekends. Both on weekdays and weekends, animal protein intake twice more consumed than protein intake from vegetable sources.¹⁴

In this study, 46 of students gain their body weight over the weekend. Compare to weekdays the average of body weight at the weekend increased 0.35 kg in female adolescent and 0.31 in male adolescent. According to McCarthy, a consistently increase in food intake every weekend has a significant impact on body weight for one year. An increases of 100 kcal every weekend for a year causes an increases 2 kg of body weight which contributes to an increasing the prevalence of overweight and obesity.²⁰ Longitudinal studies in America also showed an increases 0.077 kg in body weight on weekend. Even though it was small, but it has an impact of 4 kg increased body weight in one year if the pattern of increasing intake on weekend continues.¹⁵ This study showed that increasing intake of energy and macronutrients on weekend had an effect on weight gained. Adolescent with the increased of energy intake on weekend risked higher 4.133 to gain the body weight on weekend day

CONCLUSION

The result of this study was 28% of respondents were classified as having nutritional status overweight and obesity. Both male and female adolescents had increased energy and macronutrients intake on weekends compared to weekdays. A total of 46 student in this study gained their weight on weekend. Adolescent who increased their intake of energy on weekend 4.133 risked gained their weight on weekend. Adolescents better to pay attention of their quantity and quality food intake on weekends to prevent being over nutrition, and needed further research to see how it relates to gaining weight.

Conflict of Interest: Nil

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Factors Affecting Waiting Time for Outpatient Medical Record Documents in General Hospital Dr. H. Moch. Ansari Saleh Banjarmasin

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ABSTRACT

Waiting time of medical record documents should be less than or equal to 10 minutes. The evaluation result of providing medical record documents waiting time in The General Hospital Dr. H. Moch. Ansari Saleh $\leq$ 31 minutes. This study analyzed the influence factors of storage, management, and procedures of medical records, perceptions of the suitability of human resources for waiting time, and material resources. The research method was analytical descriptive with cross-sectional approach. The sample size is two samples, namely 399 BPJS (health insurance) patient documents and 12 samples of medical record staff. Bivariate analysis using the Multiple Logistic Regression test and Odds Ratio. The waiting time required from outpatient patients is registered until the objective document is available $\leq$ 41 minutes. So that it can be concluded that the waiting time for medical record documents is relatively long. From the factors that influence the results obtained by the medical record document storage $p\text{-value}=0.289>0.25$; $OR=2.648$; management of medical records $p\text{-value}=0.289>0.25$; $OR=2.086$; the procedure for retrieving medical record $p\text{-value}=0.289>0.25$; $OR=2.648$; transportation of medical records $p\text{-value}=0.289>0.25$; $OR=2.648$; perception of human resource suitability $p\text{-value}=0.289>0.25$; $OR=3.315$; material resources $p\text{-value}=0.289>0.25$; $OR=2.648$. From each variable that there is no influence of factors that influence the waiting time of outpatient medical record documents in the general hospital Dr. dr. Moch Ansari Saleh Banjarmasin.

Keywords: *medical record, waiting time, influence factors*

INTRODUCTION

Medical records affect the quality of health services received by patients. Medical records can also be used as educational materials, research, and quality assessment. Medical records that are maintained carefully are very important for the health care system and patients.¹

In order for medical records to be used perfectly, a hospital must carry out medical records including

registration, storage, and processing of medical record data. Registration of patients at the hospital has several parts including outpatient registration, inpatient registration, and registration of emergency patients. At the time, the arrival of the patient is enrolled in a hospital consisting of old patient registration and new patient registration.² Providing services to good medical records is reflected in fast, friendly and comfortable services. Minimum service standards are provisions regarding the type and quality of basic services which are the minimum technical specifications in the distribution of medical record services. Minimum service standards (SPM) for medical records include completing filling in medical records 24 hours after completion of service, completeness of informed consent after obtaining clear information, when providing medical records documents for outpatient/inpatient services.¹

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Provision of medical record documents is said to be fast if the time used for medical record distribution is less than or equal to 10 minutes.² As a comparison data between minimum service standards and Director's Decree on Medical Record service policies. The service quality indicators in the medical record unit have 3 quality indicators that are problematic, one of them is the difference in the provision of medical record documents between the results of monitoring and evaluation of medical records with the Ministry of Health in 2008 and the Director's Decree on hospital service policies. medical record documents according to SPM ≤ 10 minutes and Policy Decree ≤ 20 minutes. While the results of the monitoring and evaluation of the time of providing medical record documents in General Hospital Dr. H. Moch. Ansari Saleh ≤ 31 minutes. From the results of document survey data belonging to 8 people studied with the guidance of the head of the medical record unit, data obtained on waiting time in providing medical record documents at the latest ≤ 37 minutes.

The waiting time for outpatient medical record documents is long enough to be 37 minutes. The period affected many factors, namely the storage of medical record documents, medical record management, types of medical record services, procedures for retrieving medical records, transporting medical records and human resources to waiting times, as well as facilities for waiting time.

Based on the description above, researchers are interested in conducting research for the waiting time of outpatient medical record documents in outpatient services based on SPM providing medical record documents can affect patient waiting time and is one of the important things to determine quality hospital services and patient and family dissatisfaction in service.

MATERIALS AND METHOD

The research method used is Analytical Observation or Analytical Descriptive with Cross-sectional approach. The sample size in this study were two samples, namely 399 BPJS (health insurance) patients and 3 samples of medical record workers on the grounds that there were several related questions regarding medical record documents for patients who could not obtain information from patients. Analysis of data used Univariate Analysis with the aim to determine the frequency distribution and presentation of independent variables, Bivariate

Analysis to determine the factors that influence waiting time by using Odd Ratio and Multivariate Analysis using the Multiple Logistic Regression tests.

FINDINGS AND DISCUSSION

Waiting Time for Medical Record Documents for Outpatients in General Hospital Dr. H. Moch Ansari Saleh of Banjarmasin the average time required is 4 minutes from BPJS counter to numbering section, 8 minutes for medical record finding, 11 minutes to find and sending, 16 minutes for medical records sent and arrived at the destination polyclinic as well as the overall procedure and medical record flow for 41 minutes.

The results of univariate analysis show that waiting time medical record documents that are the subjects of the study are 399 medical record documents with raw road patients with categories ≤ 20 minutes as many as 18 medical record documents or 4.5% and 381 medical record documents or 95.5% of categories that are not suitable for waiting time for outpatient medical record documents.

The factor that influences the waiting time of outpatient medical record documents in General Hospital Dr. dr. H. Moch Ansari Saleh, Banjarmasin city, which is a place for storing medical record documents that are the subject of research is outpatient medical record staff, amounting to 12 medical record staff with the appropriate category 58.3% and 41.7% inappropriate categories. The management of medical records that are the subject of research is the outpatient medical record staff, amounting to 12 medical records with categories of 50% and 50% according to inappropriate categories. The procedure for retrieving medical record documents that are the subject of research is outpatient medical record staff totaling 12 medical record staff with the appropriate category of 58.3% and 41.7% inappropriate categories. Distribution of medical record documents that are the subject of research is outpatient medical record staff, amounting to 12 medical records staff with the appropriate category 58.3% and 41.7% inappropriate categories. The effect of conformity perceptions of human resources includes the number of personnel, competencies, and medical record workloads that are the subjects of the study are outpatient medical record staff, amounting to 12 medical record staff with the corresponding categories of 66.7% and 33.3% categories that are not corresponding. Material resources, namely

the facilities and infrastructure of medical records that are the subject of research are outpatient medical record

staff totaling 12 medical record staff with the appropriate category of 58.3% and 41.7% inappropriate categories.

Table 1: Results of Bivariate Analysis of Variables

Independent Variables	P value
medical record document storage place	0.289
management of medical records starting from patients registering, numbering, searching, inputting in a hospital information system, medical record delivery to destination polyclinic	0.289
procedures for medical record document collection	0.289
transportation of medical record documents	0.289
conformity perception of human resources includes the number of personnel, competence, and workload	0.289
material resources, namely facilities and infrastructure	0.289

Based on the results of the bivariate analysis Table 1 shows that all independent variables produce $p\text{-value} > 0.25$ seen from the results in the Omnibus Tests of Model Coefficients column which shows all independent variables have no effect on the dependent variable (document waiting time). However, all fixed variables were analyzed multivariate because they were considered important with the waiting time of medical record documents.

Furthermore, multivariate analysis of the six independent variables was carried out with the waiting time of the medical record documentation. From the results of the analysis, there are 6 variables that have a value of > 0.05 , namely the storage of medical record documents, management of medical records starting from patients registering, numbering, searching, inputting in management information system, sending medical record to the destination clinic, procedure retrieval of medical record documents, transportation of medical record documents, conformity perceptions of human resources include the number of personnel, competencies, and workloads, material resources namely facilities and infrastructure. Of all the fixed variables it has a $p\text{-value} > 0.05$ so that it cannot proceed to the next multivariate analysis.

From the independent variables, there are no influence on the waiting time of medical record documents, there are other factors that affect the place of registration of medical records of outpatients, patients not carrying KIB, requirements for patients who incomplete, old patient claimed to be a new patient, information system and utility (printer) error. Lack of communication

between patients and officers so patients did not carry complete registration requirements, Patients were wrong in the registration counter, new patients did not fill out the registration form for new patients.

The results of the study are in accordance with the observations of the storage of medical record documents using Roll O'Pack cabinets or moving cabinets that provide shifting, the arrangement of the filing space can save more space because there is no need to provide cabinets between one another as in other models. Related to the use of this cupboard, it can use a place or area that holds the medical record file in the filing room as a whole to be larger.⁴

In addition to the six independent variables in the concept of multicollinearity is a situation where there are two variables that mutually correlate. The existence of a relationship between independent variables is something that cannot be avoided and is indeed needed so that the regression obtained is valid.³ Multicollinearity test was conducted to see whether there was a correlation between the perfect relationship between the independent variables. The test aims to find out whether the regression model is found to have a correlation or relationship between independent variables. A good regression model does not occur correlation or relationship between independent variables. If the independent variables are correlated or related, then these variables are not orthogonal, orthogonal are independent variables whose correlation value between each independent variable is zero.

On the independent variable, the classical assumption of multiple regression models was carried out with Multicollinearity Test.

Table 2: Multicollinearity Test Result

Model	Collinearity Statistics	
	Tolerance	VIF
Storage place for medical record documents	0.021	47.271
Management of medical records Starting from Patients Registering, Numbering, Finding, Inputting on Hospital Information System, Medical Record Delivery to the Polyclinic	0.016	64.100
Procedures for retrieving medical record documents	0.038	26.276
Transportation of medical record documents	0.042	23.711
Suitability perceptions of human resources include the amount of energy, competence, and workload	0.047	21.079
Material resources, namely facilities and infrastructure	0.034	29.754

Based on the results of the SPSS output, it can be seen that the tolerance value of all independent variables is smaller than 0.10 and the value of VIF for all independent variables is greater than 10.00. So, it can be concluded that all the variables from the SPSS output value occur multicollinearity. The presence of multicollinearity can be seen in the correlation between predictors that are too high (above 0.8 or 0.9) indicating that the data is infected with multicollinearity.⁵

The implementation of medical record activities needs to be supported by the existence of Material Resources including facilities and infrastructure. The hospital information system is the most important part of hospital management to support better quality of service, while the administration of medical records must be regulated and managed in such a way that all patient data contained in the medical record can be kept confidential. Therefore, every leader of health service facilities must pay attention to the administration of medical records, because indirectly they must be able to account for all loss, damage, forgery and use by bodies or entities that are not entitled to medical records.⁶

Facilities and equipment are all things that support the ease of execution of tasks and management of medical records. Appropriate storage equipment for medical records, good lighting and temperature regulation, maintenance of space and attention of officers to safety factors that greatly help maintenance, encourage work enthusiasm and increase productivity of officers. In a row of medical record folders stored must be given out instructions to speed up the storage work and find medical records. The medical record file should be given a cover for protection and maintain the contents of the medical record so that each sheet is not torn or torn, because it is often taken or back and forth. The cover or protective folder is equipped with a clamp (fastener) to combine the sheet on the cover.⁷

CONCLUSION

The service time for providing medical record documents takes an average of 0 hours 41 minutes. So that it can be concluded that the waiting time for medical record documents is quite long. From the research factors that influence the waiting time of outpatient medical record documents in The General Hospital Dr. H. Moch Ansari Saleh Banjarmasin namely there is no influence of medical record document storage places on the waiting time of medical record documents, management of medical records starting from patients registering, numbering, distributing and finding, inputting in hospital information system, medical record delivery to the polyclinic, procedures, transportation, perception of source suitability human power includes the amount of energy, competence, and workload on the waiting time of medical record documents, material resources, namely facilities and infrastructure to the waiting time of medical record documents.

Ethical Clearance: This study approved ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. We followed guideline from Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research title, purpose, participants' right, confidentiality, and signature.

Source of Funding: This study was done by self-funding from the authors.

Conflict of Interest: The authors declare that they have no conflict interests.

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The Presence of Lead in Blood of Pregnant Women at the First Trimester in Al Najaf City–Iraq

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ABSTRACT

A certain concern is related to the presence of lead in the bloodstream of pregnant women due to its passage to the developing fetus. This study aimed to assess lead blood levels in first trimester pregnant women in Al-Najaf city . A cross-sectional study design was applied including 48 pregnant women at the first trimester who were met the inclusion criteria. Samples of blood were collected under aseptic technique and have been tested in the laboratory of the pharmacy college of Al-Kufa . Findings of the study revealed that high proportion of women aged 15-25 years while the lower proportion aged (≤ 36 years). The mean blood lead level was <1 $\mu\text{g/dl}$ in 36 women (75%), 1 $\mu\text{g/dl}$ in 4 (8.33%) and ≥ 2 $\mu\text{g/dl}$ in the remaining 8 (16.67%) women , (P.value =0.001). However, the blood lead levels of the studied group ranged (0.10 – 114.95) $\mu\text{g/dl}$ with highly statistically significant difference between minimum and the maximum values, (P.value<0.001). The mean prenatal blood lead level of housewives and worker women was (0.255 and 7.136 $\mu\text{g/dl}$) respectively with highly statistically significant difference (P.value=0.001). A strong direct correlation had been found between the previous abortion and prenatal lead blood levels ($r = 0.83$). In conclusion a significant proportion of women at first trimester had high levels of blood lead and it was associated with previous abortions. hence we recommended to conduct blood lead testing on all pregnant women and establish a program for the treatment.

Keywords: Blood Lead, abortion, Pregnancy, First trimester

INTRODUCTION

Lead can be defined as a heavy metal, this element exists in various places including gasoline, old paints, costume jewelry of children, and many types related to industry and hobbies¹. In the year of 1978, the government of US restricted using paints which contain lead, and in the year 1980 they limited using lead in gasoline. The industries of printing, manufacturing batteries, auto-repair and pottery still use lead. High amounts of lead exist in some candy types which are made in Mexico on addition to few traditional or folk medications. Drinking water could contain some amounts of lead which have been leach out of pipes². Swallowing or breathing lead could cause lead poisoning, also it could be passed from the mother to the unborn baby. The possibility of having a baby that experience a birth defect is estimated as three to five percent in each pregnancy. Lead become widely distributed in the environment, all the body organs could be damaged when there are high exposure levels, the higher damage was seen in blood, central nervous system and kidneys, the biochemical processes were affected, psychological and new behavioral function

were a weakness³⁻⁶. Even though the lead has half-life of (forty-five days) in human's bloodstream, the lead was stored in the bone of the pregnant women. Through pregnancy, some calcium is needed for fetal bone growth especially at the first and second trimester. The lead was cross placenta instead of calcium in the pregnant women through formation of fetus body^{6,7}. The present study tried to tracing of lead in the blood of a pregnant woman in the first trimester and to find association between lead levels in blood and previous abortion.

MATERIALS AND METHOD

Study Design: A cross-sectional study.

Period of the Study: The duration of collecting the samples was from 1-1/2018 to 1-2/2018.

Place of the Study: The study has been carried out in Al-Najaf city, the center of Al-Najaf province.

Sampling Design and Collections: A randomly samples technique that was the method of choosing the prenatal

women that attending to Al-Zahraa teaching Hospital for childbirth.

Included Criteria: by chosen of pregnant women at the first trimester by using a well-designed questionnaire.

The sample was 48 women, that chosen from pregnant women that reach to the counseling ward, and we were made a vein puncture at the laboratory of a hospital, 5 ccs was collected from each woman by Jell Tube, then we were centrifuge of all blood samples to take the serum.

Laboratory Tests: All serum samples were tested by atomic absorption spectrometry for screening the presence and concentration of the lead in the serum in $\mu\text{g/dl}$, all the serum that tested was transport to the laboratory of the faculty of the pharmacy/university of Al-Kufa.

Data Analysis: Descriptive and analytical statistics have been conducted through applying the statistical package for social science (S.P.S.S) v18. The Z-test has been used for the purpose of obtaining significant statistical differences. Furthermore, Pearson correlation has been utilized between abortions and blood lead concentrations of prenatal women.

FINDINGS

Figure 1: Show that the high number and percentage women of blood lead was at the age group of (15-25 years), while the age group of (≤ 36 years) was the lowest number and percentage.

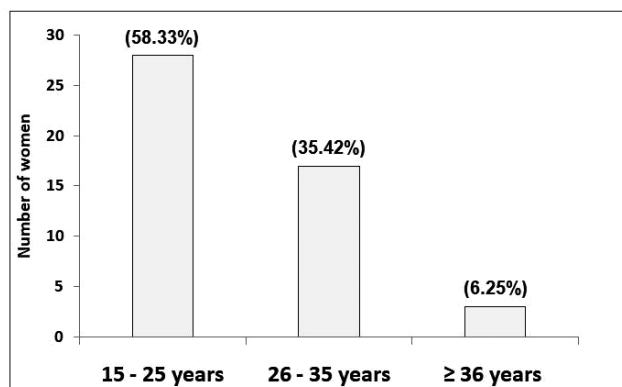


Figure 1: Number and proportions of the women according to age groups

(Table 1): Showed a highly statistically significant difference (HS) between the mean of blood lead levels of prenatal women sample with the $P\text{-value} = 0.001$,

and the higher number and percentage of 36 (75 %) respectively were in $<1 \mu\text{g/dl}$, while the lowest number and percentage 4 (8.33 %) respectively were at level of $1 \mu\text{g/dl}$. The highly mean (42.19) of prenatal women blood lead levels was at level $\geq 2 \mu\text{g/dl}$. Figure (2): Showed that a higher significant difference existed between minimum and maximum value of prenatal women blood lead levels of (0.1 and 114.95 $\mu\text{g/dl}$) respectively, at the $P\text{-value} = 0.001$.

Table 1: The number and percentage of women group sample of blood lead levels in $\mu\text{g/dl}$

Blood Lead levels	Prenatal Women Sample n (%)	Mean Lead level
$<1 \mu\text{g/dl}$	36 (75 %)	0.34
$1 \mu\text{g/dl}$	4 (8.33 %)	1.26
$\geq 2 \mu\text{g/dl}$	8 (16.67 %)	42.19
Total	48 (100%)	7.39
Z-test, P. value = 0.001, highly significant		

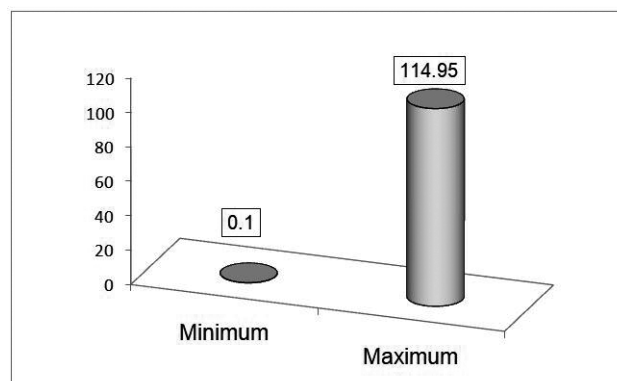


Figure 2: The comparison between the minimum and the maximum value of prenatal women blood lead levels in a unit of microgram per decilitre

(Table 2): Showed that a highly statistically significant difference (HS) existed between housewife and women working with the $P\text{-value} 0.001$ of prenatal women blood lead levels and the lead blood levels of housewife and women worker were (0.255 and 7.136 $\mu\text{g/dl}$) respectively.

Table 2: The comparison between housewife and women worker of blood lead values of prenatal sample women

Subgroup	Mean level of lead in blood ($\mu\text{g/dl}$)
Housewife	0.255
Worker	7.136
P- value (z-test) = 0.001, highly significant	

Figure (3): Showed that there were a strong direct positive correlation between the previous abortion and prenatal lead blood levels at ($r = 0.83$), which mean the number of women with previous abortion increases when the lead blood levels were increased, and there were 11 women out of all sample that was had history with abortion.

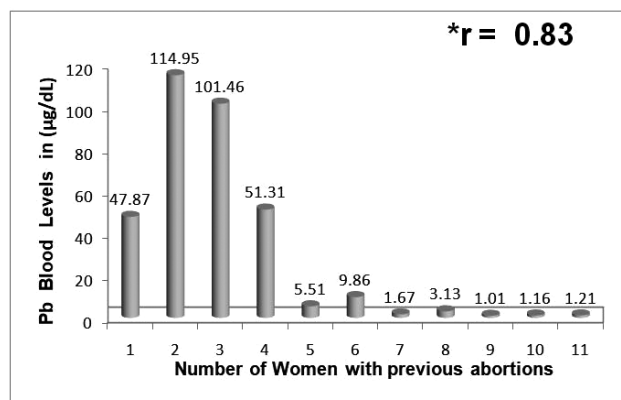


Figure 3: The number of women with previous abortion in relation with lead blood levels of prenatal women sample. (*strong direct correlation)

DISCUSSION

A pregnant women's that inhabited in the city is always her unborn baby at risk, by exposure to air pollution, also, pollutants could go in her blood through breathing. Pollutants such as lead in bloodstream could pass through placenta to the organs and developing bones of the baby. Lead readily cross the placenta via passive diffusion and it was noticed in fetal brain as early as the end of the first three months of pregnancy^{5,8,9}. The present study was showed a clear variation in number and percentage between the age group of prenatal women lead blood levels, this finding was in agreement with a similar study by Wright, et al, in the united states 2008¹¹. However the present highly women number and percentage in lead blood levels were found at the age group of (15-25 years) of 28 (58.33%) respectively, this might be due to more age group of exposure than another age group in the city to air pollutants like lead that inhaled through the different activity outside the home. The present study was showed a highly statistically significant difference (HS) between the mean of blood lead levels of prenatal women sample with the $P\text{-value} = 0.001$, and the lowest mean of prenatal women blood lead level was (0.34 µg/dl) at the level <1 µg/dl, while a highly means of prenatal women blood lead levels was (42.19 µg/dl) at a level of ≥ 2 µg/dl,

this results confirmed that the lead was found at the all study group of all sample of prenatal women but in different concentration, which indicates that al-Najaf city was one of the highest air polluted city especially with pollutants that emission from the vehicles like lead emission because of use of leaded benzene in the city. This finding agreed with that of Elderderly, et al¹² from Sudan in 2015.

In the present study there was a highly statistically significant difference (HS) between a minimum and maximum value of prenatal women blood lead levels of (0.1 and 114.95 µg/dl) respectively, at the $P\text{-value} = 0.001$, the same finding was in agreement with Tong, et al in 2015, Australia¹⁰. In the present study, there were a highly statistically significant difference (HS) between housewife and women working with the $P\text{-value} 0.001$ of prenatal women blood lead levels, the lead blood concentrations of housewife and women worker were (0.255 and 7.136 µg/dl) respectively. This significant differences between a housewife and working woman might be due to the variation in the exposure level of the air pollutant especially inorganic lead in the air of the al-Najaf city, which mean the increases of exposure to air pollution lead to increases of inorganic blood lead of prenatal women. the same finding was agreement with the Aleemuddin, et al from India at 2015¹³. In the present study, there were a strong direct positive correlated between the abortion and prenatal lead blood levels at ($r = 0.83$), which mean the number of women with previous abortion increases when the lead blood levels were increased, and there were 11 women out of all sample that was had a history with abortion. This result agrees with. Arnold, et al in the USA at 2013¹⁴, that finding the same direct positive correlation. To all results that obtained from a present study, there was a clear association in blood lead level of prenatal women and air pollution in the al-Najaf city with the effect of study women.

CONCLUSION

Blood lead was present in all samples of pregnant women. Some pregnant women had a highly significant blood lead level. There was a much difference between the minimum and the maximum levels of blood lead. The worker pregnant women had a higher mean blood lead than housewives There was a clear direct correlation between previous abortion and presence of blood lead levels of more than 1 µg/dl.

Ethical Clearance: All official agreement were obtained, signed informed consent obtained from each participant women. Data collected in accordance with the World Medical Association (WMA) Declaration of Helsinki as a statement of ethical principles for medical research involving human subjects

Conflict of Interest: Author declare none

Source of Funding: Self-funded

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Knowledge, Attitude and Practice of Relapse Malaria Patients. a Cross Sectional Study from Mandailing Natal District, Indonesia

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ABSTRACT

Background: Malaria is still the most serious public health problem and the major cause of death. Currently, the number of relapse of malaria is at an alarming and unprecedented rate. It made the prevalence of malaria escalating. Many factors have come together in making this situation such as dense population, mosquitos paracites, resistance to antimalarial drugs, climatic changes and knowledge, attitudes and practices (KAP) of patients. This study aimed to determine the relationship of knowledge, attitudes and practices against the relapse of malaria.

Method: The present study was a cross sectional design taken place in Mandailing Natal District, Indonesia. The study involved 153 malaria adult patients selected purposively, consisted of 123 malaria patients and 30 relapse of malaria. Thirty KAP questions compiled from several KAP studies were delivered to patients. To analyze the relationship between knowledge, attitudes and practices with relapse of malaria, a Chi-square test and logistic regression was performed.

Results: Most of relapse patients had low knowledge (76.4%), attitudes (61.4%) and bad practices (77.3%). There was a significant relationship between KAP with the incidence of relapse of malaria. Education, income, farmer and ventilation were strongest predictors of being relapse of malaria.

Conclusion: Level of knowledge, attitudes and practices affected relapse of malaria. The current control malaria program need to be intensified with malarial education and prevention campaigns. Taken proper and regular antimalarial medicines being important message.

Keywords: *knowledge, attitudes, practices, relapse, malaria*

INTRODUCTION

The global malaria eradication program had been started in 1950s and in 19702 the diseases incresing slowly in Asia regions and South America. It is predicted more than 100 million deaths from malaria annually. In sub-Saharan Africa, 90% of deaths were related to the presence of the vector *Anopheles gambiae*, which is the most infectious mosquito¹.

The program was very successfull in certain countries such as India, Sri Lanka and Soviet Union.

Even in United States and Europe, malaria was eliminated during the first half on the twentieth century ². However, malaria is still the most serious public health problem and the major cause of death ³. According to World Health Organization, in 2015 there was about 214 million new malaria cases and 438 thousands deaths from malaria⁴. (WHO, 2016). In Indonesia, of a total 216 million malaria cases, 655 thousands were died ⁵(Kemenkes RI, 2013). Eventhough the progress of malaria control was successful, malaria eradication seemed imminent. Many factors have come together in making this situation. The factors are dense population, presence mosquitos paracites, resistance to antimalarial drugs, climatic changes including the knowledge, attitudes and practices (KAP) of patients ⁶⁻⁸

Number of relapse of malaria is at an alarming and unprecedented rate. It made the prevalence of malaria has been escalating in Africa. Malaria has been to cause

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2.3% of global disease and 9.0% of disease in Africa⁶. There are many factors contributing to relapse of malaria such as rapid spread of malaria parasites resistance to chloroquine, migration of non-immune population, climate changing, changes of in the behavior of vectors from indoor to outdoor biters^{6,9}. However, KAP studies on malaria had proved that malaria re-emergence related to knowledge, attitudes and practices about malaria^{3,7-10}. In study location, the *Annual Parasite Incidence* (API) and relapse of malaria incidence are at alarming rate. Therefore, the current study aimed to determine the knowledge, attitudes and practices of relapse of malaria.

METHODS AND MATERIAL

Study site: The present study was a cross sectional design taken place in Mandailing Natal District, North Sumatera Province. Malaria is endemic in this district. Among 23 sub-districts, 22 of them were found malaria case. The *Annual Parasite Incidence* (API) in Natal district was 6.8%. A 2016 census indicated approximately 463,000 inhabited in Natal district¹¹. Most residents engage in cultivating rice, rubber and coconut.

Participants: There were 153 malaria adult patients selected purposively, consisted of 123 persons were not relapse patients and 30 persons relapse. The inclusion criteria were; living in district >10 years, aged 20-50 years old, not pregnant, routinely visited Primary Health Center. PHC conducted malaria control program such as insecticide treated bednet (ITN), insecticide spray and pills distribution. This background makes Natal district was selected for undertaking the study.

Data collection: The study carried out between June-September 2017. Thirty KAP questions compiled from several KAP studies were delivered to patients. The questions addressed to respondents following major categories: socio-economic characteristics, knowledge, attitudes and treatment seeking behaviour practices, personal prevention practices. The items on knowledge such as malaria transmission, type of mosquitos and parasites and medicines. Questions on attitudes and practices asking the patients on their agreement upon malaria control program, prevention activities and rule of taking antimalarial drug. For example; Do you agree indoor residual spray?, do you agree to take pills regularly, using bed nets, cover water tanks. The score of answers were changed into two categories; high vs low knowledge; positive vs negative attitude and good vs bad practices. In determining the categories, the borderline was the mean score of answers.

For convenience and easy to understand, the questions were delivered in native Batakese language vice Bahasa Indonesia. Four local residents hired and trained to conduct this task. They were at least a high school education, could speak both Bahasa and Batakese language.

Data analysis: Data were entered and analyzed using soft-ware program Statistics Package for the Social Sciences (SPSS) version 6.0. To analyze the relationship between knowledge, attitudes and practices with malaria presented in distribution frequency and compared to other KAP malaria studies.

RESULTS

Table 1: Knowledge, attitudes and practices of respondents

KAP variables	n	%
Knowledge		
High	50	32.7
Low	103	67.3
Attitudes		
Positive	59	38.6
Negative	94	61.4
Practices		
Good	51	33.3
Bad	102	66.7

As seen in Table 1. Of 153 of malaria patients participated in this study, around three fourth of them had low knowledge and bad practices, 67.3% and 66.7% respectively. However, 61.4% had positives attitudes in preventing malaria.

Table 2: The p-values of socio-economic characteristics related to malaria prevalence

Socio-economic characteristics	p-value
Age	0.08
Sex	0.02
Education	0.04
Types of occupation	0.04
Income	0.04
House ventilation	0.04

Table 2 implied that of six socio-economic characteristics, only age that had not significantly related

to malaria. Type of sex, education, occupation, income and house ventilation were significantly affected to malaria incidence (p -values = 0.02; 0.04; 0.04; 0.04; 0.04 respectively). Males worked as farmers had low income and lived in house with not enough ventilation prone to suffer malaria.

Table 3: The relationship of knowledge, attitudes and practices with malaria status

KAP Variables	Status of malaria				p-value
	Relapse n = 123		Not Relapse n = 30		
	n	%	n	%	
Knowledge					
High	29	23.6	21	70.0	0.02
Low	94	76.4	9	30.0	
Attitudes					
Positive	54	43.9	5	16.7	0.01
Negative	69	56.1	25	83.3	
Practices					
Good	28	22.7	23	76.6	0.02
Not Good	95	77.3	7	23.4	

Table 3 shows that the proportion of relapse patients who had low knowledge, negative attitudes and not good practices were double compared to not relapse patients. There were 76.4%, 43.9% and 77.3% of relapse patients had low knowledge, negative attitudes and bad practices while in not relapse patients only 30.0%, 16.7% and 23.4% respectively.

DISCUSSION

The current study found that knowledge, attitudes and practices and socio-economic were the strong predictors of being relapse of malaria. With respect to knowledge, our investigation confirm that one in the three participants has misconceptions of malaria transmission and symptoms, even though they have ever experienced such as headache, vomiting and diarrhea. They should know that malaria symptoms can re-occur up to 1 year therefore they have to seek medical consultation. This findings confirm with study conducted by Weber et al. and Tyagi's found that repeated infection of malaria were understandable belong to socio-economic strata; poor living condition, poverty and poor health seeking behaviour and low knowledge, attitudes and practices⁷⁻⁸

Several studies showed that the causes of relapse pertaining to knowledge, attitudes and practices^{3,10,12-13}

In term of attitudes, we found the residents of Mandailing Natal preferred self-treatment as the first action and seeking professional medical treatment after they failed to resolve the illness. Delay treatment may improve of relapse. Local health seeking behaviour might affected the attitudes of taking action in preventing malaria as it happened in several developing countries such as in Philippines¹⁴, Kenya¹⁵, Solomon Islands¹⁶.

Less malaria incidents in higher education may be due to better treatment of protecting from mosquitos bites and taking regularly anti malaria drugs. In this study, the higher education respondents followed the rule of taking drug; 15 mg for 5 days and followed with high dose primaquine, 30 mg twice a day for 7 days¹⁷⁻¹⁸. This dose is effective and practical. Numerous studies have shown that poor treatment and low compliance to the regimen had caused against relapse because the predominant species of malaria parasites has a relapse mechanism that results in the re-appearance of parasitemia¹⁹. Most countries with low relapse malaria-incidence areas used a dose of 15 mg of primaquine a day for 5 days¹⁷. Therefore our findings support the concept of those regimens.

This relatively low relapse malaria incidence of higher knowledge respondents also due to the greater access to media information and contact to health staffs. While others had low response to get information and communicate with health staffs due high social burden. This situation also seen Nigerian and Colombia^{12,20}.

CONCLUSION

The incidence of relapse of malaria happened because of low knowledge, attitudes and practices on malarial prevention. The current control malaria program need to be intensified with malarial education and prevention campaigns. Taken proper and regular antimalarial medicines being important message.

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Effect of Adding Different Levels of Green Tea Powder *Camellia Sinensis* to Diet on Some Physiological Traits in Broiler

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ABSTRACT

This study was conducted at the Poultry Researches Station/Department of Animal Resource/Directorate of Agricultural Researches/Ministry of Agriculture, during the period from 15/5/2018 to 21/7/2018 to study the effect of adding green tea powder in broiler diet on some physiological traits.

In this study 300 (Ross 308) broilers at age of one day has been used, these birds has randomly distributed to 5 dietary treatments, each treatment has three replicated (20 birds/ replicates) T1 control treatment without adding green tea powder while T2 was used (0.5 %) of green tea powder, T3 used (1%) green tea powder, wherever T4 used (1.5%) of green tea powder and T5 used (2%) green tea powder. The birds had been fed with one diet during the experiment period and the diets content were calculated as ⁽¹⁶⁾, the results of this study showed:

There was a high significant difference ($P<0.01$) in plasma total protein for adding treatment and reached the best average in T5 treatment and a minimum average in T1 treatment, observed a highly decreased ($P<0.01$) in plasma albumin levels for T4 treatment compared with other treatments, and there is a highly increased ($P<0.01$) in plasma globulin levels in T5 and T4 treatment compared with T1, T2 and T3 treatments, there was a highly decreased ($P<0.01$) in cholesterol levels in T5 compared it with control and other treatments, in the same time the results showed a high significant decreased ($P<0.01$) in high density lipoprotein (HDL) for T5, T4 and T1 treatments compared to T3 and T2 treatments, and there was a high significant decreased ($P<0.01$) in low density lipoprotein (LDL) in T2, T3, T4 and T5 compared to control, there was a highly decreased ($P<0.01$) in very low lipoprotein (VLDL) levels in T5 compared with other treatments. For the triglyceride the results showed a high significant decreased ($P<0.01$) in blood plasma for T2, T3, T4 and T5 treatments compared with control treatment.

This study recorded a highly decreased ($P<0.01$) in ALT level for T5 compared to T4, T3, T2 and T1, in the other hand there was a highly significance ($P<0.01$) in same trait for T3, T4 and T5 compared with T2, wherever the results showed a highly decreased ($P<0.01$) in AST level in T5 and T4 treatment compared with T1, T2 and T3 treatments.

Keywords: Green tea powder, *Camellia sinensis*, physiological trait, broiler.

INTRODUCTION

Due to the development presents in poultry and the infection of poultry with infectious diseases lead to decrease in reproductive performance and this leads to increase in veterinary costs and therefore high production costs so the researchers interested in herbals for the purpose of improving the productive and physiological performance of animals, including domestic poultry, and their use as an alternative to preservatives for the production of healthy and functional foods ⁽¹⁾, for avoiding the negative effects of the use of medicinal

drugs with the chemical origin of the birds, and to maintain consumer health and enhance the immunity of the body by stimulating the immune system ⁽²⁾.

Green tea has many purposes such as antitoxin, anticancer, antiviral, antibacterial and anti-obesity and others purpose which belong that green tea contains catechins compound (GTCs)⁽³⁾, and contains phytochemicals, such as polyphenols and caffeine. Polyphenols found in green tea include epigallocatechin gallate (EGCG), epicatechin gallate, epicatechins and flavanols ⁽⁴⁾, these flavonoids contains a substance called

catechins, the major catechins present in green tea are epicatechins(EC), epigallocatechins gallate (EGCG), epigallocatechins (EGC) and epicatechins gallate (ECG)⁽⁵⁾, which have antioxidant, anticarcinogen, anti-inflammatory, and anti-radiation biochemical effects in vitro ⁽⁶⁾. Other components include three kinds of flavonoids, known as kaempferol, quercetin, and myricetin ⁽⁷⁾.

Green tea is a rich of minerals elements which are essential for health like zinc, Iron, silver, manganese, magnesium, sodium, potassium, titanium, copper, bromium, aluminum, nickel and phosphorus ^(8, 9, 10), these metal ions promote the antioxidant property of green tea⁽¹¹⁾.

Green tea is reported to contain 4000 bioactive compounds, The active constituents in green tea are powerful antioxidants call polyphenols, and this polyphenols belong to flavonoids family ⁽¹²⁾, and it's consider as basic phenolic compounds in green tea responsible for antioxidant activities that are form in the process of metabolism ⁽¹³⁾, ⁽⁵⁾.

The aim of this study was to investigate the effect of adding different levels of green tea powder to broiler and its effect on the physiological performance and the.

MATERIALS AND METHOD

Birds and Dietary treatment: This study was carried out at the poultry research/ office of the agricultural research/ministry of agriculture for 15/5/2018 to 21/6/2018 on 300 (Ross 308) broilers at one day age and randomly distributed to five dietary treatments with three replicated (20 birds/ replicates), T1 control treatment without adding green tea powder, while T2 used 0.5 % green tea powder, T3 used 1% green tea powder, T4 used 1.5% green tea powder and T5 used 2% green tea powder. All the treatments gave ad libitum diet and water in all the experiment period, the diet contents chosen as ⁽¹⁴⁾ which showed in (table 1).

Table 1: Percentage composition of the experimental diets

Ingredients %	Types of diets		
	Starter 1-13D.	Grower 14-27d.	Finisher 28-42d.
Corn	47.5	50.85	54.84
Wheat	10	10	10
Soybean Meal ¹	32	28	24
Protein ²	5	5	5

Conted...

Hydrogenated Vegetable Fat	3	4.15	4.3
Dicalcium Phosphate	0.7	0.5	0.4
NaCl	0.1	0.1	0.1
Limestone	1.2	1.14	1.1
Methionine	0.25	0.13	0.13
Lysine	0.25	0.13	0.13
Total	100	100	100
Calculated Values³			
M.E. Kcal/Kg Diet	3059	3177	3277
Crude Protein %	22.5	20.9	19.3
Crude Fiber %	3.5	3.4	gt3.2
Lysine %	1.38	1.19	1.09
Methionine Plus Cysteine %	1.08	0.92	0.88
Ca %	1.02	0.95	0.90
Available P %	0.45	0.41	0.38

STATISTICAL ANALYSIS

Completely randomized design (CRD) was used to study the effect of different treatment in all traits, ⁽¹⁵⁾ and multiple range tests was used to compare the significant differences between means. Data were analyzed by using statistical analysis system ⁽¹⁶⁾.

RESULTS & DISCUSSION

Noticed from table (2) a high significant different ($P<0.01$) in total protein in T5 compared with other treatments, and a high significant decreased ($P<0.01$) in T4 compared to T1,T2 and T3, and a high significant decreased ($P<0.01$) in T4 compared to T1,T2 and T3 treatments.

Also observed from table (2) a highly decreased ($P<0.01$) in plasma albumin levels in T4 compared with T1, T2, T3 and T5 treatments, while there was a highly increased ($P<0.01$) in globulin levels in T5 and T4 compared with T1, T2 and T3 treatments.

This significant improvement in total protein may be due to containment of green tea of minerals elements which are essential for health such as cooper which helps to increase growth hormone from pituitary gland ⁽¹⁷⁾. Growth hormone also leads to a decrease secretion rate of corticosterone hormone from adrenal cortex ⁽¹⁸⁾,

as well as the role of copper is important for antioxidant enzymes ^(19, 20), and this provides protection against destruction reactions in the body through its role in the grape of free radicals and inhibit the destruction of

protein ⁽²¹⁾, antioxidants also work to prevent proteins breakdown and thus improve their serum concentration ⁽²²⁾. And this improvement in total protein accompanied by improvement in albumin and globulin levels in serum ⁽²³⁾.

Table 2: Effect of using green tea in broiler diet on total protein, albumin and globulin levels in blood plasma

Treatment	Total protein (g/dl)	Albumin (g/dl)	Globulin (g/dl)
T1	3.500 ± 0.816 d	1.733 ± 0.76 a	1.76 ± 0.095 c
T2	4.433 ± 0.091 c	1.716 ± 0.144 a	2.616 ± 0.130 b
T3	4.616 ± 0.079 c	1.383 ± 0.107 ab	3.233 ± 0.117 b
T4	5.416 ± 0.144 b	1.283 ± 0.070 b	4.133 ± 0.147 a
T5	6.150 ± 0.095 a	1.633 ± 0.088 ab	4.516 ± 0.162 a
Significantly	**	**	**

The means with different letters within the same column are significantly between them
($P < 0.01$) **

Table (3) showed a highly decreased ($P < 0.01$) in cholesterol levels in serum in T5 compared with T1 and other treatments, in the same time the results showed a high significant decreased ($P < 0.01$) in high density lipoprotein (HDL) for T5, T4 and T1 treatments compared to T3 and T2 treatments, a high significant decreased ($P < 0.01$) in low density lipoprotein (LDL) in T2, T3, T4 and T5 treatments compared to T1 treatment, while there is a highly decreased ($P < 0.01$) in very low lipoprotein (VLDL) levels for T5 treatment compared with other treatments, results obtained from table (3) a high significant decreased ($P < 0.01$) in triglyceride in T5 compared with other treatments, may be due to supplementing of green tea in diet may prevent an excessive accumulation of lipids in the liver and other tissues as a result of green tea content from caffeine and catechin which may have an inhibitor effect on intestinal absorption of lipids, and

may be due to the caffeine and catechin content of green tea may have an inhibitor effect on intestinal absorption of lipids ⁽²⁴⁾, and this may be due to the contain of green tea on the compounds epigallocatechins gallate (EGCG) that works to reduce from differentiation and proliferation of lipid cells and the manufacture of fat and the birth of new fat cells and fat block and thus reduce body weight and reduce the oxidation of fat and the level of tricipers in plasma blood and free fatty acids and cholesterol source, as well as the factor effect on cholesterol it's same effect on triglyceride ⁽²⁵⁾.

The reasons for moral improvement can be explained in the lipid of plasma in the green tea supplementation coefficients so green tea is currently used in the fight against obesity as it is used in lowering fat level and preventing excess weight ⁽²⁶⁾.

Table 3: Effect of using green tea in broiler diet on cholesterol, HDL, LDL, VLDL and Triglyceride levels in blood plasma

Treatment	Cholesterol (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	VLDL (mg/dl)	Triglyceride (mg/dl)
T1	115.24 ± 3.77 a	36.666 ± 3.272 c	25.0001 ± 1.71 a	53.514 ± 2.11 a	125.305 ± 8.57 a
T2	96.53 ± 1.30 b	63.0016 ± 0.909 a	16.839 ± 0.17 b	16.674 ± 1.83 b	84.196 ± 0.98 b
T3	78.106 ± 1.11 c	46.200 ± 0.590 b	14.868 ± 0.18 b	17.038 ± 1.40 b	74.341 ± 0.93 b
T4	74.495 ± 0.62 c	41.833 ± 0.792 b c	15.019 ± 0.08 b	17.642 ± 0.83 b	75.098 ± 0.42 b
T5	55.708 ± 1.74 d	35.500 ± 2.432 c	14.775 ± 0.27 b	5.432 ± 1.87 c	73.878 ± 1.36 b
Significantly	**	**	**	**	**

The means with different letters within the same column are significantly between them,
($P < 0.01$) **

Observed from table (4) a highly decreased ($P<0.01$) in plasma ALT levels in T5 compared to T4, T3, T2 and control, a highly significant ($P<0.01$) in same trait for T3, T4 and T5 treatments compared with T2, however the results showed a highly decreased ($P<0.01$) in plasma AST levels in T5 and T4 compared with T1, T2 and T3, ⁽²⁷⁾ found that green tea in the laying hen diets significantly improved liver function by reducing concentration due to improvement moral in both ALT and AST, and this may be attributed that green tea reduced activity of ALT and AST and this improvement of ALT and AST due to green tea contain a high levels from antioxidant called polyphenols which has high antioxidant energy and which mainly works to inhibit free radical activity, inhibit disease and promote immune function, these materials possess high antioxidant energy which mainly works to inhibit free radicals and inhibition of cancer and heart disease and enhance immune function ⁽⁵⁾, it has been found that consumption of green tea reduces plasma and LDL sensitivity to the oxidation process and regulates cholesterol metabolism⁽²⁸⁾.

Table 4: Effect of using green tea in broiler diet on ALT and AST enzyme levels in blood plasma

Treatment	ALT (IU/L)	AST (IU/L)
T1	125.650 ± 2.362 a	12.666 ± 0.881 a
T2	114.116 ± 1.221 b	7.333 ± 0.494 b
T3	99.800 ± 1.321 c	6.000 ± 0.258 cb
T4	94.666 ± 1.364 c	4.183 ± 0.079 cd
T5	83.600 ± 1.279 d	3.550 ± 0.243 d
Significantly	**	**

The means with different letters within the same column are significantly between them ($P<0.01$) **

In general's green tea contain high levels of polyphenolic catechins (epigallocatechin, epigallocatechin gallate and epicatechin gallate), therefore regarded as a source of antioxidants. Nevertheless, the polyphenols found in GTEs are thought to provide health benefits beyond antioxidative mechanisms. For instance, green tea polyphenols are thought to interact with proteins and phospholipids in the plasma membrane, regulating signal transduction pathways, transcription factors, DNA methylation, mitochondrial function and autophagy ⁽²⁹⁾.

CONCLUSION

From the results of this study we conclude that use green tea improvement in total protein, albumin, cholesterol, HDL, LDL, VLDL, Triglyceride, ALT and AST traits because it contain a high level of antioxidant compound.

Conflict of Interest: None of the authors have any conflicts of interest to declare.

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Ethical Clearance: The project was approved by the local ethical committee (College of Agriculture engineering science/ Baghdad University).

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The Prevalence of Cesarean Section in Misan Province and It's Indicating Factors

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ABSTRACT

Background: Cesarean sections increases the health risks for mother and infant as well as the costs of health care when they are compared with vaginal birth.

Objectives: Determine the prevalence of cesarean section (CS) in Misan province and its main indicating factors.

Method: Clinical records of all patients who underwent cesarean section were analyzed. Indications and the type of cesarean section (elective, emergency) were recorded.

Results: There were 5,109 deliveries during the study period, 1169 delivery was by cesarean section. The rate of CS was 22.88% (95%CI: 22.77 – 23.0%), 52% had elective CS, and 49% had emergency CS. Women with age between (19-45) years, and multigravida (2 – 4 children) carried the highest rate of CS. The main indications for CS were a failure to progress in labor (29%), recurrent CS (24%), fetal distress (16%), malpresentation (14%). No maternal mortality recorded, but there was (5%) maternal morbidity in the form of postpartum hemorrhage.

Conclusion: The rate of CS in Misan province was higher than required by the WHO recommendation guidelines, but it is lower than that reported in the latest survey in Iraq (MICS6). The most common indications for cesarean section were a failure to progress in labor and previous cesarean section. The most common age for CS was between (19-45). Also, the history of multigravida represents half of the cases performing CS. A similar rate of elective and emergency CS. Low complication rate and low neonatal death.

Keywords: cesarean section, multigravida, postpartum hemorrhage, recurrent cesarean, low neonatal death

INTRODUCTION

Cesarean section (CS) defined as the birth of a fetus through incisions in the abdominal wall (laparotomy) and uterine wall (hysterectomy) ¹. CS increase the health risks for mothers and infants as well as the costs of health care when they are compared with vaginal birth ².

CS performed for a vast array of indications including, labor dystocia, malpresentation such as breech or brow, cephalo-pelvic disproportion, fetal distress, or previous cesareans ³. CS is a relatively common procedure in modern obstetric practice ⁴, CS rates have increased over the past 40 years from approximately 5% to more than 30% in many industrialized countries ⁵. CS rate is approximately 21.1% for the most developed regions of the globe, 14.3% for the less developed regions, and 2% for the least developed regions ⁶. Recommendations of the world health organization (WHO) about optimal CS rates, addressing that the best outcomes of mothers and babies appear to occur with CS rates of 5% to 10%,

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while rates above 15% seem to do more harm than good⁷. However, CS rates vary worldwide, ranging from approximately 10% in Sweden to about 80% in private-sector hospitals in Brazil⁸. This epidemic is a reason for immediate concern and deserves serious international attention, the procedure is not benign and needs to be performed only when circumstances distinctly require it⁹. In Iraq, the overall rate of cesarean section increased remarkably from 18.0% in 2008 to 24.4% in 2012; the rate increased in all of the governorates during this period except Maysan. The increase was highest for Erbil, Basrah, Al-Sulaimaniya and Kirkuk with a relative change of 116.6, 90.8, 58.0 and 52.0%, respectively¹⁰. CS is associated with immediate and delay morbidity and mortality risk compared with vaginal deliveries. The complications divided into short-term which includes infection, hemorrhage, urinary tract or bowel problems, venous thrombosis and embolism^{11, 12}, and long-term risks, which includes abnormal placentation, scar complications, uterine rupture, and adhesions¹³⁻¹⁶.

The study aims to determine the prevalence of cesarean section in Misan province and its indications, to establish a database of CS, and improves the quality of hospital care and ensures good health of mother and child to improve quality of life.

PATIENTS AND METHOD

A descriptive study conducted in the two main hospitals in Misan province (Al-Sader teaching hospital, maternity and child hospital), during the period from 1st Aug 2017 to 30th Feb 2018. During the study period, 1,169 CS was done, of those 200 patients were selected.

The patients admitted as an emergency to the labor room or from the out-patient department as the elective case. The special questioner was prepared to collect the study information. This questioner consisted of demographic characteristics of women which includes (maternal age and gravidity), and questions regarding the CS which includes (time, the main indication, any intra-operative and postoperative complication, and perinatal outcome). According to their age, women were grouped into three categories: below 19 years, between 19-45 years, above 45 years. According to the gravidity, they were grouped into three categories: primigravida, multigravida (2-4), grand- multigravida (more than 5). According to the time of CS, they were grouped into two categories: emergency CS and elective CS. While the CS indications grouped into five main indications: failure

to progress, fetal distress, malpresentation, recurrent CS, and others, patients with any medical disease were excluded from the study.

Chi-square test used to perform the inference between the indications of CS and its type, the 95%CI of the prevalence was calculated using the formula:

$$95\% \text{ CI} = p \pm \frac{Z}{(\alpha/2)} \sqrt{\frac{p \cdot q}{n}}$$

In which p = prevalence of the disease, $q = 1 - p$, z is normal score distribution, $\alpha = 95\%$, n = total sample size. GraphPad Prism version 8.0.0 for Windows, GraphPad Software, San Diego, California USA, software package used to make the statistical analysis, p-value considered when appropriate to be significant if less than 0.05¹⁷.

RESULTS

From all the (5,109) pregnant ladies presented to the hospitals for delivery during the period from 1st Aug 2017 to 30th Feb 2018, there were (1,169) deliveries ended by CS, representing a percent of (22.88%, 95%CI: 22.77–23.0%), with a rate of (7.8) caesarean section per day.

The most common age group was 19–45 years, half of the cases, regarding gravidity half of the cases had multigravida. Table 1 illustrate the indication (failure to progress was the most common) and type of CS (both emergency and elective show a similar ratio),

The only reported complication was Postpartum hemorrhage (PPH) with 10 cases (5%), they divided into primary (8 cases) and secondary (2 cases). Additionally, seven cases given a blood transfusion of those 2 cases used $\geq$ four units of blood and 5 cases given <4 units of blood.

Table 1: Assessment of the demographic, maternal clinical characteristics and neonatal outcomes

	Number	Percentage
Age (years)		
< 19	11	6%
19-45	188	94%
>45	1	0.5%
Gravidity		
Primigravida	35	18%
Multigravida	100	50%
Grand-multigravida	65	33%

Conted...

Indications of CS		
Failure to progress in labor	58	29%
Fetal distress	32	16%
Malpresentations	27	14%
Recurrent CS	48	24%
Others	35	18%
Type of CS		
Emergency	97	49%
Elective	103	52%
Perinatal outcome		
Preterm	1	1%
Full Term	189	95%

Conted...

Post-term	10	5%
Neonatal outcome		
Dead	2	1%
Alive	199	99%
Complications		
Postpartum hemorrhage	10	5%
Blood transfusion	7	3.5%

Figure 1 illustrates that according to the type of CS procedure the indication of CS is significantly different, in which in the emergency CS failure to progress in labor was the most common, while in the elective procedure recurrent CS was the most common.

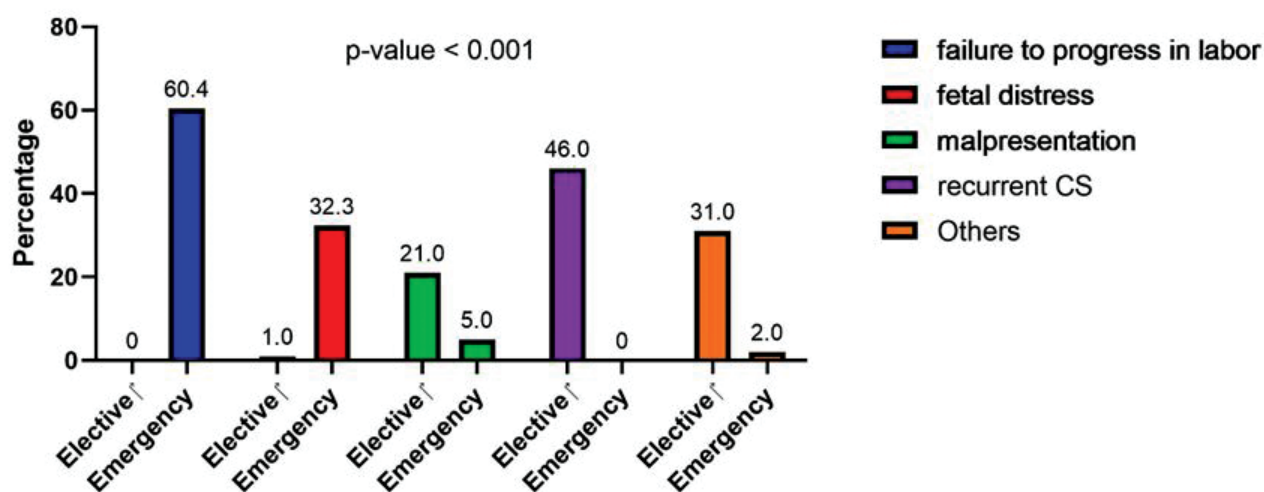


Figure 1: Indications for elective CS and emergency CS

DISCUSSION

The problem of increasing family size still exists in many developing countries. Although CS can be a valuable intervention to mothers and infants, every effort should be made to decrease the CS rate because unnecessary CS are costly and potentially life-threatening¹⁸. The rate of CS in the current study was 23% in comparison with 17% in 2006¹⁹, 18.0% in 2008¹⁰, 24.4% in 2012¹⁰, and continue to increase to a rate of (33%) according to the Iraq Multiple Indicator Cluster Survey 2018 (Iraq MICS6)²⁰, indicating an increase in the rate of CS.

It has been shown in a population and hospital-based studies of CS rates in 18 Arab countries, that Yemen, Mauritania, Sudan, and Algeria have CS rates

below 5%²¹. Almost 26% of Iraqi women giving birth at public hospitals do so via CS according to the 2010 health report for the Iraqi Health Ministry; and in 2012, the rate was further increased to 29.25%²².

In the USA and Canada, the national rates were almost 25% and 20%, respectively^{23, 24}. In the United Kingdom, the rate reported as 13%²⁵. WHO recommended guidelines stating that CS rates should range between 5 and 15 percent, adding that rates lower than five percent reflect women's lack of access to life-saving care and levels more than 15 percent carry no additional benefits to mother or newborn²⁶.

The study showed that two main indications for CS were failure to progress (29%) and recurrent CS (24%) this is similar to a study conducted in Saudi

Arabia ²⁷, and also similar to a study conducted in Iraq (2011), in which the main medical indication of CS was previous CS (25.9%) ²⁸. According to the international data, repeat cesareans and labor dystocia are the major indications for CS ²⁹. Malpresentation constituted about 14% of the causes in this study compared to 24.3% in another Iraqi study ³⁰. In the current study, 74% of the malpresentation was due to breech and 25% due to transverse lie. Successful external cephalic version during the antenatal period will prevent a lot of these operations. Fetal distress constituted about 16% of the causes in this study compared to 12.1% in another Iraqi study ³⁰.

Regarding the type of cesarean section, the current study showed similar rate between elective (52%) and emergency (48%) CS, which is a contrast to another study done in Hajjah, Yemen (2013) which revealed (79.3%) of cesarean sections were emergency ³¹.

Regarding gravidity, multigravida women were half of the women, which is in agreement with an Indian study ³². In the current study primigravida, women were (18%) in contrast to another study conducted in Egypt (2005) in which the rate was (36%) ³³. Grand-multiparity and pregnancy over the age of 35 years are common in the Iraqi society as shown in a study conducted at Al-Batool Maternity Teaching Hospital ³⁰.

The current study reported that 99% of babies delivered alive, which similar to another study conducted in Jordan (90.4%) ³⁴. Preterm babies were only (1%) of the total number in the current study which is different from an Indian study with 20% preterm infants ³².

CONCLUSIONS

The rate of CS in Misan province was higher than required by the WHO recommendation guidelines, but it is lower than that reported in the latest survey in Iraq (MICS6). The most common indications for cesarean section were a failure to progress in labor and previous cesarean section. The most common age for CS was 'between (19-45); also the history of multigravida represent half of the cases performing CS. A similar rate of elective and emergency CS. Low complication rate and low neonatal death.

Conflict of Interest: None

Ethical Clearance: Informed written consent obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by Gynecology & Obstetric department of Al-Sader teaching hospital, maternity and child hospital.

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Role of Diffusion-Weighted MRI and Dynamic Contrast-Enhanced MRI in Early Staging of Bladder Cancer

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ABSTRACT

Objective: study the role of Dynamic contrast-enhanced (DCE), and Diffusion-weighted (DWI) MRI for preoperative early staging of urinary bladder cancer and compare their diagnostic accuracy with histopathological diagnosis.

Materials and Method: Thirty-seven patients with bladder cancer included in this study. All patients underwent Magnetic Resonance Imaging (MRI) on a 1.5-T scanner. MR images were evaluated and assigned a stage which compared with the histopathological staging depending on transurethral resection of bladder tumor (TURBT).

Results: There was substantial agreement between DCE- and DWI-MRI for T staging ($\kappa = 0.943$, $p < 0.001$), both MRI modalities had similar specificity for diagnosing stage T1 bladder CA with DWI offered slightly higher sensitivity (SN), positive predictive value (PPV), negative predictive values (NPV) and accuracy. Both MRI modalities show fair specificity for stage T2 with DWI offered slightly higher specificity and similar sensitivity for both with good accuracy.

Conclusion: MRI is an excellent modality for preoperative early staging as well as grading of the bladder cancer. Both Diffusion-weighted MR imaging and dynamic contrast-enhanced MRI offer excellent agreement for T-staging of bladder cancer with DWI as the preferred modality without the use of contrast media.

Keywords: Bladder cancer, diffusion-weighted, dynamic contrast-enhanced. MRI, transurethral resection

INTRODUCTION

Bladder tumors are the second most common tumor that can occur in the reproductive and urinary tract (prostate tumor is the most common)¹, and when diagnosed in the early stages, it is highly treatable². It accounts for 6-8% of overall malignancy in men and 2-3% in women and typically occurs in patients over the age of 50. They classified into either epithelial or nonepithelial (mesenchymal) tumor, on an average 90-95% of bladder neoplasms arise from the epithelium; the most common subtype is transitional cell carcinoma (90%)¹.

Urothelial tumors are classified as either invading muscle (nonpapillary) or not invading muscle (superficial or papillary)³. Approximately 80%–85% of urothelial tumors are non-muscle invasive. These are low-grade lesions, can be multifocal, and arise from a hyperplastic epithelium. They generally have a good prognosis and rarely evolve into invasive cancer, although urothelial recurrence rates are about 50%. Approximately 20%–25% of bladder cancers are muscle invasive, arise from severe dysplasia or carcinoma in situ, and have a higher histologic grade. Non-muscle-invasive urothelial tumors have a higher rate of recurrence than do the muscle-invasive variety³. Mesenchymal tumors represent the remaining 5% of bladder tumors, with the most common subtypes being rhabdomyosarcoma, in children, and leiomyosarcomas, in adults⁴.

Magnetic resonance imaging (MRI) is the best imaging modality for bladder cancer local staging⁵. Currently, for local staging of bladder cancer, a

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multiparametric approach with conventional and functional sequences is useful⁶. Diffusion-weighted imaging (DWI) imaging provides both qualitative and quantitative information that reflects changes at the cellular level concerning tumor cellularity and cell membrane integrity. Most of the bladder tumors manifest as areas increased signal intensity on diffusion-weighted images with a reduced apparent diffusion coefficient (ADC) at quantitative analysis^{6,7}. DW MRI, therefore, has the potential for monitoring treatment response to chemotherapy or radiotherapy with the identification of early non-responders who may benefit from a change in treatment approach⁸.

Dynamic contrast-enhanced (DCE)-MRI is a useful technique in which rapid enhancement of tumor by uptake of the contrast agent is compared to the bladder wall, assisting in differentiating tumor from surrounding normal tissue⁹. Dynamic MRI staging of bladder shows high accuracy in differentiating superficial tumors from invasive tumors and organ-confined tumors from non-organ-confined tumors of bladder¹⁰. The current study aimed to study the role of DWI- and DCE-MRI for the early staging of urinary bladder cancer and compare their diagnostic accuracy in correlation with histopathology.

METHOD

A cross-sectional study conducted in the MRI unit of an oncology teaching hospital, Baghdad Medical city, the study involved 37 patients diagnosed as having bladder tumor (31 males and six females) with their age ranged from (41–78 years) in the period between January 2017 and December 2017.

Patients with recent bladder biopsy (<20 days), patient with bladder CA having radiological T-stage more than T2 (T3 and T4), patients with multiple bladder masses, patients with impaired renal function (abnormal glomerular filtration rate (GFR<90)), patients who received radio or chemotherapy and the common contraindication to MRI (pacemaker, metallic foreign body, etc.) excluded from the study. All the patients had histopathological confirmation of CA bladder by conventional cystoscopy and biopsy.

MRI examination: It was done using 1.5 Tesla MRI machine (Magnetom Aera, Siemens medical system, Germany) using body surface coil. The examination

was done in the supine position with adequate bladder distention by instructing the patient to start drinking water 30 minutes before MRI study. In patients with a urethral catheter, 250–400 ml sterile saline was used to distend the bladder. During the imaging procedure fullness of the bladder was checked at the localizer images and the examination delayed if the bladder was not full.

Statistical Analysis: The categorical data compared by applying a Chi-Square test; Independent unpaired student t-test was used to analyze the differences in the values of ADC at different pathological regions. Cohen's kappa analysis of agreement was used to assess the possible agreement (or disagreement), and its magnitude for similarity between 2 discrete variables. Receiver operator curve used to see the validity of different parameters in separating active cases from control. The statistical analysis was performed using SPSS 20.0.0, MedClac 14.8.1 software package. A $P < 0.05$ considered statistically significant.

RESULTS

The study included 37 patients with bladder cancer, mean age was 61.59 ± 8.89 years, 83% were males, and 75.7% were smokers. The majority of cases (24 patients (64.9%)) had a high grade (III) of bladder cancer while 13 patients (35.1%) had a low-grade tumor. Mean ADC was significantly lower in patients with higher grade tumor compared to low grade (0.758 ± 0.202 vs. 0.970 ± 0.158 , p -value = 0.002), as illustrated in figure 1.

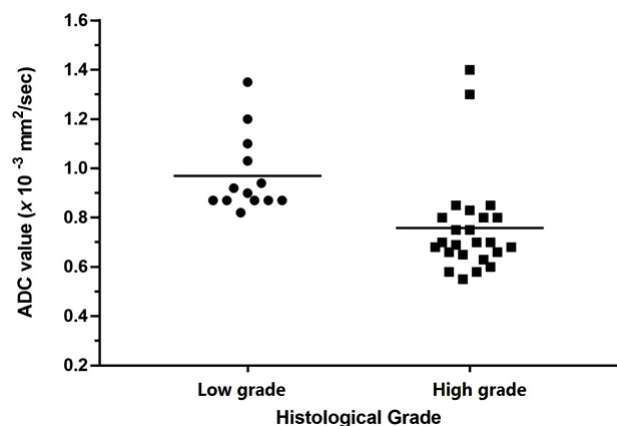


Figure 1: dot plot of ADC vs. histological grade

There was a substantial agreement between DCE and DWI in diagnosis of T-staging, as illustrated in table 1.

Table 1: comparison of the agreement of both MRI methods (DWI and DCE) in T-staging of bladder cancer

		DCE	
		T ₁ (15)	T ₂ (22)
DWI	T ₁ (14)	14	0
	T ₂ (23)	1	22
Kappa = 0.943, p < 0.001			

There is good agreement between DWI and DCE with TURBT, as illustrated in table 2.

Table 2: agreement between DWI and DCE and histopathological staging

		TURBT	
		T ₁ (19)	T ₂ (18)
DWI	T ₁ (15)	14	1
	T ₂ (22)	5	17
Kappa = 0.677, p < 0.001			
DCE	T ₁ (14)	13	1
	T ₂ (23)	6	17
Kappa = 0.624, p < 0.001			

ROC analysis revealed diagnostic utility of DWI and DCE for diagnosing T1 and T2 staging, it revealed that both have similar SN, SP, AC, PPV and NPV, as illustrated in table 3. Figures 2 and three show images of some patients in this study.

Table 3: Diagnostic efficacy of T staging by DWI and DCE based on histopathological T staging by TURBT

		Sensitivity	Specificity	Accuracy	PPV	NPV
DWI	T ₁	73.7%	94.4%	83.8%	93.3%	77.3%
	T ₂	94.4%	73.7%	84.3%	77.3%	93.3%
DCE	T ₁	68.4%	94.4%	81.0%	92.9%	73.9%
	T ₂	94.4%	68.4%	81.8%	73.9%	92.9%

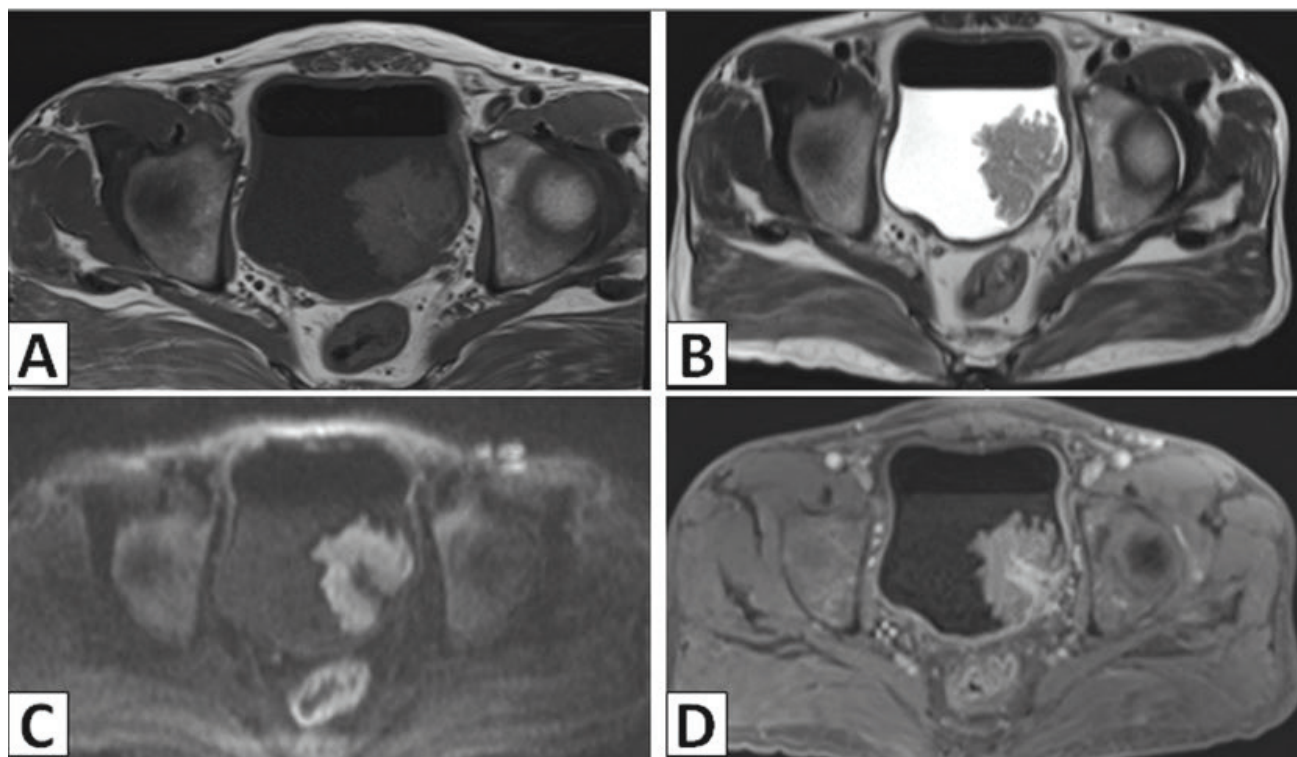


Figure 2: pelvic MRI for a 51 years old male presented with painless hematuria. A and B: are axial T1WI and T2WI show intermediate SI mass seen in Lt posterior-lateral wall of UB. C: axial DWI shows the mass with restricted diffusion. D: immediate sequence of DCE T1 WI with fat suppression show moderately enhancing tumor. MRI stage I bladder cancer which is proved by histopathology

DISCUSSION

Correct staging of the bladder carcinoma especially in the pre-operative period is critical, the clinical spectrum of bladder cancer classified into three categories (these classes have different prognosis, management, and therapeutic decisions), first non-muscle invasive bladder cancer which is best treated using transurethral resection, secondly muscle-invasive bladder cancer with goals to determine the need for complete or partial cystectomy, and finally metastatic group ¹¹.

In the current study, about 91.9% of the patients were above 50 years, with a mean age at diagnosis 61.59 ± 8.89 years with a male to female ratio was 5.2:1, these findings were similar to previously reported studies ^{1,12,13}.

In this study, 51% of patients had non-muscle invasive, and 49% had an invasive muscle disease, these results were slightly higher than the results of previously reported studies regarding high prevalence of muscle-invasive disease ¹⁴⁻¹⁸.

The current findings showed that 35.1% of the cases presented with low-grade bladder cancer and 64.9% with high-grade bladder cancer, these results were similar to a previously reported study in Iraq which show that 63.27% having muscle-invasive and 42.9% had grade II disease, and 44.9% had grade III disease ¹⁹, Sfakianos et al. ²⁰ study showed that 75.3% had high-grade tumor, Divrik et al. ¹⁶ study revealed 78.7% had high grade, and Herr et al. ¹⁷ study revealed 97.3% had high-grade tumor, on the other hand, Gupta et al. ¹ study show different results with 41.7% had low grade and 25% presented with high grade. This disagreement between different studies can be attributed to the difference in social, environmental and genetic predisposing in the different population.

In the current study both DWI and DCE show almost perfect agreement ($\kappa = 0.943$) with T staging using transurethral resection, both MRI modalities showed excellent specificity (94.4% for DWI and 94.4% for DCE), good sensitivity (73.7% and 68.4% sensitivity), and accuracy (83.8% to 81.0%) for T1 staging, these findings were similar to that reported by Gupta et al ⁽¹³⁾ which reported 100% specificity, 62.5% sensitivity, 90% accuracy for both DCE and DWI in diagnosing T1 disease, with both MRI modality showing substantial agreement with histopathological staging, Tuncbilek et al ²¹ reported an accuracy of 62.5%, Tekes et al. ²² reported 62% accuracy.

In the current study both DWI and DCE show 94.4% sensitivity of T2 staging and fair specificity (73.7% and 68.4%), which was in agreement with Gupta et al. ¹ in which the specificity was 72.2%, while the sensitivity was 83.3% and 91.7% (DCE and DWI). DWI MRI provides information on diffusion in any organ and can be used to differentiate normal and abnormal structures of any tissues better, and it might help in the characterization of various abnormalities. DW MRI of the urinary bladder seems to be a feasible and reliable method to diagnose bladder carcinoma ²³.

CONCLUSIONS

MRI is an excellent modality for preoperative early staging as well as grading of the bladder cancer. Both Diffusions weighted MR imaging, and dynamic contrast-enhanced MRI offers excellent agreement for T-staging of bladder cancer with DWI preferred without the use of contrast media.

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by the oncology teaching hospital, Baghdad Medical city.

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Effect of Gender on Difficulties in Laparoscopic Cholecystectomy

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ABSTRACT

Background: Cholecystectomy is one of the most commonly performed abdominal surgical procedures, there is a possible association between gender and Laparoscopic Cholecystectomy complications.

Objective: Assessment of the relationship between gender and Laparoscopic Cholecystectomy complications.

Material and Method: a retrospective study involved 160 patients (130 females and 30 males) were examined, patients' age, gender, and surgical complication were collected (type of inflammation, Anatomical difficulties in resection, Perforation during the operation, Conversion to open cholecystectomy and Omental and organ adhesions to the gallbladder).

Results: results showed that multiple gallstones with chronic inflammation in male 26.6% and female were 11.5%, also severe difficulties in anatomic resection in male's 33.3% whereas in females 10%. Mild difficulty in resection in female 38.5%, but in the male, it was 3.3%. In perforation during laparoscopy in male was zero & in female was 2.3%. In conversion to open cholecystectomy in the male patients it was 16.7%, but in female was 1.5%. In adhesions to surrounding structures in the male it was 36.7%, in the female it was 18.5% with no adhesions in female was 73.1%, in the male, it was 50%.

Conclusion: Some laparoscopic cholecystectomy complications appear to be more prevalent in male compared to female (Conversion to open cholecystectomy and Anatomical difficulties in resection), while others appear to have similar laparoscopic cholecystectomy complications between males and females.

Keywords: *laparoscopy, gallstones, gender, perforation, adhesions*

INTRODUCTION

Cholecystectomy is one of the most commonly performed abdominal surgical procedures, and in developed countries, many are performed laparoscopically. As an example, 90 percent of cholecystectomies in the United States are performed laparoscopically¹. Laparoscopic cholecystectomy is considered the "gold standard" for the surgical treatment of gallstone disease. This procedure results in less postoperative pain, better cosmesis, and shorter hospital stays and disability from work than open cholecystectomy². However, the overall serious complication rate in laparoscopic cholecystectomy remains higher than that seen in open cholecystectomy^{3,4}.

Few clinical studies were performed to compare this new procedure to standard open cholecystectomy. As laparoscopic cholecystectomy gained wider acceptance, complications that were rarely seen with open cholecystectomies, such as bile duct injury, were reported

in as many as five percents of patients⁵. At present, approximately 750,000 laparoscopic cholecystectomies are performed annually in the United States (accounting for roughly 90 percent of all cholecystectomies) with an overall serious complication rate that remains higher than that seen in open cholecystectomy, despite increasing experience with the procedure^{3,4}. The complication rate of open cholecystectomy has increased as well, due to overall declining experience in open surgery as this approach is now reserved for the most complicated and challenging cases⁶. The aim of the current study to establish the relationship between gender and Laparoscopic Cholecystectomy complications.

MATERIAL AND METHOD

A total of 160 patients included in this study; it was carried out in Al-Zahrawi Private Hospital, Mosul, Iraq; from the period of 1st January 2017 to 1st January 2018. The data obtained from case sheets of the patients including symptoms, signs, and investigations

In this retrospective study, 130 females and 30 males were examined, patients' age, gender, and surgical complication were collected (type of inflammation, Anatomical difficulties in resection, Perforation during the operation, Conversion to open cholecystectomy and Omental and organ adhesions to the gallbladder).

Type of inflammation divided into Double gallstones with chronic inflammation. Multiple gallstones with chronic inflammation, severe acute inflammation, and severe chronic inflammation. Anatomical difficulties in resection divided into very difficult, moderate difficulty and mild difficulty. Omental and organ adhesions to the gallbladder divided into Adhesions to the omentum, adhesions to surrounding structures, adhesions to between Omentum, duodenum, colon, and anterior abdominal wall and no Adhesions.

STATISTICAL ANALYSIS

Analysis of our data done using the software program: SPSS 21 (Statistical Package for Social Sciences). Numeric data were represented by the mean $\pm$ standard error, while the categorical data represented by numbers and percentages. For studying the association

between categorical data, the Chi-Square test or Fisher exact test used. The significant level considered when the P value < 0.05 ^{7,8}.

RESULTS

Table 1 describes age distribution according to gender. Concerning anatomical\difficulties in resection mild difficulties were significantly higher in female compared to male, while very difficult was significantly higher in males compare to females, Conversion from laparoscopy to open cholecystectomy was significantly higher in males compared to females, the rest of the complications show no significant difference between gender, as illustrated in table 2.

Table 1: Comparison between patients with appendicitis and ovarian cyst

Items	Male	Female	p-value
Number	30	130	-
Age group			
< 40 years	19 (63.3)	75 (57.7)	0.572
≥ 40 years	11 (36.7)	55 (42.3)	

Table 2: association between gender and Laparoscopic Cholecystectomy complications

Items	Male	Female	p-value
Number	30	130	-
Type of inflammation, n (%)			
Double gall stones with chronic inflammation	18 (60.0)	95 (73.1)	0.206
Multiple gallstones with chronic inflammation	8 (26.6)	15 (11.5)	
Severe acute inflammation	2 (6.7)	9 (6.9)	
Severe chronic inflammation	2 (6.7)	11 (8.5)	
Anatomical difficulties in resection, n (%)			
Negative	14 (46.7)	47 (36.2)	<0.001
Very difficult	10 (33.3)	13 (10.0)	
Moderate difficulty	5 (16.7)	20 (15.4)	
Mild difficulty	1 (3.3)	50 (38.5)	
Perforation during the operation, n (%)	0 (0)	3 (2.3)	1.0
Conversion to open cholecystectomy, n (%)	5 (16.7)	2 (1.5)	0.003
Omental and organ adhesions to the gallbladder, n (%)			
Adhesions to omentum	0 (0.0)	2 (1.5)	0.936
Adhesions to surrounding structures	11 (36.7)	24 (18.5)	
Adhesions to between tissues	4 (13.3)	9 (6.9)	
No Adhesions	15 (50.0)	95 (73.1)	
Chi-square test and Fisher exact test used			

DISCUSSION

Some studies have shown that severe fibrosis and anatomical anomalies are more common in male than female, so laparoscopy is more difficult. In the current study anatomical difficulties in resection, mild difficulties were significantly higher in female compared to male, while very difficult was significantly higher in males compared to females, Conversion from laparoscopy to open cholecystectomy was significantly higher in males compared to females, the rest of the complications show no significant difference between gender. Akcakaya et al. reviewed 915 patients retrospectively with symptomatic cholelithiasis, the patients divided two groups, group 1 is male, and group 2 is female. The average duration of surgery in group 1 was (20- 160) minutes and in group 2 was (15- 135) minutes. The conversion rate between group 1 and group 2 was significantly different ($P < 0.05$). Inflammatory findings (acute or chronic) in resected gallbladder between groups 1 and 2 were significantly different ($p < 0.0001$ and $p < 0.05$, respectively). The frequency of adhesions between the gallbladder and omentum and other organs was higher in male ($p = 0.003$ and $p = 0.0006$, respectively). The anatomical difficulty was more prominent in male patients ($p < 0.0001$). These findings were partially in agreement in the current study.

Lein and Huang studied the effect of male gender on the clinical presentation of symptomatic cholelithiasis, and they found that the male/female ratio increased (in the patient group sequence of simple Laparoscopic cholecystectomy (LC), acute LC, acute open, and acute conversion group), in the acute LC group male patients had significantly ($p = 0.04$, t-test) longer operating time than females, these findings similar to the current study in which male gender show more complications than female ⁹. These findings were also reported by Târcoveanu et al. ¹⁰, Bazoua and Tilston ¹¹.

CONCLUSION

Some laparoscopic cholecystectomy complications appear to be more prevalent in male compared to female (Conversion to open cholecystectomy and Anatomical difficulties in resection), while others appear to have similar laparoscopic cholecystectomy complications between males and females.

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all

its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. Approved by the Al-Zahrawi hospital, department of surgery.

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Effects of Empowerment and Work Environment on Job Satisfaction of Nurse-midwives Working in Hospitals

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ABSTRACT

Purpose: The purpose of this study was to provide basic data needed to develop programs to improve job satisfaction for nurse-midwives by analyzing factors affecting job satisfaction.

Method: The study was a descriptive study where the data were collected using questionnaires from 136 nurse-midwives and analyzed by frequency, percentage, mean, standard deviation, t-test, ANOVA, Pearson's correlational coefficients and stepwise multiple regression.

Results: Job satisfaction according to general characteristics and job characteristics of nurse-midwives showed a significant difference according to age, hospital type, career of nurse, monthly income, and reason for going to the current hospital. Job satisfaction of nurse-midwives was positively correlated with empowerment ($r=.59$, $p<.001$) and work environment ($r=.60$, $p<.001$). The factors affecting job satisfaction of nurse-midwives were work environment ($\beta=.54$, $p<.001$) and empowerment ($\beta=.41$, $p<.001$), and the total explanatory power was 59.4%.

Conclusion: As the factors affecting job satisfaction of nurse-midwives have been identified as work environment and empowerment, hospital leaders should support the nurse-midwives that are registered according to medical law to create a work environment suitable for job performance and fulfill their duties faithfully.

Keywords: Nurse-midwives, Empowerment, Work environment, Job satisfaction, Hospital

INTRODUCTION

In Korea, according to the Article 6 of the Medical Law, after having passed a national examination through training such as education and practice at a medical institution for prenatal care for one year with the license of a nurse, the nurse-midwives are licensed. According to Article 2 of the Medical Law, nurse-midwife's duty is to provide health and well-being guidance for preterm delivery, pregnancy, marital division, postpartum and newborn infants.¹ Therefore it can be said that nurse-

midwife is experts who can cooperate with other medical professionals and perform health care of pregnant women and babies efficiently and competently at all places.

On the other hand, today, pregnant women tend to want to have babies in hospitals rather than maternity centers, and with the sudden drop in birth rates due to low birthrates, and most nurse-midwives want to work as nurse-midwives or nurses in maternity wards, newborn units, etc. It is therefore necessary to analyze how satisfied nurse-midwives are in performing their jobs in the hospital.

Job satisfaction refers to how satisfied an individual is with a job² and this is not only an important indicator in predicting organizational performance.³ In particular, it was reported that higher job compensation, which is directly related to job performance, is associated with higher job satisfaction.⁴ In a previous study of hospital

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nurses, empowerment and job satisfaction of nurses were positively correlated⁵ and work environment and job satisfaction were also positively correlated⁶ where the more nurses' awareness of their empowerment and the better the work environment, the higher the job satisfaction. In nursing organizations, empowerment leads to positive changes in the attitudes and behaviors of organizational members by increasing the capacity of nurses and spreading their power into nursing organizations.⁷ These changes also were reported to have positive effects on job satisfaction increase,⁸ decrease in turnover intention,⁹ and organizational effectiveness improvement.¹⁰

Also, it was reported that the work environment is the main factor that decides turnover intentions of the hospital, and many factors affect the work environment in the hospital, such as relationships with health care providers, patient populations, patient-to-nurse ratios, and ward placement.¹¹ Like nurses, nurse-midwives should also be able to faithfully fulfill their duties while perception that they are motivating their internal work and performing important job values in a proper work environment. However, there is no study of empowerment and awareness of work environment and job satisfaction for nurse-midwives so far.

For this the researches of the study aimed to analyze the factors affecting job satisfaction, to improve the empowerment of nurse-midwives, to create desirable nursing work environment and to provide basic data to increase job satisfaction.

Purpose

1. Identify difference of job satisfaction according to general characteristics and working characteristics of nurse-midwives.
2. Identify degree of empowerment, work environment and job satisfaction of nurse-midwives.
3. Identify correlation between empowerment, work environment and job satisfaction of nurse-midwives.
4. Identify factors that affect job satisfaction of nurse-midwives.

MATERIALS & METHOD

Research design: This study is a descriptive research study to identify factors affecting job satisfaction.

Subjects: For the study, convenient sampling was performed on nurse-midwives working at a total of 10 hospitals in S city (5), D city (1), and B city (4), from September to November 2016. The data collection was submitted to the director of the institution concerned and the department concerned with the research plan including the purpose and method of the research and requested cooperation. The purpose of the study, method, participation, and autonomy of withdrawal were explained to the subjects and received the written consent of those who agreed to participate in the study. For the number of samples for this study, using G*power 3.1 program, 150 were recruited considering 20% dropout rate at 123 calculated from statistical power (1- β) .90, significance level α =.05 in two-sided test, and mild effect size .30, and a total of 136 were used for the final analysis except for 17 with incomplete or insincere responses.

Instruments

Empowerment: The study utilized 12 items on semanticity, competence, self-determinism, and effectiveness which are motivation and psychological factors of Thomas & Velthouse developed by Spreitzer and modified by Chung¹² was used. Each item is in a 5-point scale, where higher scores represent higher empowerment. The reliability in the study was Cronbach's α =.93.

Work environment: The study utilized 21 items in Korea Practice Environment Scale of the Nursing Work Index developed by Lake and adapted by Cho et al.¹³. The tool consists of five sub-factors, and each item is in a 4-point scale, where higher scores represent higher evaluation of professional work environment. The reliability in the study was Cronbach's α =.89.

Job satisfaction: The study utilized 21 items from the tool by Slavitts et al. modified and supplemented by Kim¹⁴. Each item is in a 5-point scale, where higher scores represent higher job satisfaction. The reliability in the study was Cronbach's α =.87.

Ethical Consideration: The research plan was submitted to the IRB of S University and the approval (1041449-201606-HR-002) was received before the study. The consent to participate in the study included the purpose of the study, the procedures of participation, the risks and benefits of participating, and personal information and confidentiality, and made it possible for the subjects

to participate in the research voluntarily. If the subject voluntarily agreed to participate in the study, the subject signed the agreement before participating in the questionnaire. In order to protect personal information, the questionnaires were sealed in envelopes immediately after completing the questionnaires then submitted.

DATA ANALYSIS

The data were analyzed using SPSS WIN 21.0 program.

1. Job satisfaction differences according to general characteristics and job characteristics of nurse-midwives were analyzed by t-test, ANOVA and post-analysis was performed using Scheffe test.
2. For variables of nurse-midwives, mean and standard deviation were obtained.
3. The relationship among variables was analyzed by Pearson's correlation coefficient.
4. The factors affecting job satisfaction were analyzed by multiple regression analysis.

FINDINGS

General Characteristics and Job Characteristics of Nurse-midwives and the Difference in Job Satisfaction: Among the general characteristics of

nurse-midwives, 44.9% were from 40 to 49 years. Marital status was 71.7% for married and in education, it was 74.6% for college graduation. Among the job characteristics of the subjects, in hospital type, 48.6% was 2nd general hospital and 44.2% was special hospital. For career of nurses, 56.5% were under 10 years, for career of nurse-midwives, 32.6% were under 10 years, and 73.9% had under 10 years of experience in the current department. The most common average monthly income was less than 2,500,000-3,000,000 won (39.9%) For position, 52.2% were head nurses or higher positions, and 66.7% were in the maternity and pediatrics department. For reason for going to the current hospital, there were in favor of the hospital 56.5%. In parts that need improvement in the hospital, there were discontent working environment or welfare benefits 26.1%.

For job satisfaction based on general characteristics and job characteristics of nurse-midwives, there were significant differences according to age ($F=5.14, p=.002$), hospital type ($F=3.37, p=.037$), career of nurse ($F=2.78, p=.044$), monthly income ($F=3.52, p=.017$), and reason for going to the current hospital ($F=4.17, p=.018$).

Degree of Empowerment, Work Environment and Job Satisfaction of Nurse-midwives: The empowerment level of nurse-midwives was found to be 48.02 ± 6.41 , and work environment was 60.63 ± 8.84 , and job satisfaction 72.07 ± 8.66 <Table 1>.

Table 1: Degree of Empowerment, Work Environment, Job Satisfaction (N = 138)

Variables	Mean $\pm$ SD	Possible range	Actual range
Empowerment	48.02 ± 6.41	12-60	30-60
Work environment	60.63 ± 8.84	21-84	42-80
Job satisfaction	72.07 ± 8.66	21-105	52-96

Relationship between Empowerment, Work Environment and Job Satisfaction of Nurse-midwives: Job satisfaction was positively correlated with empowerment ($r=.59, p<.001$), and it was found to have positive correlation with work environment ($r=.60, p<.001$) <Table 2>.

Table 2: Correlation among Empowerment, Work Environment, Job Satisfaction (N = 138)

Variables	Empowerment	Work environment	Job satisfaction
	r (p)	r (p)	r (p)
Empowerment	1		
Work environment	.36 (<.001)	1	
Job satisfaction	.59(<.001)	.60(<.001)	1

Factors Affecting Job Satisfaction of Nurse-midwives:

To analyze the factors affecting job satisfaction of nurse-midwives, the study conducted a stepwise regression analysis of the variables that showed significant differences in empowerment, work environment, general characteristics, and job satisfaction, including age, hospital type, career of nurse, monthly income, and reason for going to the current hospital. In order to verify the hypothesis of independent variables of multiple regression analysis, it was found that there was no problem of multicollinearity, as the regression analysis

had a tolerance range of .911 and a dispersion expansion coefficient of 1.098. In addition, the Durbin-Watson value was calculated to verify the independence of the residuals. As a result, it was 1.671, which is close to 2, confirming that there is no autocorrelation. Regression model fit was significant at $F=85.62(p<.001)$.

The factors affecting job satisfaction of nurse-midwives were found to be work environment ($\beta=.54$, $p<.001$) and empowerment ($\beta=.41$, $p<.001$), and total explanatory power was 59.4% <Table 3>.

Table 3: Multiple regression analysis for Influence factors associated with Job Satisfaction**(N = 138)**

Variables	B	S.E.	β	t (p)	Adjusted R ²	F(p)
Constant	11.17	4.71		2.37(.019)		
Work environment	.56	0.06	.54	8.73(<.001)	.434	
Empowerment	.57	0.09	.41	6.69(<.001)	.587	85.62(<.001)
R ² =.594, Adj. R ² =.587, F=85.62, P<.001						

DISCUSSION

According to the results of the study, job satisfaction according to general characteristics and job characteristics of nurse-midwives was significantly different according to age, hospital type, career of nurse, monthly income, and reason for going to the current hospital. Job satisfaction of nurse-midwives over 30 and 50 years old was high, nurse-midwives working in special hospitals were highly satisfied, those with 20-29 years career of nurse had high job satisfaction, and job satisfaction was higher when monthly income exceeded 3 million won. For the reason for working at the current hospital, the group that favored the hospital had higher job satisfaction than the group that had intimate relations with colleagues.

Direct comparison is difficult because of the lack of research on nurse-midwives. However, the study aims to discuss using study results on nurses, a similar medical professional. The study result was similar to another study where nurses working at care facilities showed higher job satisfaction in age group between 51 to 60⁸. In addition, Koh¹⁵ reported that job satisfaction was higher in the age group of 40 years or older, and job satisfaction was higher in the group with 20 or more years of work experience than in the group with 3-5 years of experience, which was similar to the study results.

In addition, job satisfaction is considered to be higher in nurse-midwives working in women's special hospitals because they are more likely to perform maternity-related tasks with better conditions than nurse-midwives in general hospitals. It was similar to the study results⁶ where nurses with 15 years or more of experience had higher job satisfaction than those with fewer years of experience, and it is thought that with more years of experience, it is possible to reduce job burden and increase satisfaction with higher expertise and competence. Also, as income is higher with experience and work at preferred hospitals can increase job satisfaction, there should be adequate establishment of work environment for continued performance of maternity -related tasks.

The empowerment of nurse-midwives was 48 points out of 60 points, the work environment was 60 points out of 84 points, and job satisfaction was 72 point out of 105 points, showing above-average levels. This was somewhat higher in the study by Ko⁶ than in the work environment perception and job satisfaction scores. This implies that nurse-midwives' intensive education and high professionalism led to these results even though nurse-midwives are working in the same environment as hospitals rather than nurses. Therefore, it is crucial to create environments where nurse-midwives can perform their legal tasks smoothly.

The empowerment of nurse-midwives, work environment and job satisfaction were positively correlated. In addition, factors affecting job satisfaction of nurse-midwives were explained by work environment and empowerment, with 59.4% explanatory power. This matches the results⁵ of positive correlation between environment and job satisfaction in hospital nurses and results⁶ showing positive correlation between work environment and job satisfaction in general hospital nurses. Nurses and nurse-midwives working at hospitals have higher job satisfaction with higher empowerment and better recognition of working environment, and therefore it is necessary to provide resources and support as well as opportunities and information to increase empowerment. In addition, there needs to be provision of an environment where nurse-midwives can participate in hospital policy, establish foundation to guarantee quality of maternity management, establish abilities, leadership, and support systems for leaders, and communicate smoothly with other medical professionals with ample manpower and resources. Because work environment and empowerment explained job satisfaction by 59.4%, it is necessary to conduct studies to analyze the factors influencing other factors. There is also a lack of studies on nurse-midwives and private nurse-midwives, and continuous research is needed.

Conflict of Interest and Source of Funding: The authors declared of interest.

Source of Funding: Selves

Ethical Clearance: The data of study was analyzed after review and approval of IRB in S University. (1041449-201606-HR-002)

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Effectiveness of the Smoking Stop Model to Improve the Rehabilitative Behavior of Adolescent Smokers

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ABSTRACT

Rehabilitative behavior of smokers behavior makes the body's system work continuously to reduce damage caused by a mixture of toxic and carcinogenic substances that enter the body during smoking. There are short-term and long-term benefits of stopping smoking. After two days of smoking cessation, nicotine left in the body is released, and the taste and smell improves, then. After a week, the heart pumps blood that is richer in oxygen. After two months, the bones become stronger and denser. After two and a half months, the skin becomes smoother, the hair becomes healthier and the teeth become whiter. After four months, coughing and shortness of breath are reduced. This research was conducted in 2017 in South Jakarta and Depok, Indonesia. This type of research is quasi-experimental using treatment groups and control groups. The respondents involved were 30 students from Junior High School X Jakarta as a treatment group and 30 students from Junior High School Y Depok as a control group. The treatment given is the 'smoking stop model', namely blended model community based, self efficacy, and cognitife behavior. Furthermore, the effectiveness of the model will be studied to improve the rehabilitative behavior of adolescent smokers. To prove the effectiveness of the treatment, data analysis was performed using the Ancova test. The results of the study show that the smoking stop model is effective for improving smoking rehabilitative behavior of junior high school students.

Keywords: *Smoking stop model, Adolescent, Rehabilitative behavior*

INTRODUCTION

The Government of Indonesia through the Ministry of Health has launched a healthy community movement, namely: doing physical activities, eating vegetables and fruit, not smoking, not consuming alcohol, checking health regularly, cleaning the environment, and using latrines⁽¹⁾. Several studies on smoking behavior have been carried out such as: The success of community-based⁽²⁾, Smoking cessation and weight changes over 9 years in a community-based cohort study⁽³⁾, and Community Based/CTC that shows excellent recovery and coverage⁽⁴⁾. Through the cognitive behavior model, through family/community education and involvement, 89% of participants who had a history of smoking

behavior had stopped smoking during the follow-up period, and 86% of people stopped smoking before the basic examination.

Rehabilitative behavior of smokers makes the body's system work continuously to reduce damage caused by a mixture of toxic and carcinogenic substances that enter the body during smoking. There are short-term and long-term benefits of stopping smoking. After two days of smoking cessation, nicotine left in the body is released, and the taste and smell improves, then. After a week, the heart pumps blood that is richer in oxygen. After two months, the bones become stronger and denser. After two and a half months, the skin becomes smoother, the hair becomes healthier and the teeth become whiter. After four months, coughing and shortness of breath are reduced⁽⁵⁾.

Referring to the explanation above, it is necessary to make a 'smoking stop model', namely a non-smoking movement in a unit of health education by involving young smokers as targets and family/people/teachers as monitors.

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MATERIALS AND METHOD

This research was conducted in 2017 in South Jakarta and Depok, Indonesia. This type of research is quasi-experimental using treatment groups and control groups. The respondents involved were 30 students from Junior High School X Jakarta as a treatment group and 30 students from Junior High School Y Depok as a control group. The treatment given is the 'smoking stop model', namely blended model community based, self efficacy, and cognitive behavior. Furthermore, the effectiveness of the model will be studied to improve the

rehabilitative behavior of adolescent smokers. To prove the effectiveness of the treatment, data analysis was performed using the Ancova test.

FINDINGS

The results of data analysis (Table 1) show that there was no difference of age and knowledge about smoking between the treatment group and the control group (p -value > 0.05). In other words, before being given treatment, the two groups are equal.

Table 1: Equality of age and knowledge about smoking between the treatment and control groups

Variable	Group	n	Mean	Median	SD	Min-Max	p-value
Age	Treatment group	30	14	14	0.983	12-16	0.526
	Control group	30	13.87	14	1.042	12-16	
Knowledge about smoking	Treatment group	30	14.90	15	2.279	7-19	0.376
	Control group	30	13.26	13.5	2.242	10-18	

The results of data analysis (Table 2) show that there was no difference of grade of school, the presence of household smokers, sources of exposure, duration of smoking and places to get cigarettes between the treatment group and the control group (p -value > 0.05). In other words, before being given treatment, the two groups are equal.

Table 2: Equality of grade of school, the presence of household smokers, sources of exposure, duration of smoking and places to get cigarettes

Variable	Treatment group		Control group		p-value
	n	%	n	%	
Grade of School					
7 th grade	9	30	10	33.3	0.951
8 th grade	11	36.7	10	33.3	
9 th grade	10	33.3	10	33.3	
The presence of household smokers					
Only me	4	13.3	7	23.3	0.548
Brother	3	10	2	6.7	
Father	16	53.4	11	36.7	
Father and brother	4	13.3	6	20	
Grandfather	1	3.3	-	-	
There is no	2	6.7	4	13.3	

Conted...

Sources of exposure					
Mass media	13	43.3	18	60	0.350
I tried it myself	11	36.7	8	26.7	
Forced	4	13.3	1	3.3	
Never	2	6.7	3	10	
Duration of smoking					
< 1 week	11	36.7	8	26.7	0.192
< 2 weeks	5	16.7	2	6.7	
< 3 weeks	1	3.3	-	-	
< 4 week	3	10	1	3.3	
> 1 month	5	6.7	6	20	
Never	5	6.7	13	43.3	
Places to get cigarettes					
Take from family	1	3.3	4	13.3	0.069
Friends	6	20	-	-	
Brothers	1	3.3	-	-	
Buy in a shop	17	56.7	13	43.3	
Never	5	16.7	13	43.3	

Table 3: Differences in rehabilitative behavior scores, health status and cognitive function between the treatment and control groups, after being given treatment

Variable	Group	Mean	SD	95% CI	F	P-value
Rehabilitative behavior	Treatment group	0.833	1.288	1.916-0.283	0.155	0.049
	Control group	0.266	1.818			
Health status	Treatment group	0.166	0.379	4.737-1.403	3.504	0.066
	Control group	1.500	8.215			
Cognitive function	Treatment group	0.300	1.643	2.246-1.312	1.557	0.217
	Control group	0.766	4.583			

The results of the analysis showed that there were differences in rehabilitative behavior of smoking (p-value < 0.005), after the exercise program was conducted.

DISCUSSION

It was found information that the majority of adolescent smokers were 8th grade students, aged 13-14 who were at risk of trying to smoke. This condition is a trigger as well as an amplifier of conditions that occur in adolescents who smoke. The results of expert research show that mothers and siblings who smoke are associated with initiations that occur during daily interactions. This is a significant risk factor for initiating smoking behavior⁽⁶⁾.

Meanwhile, the results of the data analysis concluded that the stop smoking model had no effect on the health status and cognitive function of adolescents. In other words, adolescents continue to behave smoking even though teenagers already know about the dangers of smoking.

It is often found that adolescent smokers have difficulty stopping their smoking habits, when they want to quit smoking. Even one study reported that it took 6 months for interdisciplinary intervention programs "Cognitive Behavior (CB)" by completing intensive program for 3 weeks, smokers will succeed effectively⁽⁷⁾.

The results of another study reported that seven out of eight cognitive attributions for smoking were associated with subsequent smoking behavior (p-value <0.05). Curiosity, autonomy, social image, social ownership, and handling affect the initial stages of smoking, while mental improvement and involvement affect the next stage of smoking. Curiosity, autonomy, social image, and mental improvement precede the development of smoking; social ownership prevents smoking regression; and the handling and involvement of both precedes the development of smoking and prevents smoking regression. This study shows that differences in cognitive attribution affect smoking at different stages in different ways. This finding can inform the smoking prevention and cessation program⁽⁸⁾.

CONCLUSION

The results of the study show that the smoking stop model is effective for improving smoking rehabilitative behavior of junior high school students.

Ethical Clearance: This study has obtained ethical clearance from Ethics Committee of the Ministry of Health of the Republic of Indonesia, with Number: 93/KEPK/VIII/2018.

Source of Funding: This research was funded by the Health Polytechnic of Jakarta I, 2017 budget.

Conflict of Interest: Related to this study, it was stated by the researchers that there was no conflict of interest that could affect the objectivity of the results of the study.

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Family Support and Activities of Elderly with Hypertension in the Working Area of Mangasa Public Health Center, Makassar City, Indonesia

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ABSTRACT

Families have important support functions including social support (families function as seekers and information givers), emotional support (families function to assist in emotional mastery), concrete support or direct support including financial assistance, and support for child care, elderly care, shopping and carrying out household tasks. This form of support consists of informational support, instrumental support, appreciation support and emotional support. The study aimed to analyze the relationship between family support and the activities of elderly with hypertension in the work area of Mangasa Public Health Center, Makassar City, Indonesia, using a cross sectional design. The subjects of the study were 139 elderly with hypertension selected randomly. Data collected through filling out the questionnaire then analyzed by Fisher exact test. The results of the analysis indicate a correlation between information support, appreciation, and emotional support with the activities of elderly hypertension.

Keywords: *Elderly, Hypertension, Family support*

INTRODUCTION

Increased Life Expectancy affects the elderly population. Life expectancy in 2007 is 70.5 years⁽¹⁾. Life expectancy in 2011 is 74.5 years⁽²⁾. Increasing life expectancy has an impact on increasing the number of elderly people. Various impacts will arise due to an increase in the number of elderly people and this fact will have an impact on the health condition of the elderly, along with age. Elderly people will experience a decline in function as a result of changes that occur. Degenerative diseases often accompany the lives of the elderly⁽¹⁾.

Along with age, the elderly will experience changes in their entire body system. Elderly people experience changes in the cardiovascular system that cause various physiological changes such as changes in blood vessel elasticity and increased blood pressure. The 2007 Basic

Health Research results showed that the prevalence of hypertension in Indonesia based on the results of blood pressure measurements at the age of 18 years and over was 31.7% with hypertension, and only 7.2% of the population had known that they were suffering from hypertension⁽³⁾.

Hypertension experienced by the elderly will affect the fulfillment of daily needs and other physical activities. The type of activity that is disrupted, generally is part of daily routines that reflect independence, physical function and involvement in social relations⁽⁴⁾. The characteristics of disorders in the elderly are the presence of disability and disease. Disease can cause disability, weakness and dependence⁽⁵⁾. The family is a place for the elderly to fulfill all their needs and most of the elderly live with their families, which is 85%⁽⁶⁾. Families can provide a familiar environment, affection and feeling needed for the elderly⁽⁷⁾. Not allowing the elderly to live in nursing homes is a form of appreciation for the elderly.

According to Caplan in Friedman, families have important support functions including social support (families function as seekers and information givers),

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emotional support (families function to assist in emotional mastery), concrete support or direct support including financial assistance, and support for child care, elderly care, shopping and carrying out household tasks. This form of support consists of informational support, instrumental support, appreciation support and emotional support⁽⁸⁾.

The study aimed to analyze the relationship between family support and the activities of the elderly with hypertension.

MATERIALS AND METHOD

The design of this study was cross sectional, namely analyzing the relationship between family support (information support, financial support, award support, and emotional support) with the activities of the elderly with hypertension. The study was conducted in the work area of the Mangasa Public Health Center, Makassar City, Indonesia, on July 25 to October 29, 2016. The population in this study were all families who had elderly family members with hypertension. The sample size is 139 people selected by random sampling technique. Data was collected through filling out questionnaire questionnaires about family support that had been developed by researchers, using the IADL measurement format (Daily Living Instrumental Activity) according to Lorenz. The collected data is categorical so that it is presented as a frequency and percentage⁽⁹⁾, then analyzed using Fisher's exact test.

FINDINGS

Most of the elderly aged 60-74 years (82.8%), women (61.9%), high school education (38.8%). The level of dependence of elderly people with hypertension, most were in the independent category (75.5%). Meanwhile, most of the information support was in the adequate category (92.8%), instrumental support in the adequate category (82.7%), award support in the adequate category (97.1%), and emotional support were also in the adequate category (89.2%). It was concluded that the proportion of adequate support was greater when compared to inadequate support.

The Fisher's exact test show the following results:

1. Information support was related to the activities of the elderly with hypertension (p-value <0.05, with OR = 2.764 (CI: 1.513-5.052)

2. Instrumental support was not related to the activities of the elderly with hypertension (p-value > 0.05)

3. Award support was related to the activity of the elderly with hypertension (p-value <0.05, with OR = 3.266 (CI: 1.714-6.223)

4. Emotional support was related to the activity of the elderly with hypertension (p-value <0.05, with OR = 3.444 (CI: 2.074-5.719).

DISCUSSION

Activities of the elderly with hypertension are generally in the independent category. This is in line with the results of the research in the category of the highest age, namely the youngest elderly. Aging accompanied by physical or psychological disorders will affect the level of dependence of the elderly. The older people are accompanied by problems, the higher their dependence on other people or families.

Family support in this study was divided into two categories, namely adequate and inadequate. In this case, the highest proportion is in the adequate category. Both information support, instrumental support, appreciation support, and emotional support are all in the adequate category. Family support is an important social support for family members, especially for the elderly who have problems or those who experience illness. Social support is a process of relationships between families and their environment. Family social support is interactional and reciprocal⁽¹⁰⁾.

Furthermore, it was stated that people who are in a supportive social environment generally have better conditions than people who do not have support. Only a few families prepare to fulfill the physical, financial and emotional needs of the elderly. Based on the results of the analysis it can be stated that family social support consisting of information support, instrumental support, appreciation support and emotional support is needed by the elderly with hypertension. The existence of a strong intergenerational relationship is expected that the family will provide maximum support to the elderly. Social support can be given maximally if the family has knowledge about the elderly and problems that may be faced by the elderly, especially about hypertension experienced by the elderly.

The results of this study state that, there is a relationship between information support with the activities of the elderly with hypertension. Families with inadequate information support are more likely to have problems with the activities of the elderly with hypertension in their families. Information support is part of family social support. Information support is used in interacting and is coping used by the family in dealing with problems faced by the family. Information support is defined as information exchange at the interpersonal level⁽¹⁰⁾.

Families need to get information about how to communicate or how to deliver effective and efficient information to the elderly, so that the occurrence of misperceptions can be avoided. Submission of information to families about hypertension, including ways to prevent and treat it will be useful to prevent or reduce the level of dependence of the elderly, or it is expected that the elderly with hypertension can be independent in meeting their needs and will affect the psychological condition of the elderly so they can live better lives. In addition, facilities and infrastructure in the house can support the elderly to obtain information that is useful for maintaining health.

The results of this study state that, there is no relationship between instrumental support and the activities of the elderly with hypertension. Instrumental support is closely related to the activity of elderly people with hypertension as measured by using the IADL measuring scale. The IADL scale specifically measures the level of ability of the elderly in fulfilling their daily needs. Family instrumental support also measures the level of family support in meeting the daily needs of the elderly. It can be concluded that older people with more independent activities will be able to meet their own needs so that they will need a minimum of instrumental support from the family. Although the results of the study state that there is no relationship between instrumental support and the activities of the elderly with hypertension, but instrumental support from the family is still needed by the elderly hypertension. Elderly people with hypertension still need family financial support in dealing with hypertension that they experience such as the need to arrange a menu that is suitable for hypertension, the need for treatment and treatment of hypertension experienced by the elderly.

The results of this study state that there is a relationship between award support and the activities of

the elderly with hypertension. Families with inadequate appreciation support are more likely to have problems with the activities of the elderly with hypertension, compared to adequate support. Award support is part of family social support. Families are expected to involve the elderly in making decisions about the lives of the elderly later⁽¹⁰⁾. Furthermore it was stated that, support for family members such as involving family members in solving problems in the family or conducting deliberations is a form of appreciation to family members.

Based on the results of the analysis it can be stated that the form of award support for the elderly will improve the health status of the elderly. With adequate appreciation support, the level of health of the elderly with hypertension will be better, so that activities will be more independent in meeting their needs.

The results of this study state that, there is a relationship between emotional support and the activities of the elderly with hypertension. Families with inadequate emotional support are more likely that the elderly in their families experience dependence in activities, compared with families with adequate emotional support. Emotional support is part of family social support. Emotional support is expected to provide a supportive effect, providing comfort to family members⁽¹¹⁾. Conveying warmth, listening to worries and complaints of family members is the practice of giving emotional support⁽¹⁰⁾. Family emotional support for family members, including the elderly with hypertension, is expected to improve the psychological condition of the elderly, so that the elderly feel still valued and useful for other family members and the elderly do not feel lonely in the family⁽¹²⁾.

Based on the results of the analysis it can be stated that the higher the family's emotional support for the elderly, the lower the level of loneliness experienced by the elderly. By reducing the level of loneliness experienced by the elderly, it means that the family has tried to prevent the occurrence of depression in the elderly. Preventing loneliness and depression in the elderly is a form of emotional support given by the family. In addition to support from the family, emotional support can be provided by giving the opportunity for the elderly to socialize or interact with the environment, so that they can increase the dignity of the elderly such as participating in the elderly group, Self Help Group, and integrated elderly service post.

The activity will be a forum for the elderly to increase self-esteem and can increase the knowledge of the elderly, so that the elderly avoid feeling lonely. With increasing self-esteem in the elderly with hypertension, it is expected that there will be an increase in the spirit of life of the elderly, so that the will and ability to do activities will be even greater, so that they will be more independent and less dependent on their families.

CONCLUSION

In the work area of the Mangasa Public Health Center, Makassar City, Indonesia, the independence of the elderly with hypertension in activities is related to information support, appreciation support, and emotional support provided by their families.

Based on the results of the study it was suggested that the development of health care programs for the elderly be supported by the formation of support groups for elderly health problems, especially those suffering from hypertension. It is also necessary to provide extensive information to the public about the problems of the elderly in the family, using more complex methods. Methods that can be used include the distribution of leaflets, the use of posters, the dissemination of information with audiovisual media.

Ethical Clearance: This research had fulfilled the ethical clearance procedure.

Conflict of Interest: In addition, there was no conflict of interest relating to this research.

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SITRUST App: Detecting TB Cases and Increasing RMT Utilization in the Healthcare Facilities in East Java

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ABSTRACT

Rapid Molecular Test (RMT) is a revolutionary test for detecting TB cases in developing countries. However, RMT has not been utilized optimally in developing countries. For example, in East Java, 80% of healthcare is expected to utilize RMT in order to diagnose TB cases, yet only 28% of healthcare facilities utilize it. Most healthcare facilities prefer to use microscopic approach to diagnose TB cases in their areas. Some challenges remain, such as complex referring system, time consuming, and use paper based recording system. In regards to address these challenges, SITURST Application was developed to also improve the accuracy as well as the effectiveness of detecting TB cases. SITRUST App is a system that support healthcare facilities in delivering TB specimen to have tested in other healthcare facilities that have Xpert Test. The Ministry of Health has been piloted SITURST App in 10 provinces in Indonesia, including five districts in East Java. A qualitative approach was implemented in order to understand the key factors that influence RMT utilization after SITRUST App was being introduced to several healthcare facilities in East Java, Indonesia. The results show that SITRUST App has several advantages compare with the previous test, such as easy and rapid which encourage healthcare facilities to utilize RMT.

Keywords: *SITRUST App, RMT utilization, Sample reference test*

INTRODUCTION

In 2016, it was estimated that there were 1,020,000 TB cases in Indonesia, yet only 35 percent of the predicted were notified^{(1),(2)}. The cases is probably underreported or under-diagnosed. The Government of Indonesia (GoI) introduced a new test to detect TB cases which is called RMT. Initially, in 2012, RMT was introduced to only diagnose TB drug resistance⁽³⁾. Since 2016, RMT became the main test to diagnose TB cases in all suspected TB patients⁽³⁾.

Compared to other provinces in Indonesia, East Java has the most RMT test with approximately 84 RMT in healthcare facilities which has been distributed in 38

districts. However, only 28 percent of the total RMT in healthcare facilities was utilized⁽³⁾. This percentage is still far away from the target (80 percent of RMT utilization in the healthcare facilities). RMT has not been utilized optimally in East Java Province⁽⁴⁾. With this in mind, East Java Provincial Health Office and KNCV Foundation, Indonesia developed a join collaboration which aims to strengthen the existing referral system by involving digital technology or SITRUST App⁽⁵⁾.

The concept of SITRUST app is basically similar to online transportation system which has been use widely in Indonesia and other countries. It is functioning as an external currier which accountable to deliver TB sputum to be tested in the healthcare facilities that have RMT, In December 10th, 2017⁽⁵⁾. The local government, in this case the East Java Provincial Health Office together with PT. POS Indonesia signed an agreement in order to strengthen referral system of diagnosing TB incident. Using the existing currier, such as PT. POS Indonesia, it is expected to have reach out wider communities including healthcare facilities remote areas in East Java Province.

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As a new technique (SITRUST App) that has never been implemented in Indonesia which aims to improve TB referral system in Indonesia, it is important to understand the contribution of this app in increasing the utilization of RMT in East Java Province. Thus, SITRUST App was piloted in five districts in East Java, namely Surabaya, Gresik, Sidoarjo, Malang and Jombang, and started since September 1st, 2017. These areas were selected due to high number of TB cases and near with Referral Hospital of TB Drug Resistant (dr. Soetomo Hospital of Surabaya, Haji Hospital of Surabaya, dr. Saiful Anwar Hospital of Malang, General Hospital of Sidoarjo, Ibnu Sina Hospital of Gresik and General Hospital of Jombang).

Table 1: Number of TB Cases & TB Drug Resistant Cases in five districts in 2016

No.	Name of Districts	TB Cases	TB Drug Resistant Cases
1.	Surabaya	5428	66
2.	Sidoarjo	2877	17
3.	Gresik	1815	23
4.	Jombang	1325	12
5.	Malang	1860	7

MATERIALS AND METHOD

RMT and Xpert MTB/RIF test is a new methodology to detect TB cases using molecular with the basis of nested real-time PCR. PCR Primer is able to amplify 81 bp of the core of gen rpoB MTB complex, while probe is designed to differentiate between wild type sequent and mutation on the core area that relates to rifampicin resistance^{(6),(7),(8)}.

This test is using GeneXpert which automatically integrates specimen purification, amplification of nucleate

acid, and detection of the targeted sequent. The system consists of GeneXpert, computer and software device. Each test uses non-reusable cartridge which is designed to minimize cross contamination. Xpert MTB/RIF cartridge has two samples, namely Sample Processing Control (SPC) and Probe Check Control (PCC). SPC is used as an adequate process control of the targeted bacteria in order to monitor the PCR reaction inhibitors. PCC is used to ensure the reagent rehydrate continuously, PCR tube charging to cartridge, probe integrity, and dye stabilization are working well. The Xpert MTB/RIF test is able to detect MTB complex and drug rifampicin resistance in the same time by using amplification of the gen rpoB sequent specific. MTB complex uses five probe molecular beacons (Probe A-E) to identify gen mutation in gen rpoB area. every molecular beacon is labelled by different dye florofor. Cycle threshold (Ct) is able to analyse the results of probe A, B and C in total of 39 cycles, while probe D and E are 36 cycles. The results can be interpreted in different ways.

Xpert MTB/RIF test is organised automatically based on standard procedure operational (SOP) and cannot be modified. It needs two good quality samples of specimen–S-S or S-P. This is because of several reasons as below:

- one specimen to be tested by RMT
- one specimen to be stored temporarily and it will be tested if the first specimen: 1) invalid, 2) RIF indeterminate, 3) RIF resistance on suspect TB that is not categorized as TB drug resistance, 4) RIF Resistance, specimen refer to Line Probe Assay (LPA) for test of Lini-2 with rapid test.

Specimen non-sputum to be tested by RMT should consist of Cerebro Spinal Fluid (CSF), biopsy tissues, gastric lavage, and gastric aspirate.

Table 2: Results and interpretation of RMT test

Results	Interpretation	Follow-up
MTB DETECTED; Rif Resistance DETECTED	DNA MTB is detected Mutation Gen rpoB is detected, potentially Rif Resistance	Follow the process based on TB resistance flow chart
MTB DETECTED; Rif Resistance NOT DETECTED	DNA MTB is detected Mutation gen rpoB is not detected. High sensitivity to Rif	Follow the process based on regular TB diagnose flow chart
MTB DETECTED; Rif Resistance INDETERMINATED	DNA MTB is detected Mutation gen rpoB/Rif resistance cannot be detected because the first signal is not enough to be detected.	Repeat test*) as soon as possible using the new sputum with better quality

Conted...

MTB Not Detected	DNA MTB cannot be detected	Continue to TB diagnose flowchart
INVALID	DNA MTB cannot be determined because the SPC curve shows some increases in amplicon; this sample process is not right, PCR reaction is late.	Repeat test with new sputum and cartridge*); ensure no materials that could obstruct PCR (see annex 11)
ERROR	DNA MTB cannot be determined, quality control internal failed or the system is failed	Repeat test with the new cartridge*), ensure the specimen management correctly (see chapter VI.B. Problem Solving)
NO RESULT	DNA MTB cannot be determined because PCR data reaction is not enough	Repeat test with new cartridge*) (see chapter VI.B. Problem Solving)

*) if Intermediate/Invalid/Error/No Result is appeared in the monitor, the test can only be repeated once.

Table 3: RMT Location in Five Districts with SITRUST Implementation

No.	Districts/ Municipalities	Healthcare Facilities	Number of Equipment	Total Module
1.	Surabaya	dr. Soetomo Hospital of Surabaya	1	16
		BBLK Surabaya	2	6
		Haji Hospital of Surabaya	1	4
		RSP Surabaya	1	4
2.	Sidoarjo	General Hospital of Sidoarjo	1	4
		Krian Health Center	1	4
3.	Jombang	General Hospital of Jombang	2	8
4.	Gresik	Ibnu Sina Hospital of Gresik	2	8
		Semen Gresik Hospital	1	4
		Alon-alon Health Center	1	4
		Driyorejo health center	1	4
		Balongpanggang Health Center	1	1
		Mentaras Health Center	1	4
		Cerme Health Center	1	4
		Sidayu Health Center	1	4 (out of order; waiting for maintenance)
5.	Malang	Kanjuruhan Hospital	1	4
		Wawa Husada Hospital	1	4
		Lawang Hospital	1	4
		Turen Health Center	1	4
		Donomulyo Health Center	1	4
		Singosari Health Center	1	4
		Ampel Gading Health Center	1	4

Online shopping has become a new trend in this digital era. Many people prefer to shop online due to its efficiency. People can search any appropriate applications and download it based on their preference. Online shopping is identically with freight forwarding

services because it supports their business, particularly delivering their products. Smart phone supports online business significantly, because with one click away, people are able to monitor their package as well as checking cost of delivery.

As above, SITRUST App uses the same principle as this online shopping. SITRUST is an information system that to monitor specimen delivery from healthcare facilities which no RMT tool to healthcare with RMT. SITRUST app has five menu such as (i) delivery order, (ii) delivery status, (iii) recipient healthcare facilities, (iv) courier information and (v) user setting. As an example, if health professional wants to monitor the delivery, she/he should press the delivery status, then, the courier will receive a notification of package delivery. A confirmation that the specimen has been accepted will be provided by the recipient, and the recipient will also provide the result of the diagnose.

SITRUST App needs an internet connection. This app can be accessed by many people based on their tasks and responsibilities. SITRUST App consists of two platforms, namely Web Base App that is used as data analysis and recording SITRUST users and Mobile Based App using Android that is used to deliver and

receive specimen. Compare to the conventional test, SITRUST can assist healthcare facilities to record and refer TB specimen safely, therefore, it is important to encourage healthcare facilities to utilize this App.

A descriptive analysis approach was used to understand RMT Utilization before and after use SITRUST app. The data was collected in five districts such as Sidoarjo, Malang, Jombang, Gresik and Surabaya from September 2017 to September 2018. The resource was gathered from SITRUST dashboard which facilitated by the Ministry of Health. KNCV Foundation, Indonesia together with the local government, in this case District Health Office in East Java provided the relevant data of their regular report from healthcare facilities in five piloting districts. The report is related to RMT utilization in these five areas. The data, then analyse using descriptive method, as this method is able to provide clear information about TB referring system that utilize SITRUST and RMT.

	NO	NO ORDER	TGL ORDER	FASKES PENGIRIM	TGL PICKUP	FASKES PENERIMA	TGL TERIMA	STATUS	DURASI	
  	3021	P3517010101-0518-05	17-05-2018 09:37	Pusk.Bandar Kedungmulyo	17-05-2018 11:32	RSUDJombang	22-05-2018 10:19	Terima	4 Hari, 22 Jam, 47 Menit	●
  	3022	P3507210101-0518-10	17-05-2018 09:36	Puskesmas Wagir		RSU WAWA HUSADA	22-05-2018 10:49	Terima		●
  	3023	P3507040202-0518-09	17-05-2018 08:58	PKM Wonokerto		PKM Turen	17-05-2018 10:56	Terima		●
  	3024	P3507080201-0518-07	17-05-2018 08:56	PKM Tirtoyudo		PKM Ampelgading	22-05-2018 09:54	Terima		●
  	3025	P3517090101-0518-20	16-05-2018 14:44	Pusk.Mojoagung	16-05-2018 15:22	RSUDJombang	22-05-2018 10:31	Terima	5 Hari, 19 Jam, 8 Menit	●
  	3026	P3517090101-0518-19	16-05-2018 14:42	Pusk.Mojoagung	16-05-2018 15:22	RSUDJombang	22-05-2018 10:31	Terima	5 Hari, 19 Jam, 8 Menit	●
  	3027	P3517090101-0518-18	16-05-2018 14:41	Pusk.Mojoagung	16-05-2018 15:22	RSUDJombang	22-05-2018 10:22	Terima	5 Hari, 19 Jam	●

Source: Sitrust Dashbord - The Ministry of Health and KNCV Foundation, Indonesia

(**Note:** The contents are in Indonesia version)

Figure 1: Dashbord of SITRUST

FINDINGS

Since SITRUST was introduced, the referral system of TB specimen is recorded automatically to the server. Prior to SITRUST app, referral of TB specimen was

recorded manually (paper based system). As a result of an AutoSaved system, the data are easy to access and recall by the users. Using this new technology, there are some significant advantages, such as (i) easy to identify TB incident; (ii) easy to count the total of TB suspect that

refers to healthcare facilities; (iii) easy to measure the contribution of SITRUST utilization to the increasing number of RMT utilization.

After a year of SITRUST App was implemented (from September 2017 to September 2018) in five districts in East Java. The trend of utilization RMT has increased significantly from nine referral sputum samples in September 2017 to 2518 by September 2018. Figure 2 shows that SITRUST App has helped health facilities to have a better way to measure the number of TB cases in the community. This number can be a basis to develop some solutions to prevent and reduce TB cases.

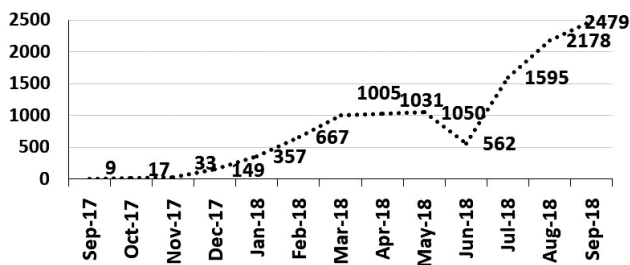


Figure 2: Number of sample referral to healthcare facilities with RMT in East Java Province, September 2017–September 2018

Additionally, the increased of SITRUST utilization has also impacted on the increased number of specimen referral and utilization of RMT as tools to rapid diagnostic of TB cases. The results of TB test are recorded in the SITRUST system automatically, thus it can be forwarded to the related healthcare facilities within a minute. This system has significant impacted on the risk of loss to follow-up as the paper based system is more likely to experience it. In June 2018 a lot of holiday so that SITRUST utilization became decrease.

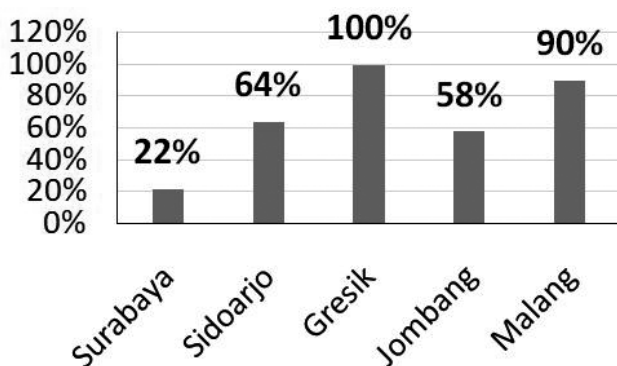


Figure 3: Percentage of healthcare facilities participation in five districts in East Java Province, September 2017–September 2018

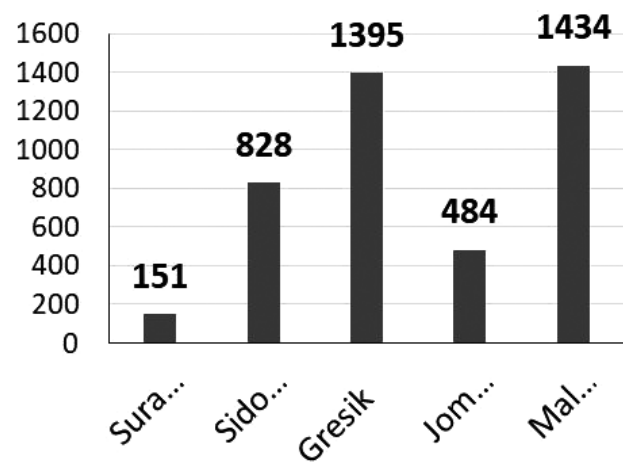


Figure 4: Sample Referral to Healthcare Facilities with RMT in Five Districts in East Java Province, September 2017–September 2018

Figure 3 and 4 indicates that the highest number of the specimen referral was located in Gresik district. Gresik district and Malang Municipality were the two healthcare facilities utilize SITRUST App reached 100 percent. While other healthcare facilities in referring TB specimen to RMT laboratory was varied between districts/municipalities from 22 percent to 100 percent. Because Gresik has 8 RMT and Malang has 7 RMT so can built network with many healthcare for sample referral to RMT.

Since the pre-implementation of SITRUST was introduced in five districts/municipalities in East Java shows, a significant increased on RMT utilization was shown in Figure 2 healthcare facilities where reached its peak on RMT utilization was General Hospital of Sidoarjo, it was 100 percent in January 2018. Krian Health Center reached 96 percent of the RMT utilization and General Hospital of Jombang reached 95 percent of the utilization of RMT. These three healthcare facilities have maintained their percentage above 80 percent on Xpert-Test utilization. Because District Health Office has developed networking of sample referral to RMT and every suspect TB diagnosed by RMT.

CONCLUSION

SITRUST App is able to: 1) Strengthen notification system within healthcare facilities network from a healthcare facility that has no RMT to the one that has RMT, 2) Contribute to RMT utilization, 3) Uplift the burden of delivering TB specimen by health workers, 4) Increase the access on TB diagnostic which notified

by using electronic device, 5) Encourage delivery of TB specimen to be tested in healthcare facilities that has RMT, 6) Support the risk of loss to follow-up. Furthermore, it is recommended to increase its use in the field by improving the elements in SITRUST in the order of priority, for example using DUP (Difficultness Usefulness Pyramid)⁽⁹⁾.

Conflict of Interest: No

Ethical Clearance: Yes

Source of Funding: Authors

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Adherence to the National Immunization Schedule for the First Year of Life in Misan, Iraq

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Abstract

Background: Compliance with age-appropriate receipt of immunization is critical for providing maximum effectiveness against the vaccine-preventable diseases. The Advisory Committee on Immunization Practices recommends specific ages and intervals for vaccines to be administered to maximize their effectiveness. Till now in Misan (South East of Iraq); a considerable proportion of morbidity and mortality was detected in children under the age of 5 years due to vaccine-preventable diseases.

Objectives:

- To determine the rate of adherence to the immunization schedule in the first year of life in order to generate a baseline data that can be used to improve the vaccination uptake in Misan, thus, saving more lives.
- To determine the causes and risk factors influencing the pattern of immunization adherence.

Patients and Method: A cross-sectional study was conducted in Misan Hospital for Child and Maternity. By a random selection, the study enrolled 250 mothers having infants aged 1-2 years attending the hospital as out-patient visitors. Through an interview with the mother, the required data were collected.

Results: Among 250 infants; 22.8% with complete adherence to the national immunization schedule during the first year of life, 68% with partial adherence, and 9.2 % with no adherence. Statistically, immunization adherence was significantly associated with mother's education, residence, and place of delivery.

Conclusion: Adherence to the national immunization schedule in the first year of the life in Misan province was low and not the promising rate. Efforts toward the primary health care centers to raise the awareness and education about immunizations are still required to further reduce the vaccine-preventable morbidity and mortality in children.

Keywords: immunization, vaccine, adherence, infant, Misan.

INTRODUCTION

Childhood immunization is one of the most important public health strategies in the control and prevention of infectious diseases ^(1,2). In spite of these facts, some parents may delay vaccinating their children or may follow an alternative immunization schedule or may even reject the administration of some vaccines because of some beliefs or medical, religious, or socioeconomic causes ^(2,3,4).

However, this attitude will make their children at more risk to have communicable diseases and will increase the chance of having outbreak via the loss of the herd immunity with the reemergence of the vaccine-preventable diseases ^(5,6).

Furthermore, the World Health Organization has reported that about ten millions of children under the age of five years are still dying every year in the world and more specifically in developing countries. The communicable diseases are still representing 7 out of 10 major causes of death in children, and reach about 60% of all child deaths ^(7,8,9).

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Annually, the Advisory Committee on Immunization Practices recommends specific ages and intervals for vaccines to be administered to maximize

their effectiveness. Therefore, compliance with age-appropriate receipt of immunization is critical for providing maximum effectiveness against the vaccine-preventable diseases ⁽¹⁰⁾.

Iraq is one of the Middle East countries of over 30 million populations who have faced a lot of challenges till now. Misan province is located in the South East region of Iraq with about 1.1 million individuals according to the annual report at 2017 ⁽¹¹⁾.

In spite of the limited data, it was reported that the major causes of death in Iraq at 2009 were respiratory tract infection followed by diarrhea forming 34.0% and 24.4% respectively from the total mortality rate in children under the age of 5 years ⁽¹²⁾.

It is of note that in Iraq, 2011; the rate of immunization uptake in infants (less than 1 year) was 78% only ⁽¹³⁾. Currently, in Misan at 2017, the total hospitalization due to gastroenteritis in children younger than 5 years was approximately 21.5% from the total inpatient admission whereas the total mortality rate in children under the age of 5 years was 17/1000 live birth ⁽¹¹⁾.

For these reasons, this study had arisen to estimate the rate of immunization adherence in infancy in order to establish an approach to improve the vaccine compliance in Misan, hence, more vaccination uptake, less risk of vaccine-preventable diseases, and saving more lives.

PATIENTS AND METHOD

A cross-sectional study was conducted in Misan Hospital for Child and Maternity during a period of 3 months from September 2018 to December 2018.

By a random selection, the study enrolled 250 mothers having infants aged 1-2 years attending the hospital as out-patient visitors. Through an interview with the mother, the required data were collected; infant's age, gender, place of delivery, residence, education level of the mother, and the causes beyond the partial or non-adherence to the immunization schedule.

Depending on the immunization card or based on mother recollection if no immunization card was available, the infants were classified into 3 groups according to the adherence pattern;

1. Infants who received all immunization doses of the first year of life according to the national

immunization schedule timing were called infants with complete adherence,

2. Infants who received all vaccines of the first year during the first year of life but did not restrict to the schedule timing and vaccines administration were frequently delayed were called infants with partial adherence,
3. And finally, infants with non-adherence who were unable to receive all the due vaccines for the first year of life before the first birthday.

The new National Iraqi Immunization program was applied in our country from November 2015 up to date ⁽¹⁴⁾. These vaccines are free of charge and usually provided in the Primary Health Care Centers only.

The study protocol was approved by ethical committee of the Ministry of Higher Education, College of Medicine in Misan, Misan directorate of health and Misan Hospital for Child and Maternity to carry out this study. The data analysis was done by SPSS software version 21.0, and then it was formulated as tables and figures. Also, the Chi-square test was applied to determine the association between the different variables. Statistical significance was detected whenever *p*-value is equal or less than 0.05.

RESULTS

Among 250 infants; the majority (68%) had a partial pattern of immunization adherence whereas infants with complete adherence were forming 22.8% as shown in **figure 1**.

Regarding the causes that affect the immunization adherence; it was found that more than half (52.8%) of infants had an acute illness during the time of vaccine and more than a quarter were of a busy family.

Other causes were being lived away from the primary health care center, had a chronic illness, and parental belief forming 12.4%, 4.1%, and 3.2% respectively as shown in **table 1**.

Statistically, there was a significant association between the pattern of immunization adherence and residence, place of delivery, and mother's education in which *p*-values were 0.008, 0.013, and 0.04 respectively as shown in **table 2**.

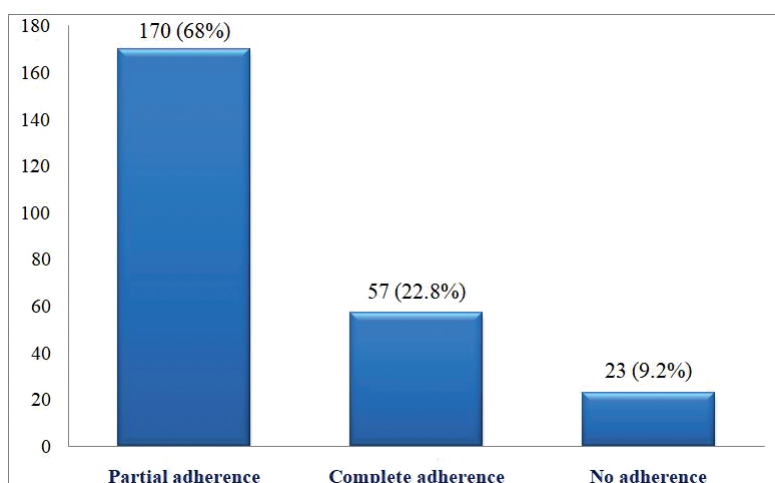


Figure 1: Patterns of immunization adherence in the first year of life

Table 1: Causes of non-adherence to the immunization schedule for the first year of life

Causes	Number (%)
Ill infant during the time of vaccine	102 (52.8%)
Busy family	53 (27.5%)
Living away from the primary health care center	24 (12.4%)
Infant with chronic illness	8 (4.1%)
Parental belief	6 (3.2%)
Total	193 (100%)

Table 2: Relationship between the immunization adherence and risk factors

Risk factors	Immunization adherence			Total No. (%)	P. value
	Complete adherence	Partial adherence	No adherence		
Gender:					
Male	36 (26.7%)	88 (65.2%)	11 (8.1%)	135 (100%)	0.26
Female	21 (18.3%)	82 (71.3%)	12 (10.4%)	115 (100%)	
Residence:					
Urban	20 (18.0%)	86 (77.5%)	5 (4.5%)	111 (100%)	0.008
Rural	37 (26.6%)	84 (60.4%)	18 (13.0%)	139 (100%)	
Place of delivery:					
Hospital	48 (22.0%)	154 (70.6%)	16 (7.4%)	218 (100%)	0.013
Home	9 (28.1%)	16 (50.0%)	7 (21.9%)	32 (100%)	
Education level:					
Illiterate	22 (20.4%)	72 (66.6%)	14 (13.0%)	108 (100%)	0.04
Primary	18 (20.9%)	65 (75.6%)	3 (3.5%)	86 (100%)	
Secondary	10 (25.0%)	24 (60.0%)	6 (15.0%)	40 (100%)	
College	7 (43.7%)	9 (56.3%)	0 (0.0%)	16 (100%)	

DISCUSSION

Immunization is considered one of the most cost-effective public health efforts in reducing mortality

in children under the age of 5 years ⁽⁹⁾. The measles vaccination alone prevented 15.6 million deaths in children between 2000 and 2015 globally ⁽¹⁵⁾ indicating that the compliance to the recommended immunization

program is a challenge for the health care system to achieve Millennium Development Goal 4^(7,9,15).

The current study revealed that the rate of infants with complete adherence to the national immunization program was low and not reaching even one-quarter from the total (22.8% only). In comparison with United States (US) in 2016; it is lower than US rates (26%)⁽¹⁶⁾.

On the other hand, vaccines administration were frequently delayed in infants with partial adherence to the national immunization program and those were forming the vast majority of the cases reaching 68% whereas the rate of no-adherence was not low forming about 9.2%. Approximately, the same was seen in US in whom the vast majority (74%) was frequently not restricted to the schedule timing⁽¹⁶⁾.

Consequently, the delayed vaccination would abate the effectiveness of immunization⁽¹⁰⁾, affect the development of herd immunity, and lead to disease transmission⁽⁵⁾.

The present study showed that most common cause of non-adherence to the national immunization program was ill infant during the time of vaccine, thus, parents would decide to postpone the due vaccine according to their poor knowledge and these findings were consistent with Turkey (Istanbul)⁽¹⁷⁾. So failure to administer vaccines for infants with minor illness will impede the vaccination effectiveness⁽¹⁰⁾.

Lack of parental education was the second main barrier to the immunization as concluded by Bahari et al in Mosul (North Iraq)⁽¹⁸⁾ and this was consistent with the results of the current study in which there was a significant relationship between the education and the adherence to the immunization program.

Moreover, the rate of being fully vaccinated infants is approximately nine times more in educated mothers than non- educated mothers as concluded by Torun et al study in Istanbul⁽¹⁷⁾.

The second cause affecting the parental adherence to the immunization was the busy family (27.5%) and this agreed with Sporton et al study⁽¹⁹⁾. This can be attributed to the importance of parental education about the importance and effectiveness of vaccines against communicable diseases.

Living away from the primary health care center was the third cause affecting the immunization adherence as

agreed by 12.4% of the total sample. This obstacle was also seen at a higher rate (43.6%) in Istanbul in those with poor knowledge about vaccinations and living in the villages⁽¹⁷⁾.

In Turkey, Topuzoglu et al concluded that the ability to reach the primary healthcare center is one of the important factors that should be taken in consideration when planning the immunization program in the developing countries⁽²⁰⁾.

In Misan, there was a misunderstanding by mothers that any infant with chronic illness should not receive any vaccine as seen in 4.1%. Additionally, to date, there was 3.2% not adhering to the national program because of their belief that there is no benefit from the vaccine and this was in accordance with Greek study in which there was less than 5% of parents omit or postpone immunization secondary to their beliefs⁽²¹⁾. Again this affected by the educational level of the parent and would need more communication efforts with the immunization provider to clarify the precaution and contraindication of the vaccines and highlight the important value of immunization adherence⁽²²⁾.

Regarding the place of delivery; the current study showed that there was a significant association between immunization adherence and the place of delivery. There was more chance to have good compliance with infants who delivered in hospital and this can be explained by the policy of a routine initiation of immunization by giving hepatitis B vaccine to all delivered newborns in the Iraqi governmental hospitals. This significant association was compatible with Mosul study which reported that infants who delivered in the general hospitals were 12.9 times more possible to have complete immunizations than infants born at homes⁽²³⁾. Also, it is agreed with Istanbul⁽¹⁷⁾ which revealed that the delivered infant at home would be at a double risk to have delayed vaccination than the delivered infant in the hospital.

Moreover, Hospitalization could be used as an opportunity to provide the recommended immunizations and efforts should be considered to administer vaccines during admission or at discharge⁽²⁴⁾.

In studying the different associated risk factors; the present study reported no significant association between the immunization adherence and gender which was incompatible with Istanbul and Ghana which showed that the gender would affect the immunization uptake^(17,25).

Misan is consisting of urban (74%) and rural groups (26%) ⁽¹¹⁾. The present study revealed a significant relationship between the residence and the pattern of immunization adherence in which there were more infants with complete adherence in rural than urban areas and this was compatible with Turkey ⁽²⁰⁾.

Lately, the incidence and the associated risks of communicable diseases have been significantly declined in the Western countries due to the immunization strategies that focused on infants and children ⁽²⁾.

Different studies emphasize the important role of education about immunization in achieving more parental compliance with immunization schedule, thus, increasing the immunization rate of their children as demonstrated by different studies in Iraq ⁽¹⁸⁾, Istanbul ⁽¹⁷⁾, Greece ⁽²¹⁾, and Ghana ⁽²⁵⁾.

In addition, educational and reminders interventions have a recognizable role in achieving appropriate immunization adherence, as well as, increasing immunization rates as shown in different studies ^(18, 26).

Finally, the effective role of immunization in decreasing the morbidity and mortality in children and achieving Millennium Development Goal 4 cannot be launched without parental compliance and appropriate adherence to the immunization schedule ^(4, 7, 9, 15).

CONCLUSION

Adherence to the national immunization schedule in the first year of the life in Misan province was low and not the promising rate. Efforts toward the primary health care centers to raise the awareness and education about immunizations are still required to further reduce the vaccine-preventable morbidity and mortality in children.

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Personal Factors that Affect Adherence of Fluid Restriction in Patient with Hemodialysis

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ABSTRACT

Background: Adherence to fluid restriction are a common problem and a major challenge for dialysis patients. The purpose of this study was to predict various patient personal factors which included changes in physical conditions (duration of dialysis, severity), psychological factors (stress, motivation), social factors (family support, peer support) and perceptions of adherence that affect dialysis patient's adherence on fluid restriction.

Method: A descriptive analytic with cross sectional approach was this research's design. There were 135 respondents involved in this research. The inclusion criteria for patients with a minimum age of 18 years, receiving similar dialysis therapy for at least 3 months, in stable medical conditions, and not experiencing psychological problems. The variables include fluid restriction adherence and the patient's personal factors which are physical factors (knowledge, length of dialysis, severity); psychological factors (stress, motivation); social factors (family support, peer support); and perceptions related to adherence. Data were analyze using logistic regression analysis.

Findings: The results showed that the most influential variable on adherence to fluid restriction was the level of stress experienced by patients. Odds Ratio (OR) of stress variables was 11.4 which means that dialysis patients who experience stress will show adherence of fluid restriction 11.4 times lower than other dialysis patients after controlling for variables of age, education, knowledge, severity, motivation, family support, peer support and perception.

Conclusion: psychological changes (stress) are the main predictors of fluid restriction compliance after being controlled by other variables.

Keywords: *dialysis, adherence, fluid restriction, stress*

INTRODUCTION

Hemodialysis is one of kidney replacement therapy for patients with end stage renal disease, because kidney function improves the decline ⁽¹⁾. Fluid restriction are recommended for hemodialysis patients due to the inability of the kidneys to remove excess body fluids ⁽²⁾ and the risk of increasing complications from excess fluid ⁽³⁾. Low fluids adherence may lead to the increased discomfort and side effects (e.g., cramping,

emesis, syncope) during and immediately after dialysis sessions ⁽⁴⁾, cardiovascular problem (e.g., left ventricular hypertrophy, congestive heart failure, hypertension) ⁽⁵⁾, fluid overload symptoms (lower-extremity oedema, ascites, shortness of breath, and pulmonary vascular congestion or acute pulmonary oedema) ^(5,6), increased morbidity ⁽⁶⁾, increased hospitalizations ⁽⁴⁾ and increased mortality in CKD patients ⁽⁵⁾.

Problems with adherence to fluid restriction are a common problem and a major challenge for dialysis patients ^(7,8). Adherence is the main key to success ⁽⁹⁾ and the patient's support in undergoing the treatment process through the knowledge and skills possessed ^(10,11). Fluctuating changes of physical and psychosocial conditions in dialysis patients seem to contribute to

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the inability of dialysis patients to maintain adherence⁽¹²⁾. Specific factors related to changes in physical and psychological conditions (duration of dialysis, severity, stress, motivation) and perceptions of adherence and peer support need to be further analyzed to find out whether these factors also influence the adherence of dialysis patients in fluid restrictions.

Many previous studies have been carried out to determine the factors that influence adherence. Demographic characteristics that have been studied and are predictors of adherence include age^(9,12-14); gender^(9,12,15); level of education^(9,12,16); and marital status⁽⁹⁾. Other factors studied included patient knowledge related to disease and therapy^(17,18); social support^(17,19,20); duration of implementation on prolonged hemodialysis^(15,21); complexity and variety of drugs^(22,23); psychological condition (depression)^(13,24-26); limited awareness of health^(27,28); level of patient disability (which includes disability and difficulty in participation)⁽¹⁴⁾; difficult transportation⁽¹⁷⁾; dialysis measures (dialysis schedule, routine laboratory tests to be undertaken, complications during dialysis, problems related to hemodialysis machines)⁽¹⁷⁾ and issues of individual trust in dialysis measures⁽¹⁷⁾. The purpose of this study was to predict various patient personal factors which included changes in physical conditions (duration of dialysis, severity), psychological factors (stress, motivation), social factors (family support, peer support) and perceptions of adherence that affect dialysis patient's adherence of fluid restriction.

MATERIAL & METHOD

A descriptive analytic with cross sectional approach was this research's design. There were 135 respondents involved in this research. The inclusion criteria for patients with a minimum age of 18 years, receiving similar dialysis therapy for at least 3 months, in stable medical conditions, and not experiencing psychological problems. The "y" variable in this study is fluid restriction adherence, while the "x" variable includes demographic characteristics (age, sex, education); physical factors (knowledge, length of dialysis, severity); psychological factors (stress, motivation); social factors (family support, peer support); and perceptions related to adherence.

The instruments used in this study included a patient characteristic data sheet asking for age, sex, education, duration of dialysis and severity. Another instrument is

the knowledge questionnaire (consisting of 5 questions related to fluid restriction prepared by researchers using a reference to basic information on fluid restriction for patients with dialysis). The level of stress is obtained using the Perceived Stress Scale (PSS) instrument⁽²⁹⁾. Assessment of patient motivation is obtained by modifying the Patient Motivation Inventory instrument⁽³⁰⁾. The Multidimensional Scale of Perceived Social Support instrument⁽³¹⁾ was used to assess family support and peer support. The patient's perceptions of adherence were modified from the Patient Perception Questionnaire instrument⁽³⁰⁾. Assessment of adherence to fluid restriction was carried out using the Dialysis Diet and Fluid Non-Adherence Questionnaire (DDFQ) questionnaire⁽³²⁾. Logistic regression analysis was used in the research and considered the value of Odd Ratio (OR).

FINDINGS

There were 89.6% of respondents in the non-severe category showing adherence of fluid restrictions. There were 91% of respondents who showed adherence to fluid restrictions are in the category of very high stress levels. In table 1 could be seen that after going through the bivariate, multivariate and interaction analysis processes the results of the last statistical analysis showed that the most influential variable on adherence to fluid restriction is the level of stress experienced by patients. Odds Ratio (OR) of stress variables is 11.4 which means that dialysis patients who experience stress will show adherence of fluid restriction 11.4 times lower than other dialysis patients after controlling for variable of severity.

Table 1: Factors associated with fluid adherence

Variable	Fluid Adherence OR (95% CI)	p-value
Level of Stress	11.329 (1.113-115.344)	0.040
Severity	0.257 (0.089-0.744)	0.012

DISCUSSION

In this research, stress levels were the main predictor in adherence to fluids restriction after controlling for variables of age, education, knowledge, severity, duration of dialysis, motivation, family support, peer support and perception. Very high stress levels increase the risk of non-adherence of dialysis patients. The results

of this study are in line with other studies that predict the relationship between adherence with psychosocial conditions which states that psychological conditions are predictors of phosphate binders adherence in addition to age and work⁽³³⁾. In that study also stated that the variables of depression, anxiety, and stress were negatively related to adherence to treatment, which confirmed that negative emotional states could be a risk to adherence⁽³³⁾.

Psychological distress and disorder represent a significant problem for ESRD patient⁽³⁴⁾. Dialysis patients are susceptible to stress especially due to exposure to hemodialysis stressors and various rules that must be followed⁽³⁵⁾. Another stressor was the problem of life, both related to the economy, personal relationships with partners, with children or other family members, social relationships, work, even education. Similar to other results which mentioned that the most psychological problems were food and fluid concerns, unemployment, sexual problems, changes in body appearance, limitation in physical activities, frequent hospitalizations, the length of time on dialysis, uncertainty about the future, changes in life style, increased dependence, and sleep disturbances⁽³⁶⁾. Regarding the physiological stressors, the problems include fatigue, pain during venipuncture, muscle cramps, itching between treatments, nausea and vomiting⁽³⁶⁾.

Psychosocial stressors are known to be associated with the use of coping mechanisms that are problem solving oriented⁽³⁷⁾. This study confirms that psychosocial stressors (including those related to fluid restriction stressors) are more easily adapted to patients, of course, if the coping mechanism owned by patients focuses on solving problems⁽³⁷⁾. Dialysis patients who experience repeated stressors will show skills in overcoming these stressors or as well as can cause exacerbations of symptoms of depression and impact on adherence⁽³⁵⁾. Although stress is a major predictor that affects the adherence of dialysis patients in fluid restriction, dialysis nurses should consider severity of the disease.

Lack of motivation as known as one of the psychological barriers to restrict fluid⁽¹⁸⁾. In this research, motivation of respondents in this study is in the average category of being adherence of fluid restrictions. Respondents mention that fluid restriction is one of the recommendations that is felt to be quite difficult and burdensome to follow. Respondents who have been on dialysis for a longer time have a higher perception of the

benefits of controlling fluid overload⁽³⁸⁾. Other research also reveal that there was a significant relationship between social support and adherence to dietary and fluid restrictions⁽¹⁹⁾.

The young age category is also a predictor of compliance with dialysis patients in fluid restrictions. The results of this study are different from studies that state that the younger age is a predictor of multidimensional repetitive or non-adherent (not only for fluid restrictions)⁽³⁹⁾. Younger⁽¹⁵⁾, male patients and those with longer duration on hemodialysis found more likely to be non-adherent⁽¹⁵⁾. Respondents with a sufficient level of knowledge showed a comparison of the percentage of compliance and non-compliance with fluid restrictions was not much different. Lack of adequate knowledge of the major perceived barriers towards better adherence to fluid⁽¹⁵⁾. Others research states that no direct relationship was observed between dietary knowledge and any adherence measures⁽⁴⁰⁾.

CONCLUSION

Physical and psychosocial changes experienced by dialysis patients contribute to the achievement of fluid restriction compliance. This study shows that psychological changes, namely stress experienced by dialysis patients, are the main predictors of fluid restriction compliance after being controlled by other variables. Dialysis nurses need to consider the psychological changes experienced by patients and plan interventions that are appropriate to these conditions.

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Shift Work and the Risk of Cancer—A Systematic Review

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ABSTRACT

In 2007, the International Agency for Research on Cancer (IARC) classified shift work involving circadian disruption as “probably carcinogenic to humans”. A few epidemiological studies have sought to assess the association between shift work and the risk of cancer, although the results have been inconsistent. Thus, we aimed to conduct a systematic review of prospective cohort studies to summarize the epidemiological evidence of an association between shift work and the risk of cancer. The database used in this review was Medline/PubMed and search terms “shiftwork”, “shift work”, and “night work”. The limitations included text availability (free full text), language (English), search fields (title), and publication between January 2008 and January 2018. The search strategy resulted in twelve articles that met the selection criteria. Three studies presented results related to prostate cancer, two studies were related to lung cancer, four studies to breast cancer, and three studies related to other cancers. In conclusion, there is limited evidence of a causal association between night shift work and breast cancer, while there is insufficient evidence in respect to lung cancer, prostate cancer, and other cancers.

Keywords: *Shift work; night work; prospective cohort; cancer.*

INTRODUCTION

Shift work and night work facilitate the round-the-clock activities required to meet technological needs (e.g. power plants, oil refineries, and the steel industry), social services/utilities functions (e.g. hospitals, transports, and the police), productive and economic demands (e.g., textiles, paper, food), and the needs of the leisure industry¹. The effect is that companies require employees to work continuously, thereby creating a need for shift and night work schedules. Shift schedules allow companies to operate on a continuous basis by ensuring that their job positions are constantly filled by rotating employees. While shift frequency and duration may vary between companies, differences may also be observed in the number of consecutive work days and the direction of rotation. In Britain and Europe shifts will typically run from 6 am to 2 pm (early shift), 2 pm to 8 pm (late

shift) and 8 pm to 6 am (night shift), perhaps with the variation of an hour (or occasionally two hours) earlier in each case².

Shift work has been linked to various acute and chronic diseases³. Chronic diseases such as cancer, can be triggered by circadian system disorders caused by exposure to light at night which changes the pattern of sleep activity, suppressing melatonin production, and leading to dysregulation of the genes involved in tumor development (Press Release N° 180 - International Agency for Research on Cancer 2007). Several case-control studies have identified that shift work or night work can be associated with an increased risk of prostate cancer^{4,5}, despite other cohort studies revealing no such association^{6,7,8}. Scernhammer et al.⁹ found an elevated risk of breast cancer among women who had worked 20 or more years of rotating night shift work compared to women who reported never having worked rotating night shifts. Schwartzbaum et al.¹⁰ meanwhile, found no increase in the risk of female breast cancer based on their definition of night work.

Over the past several decades, a number of epidemiological studies have assessed the association

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between shift work and the risk of cancer, yet the results have been inconsistent. Thus, we aimed to conduct a systematic review of prospective cohort studies with the aim of summarizing the epidemiological evidence of an association between shift work/night work and the risk of cancer.

METHOD

Literature search: The database used in this systematic review was Medline/PubMed. The search for literature

in the database was conducted on July 12, 2018 using the keywords “shiftwork”, “shift work”, and “night work”, with the search criteria including text availability (free full text), language (English), search fields (title), and publication in peer-reviewed journals between January 2008 and January 2018. A prospective cohort study is the best observational design for questions of etiology and consequences¹¹. For inclusion in this review, studies had to be prospective cohort studies with population based samples. Shift work/night work was the exposure variable, and the outcome was cancer.

RESULTS

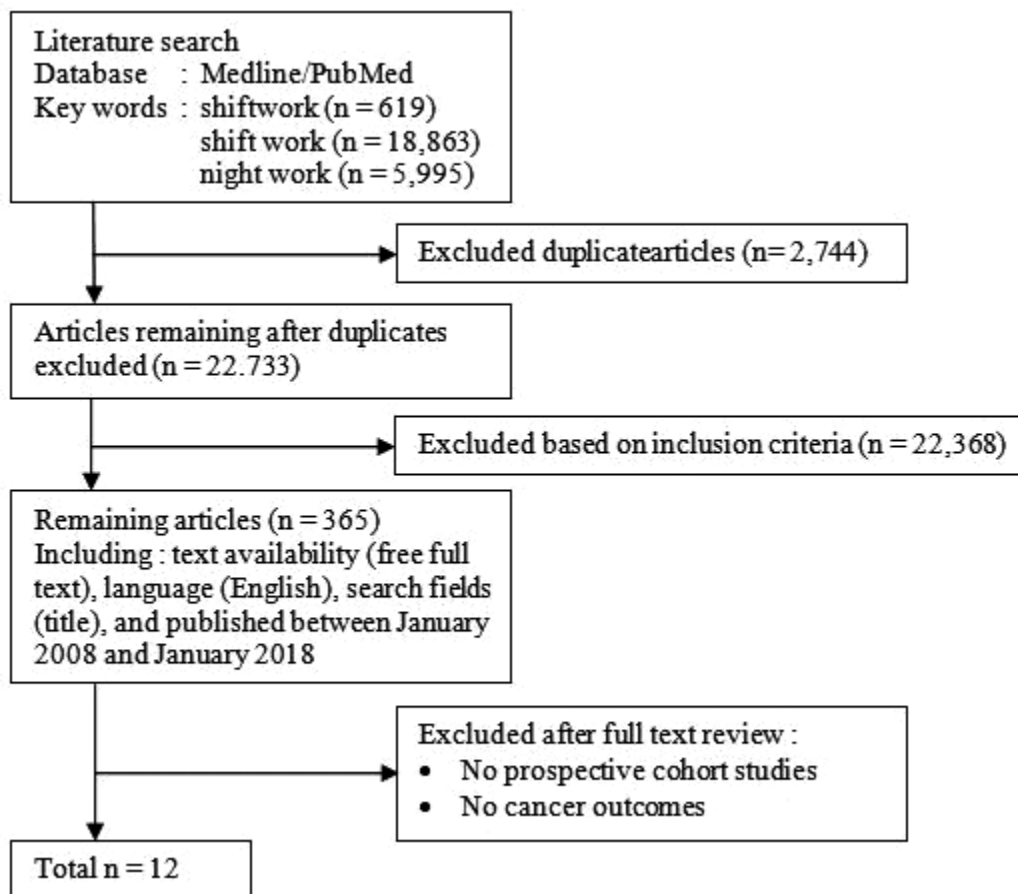


Figure 1: Flow diagram of the selection procedure

DISCUSSION

In 2007, The International Agency for Research on Cancer (IARC - Press Release N° 180) stated that “shift work that involved circadian disruption was probably carcinogenic to humans”. The mechanism is a disruption of the circadian system caused by exposure to light at night. This has the ability to alter sleep-activity patterns, suppress melatonin production, and lead to dysregulation

of the genes involved in tumor development (International Agency for Research on Cancer 2007).

Prostate cancer: Based on the evidence obtained from three epidemiological studies, no significant association has been found between shift work and the risk of prostate cancer^{6, 7, 8}. Hammer et al.⁸ reported that shift workers did not have an elevated hazard ratio for prostate cancer in comparison to daytime workers (HR = 0.93, 95%

[CI] 0.73-1.18). In the overall analyses of Finnish twin studies, no significant association was identified between sleep duration, sleep quality, or shift work and prostate cancer risk, and no significant association between sleep and circadian-related parameters and prostate cancer specific mortality⁷. Similar results were found in Swedish twin studies, showing no association between the working of nightly shift and prostate cancer, nor between the duration of night work and prostate cancer. Likewise an analysis of twin pairs discordant for prostate cancer (n=332) showed no significant association between night work and prostate cancer⁶. These three studies contradict the results found by Kubo et al.¹² in their study, where it was reported that compared to day workers, shift workers were at a significantly greater risk of developing prostate cancer (RR = 3.0, 95% [CI] 1.2-7.7). However, there were several limitations to the research from Kubo et al.¹² one of which was the short follow-up time and relatively small cohort involved. The follow-up time was 10 years and there were only 31 cases of prostate cancer, meaning the results must be interpreted with caution. Overall for prostate cancer, a recent meta-analysis of nine prospective cohort studies found no clear association between night shift work and prostate cancer¹³.

Lung cancer: There is only a very limited amount of epidemiological research related to the association between shift work and lung cancer risk. Among the findings are a 28% increased risk of lung cancer among women (Nurses' Health Study) who have spent 15 or more years working rotating night shifts (RR = 1.28, 95% [CI] 1.07-1.53) compared to women who have not worked any night shifts¹⁴. This association was strongest in respect of small-cell lung carcinomas (RR = 1.56, 95% [CI] 0.99-2.47) and was not observed for adenocarcinomas of the lung (RR = 0.91, 95% [CI] 0.67-1.24). Further, the increased risk associated with 15 or more years of rotating night-shift work was limited to current smokers (HR = 1.61, 95% [CI] 1.21-2.13), with no such association seen in nonsmokers. Kwon et al.¹⁵ conducted a study on female textile workers in Shanghai, with their result indicating an increased risk of lung cancer not related to rotating night shift work, for both cumulative years (HR = 0.82, 95% [CI] 0.66-1.02) and cumulative number of nights (HR = 0.81, 95% [CI] 0.65-1.00).

Breast cancer: A total of four epidemiological studies from the selection of literature discuss the association between night/shift work and breast cancer, with

inconsistent results¹⁶. Pronk et al.¹⁶ reported that breast cancer risk was not associated with ever having worked a night shift (HR = 1.0, 95% [CI] 0.9 to 1.2). Likewise Travis et al.¹⁹ with three participants from the UK Study concluded that night shift work including long-term shift work had no effect on the incidence of breast cancer. Others, however, have identified a link between an increased risk of breast cancer and exposure to a long period of night-shift work^{17,18}. Swedish twin studies involving participants under the age of 60 years exposed for more than >20 years showed (HR = 1.77, 95% [CI] 1.03-3.04), while shorter exposures to night shift work revealed no significant effect¹⁷. In the Nurses' Health Study II, the risk of breast cancer was found to be significantly higher in women with 20 years or more of shift work at baseline (HR = 2.15, 95% [CI] 1.23-3.73), although the same did not apply to the Nurses' Health Study I, in which women with 30 years or more of shift work did not have a higher risk of breast cancer (HR = 0.95, 95% [CI] 0.77-1.17) compared with those who had never done shift work¹⁸. The expert working group at IARC identified eight studies looking at night shift work and breast cancer, six of which noted a modestly increased risk of breast cancer among long-term night workers compared with those who were not engaged in shift work at night¹. Two of these studies reported data from prospective studies of nurses engaged in night work. The first, from the Nurses' Health Study in the United States, estimated that nurses reporting ≥ 30 years of rotating night shifts were 36% more likely to get breast cancer than those who did not report working rotating night shifts (RR = 1.36, 95% [CI] 1.04-1.78). In the Nurses' Health Study II, those women who reported ≥ 20 years of rotating night shifts had an elevated risk of breast cancer compared with women who did not report working rotating night shifts (RR = 1.79, 95% [CI] 1.06-3.01).

Other cancers: Evidence was also examined from the epidemiological studies in the selection of literature with respect to the association between night/shift work and several other cancers, including ovarian cancer, bile duct cancer, and skin cancer^{20,21,22}. Poole et al.²⁰ reported no association between the duration of rotating night shift work and the risk of ovarian cancer. Studies among Japanese men revealed no significant increase in the risk of bile duct cancer in shift workers (HR = 1.50, 95% [CI] 0.81-2.77); however, when the analysis was limited to extrahepatic bile duct cancer, significant associations appeared for shift workers (HR = 1.93, 95% [CI]

1.00-3.72)²¹. Heckman et al.²² reported no significant association between shift work and melanoma (1.02, 95% [CI] 0.86-1.21), Basal Cell Carcinoma (0.93, 95% [CI] 0.90-0.97), and Squamous Cell Carcinoma (0.92, 95% [CI] 0.80-1.06).

CONCLUSION

In conclusion, there is limited evidence of a causal association between night shift work and breast cancer, while there is insufficient evidence with respect to lung cancer, prostate cancer, and other cancers.

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Analysis of Peripheral Neuropathy Disorders in Humans from Mercury Exposure: A Systematic Review

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ABSTRACT

Introduction: Mercury is recognized as a global contaminant because it can travel long distance in the atmosphere, stay in the environment, accumulate in food webs, and cause severe adverse effects on human and ecosystem health. Exposure to mercury can affect peripheral nerve disorders and is usually found in populations exposed to workplaces with high mercury exposure. This study aims to analyze exposure of peripheral neuropathy in humans to mercury.

Method: This systematic review uses the PRISMA-P 2015 and keyword search using PICO-S technique.

Results and Discussion: We found that direct exposure of mercury to humans for less than six continuous months can cause peripheral neuropathy. Susceptibility factors affecting mercury poisoning are age, sex, type of work, immunity, length of stay, distance of residence to a mining location, distance of sources of clean water and sources of pollutants, smoking status, and consumption of fish.

Keywords: *mercury; neuropathy; humans; systematic*

INTRODUCTION

Mercury (Hg) is a natural element found in the environment. Mercury is recognized as a global contaminant because it can travel long distance in the atmosphere, stay in the environment, accumulate in food webs, and cause severe adverse effects on human and ecosystem health⁽¹⁾. In 2011, the amount of mercury emission worldwide was estimated at 1,400 tons every year. In the case of the small-scale gold mining industry, it is estimated that it involves between 12 million and 15 million people in more than 70 countries and generates 20% of the world's gold supply⁽²⁾. Human exposure to Hg can cause various health risks, with a degree of severity dependent largely on the magnitude of the dose. All forms of mercury are toxic, but the most dangerous one is in an organic form, methylmercury (MeHg), which is a neurotoxin. Acute mercury exposure can cause permanent damage to the nervous system resulting in a variety of symptoms⁽¹⁾. The tragic events in Minamata and Niigata, Japan, where large populations suffered from MeHg from contaminated fish consumption, have dramatically shown the danger of mercury through the food chain and its risks to human health⁽³⁾. Recently there have been reports of unintentional acute exposures to

element mercury in school children due to broken bottles containing mercury in chemical laboratories in schools in different cities in Turkey⁽³⁾. The most prevalent health problems experienced by 166 respondents in Rataotok sub district and its surroundings were cramps in the feet and hands (33.1%) and tremors (10.5%)⁽⁴⁾. Moreover, study results in Muara Angke, Jakarta, Indonesia, involving 160 respondents suggest that a number of respondents experienced clinical symptoms of chronic mercury poisoning in the forms of trembling on fingers, tingling on fingers and toes and often accidentally dropping, positive ataxia and tremor⁽⁵⁾.

The correlation between exposure to mercury and peripheral nerve disorders and impairments usually has been studied in occupationally exposed populations experiencing high mercury exposure⁽⁶⁾. Peripheral neuropathy or peripheral neuritis is a common neurological disorder that results from peripheral nerve damage. Peripheral neuropathy has a variety of causes, including toxic trauma, use of certain chemotherapy drugs, and mechanical injuries that cause compression or pressure⁽⁷⁾. Another important aspect of peripheral neuropathies is the presence of geographical and occupational distribution especially of toxic neuropathies

substances such as mercury, arsenic, lead where the main source is occupational exposure⁽⁸⁾. Although the neurological effects of organic mercury exposure are well defined, there have been no in vivo studies examining the mechanisms that cause neurological symptoms from mercury exposure⁽⁸⁾. This study aims to analyze mercury exposure to peripheral neuropathy in humans.

METHOD

This systematic review used PRISMA-P protocol (Preferred Reporting Items for Systemic Review and Meta-Analysis Protocols) 2015⁽⁹⁾.

Search Strategy and Study Selection: Studies were collected through search in the source data from PubMed, Science Direct, Scopus, and EBSCO from January 2008 to August 2018. Keywords search used PICO-S (Population Intervention Compare Outcome-Study design) technique. By using search with keywords: (1) Mercury or Hg, (2) peripheral neuropathy, (3) humans, (4) analysis, (5) quantitative study.

Study Inclusion Criteria: The inclusion criteria of the documents that we consider appropriate (eligibility) for the systematic review are as follows: (1) targeted group: Mercury or Hg, (2) outcomes: peripheral neuropathy in humans, (3) research method: quantitative study, (4) studies written in English or Indonesian language.

Study Exclusion Criteria: We screened the title and abstract of studies that are not-full text and irrelevant. We considered aspects such as population, sampling, and method. If the documents are not included in PICO-S and do not discuss the exposure to mercury and its effects on peripheral neuropathic disorders in humans, they were also excluded. Furthermore, we only selected studies that were conducted between 2015 and 2018, as well as written in English and Indonesian language.

Data Extraction: Electronic database search was conducted for 30 days from 24 July to 24 August 2018. Screening was conducted based on relevance to the title and abstract of the full paper. Document selection process can be seen in Figure 1.

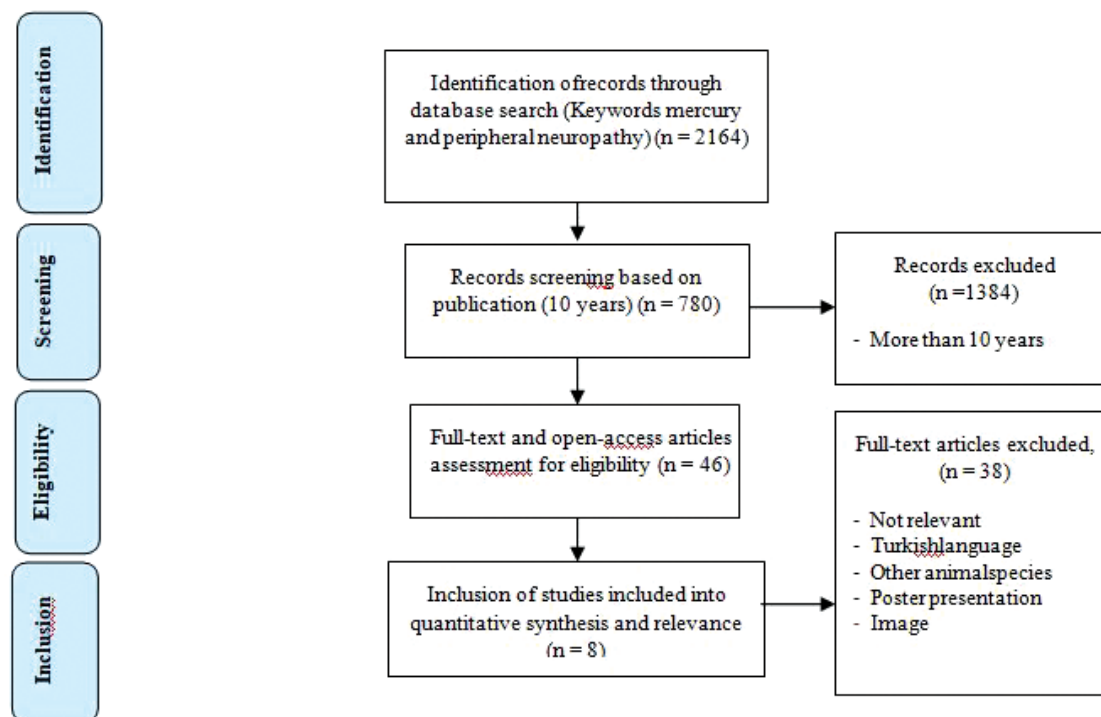


Figure 1: Preferred Reporting Items for Systematic Review

RESULT

Amongst 2164 research, we found five studies that fit the inclusion criteria discussing mercury exposure to

peripheral neuropathy in humans. The studies included in this analysis were carried out in countries where there were cases of mercury and its effects on peripheral neuropathy. Four were case report studies, one of which

used a retrospective study design, two of which used a prospective study design, and one of which used observational studies. What the eight studies above have in common is that their independent variable consists of the central nerve system or peripheral nerve function. In addition, other variables are mostly similar, such as age, sex, previous mercury exposure history, demography, previous disease history, and BMI (Body Mass Index). The samples in this study are not limited in terms of age or sex. Based on the results, most are children in the age range between 2 and 18 years. As for adults, the age range is between 20 and 54 years. In average, the analyses used in these eight studies were bivariate analysis, followed by multivariate analysis using linear regression.

Some studies have shown cases of mercury poisoning with nervous system disorders, which in this case is peripheral neuropathy. The study ⁽¹⁰⁾ is a case report in which a man 35 year old, Latin American experienced an unstable gait, nausea, vomiting for more than 1 week and was followed by headache, diplopia, and vertigo. He claimed to have injected subcutaneous “quicksilver” smelters into his right shoulder a year earlier for “protection from a disease” as part of his Caribe culture. After that, a physical examination and examination of blood mercury levels in the laboratory revealed a serum mercury level of 84 ng/ml (normal <10 ng/ml) with random urine equivalent to mercury 371 µg/l. Eleven months after treatment, the serum mercury level was down to 7 ng/ml. Another case was also reported where two 13 year old twin sisters with pain throughout the body, especially the extremities and back, headache, cold, and sweating. Examination on mercury concentration in urine showed 50 and 70 µg/l for the both sisters, which were higher than normal threshold (<25 mg/l). After being investigated, his mother said they were using a compound containing mercury for pediculosis treatment 3 months ago which was used locally in the scalp⁽¹¹⁾.

In a case control ⁽¹²⁾, there was a significant correlation between exposure to mercury and central nervous system disorders with NSE, S100B, GRIA 1 results, and blood mercury levels significantly higher in the exposed group compared to the subjects who were not exposed (median value of NSE was 22.4 ng/ml, 17.2 n /ml; S100B 0.09 ng/ml, 0.08 ng/ml; GRIA 1 70.6 pg/ml, 54.1 pg/ml, and mercury levels in blood were 15.2 µg/l, 0.23 µ g/l for the exposed and unexposed groups, respectively). Similar

results show the impact of mercury exposure on the central nervous system, especially peripheral neuropathy found in case report studies⁽¹³⁾. The resulting data on 179 cases of mercury poisoning from mercury exposure in schools in two different provinces in Turkey show a positive correlation between duration of exposure and urine mercury levels⁽¹³⁾. Meanwhile, other studies report various clinical presentations of five family members exposed to mercury fluids through dermal contact and inhalation. Although rare, heavy metal exposure should be considered in patients who present symptoms involving multiple systems, including the skin, and the cardiovascular, respiratory, and neurological systems⁽¹⁴⁾. Observational study, there are reports of 2 cases of heavy metal poisoning from the inappropriate use of Chinese mineral medicine confirmed by toxicological investigations⁽¹⁵⁾.

The prospective studies show different results. There were no significant results because most p values ranged from 0.01 to 0.05. Although there was a possibility of false positives, the results showed little evidence of modification of the SNPs effect in the relationship between mercury biomarkers and peripheral nerve function at exposure to levels relevant to the US general population. Therefore, further research is needed to fully investigate the role of genetic polymorphism in development that is detrimental to neurological outcomes associated with mercury exposures⁽¹⁶⁾⁽⁶⁾. Of the results of the eight studies on mercury exposure to peripheral neuropathic disorders in humans, it was found that direct mercury exposure to susceptible human beings for less than continuous six months can cause peripheral neuropathy.

DISCUSSION

Mercury is considered a dangerous metal because as an ion or in the form of certain compounds it is easily absorbed into the body. In the body, mercury can inhibit the function of various enzymes and can even cause cell damage⁽¹⁷⁾. Historically, the relationship between occupational exposure to mercury elements and peripheral nerve disorders has been reported populations. Ulnar motor nerve conduction velocity was significantly associated with long-distance elemental mercury exposure ⁽⁶⁾. Mercury can also cause peripheral neuropathy, which affects the lower more than the upper extremities. Paresthesia with peripheral neuropathy

with muscle atrophy may also occur⁽¹⁸⁾. Evaluation of the comprehensive data for animals and humans shows that no nephrotoxic or clinically relevant neurotoxic effects are to be expected in humans at a biological value of 30 µg mercury/l urine⁽¹⁹⁾. In epidemiological studies in India, the overall prevalence of peripheral neuropathy varies from 5 to 2400 per 10,000 population in various community studies. Another important aspect of peripheral neuropathies is in terms of geographic distribution and work mainly from toxic neuropathies such as arsenic common in the Eastern belt; lead, mercury, and organo-phosphorus⁽⁸⁾.

There are several factors that influence the level of mercury in tissues: solubility and lipophilicity of Hg compounds, the balance between absorption and elimination rate, and the affinity of the binding of Hg compounds to tissues. The existence of very small amounts of Hg and sulfide ions can be released and damage the nervous system⁽²⁰⁾ while mercuric sulfide (HgS). There are several factors that influence mercury poisoning, namely age, sex, type of work, immunity, length of stay, distance of residence to the mining location, distance of sources of clean water and sources of pollutants, smoking status and consumption of fish⁽²¹⁾. There are factors that determine the occurrence of adverse health effects and how severe health effects, which include the chemical form of mercury, dosage, age of the person exposed, duration of exposure, route of exposure and fish consumption pattern⁽²²⁾. Compared to adults, children often reach much higher external mercury body concentrations in the same amount of exposure. This concept can be explained by five mechanisms: (a) heavy mercury vapor and settles, making the concentration higher on the ground where young children play; (b) blood barrier to the brain in children is less able to keep mercury out of the brain; (c) the rate of respiration of children is higher than that of adults, so children breathe in more mercury at the given concentration than adults; (d) their nervous system is still developing, which makes them more sensitive to mercury; and (e) children are also at risk because they are fascinated by seeing the element of mercury being spilled and therefore, more likely to handle it⁽¹³⁾. The effects on infants may be subtle or more pronounced, depending on the amount to which the fetus or young child was exposed. In cases in which exposure is relatively small, some effects might not be apparent, such as small decreases in IQ or effects on the brain that may only be determined by the use of very sensitive neuropsychological testing⁽²³⁾.

The element of mercury has been misused for various purposes. Mercury has been injected intravenously for a suicide attempt. In this study, we also found that in Espiritismo, a spiritual belief system that is independent of Puerto Rico and the Caribbean Islands, as well as in the Afro Caribbean and other Latin American traditions, it is used to bring goodness and protect from the evil and jealousy of others⁽¹⁰⁾. A case of 5 families with elemental mercury poisoning due to inhalation of vapors and dermal contact. Mercury quickly evaporates and pollutes the air inhaled by the victim. Mercury glass thermometers can break in the mouth, causing inhalation and consumption of mercury. Although rare, researchers think that heavy metal exposure should be considered in patients who present multiple systematical symptoms, including the skin, and the cardiovascular, respiratory, and neurological systems⁽¹⁴⁾. Another case study showed patients suffered from chronic inorganic mercury poisoning, which affected mainly the patient's central nervous system and kidney. The patient has tremor, choreoathetosis, neurasthenia, erethism, sensory motor neuropathy, and ataxia and visual field disorders. Urine tests for N-acetyl-β-D-glucosaminidase (NAG) and β2-microglobulin were used to detect subclinical mercury toxicity⁽²⁴⁾.

Different findings of the effect of SNP on outcome-biomarker relationships (urine and hair) are not surprising given that binding of heavy metals depends on several factors: amount of enzyme in the target tissue, mercury from the target tissue and redox chemistry of the enzymes. Inorganic mercury and MeHg differ in their target organs (kidney versus brain) and elimination routes (urine versus feces). Thus, the enzyme level is very compatible with the target tissue, which can contribute to differential modification⁽²⁵⁾. Biomarkers are broadly defined as indicators that indicate events in biological systems or samples. Hair has been used as a biomarker for MeHg exposure. The use of mercury in umbilical cord blood has the advantage of being a measure more directly from fetal exposure, but the rate at term cannot reflect exposure to the original ear development stage. Meanwhile, blood and urine mercury levels have been used as biomarkers of acute and chronic exposure to high levels of inorganic and organic mercury⁽²⁶⁾. There is a long history of evaluating neurophysiological and neuropsychological effects associated with mercury levels in blood, urine, and hair⁽²⁴⁾. Limitations in this study may occur due to a lack of searching by the keywords used and the limitations in the data source used.

CONCLUSION

Based on our review's result, it is found that there are potential effects of mercury exposure in peripheral neuropathy disorders, especially in humans. There are several factors affecting mercury poisoning. Children often reach much higher elemental body mercury concentrations in the same amount of exposure. Even so, despite the rare occurrence, we think that heavy metal exposure should be considered and protected from the start to prevent cases of mercury exposure.

Conflict of Interest: There is no conflict of interest to declare, including specific financial interests, relationships, and/or affiliations relevant to the subject matter or materials included.

Ethical Clearance: This systematic review study has been approved from the ethical review procedures stand point by the ethical committee at the Faculty of Public Health, Universitas Indonesia, and is declared feasible to be carried out with letter number 676/un2.f10/ppm.00.02/2018.

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Accident Compensation and Disability Cash Compensation Utilization of Workers with Disabilities Due to an Accident

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ABSTRACT

Introduction: Workers who experience an accident is entitled to get accident compensation. The benefits of accident compensation are in the form of medical services and cash. Disability cash compensation that has been received by the workers is used for various matters. The objective of this study was to analyze the influence of the characteristics and the amount of cash compensation on the disability cash compensation utilization.

Method: This was a cross-sectional research. The participants was 182 workers with disability due to an accident in Sidoarjo Regency and Gresik Regency. The sampling technique employed was simple random sampling technique. The variables were the characteristics of the individual, the amount of disability cash compensation, and the disability cash compensation utilization. A questionnaire was used to obtain data. The data analysis was conducted using regression logistic ordinal test.

Results: Most of the participants are male and between the age of 40-49 years old. 54.4% of the participants received disability cash compensation of IDR 1 million – IDR 10 million. Most of them used the compensation to meet their daily needs. There was an influence of marital status and the amount of compensation on the duration of compensation utilization ($p=0.000$). There was an influence of marital status on type of disability cash compensation utilization ($p=0.048$).

Conclusion: This research showed that marital status and the amount of disability cash compensation had an influence on the disability cash compensation utilization. Participants still used the compensation for meet their daily needs. It didn't give benefit for long time.

Keywords: *workers with disabilities, characteristics, disability cash compensation utilization*

INTRODUCTION

The impacts of accident include partial anatomical disability, partial functional disability, permanent total disability, and death. Disability can cause workers with disabilities to loss of their occupation¹ and income². Disability also effect on their quality of life³.

Based on the Government Regulation of the Republic of Indonesia Number 44 of 2015, workers who encountered an accidents shall receive accident compensation⁴.

Social security is eminently vital to workers⁵. Compensation becomes the primary requirement for workers with disabilities to be able to live independently⁶. Therefore, the disability compensation received has to be utilized as best as possible to be able to support the formation of independence that affects the quality of life of the workers with disability¹². Social security insurance maximizes the quality of life of a person with disability^{7,13}

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The objective of this research is to analyze the influence of characteristics and amount of disability compensation

on the duration and type of disability cash compensation utilization of workers with disability due to accident.

METHOD

This research was a cross-sectional study. This research was conducted in Gresik Regency and Sidoarjo Regency. The research was started from January to April 2018.

The population used in this research was the workers with disability due to an accident in Gresik Regency and Sidoarjo Regency, Indonesia, who obtained accident compensation of the National Social Security for workers. The number of samples was 182 workers. Simple random sampling technique was used.

The authors collected both primary and secondary data. Primary data in this research was obtained by interviewing the workers with disability due to an accident who obtained work accident compensation of National Social Security for workers. Secondary data was obtained from documents of National Social Security for Workers in Gresik Regency and Sidoarjo Regency.

The independent variable in this research were the characteristics of individual and the amount of disability cash compensation, while the dependent variable was the utilization of disability cash compensation. Regression logistic ordinal test is used to analyze the influence within 2 variables. There were 4 categories of disability cash compensation utilization, namely daily needs, treatment and medication, savings, and business establishment.

RESULTS

The Characteristics of Individual: The individual characteristics within this study are age, sex, and marital status.

Age, one of the individual characteristics components, is analyzed in this research. Most of the participants were between the age of 40 – 49 years old. The youngest participant was 20 years old, and the oldest participant was 65 years old.

Table 1: The Distribution of Respondents Age Categories

Age Categories	N	%
20 – 29 years old	40	22
30 – 39 years old	47	25.8
40 – 49 years old	57	31.3
> 50 years old	38	20.8
Total	182	100

Most of the participants (73.6%) were male and 26.4% of them were female. Most of the participants were married (84.6%), 11% of the participants are single, and 4.4% of the participants were divorced.

Accident Compensation: The benefits of work accident insurance are in the form of medical services and cash that the workers receive when they obtain accident in the workplace. According to the result of the research, all of the participants receive medical services since they have obtained an accident until they were recovered. The participants received the medical services at the trauma centre clinic or hospital in collaboration with BPJS Ketenagakerjaan. However, the participants did not obtain psychological treatment. Accident greatly influenced the psychological condition of the participants. Most of them felt traumatic for the accident they had. In addition, participants often felt useless, worthless, insecure, and ashamed to socialize due to their disability condition.

The Amount of Disability Cash Compensation: The amount of disability cash compensation was varied and based on the level of disability and the monthly salary of the workers. The participants obtain the disability cash compensation that was ranged from IDR 600,000 to IDR 110,000,000.

Table 2: The Distribution of the Amount of Disability Compensation

Amounts	n	%
< 1.000.0000	7	3.8
1.000.000–9.999.999	99	54.4
10.000.000–19.999.999	31	17
20.000.000–29.999.999	15	8.2
30.000.000–39.999.999	11	6
40.000.000–49.999.999	5	2.7
≥ 50.000.000	14	7.7
Total	182	100

The Utilization of Disability Cash Compensation: The utilization of disability cash compensation was analyzed based on the duration and type of utilization. The duration of utilization is the length of time to utilize the disability cash compensation until the money runs out.

The duration of utilization is influenced by the amount of disability cash compensation received and the type of disability cash compensation utilization. Most

participants used it for about two to three months while only a small proportion of them used the disability cash compensation in a longer term.

Table 3: Distribution of Disability Cash Compensation duration

Utilization	N	%
<1 month	34	18.7
2-3 months	66	36.3
4-6 months	17	9.3
7-9 months	1	0.5
9-12 months	19	10.4
> 12 months	45	24.7
Total	182	100

Disability cash compensation received by the workers is used for various matters, such as saving, start a business, daily needs and medical treatment. Most (63%) participants used disability cash compensation to meet their daily needs and only 4% of them used disability cash compensation to start a business.

Table 4: The Type of Disability Cash Compensation

The utility of accident compensation	N	%
Daily needs	111	61
Medicine	16	8.8
Daily needs & Medicine	8	4.4
Daily needs & businesses	2	1.1
Daily needs & Saving	4	2.2
Savings & Medicine	4	2.2
Saving	30	16.5
Businesses	7	3.8
Total	182	100

The Influence of Marital Status on The Duration and Type of Disability Cash Compensation Utilization:

The statistical test using ordinal logistic regression showed there was an influence of marital status on the duration of disability cash compensation utilization ($p=0,000$). Unmarried participants used the cash compensation in a longer term. The statistical test also showed there was an influence of marital status on the type of disability cash compensation utilization ($p=0,048$). Participants with unmarried status used that cash compensation for saving. Married participants used that cash compensation money to meet their daily needs.

The Influence of Amount of Disability Cash Compensation on duration of Disability Cash Compensation Benefits:

The statistical test using ordinal logistic regression showed there was significant influence between the amount of cash compensation to the duration of disability cash compensation utilization ($p=0,000$). Participants who had greater cash compensation used the money in a longer term with better benefit.

DISCUSSION

Characteristics: Most participants were young and in the productive age category. They had a disability at a young age. Most participants were men and acted as the breadwinner of the family. Most (61,5%) participants had disabilities in their fingers. Fingers are vital organs frequently used in work. This greatly influences the participants' working abilities. Disability interferes work, social life, and ability to be independent⁸. Disability also limits the participant in the workforce and increasing financial burden⁹.

Accident Compensation: Work accident is an accident which occurs in an employment relationship, including accidents on the way from home to the workplace or otherwise and diseases due to the work environment². The Indonesian Government provides protection for workers who experience work accident. The protection is regulated in the Regulations/Constitution.

According to Government Regulation No. 44 of 2015 concerns Work Accident and Death Compensation, disability is a state where the bodily function is reduced or lost or loss of limbs which are directly or indirectly results on the reduced or lost worker's ability to run his job⁴.

The benefits of Accident Compensation shall take the following form:

- A. Medical services according to medical needs, including:
 1. Basic and supporting check-up;
 2. First and advanced level of care;
 3. Inpatient in class I of the national public hospitals, regional public hospitals, or equal private hospitals;
 4. Intensive care;
 5. Diagnostic supporting;

6. Treatment;
7. Special services;
8. Medical devices and implants;
9. Doctors/medical services;
10. Operations;
11. Blood transfusion; and/ or
12. Medical rehabilitation.

B. Cash compensation for disability, including:

1. Reimbursement of Participant's transportation costs, in which the Participant suffers from Work accident or occupational disease, to the hospital and/or his home, including costs of first aid in the accident;
2. Temporary benefits while he is unable to work;
3. Compensation for anatomical partial disability, functional partial disability, and permanent total Disability;
4. Casualty compensation and funeral expenses;
5. Temporary compensation concurrently paid if the Participant dies or suffers from total permanent Disability due to Accident or occupational disease;
6. Rehabilitation costs, in the form of orthose and/or prothese;
7. Denture reimbursement; and/or
8. Scholarships for each deceased or suffered from total permanent Disability Participant's children in which such casualty or disability is due to work accident.

The medical services obtained by workers were based on medical needs. Participants shall be fully borne until recovered, including the rehabilitation. Participants are declared cured based on their physical condition. Participants did not get psychological recovery services. Participants considerably need health services not only to heal wounds, but also help them to eliminate psychological trauma from work accidents.

The Amount of Disability Cash Compensation: Participants received a variable amount of disability cash compensation. Calculation of the amount of disability compensation is regulated in the Government Regulation Number 44 of 2015. If participants experience disability from work accident, they shall receive Disability Compensation that includes:

- a. Anatomical partial Disability = % refers to table x 80 x monthly Wage
- b. Functional partial Disability = % of the functional decrease x % refers to table x 80 x monthly Wage
- c. Permanent total Disability = 70% x 80 x monthly Wage

The Utilization of Disability Cash Compensation: The results of the study on the utilization of disability cash compensation obtained by participants showed that 61% of the participants used disability cash compensation to meet their daily needs. They used the disability cash compensation because many of them experience a decrease in income during the recovery process.

In addition, 8.8% of participants used their disability compensation to continue treatment. According to the results of the interview, there were several participants who felt the need to continue the treatment, but they were already declared cured and able to start working again. 7.7% of the participants got disability compensation for more than IDR 50 million, but only 3.8% of them used the compensation to start a business. It is understandable that many workers do not have any additional skills apart from their previous job.

Nevertheless, the amount of disability compensation they received could not guarantee the continuation of workers and their family's lives. In the industry with a higher number of accidents/work-related deaths, many families did not have significant financial being after the accident happened. The loss of income due to accidents/death-resulted in the workplace creates susceptible financial difficulties in the family. It can lead to the significant and long-term effect on families, especially those whose children are still dependent¹⁰.

The Influence of Marital Status on Duration and Types of Disability Cash Compensation Utilization: The participants who had marital status tend to spend the compensation relatively more quick (1-3 months). Whilst, the single participants could spend the disability cash compensation for a longer period (> 3 months). The participants who are married had the responsibility to meetl their family's daily needs, thus the cash compensation ran out quickly and did not give long-term benefits. Then participants who are not married could save the cash compensation , so the cash compensation may provide long term benefits.

The Influence of Amount of Disability Cash Compensation on the Duration of Compensation Utilization: The participants obtain the disability cash compensation for at least IDR 600,000 to IDR 110,000,000. The greater the compensation obtained, the longer participants may utilize the cash compensation.

The disability cash compensation will run out quickly if it is not utilized properly. Those who utilize the compensation money to meet daily needs ran out the money quickly and thus it did not give long-term benefits. The compensation money will provide long term benefits if the participants save the compensation money and use it to start a business. Most of the participants did not have any additional skills apart from their previous job. This case becomes an obstacle for participants to start a business. If they no longer have income, it will cause the dependence to the family. The dependence of the family affects on quality of life¹¹.

CONCLUSION

The majority of participants were male (73.6%) and between the age 20-65 years old. Some of the participants used the disability cash compensation to meet their daily needs. The participants received the medical services and disability cash compensation due to the disability from accident.

Marital status affects the duration and types of disability cash compensation utilization. The amount of disability cash compensation affects the duration of compensation utilization.

The suggestion that can be provided to the National Social Security for workers are giving mental health services and training to workers who experience disability due to an accidents.

Conflict of Interest: Nil

Ethical Clearance: Received from the Ethics Committee of the Faculty of Public Health, Airlangga University, Indonesia.

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Use of Monitoring Cards to Increase Iron Substance and Hemoglobin Levels in Pregnant Women

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ABSTRACT

Background: This study aims to monitor the use of added blood tablets in pregnant women in southern Kalimantan. Giving tablets added to blood is one of the critical efforts in the prevention and prevention of anemia. Giving blood booster tablets for pregnant women is at least 90 tablets during pregnancy.

Method: The study was conducted using *the quasi-experimental* method with a *pre-post test control group design*. The investigation began with the examination of hemoglobin levels (*pre-test*) and administration of blood enhancing tablets in three groups — the study sample of 120 pregnant women in 6 health centers in the Banjarmasin city area with a data collection period of 90 days.

Results: The results of the study averaged 0.2 g/dl Hb level increase; 20.8% of pregnant women obey consume blood-boosting tablets; there is no correlation between determinant factors for compliance with consumption of blood booster tablets; there is the influence of monitoring card for blood booster tablets on adherence (p 0.001), there are differences in the 3 groups (p 0.032), and there is an effect of monitoring cards on the consumption of blood booster tablets (0.009) and there are differences in Ministry of Health card groups with groups without card; there is a card effect on the difference in Hb levels (p 0,019 on the Ministry of Health card and p 0,048 on the research design card, there are differences in the impact of monitoring cards on the difference in Hb levels in the 3 groups (p 0,028), and there are differences in Hb levels in the group the design card of the researcher with the cardless group and there were differences in the increase in HB levels in all three groups (p 0.013)pressure

Conclusion: The blood tablet monitoring card affected the compliance of blood booster tablets and elevated hemoglobin levels

Keywords: *Tablets supplement, Hemoglobin levels, Card monitoring, Tablet blood booster*

INTRODUCTION

In general 50% of cases of anemia due to iron deficiency ⁽¹⁾. The Department of Health of Republic Indonesia has been carrying out various activities handling of anemia since the early 1980s with the primary objective to reduce the prevalence of anemia in pregnant women to distribute tablets blood booster through district health center ⁽²⁾. Giving blood booster tablets as one of the p efforts is an effective way to prevent

anemia because it can avoid and overcome anemia due to iron deficiency and folic acid. Blood booster tablets are tablets given to pregnant mothers given daily during their pregnancy or at least 90 (ninety) tablets with the composition of each tablet containing at least 60 mg of elemental iron and folic acid 0.400 mg. The incidence of anemia deficiency in pregnant women is caused by adherence of pregnant women to taking iron tablets⁽³⁾.

Generally, the main reason not to consume blood booster tablets, among others are due to forgetfulness, pills taste unpleasant, side effects, fear of a big baby and felt no need to. The most dominant factor related to the adherence of pregnant women to consuming blood booster tablets is the role of health workers, and other related variables are knowledge, family support, and drug availability.

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The preliminary study of 96 midwives in South Kalimantan with eight closed questions on the questionnaire and one open question showed that 44 people (46.3%) started giving blood-boosting tablets at the initial pregnancy visit, 81 people (85.3%) began giving blood-boosting pills at > 12 weeks of gestation with an average of 16 weeks' gestation ; 87 people (91.6%) provided 30 tablets for pregnant women; 92 midwives (96.8%) asked pregnant women whether pregnant women routinely take blood-boosting tablets; only 11 midwives (11.6%) reminded pregnant women to bring blood booster tablets the remaining pregnancy

revisits, and 88 midwives (91.6%) said they did not have a monitoring card for blood-boosting tablets.

METHOD

The research design was *quasi-experimental* with a *pre-post test control group design*. The location of the study was in 6 health community centers in Banjarmasin City with a sample of 120 pregnant women who fulfilled the inclusion and exclusion criteria divided into 3 groups: 40 pregnant women without monitoring cards for blood-boosting tablets; 40 pregnant women with blood booster tablet monitoring cards and 40 pregnant women with blood booster tablet design monitoring cards.

RESULTS

Table 1: Compliance tablet consumption blood booster

Sample Group	Disobedient		Lack of Discipline		Obedient		Total	
	F	%	f	%	f	%	F	%
Without card	16	40,0	15	37,5	9	22,5	40	100
Ministry of Health Card	1	2,5	30	75,0	9	22,5	40	100
Research Card	9	22,5	24	60,0	7	17,5	40	100
Total	26	21,7	69	57,5	25	20,8	120	100

Table 1 shows that obedient pregnant women consume blood-boosting tablets as many as 25 people (20.8%) and the average amount of consumption of blood booster tablets can be seen in table 2.

Table 2: Consumption of Blood Add Tablets

The composition of a blood booster tablet	$\bar{x}$	min	Max	SD
Fe-1 (1st month/30th Blood Pressure Tablet)	24,4	2	30	6,72
Fe-2 (2nd month/30th Blood Pressure Tablet)	25,3	3	30	6,63
Fe-3 (3rd month/30th Blood Pressure Tablet)	24,7	5	30	7,09
Total Fe (90 Blood Enhancing Tablets)	74,4	10	90	17,78

Table 2 shows that there are still pregnant women who do not adhere to consuming blood booster tablets, but there is an increase in the minimum amount of consumption of blood-boosting tablets every month, evenly -rata consumption of 75 tablets for three months of research (category of poor adherence).

Table 3: Differences Influence Card Compliance Monitoring of the blood booster tablets Consumption

Group	N	Mean Rank	Kruskal-Wallis Test	
			Statistically Count	ρ
Without card	40	52,58	6,874	0,032
Ministry of Health Card	40	70,39		
Research Card	40	58,54		

Table 3 shows the results of different test Kruskal-Wallis p 0.032 ($<\alpha$ 0.05) there were differences in the level of adherence to consuming blood enhancing tablets in all three groups. The researcher conducted a further analysis to find out which group had the most influence on adherence to the consumption of blood improving tablets by anova test and use of blood booster tablets with a ratio scale. The results showed ANOVA different

test results p 0.009 ($<\alpha$ 0.05) there were differences in the number of consumption of blood booster tablets in the 3 groups and the results of the *post hoc test* on the Tukey test there was a significant difference in compliance with the consumption of blood-boosting tablets in groups without tablet monitoring cards blood booster with a blood booster tablet monitoring card group.

Table 4: Differences in the Effect of Monitoring Cards on Difference in Hemoglobin Levels

ANOVA Test	F count 3,672	p 0,028
Tukey Test: Without card	● Ministry of Health Card ● Research Card	Mean Difference -0,5425 -0,6175*
Tukey Test: Ministry of Health Card	● No Card ● Research Card	0,5425 -0,0750
Tukey Test: Research Card	● No Card ● Ministry of Health Card	0,6175* 0,0750

Information *) significant difference in mean on α 0.05

Table 4 shows the results of the different test ANOVA p 0.028 ($<\alpha$ 0.05). The difference in hemoglobin level differences in the three groups and the results of the *post hoc test* on the Tukey test there were significant differences in hemoglobin level differences in the group without the blood card enhancing tablet monitoring card with the blood booster tablet monitoring group designed by the researcher (0.6175). In ANOVA test the difference in hemoglobin level did not pay attention to whether there was a decrease (-), fixed or increased (+), so the researcher conducted a Kruskal-Wallis difference test by changing the scale of variable data difference in hemoglobin levels which initially the ratio became ordinal (declining code 1; fixed code 2; and increased code 3). The results of the different test Kruskal-Wallis p 0.013 ($<\alpha$ 0.05) there were differences in the difference in hemoglobin levels in the three groups.

DISCUSSION

WHO recommendations the composition of blood booster tablets containing 30-60 mg of elemental iron and folic acid 0.4 mg⁽⁴⁾. Blood booster tablets are tablets given every day during their pregnancy or at least 90 tablets. At least contain iron equivalent to 60 mg of elemental iron (in the form of ferrous sulfate, Ferro fumarate or Ferro gluconate) and folic acid 0.4 mg 3. The blood booster tablets distributed by the Banjarmasin city

health service to the health center are each membrane coated tablet containing Ferro sulfate exiccus 200mg (equivalent to fe element 60mg) and folic acid 0.25mg⁽⁵⁾.

The reason stated by the respondents not consuming 90 blood-boosting tablets in this study was due to forgetfulness and side effects of blood-boosting tablets in the form of nausea and dizziness. This is in line with previous research that many or at least consumption of blood-boosting tablets is determined by complaints of nausea and odor from blood-boosting tablets⁽⁶⁾ — other factors that cause low levels of adherence to the use of blood booster tablets due to forgetfulness and the effectiveness of blood-boosting tablets, namely nausea and dizziness. Non-compliance occurs because pregnant women feel nauseous due to the taste and smell of tablets, besides the blood booster tablets are taken every day cause boredom so that pregnant women forget and are lazy to consume it.

Giving leaflets or counseling improves adherence of pregnant women with anemia to consume blood-boosting tablets and pregnant women in the leaflet group consume more protein every day than pregnant women in the counseling group. Based on this, at the beginning of the study, all respondents were given counseling about blood-boosting tablets and were provided with leaflets about blood-boosting tablets⁽⁷⁾.

The results of *chi-square* test in the three groups showed a value of p 0.001 ($<\alpha$ 0.05) which meant that there was an effect of monitoring cards on compliance with the consumption of blood booster tablets. The use of monitoring cards to drink blood-boosting tablets in the treatment group made respondents' motivation arise which encouraged someone to do positive. It can be seen in that there are differences in compliance with fe1, fe2, and fe3 in the three groups. In groups without cards there was a decrease in accordance with fe1 to fe2, which was 37.5% to 30% and fe3 32.5%; the Ministry of Health card group increased the respect of fe1 to fe2 which was 52.5% to 60%, but experienced a decrease in fe3 of 35%; while the research card group continued to increase compliance of fe1 to fe2 and fe3 namely 27.5%, 37.5%, and 60%.

Non-compliance occurs because the blood booster tablets are taken common cause boredom so that pregnant women forget and are lazy to consume it. The monitoring card for blood booster tablets as a medium used by pregnant women is important to remember so as not to forget to take blood booster tablets. Media is everything that can be used to channel messages or information so that it stimulates one's thoughts, feelings, attention and interests to do the process.

There was a significant difference in the adherence to the consumption of blood booster tablets in the group without the monitoring card for blood-boosting tablets with the monitoring group for blood booster. The monitoring card issued by the Ministry of Health was developed in the implementation of the program for giving and monitoring the quality of blood booster tablets for pregnant women in the area of community-based health and nutrition programs in 11 provinces in Indonesia, one of which is West Kalimantan province. The blood booster tablet monitoring card by the Ministry of Health can contribute to the level of adherence to taking 30 tablets of blood-boosting tablets by 39.1%. In addition, the message on the card provides information and knowledge to the respondent, namely due to lack of blood or iron nutritional anemia can cause 1) tired, lethargic and tired quickly; 2) decreased body resistance; 3) bleeding before and or during delivery; and 4) of miscarriage, premature and low birth weight¹¹.

An increase in the average hemoglobin level of 0.2g/dl. Hemoglobin (Hb) is an oxygen-carrying compound in red blood cells ⁽⁸⁾. Hb is composed of

multiple globins and heme proteins. One molecule Hb consists of four globin molecule and four heme, so that each Huk molecule has four iron atoms. The structure of this Hb molecule that can bind oxygen and iron must be in an induced form (Fe^{2+} or Ferro) In adults the blood volume in the body is around 5 liters. Each red blood cell contains 280 million molecules Hb. Every second the body must produce 2.5 million red blood cells⁽⁹⁾.

In pregnancy, the need for oxygen is higher so that it triggers an increase in erythropoietin. As a result, plasma volume increases and red blood cells increase. Increased plasma volume is higher than the rise in erythrocytes resulting in a decrease in Hb concentration due to hemodilution. ⁽¹⁰⁾ Plasma volume expansion which causes physiological anemia in pregnancy. Changes in Hb concentration are consistent with increasing gestational age. In the first trimester the level of Hb appeared to decrease and the lowest frequency in the second trimester and the third trimester there was a slight increase in Hb concentration, so the threshold level of Hb in the 1st and 3rd trimesters was 11g/dl and II trimester 10.5g/dl ⁽¹¹⁾.

The results of the examination of Hb levels in the three groups were recorded by enumerators in the research instruments (interview guidelines) and books for pregnant women, but in the group of cards the blood booster tablets of the researchers listed Hb levels, so that respondents felt motivated to increase Hb levels both through tablet consumption blood booster or eat foods that contain iron.

The results of the ANOVA different test p 0.028 ($<\alpha$ 0.05) and the results of the various test Kruskal-Wallis p 0.013 ($<\alpha$ 0.05) there were differences in the difference in hemoglobin levels in the three groups. The results of the *post hoc* test on the Tukey test showed significant differences in hemoglobin level differences in the group without the monitoring card for blood booster tablets with the blood booster tablet monitoring card group designed by the researcher (0.6175).

Monitoring card for blood booster tablets is an influential print media and becomes a motivating or motivating factor. Motivation is defined as an internal condition that arouses us to act, encourages us to achieve specific goals, and keeps us interested in certain activities. Understanding the motivation is something that supports someone to do, complete, stop and so on, an action to achieve specific desired goals of the motivation⁽¹²⁾.

CONCLUSIONS

There were differences in adherence to the consumption of blood booster tablets in all 3 groups (the results of the test *Kruskal Wallis* p 0.032 $< \alpha$ 0.05) and the different effects of the ANOVA test (p 0.009 $< \alpha$ 0.05) and there were differences in the consumption of blood-boosting tablets in the group monitoring card for Ministry of Health blood booster tablets with groups without monitoring cards (test *tukey* 12,000 *).

There is a difference in the effect of blood booster tablet monitoring card on the difference in Hb levels in the 3 groups (ANOVA test p 0.028 $< \alpha$ 0.05) and there is a difference in Hb level difference in the group blood booster tablet monitoring group design researcher with the group without monitoring card and the test results of *Kruskal Wallis* 0,013 p $< \alpha$ 0.05 indicating no difference in Hb rate margin improvement in all 3 groups.

Ethical Clearance: Ethical clearance was obtained from The Ministry of Health Polytechnic Banjarmasin, Indonesia. We also wish to thank all the participants who contributed to this study.

Conflict of Interest: Nil.

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The Gamma Nail Versus DHS in the Treatments of Intertrochanteric Fractures

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ABSTRACT

Intertrochanteric femoral Fractures forms approximately one percent of all fractures. To assess the functional outcomes, operative time, period of union, blood loss, and complications of femoral neck fracture treated with gamma nail versus DHS we managed 124 patients with closed intertrochanteric fractures, AO type A1 and A2, during the period between October 2012 and October 2017 followed up for 12 - 24 months at al Sader Teaching hospital in Najef /Iraq. There were 62 cases treated by gamma nails method and 62 patients treated by dynamic hip screws (DHS). Functionally outcome was measured using Harris Hip Score, fluoroscopic exposure, operative time, blood loss, period of union, reoperation rate, weight-bearing time, with other parameters. Regarding gamma nail method, the outcome was excellent in 42 %, good in 45 %, and fair in 9.7% and poor in 3.3 % of cases, but with (DHS) method the outcome was excellent in 35.5%, good in 35.5%, fair in 19.3 % and poor in 9.7%. We concluded that the gamma nail fixation method is superior to the (DHS) fixation method.

Keywords: *Intertrochanteric Fractures, Incidence, Management, Gamma Nail, DHS*

INTRODUCTION

The intertrochanteric femoral fractures are common, it can occur at any age but it has a bimodal peaks of age period of which falls into two groups, young age group usually after high velocity trauma and geriatric age (group those more than 60 years old) usually after low velocity injuries mostly falls and its incidence increases in frequency with advancing age due to osteoporosis¹⁻⁵. With the aging of population in most of the world, its incidence is expected to increase over the future twenty years. For example 500000 cases of the hip fractures in USA are expected at 2040 and 16 billion is expected to be the annual cost of their managements at that time, the intertrochanteric fractures are usually forms the half of the peritrochanteric fractures, half of the intertrochanteric fractures are unstable with advancing age and progressive low bone mineral density, the incidence of unstable intertrochanteric fractures tends to increase.⁶⁻¹⁰ The women are subjected to this type of fractures more common than men in ratio 3:1. the mortality rate still 30% within 5 years after injury. Surgical treatment is the best strategy for treating intertrochanteric fractures as it permits functional recovery and early rehabilitation.¹¹⁻¹⁴ The complications of this type of fractures include mal-

union, delayed union, non-union, impaired hip rotation, Joint stiffness and osteoarthritis¹⁵⁻¹⁷

PATIENTS AND METHOD

A prospective, comparative study of 5 years duration included 124 cases presented with femoral intertrochanteric fracture admitted in the Department of trauma and orthopedic in Al Sader hospital in Najef / Iraq. In 84 (67.7%) of the patients the force causing the fracture was simple fall (twisting injuries), 30 (24%) due to car accidents and 10 (8.3%) fall from height. Patients assigned into two groups with 62 patients in each, first group fixed by Gamma nail and the second fixed by DHS. Patient was excluded if he/she had one or more of the following

Pre-existing medical disorders that affect bone physiology like a malignant tumor, hyperparathyroidism, vascular insufficiency of the upper limb, alcohol or drug dependency and patients with polytrauma with an Injury Severity Score 25 of more than 16 points, those who expected that they would be unable to participate and or unable to continue, and those who involved in other clinical studies of a drug or device, pathological

fractures secondary to tumor, history of previous trochanteric fracture, cases subjected to previous surgery on the ipsilateral intertrochanteric fracture, pregnancy, open fractures, concurrent spinal cord injury or pelvic injuries, sciatic nerve palsies were excluded.

All patients were clinically examined and evaluated after full history taking. All required investigations were performed then the limb was carefully placed in skin traction. Tight bandaging was avoided. Then CT-scan was done for all patients. The operation was performed within first week in 104 cases (83.8%), and after 8 to 10 days following trauma in 20 cases (17.2%). A 68 cases were type A1 and 56 cases (45.2) cases were type A2 according to AO system classification.

In the theater, the operations were done under spinal or general anesthesia with supine position, the lower limbs lying on orthopedic table with fluoroscopic guide the fracture was manipulated to reduce any displacement of distal fragment. when the reduction was achieved, then we did either Gamma nail or DHS fixations. Preoperative antibiotics (single injection ceftriaxone 1 gram IV infusion within one hour before operation). All screws, plates and nails were placed in their optimal positions by aid of fluoroscopy. The blood loss, screening time, duration of the procedure and all technical difficulties, we faced, were noted. The drainage and transfusion requirements and postoperative hemoglobin level, were recorded. Anti-thromboembolic stockings were used in all patients with low molecular weight heparin for five days postoperatively. Acetaminophen and codeine were the only analgesics prescribed postoperatively. Depending on their medical condition, on the first or second postoperative day, all patients were discharged and they got out of bed, and walked partially weight-bearing with a walking frame. The walking sticks are allowed as soon as their medical condition allowed. The rehabilitative regime postoperatively was exactly same for the two groups and the physiotherapists being unaware of the fixation type. Patients followed up in subsequent visits at five days, ten days, two weeks for stitches removal, three weeks, six weeks, three months, six months, one year, eighteen months, two years.

The tool for assessing patients after around hip surgeries scored 0-100 and evaluated as followed 90-100 excellent, 80-90 good, 70-79 fair, 60-69 Poor and Below 60 Failed results

FINDINGS

In group I the mean age was 51.8 years, 39 (62.9%) were females and 23 (37.1%) males. In group II 40 (64.5%) females and 22 (35.5%) males and the mean age was 52.2 years with no statistically significant differences between both groups in age or gender. (Table 1). There is more fluoroscopic exposure intra-operatively with group one than group two. Regarding operative time and blood loss, both are double with the group two had greater blood loss and longer operative time than group one. the reoperation rate is more with group two than the group two especially with unstable intertrochanteric fractures. regarding the mean fracture healing time was 15 weeks (range 14-19 weeks) in group two while in group one it is 12 weeks (range 12-16). The mean of hospital stay for group two was 4 days while that of group one was 2 days. The mean Harris Hip Score for six months postoperatively for the group two was 80 while in group one 92. The maximum HHS score is of 100 points. The mean weight-bearing time was shorter with group one than group two. The infection rate was two case 3.1% with group one and four cases (6.25%) with group two all of them were superficial surgical site infection was treated well with oral antibiotics and local care. Delayed union of the fracture was reported in sixteen cases, six of which were with gamma nail method and ten cases in DHS method. The Mal-union, reoperation rate was lower with group one than with group two. The overall complication incidence was 8.2% in group one and 15.8% in group two, all the aforementioned findings are summarized in (Tables 2, 3 & 4)

Table 1: Age and gender distribution of the studied groups

Variable	Group I (Gamma nail)	Group II (DHS)	P. value
Age (mean) year	51.8	52.2	0.72
Female n(%)	39 (62.9%)	40 (64.5%)	1.00
Male n (%)	23 (37.1%)	22 (35.5%)	1.00

Table 2: Shows the assessment scores of patients in both groups

Score	Group I (Gamma nail)	Group II (DHS)
Excellent	26 (41.9%)	22 (35.5%)
Good	28 (45.2%)	22 (35.5%)
Fair	6 (9.7%)	12 (19.4%)
Poor	2 (3.2%)	6 (9.7%)

Table 3: Clinical outcomes of the studied groups

Parameters	Group I (Gamma nail)	Group II (DHS)
Mean fracture healing time in weeks	12	15
Mean hospital stay (day)	2	4
Mean Harris Hip Score for 6 months	92	80
Mean operative time (minutes)	55	108
Mean blood loss (ml)	122	290
Mean fluoroscopic exposure (shots)	35	48
Mean weight-bearing time (day)	32	60

Table 4: Postoperative complication

Type of complication	Group I (Gamma nail)	Group II (DHS)
Delayed union	6 (9.7%)	10 (16.1%)
Mal-union	2 (3.2%)	6 (9.7%)
Surgical site infection	2 (3.2%)	4 (6.3%)
Reoperation rate	2 (3.2%)	6 (9.7%)

DISCUSSION

Intertrochanteric fractures of the distal radius have increased in frequency because of aging population. osteoporosis and medical illnesses are another contributing factors which increases the risk of patients falling. Gamma nails and DHS by plate and screws is not a new methods for treatment of intertrochanteric and it has been widely used by different surgeons with different results, the best of which is when the reduction was checked per-operatively before ending of all procedure and when the stable reduction is achieved and maintained. gamma nail as a type of fixation method provide sound method for intertrochanteric fractures treatments specially unstable type.

Sandeep Thomas George, et al in 2017 who took smaller sample (78 patients) than our study with 30 months duration, he used same Harris Hip Score for evaluation of his results. he agreed with our results as he stated that the DHS method of fixation is not optimal procedure for intertrochanteric fracture¹⁷.

Xi Yu, et al, 2018, in his recent meta-analysis study who reviewed 2653 patients with different type of fixation weather intramedullary or extramedullary. he agreed with our study as he noted that less incidence of deep infection, reoperation, and failure of implant with intramedullary device but with same incidence of other complications. he disagrees with our study in that the postoperative hip mobility was better extramedullary devices¹.

Li AB et al, 2017 in his meta-analysis study, he studied 1,543 patients in Eleven randomized controlled trials, he had found, like what we found, that there is good functional and less blood loss with intramedullary fixation while No obvious differences were found in other adverse events, blood transfusion, operative time, and hospital stay between extramedullary and intramedullary fixations¹⁸.

Zhang Y et al, 2017, in his literature review and meta-analysis study of 2431 patients with average age 74 years, with same of the functional score used in our study, he agreed with our study in that the long gamma nail has a good results regarding the operative time, blood loss and hospital stay and good functional outcome.¹⁹

Dunn J et al, 2016, in his literature review which involve 1276 cases in 135 papers, he used mostly similar parameters of our study like estimated blood loss, transfusion rate, reoperation rate, secondary femoral shaft fracture rate, operative time and length of stay. He recommended the gamma nails as best choice for intertrochanteric fractures²⁰.

Parker MJ, Handoll HH, 2008, in their study, they disagree with our study in that they notice that there is high incidence of operative and later femoral fractures and more reoperation rate²¹.

Hao Z et al, 2018, in his systematic review study, his sample was 3097 case in 24 papers, he agrees with our results in that the Gamma nails had good functional outcome with lower rate of blood loss shorter operative time²².

Airirachakaran A et al, 2017, in his meta-analysis study, with a parameters similar to that in our study with similar results of our study.²³

Wang W1, et al, 2018, 158 cases. With shorter follow up period but with similar parameters and statistical test. he agreed with our results regarding all parameters except the fracture healing time, he found no significant statistical differences between these two groups but in general he put the gamma nail in superior position.²⁴

CONCLUSION

We concluded that gamma nail fixation is superior than DHS fixation specially for unstable intertrochanteric fractures fixation as it is associated with less incidence of overall complication rate and early return to usual daily activity.

Ethical Clearance: Signed informed consents obtained from all participants and data collected in accordance with the WMA Declaration of Helsinki

Conflict of Interests: None

Source of Funding: None

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Detection Enteric Viral in the Newborn Causes Diarrhea in Al-Zahraa Hospital of Al-Najaf Government

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ABSTRACT

Diarrhea is of great concern in children under the ages of five. In developing countries, multiple incidence of diarrhea can lead to critical problems. We tried to to evaluate role of immunochromatographic assay (ICA) to detect the members of viral gastroenteritis in 120 child of both gender, aged 2-3 years presented with diarrhea, between December 2017 to April 2018 at Al zahra Maternity and Padiatric Teaching Hospital - Najaf, Iraq. Fecal Samples were collected and examined using immunochromatographic assay (ICA). The main findings revealed that 62 (51.6%) viral gastroenteritis cases, one virus- alone included Adeno virus, Astro virus, Noro virus and Rota virus found in in (26.6%), (17.7%), (13.3%) and (42.2%), of patients , respectively. Co-infection with four virauses reported in (6.6 %), three viruses in (11.1%), two viruses; Adeno and Rota virus in (15.5%), Noro and Rota virus in 2 cases (4.4%), one case had Adeno and Asto virus (2.2%). In conclusion: the study proved that highest percentage of viral gastroenteritis was Rota virus, and the incidenc of co-infection was also reported included Adeno with Rota viruses , Noro with Rota viruses, and Adeno with Astro virus.

Keywords: *Diarhea, Adeno virus, Astro virus, Noro virus and Rota virus.*

INTRODUCTION

Millions of lives of young children are lost annually to acute gastroenteritis, most of them in developing societies. Gastroenteritis is a common case for submission to general practice or emergency departments and admission to hospital in developed countries ¹. Simply put, Diarrhea is the passage of frequent faeces usually in liquid form (with increased water content). The patterns of the stool in diarrhea vary widely among young children, and changed from the norm. About 3-5 billion acute gastroenteritis cases that result to 2 million live lost annually have been reported worldwide. This affects children younger than five ².

Viral gastroenteritis occurs with similar frequencies in developing countries, but seasonal are different from one area to another ³. Very few data available from iraq, especially in Al najaf city. The Few existing data is the ususally recorded as rotavirus (Family; Reoviridae) and Norovirus (Family, Caliciviridae) ⁴⁻⁵. Thus, there is almost no data about other viruses Such as the virus human viral viruses (Astroviridae)in iraq. These viruses are highly transmissible, primarily Via the oral fecal route, by eating or Food is also polluted from person to person by Airborne drops.

Norovirus is represented as the second most important causative agent of childhood diarrhea after rotavirus ,but it is estimated that the importance of it will increase in the future, as a result of routine application of Rotavirus vaccination ⁶.

Adenovirus have been linked to acute diarrheal diseases and are responsible from 3.2 to 12.5% of the world's cases in childhood and and the detection ratio is higher in developing countries,. Intestinal viruses

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including the norovirus virus, adenoviruses were infected the intestinal cells and mainly affected children under two years of age, leading to watery diarrhea, so, if left untreated, can cause severe dehydration⁷.

The aim of this study was to identify Rotavirus, Astro, Norovirus and Adenovirus amongst kids with diarrhea admitted to AL- Zahra teaching hospital for maternity and children, Al-Najaf governorate. Iraq.

MATERIALS AND METHOD

Study population: From December 2017 to April 2018, a prospective study was conducted on diarrhea samples from a total number of 90 patients ranging from 2 to 3 years of age including both sexes at maternity and Padiatric Teaching Al zahra Hospital - Najaf, Iraq. Macroscopic and microscopic laboratory examinations were criedout. The inclusion criteria involed in this study is watery stool samples (at macroscopic examination). Neither bloody stool nor parasitic agents containing sample were considered.

Immunochromatographic assay: All samples collection were collected in a labeled streile tube and tested by immunochromato graphic assay (CerTest, Spain) for antigenic expression of Astrovirus, Adenovirus, Rotavirus and Norovirus consistent with the manufacturer's instructions.

Stool samples were Homogenized as possible prior to preparation, approximately 125 microliter of diarrheic sample was dringed by sterile micropipette then put in collection tube containing stool samples and diluents. The tube was shaken in order to assure good sample dispersion. Four drops were dispensed in CER test circular window of card (Figure 1).

Reading Results: Appearance of colored bands were read after 10 minutes. While negative results were indicated by only one green band (control line), all the positive samples for viral gastroenteritis had in addition to the green band, a red band as well as a side result line. Absence of the green colored band regardless the appearance or not of the results lines (red color) in samples was evaluated as invalid result

Statistical analysis: All results were analyzed by ANOVA test, and Chi square test at the level of significant when p- value < 0.05. the statistical analysis was performed using SPSS program.

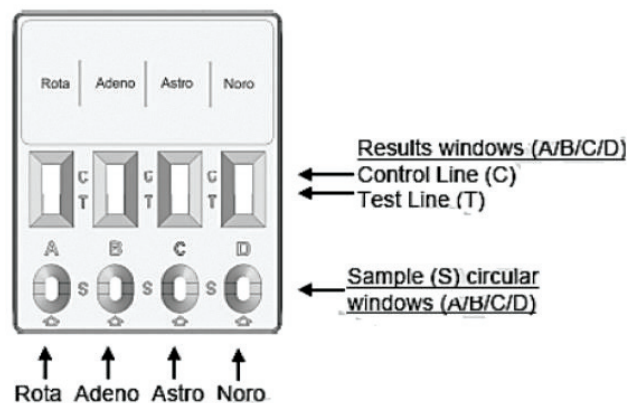


Figure 1: One step CERTEST card test before its use

FINDINGS

The distribution of the studied group according to the detected viruses; single viral infections were Rota virus as the more frequent detected virus accounted for (42.2%), Adenovirus (26.6%), Astrovirus (17.7%) , Norovirus (13.3%). Coinfection was Rota&Adeno virus (15.5%), Adeno&Astro&Norovirus (11.1%), Noro&Rotavirus (4.4%), and co-infection of four viruses in (6.6%) (Table 1 and Figures 2,3 & 4). Gastroenteritis viruses have been identified as the most important cause of the disease, however, there are four categories of viruses are being clinically related; Norovirus (family Caliciviridae), Rotavirus (family Reoviridae), Adenovirus and Astrovirus. Clinical rotavirus infection is most often associated with children aged between 6 months and 2 years. Our results indicated that three viral co-infection achieved in Al-zahrah hospital. In the same results our study illustrated the other two viral co-infection Rota and Adenovirus.

Table1: Shows the number of viruses that infected the children in our country

Name of viruses	Total	%
Rota virus	19	42.2
Adenovirus	12	26.6
Astrovirus	8	17.7
Norovirus	6	13.3
Rota&Adeno virus	7	15.5
Adeno&Astro&Norovirus	5	11.1
Noro&Rotavirus	2	4.4
Four viruses	3	6.6

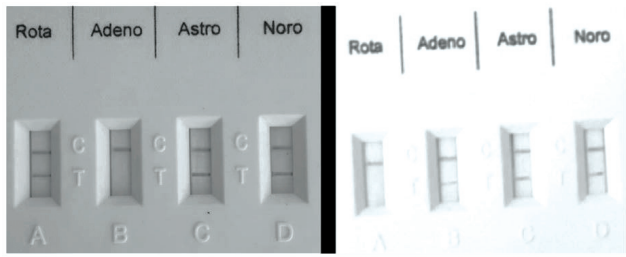


Figure 2: Two viral sections kit test illustrate three viral infections; left section shows Rota, Astro and Noro virus coinfection, right section shows Adeno, Astro and Norovirus coinfection



Figure 3: Two viral sections kit test illustrate two viral infections; left section shows Rota virus and Adenovirus coinfection, right section shows Rota virus and Norovirus coinfection



Figure 4: Four viral types coinfection shows as Rota, Adeno, Astro and Norovirus

DISCUSSION

Acute gastroenteritis has thought to be wide spread among young children. Moreover, the dehydration that has been associated with it is the main reason for admission to the hospital in industrialized countries. Acute diarrhea is a major health problem worldwide and a major source of death in developing countries⁸. The present study showed the most significant etiological viral

agent were group A rota virus and Adenovirus, regarding as 42.2% and 26.6%, this result was agreement with previous study⁹, who were documented that Rotavirus and adenoviruses are the predominant causative agents of acute infantile gastroenteritis. Adenovirus infection may cause disease of the upper respiratory tract, particularly in children under 3 months of age, certainly, in the patient have combined immunodeficiency (CID)¹⁰. The mortality in these children is 12% overall 9 of 74 patients to 19% overall 7 of 36 patients, out of children with high risk for infection¹². Rotaviruses are a major cause of severe childhood gastroenteritis in developing countries including Asia, it is estimated that there are 2.3 million hospital admissions and about 527,000 deaths among those aged less than five years due to rotavirus^{14,15}. Immunocompetent patient normally develop subclinical or mild forms of disease, the course of disease is 10 to 56 days⁽¹¹⁾. Disease is most often associated with neonates and can result in significant fluid losses in bloody diarrhea. The virus primarily infects adsorptive cells of the intestinal villi with resulting diarrhea, The clinical severity of the infection depends on factors such as age, viral virulence, the presence of passive immunity, and secondary infection¹³. Transmission of Astrovirus and Norovirus is via feco-oral route, by contact with patients, contamination of recreational and drinking water and also environmental contamination¹⁶, aerosol contamination from projectile vomit and also through food-borne transmission¹⁷. Some previous study on molecular assay reported significant frequency of norovirus and adenovirus within children of ages ranging from 1–2 years. The strength of the red color bands in the test lines (T) within the results windows vary with antigen concentration present in the specimen. Yet, this test is not able to determine either the quantitative value or the rate of increase in antigens¹⁸. The results also showed two gastrointestinal viral co-infection Rota and Norovirus. The results regarding the reported co-infection in the present study agreed that reported in previous studies who was found that in young children, Rota virus and norovirus coinfection manifested as diarrhoea (81%), and fever (66%) while During rotavirus infection, fever was present in 97% of cases and 81% of them were $>38^{\circ}\text{C}$ ¹⁸

CONCLUSION

This study highlights the spread of diarrhea causing, viral pathogens in children below the age of

five. Astrovirus, norovirus, adenovirus and rotavirus have been found common in such group of patients. Immunochromatographic assay Lead to improved laboratory diagnosis of these viruses.

Ethical Clearance: All official agreement were obtained, signed informed consent obtained from parents of the included children. Data collected in accordance with the World Medical Association (WMA) Declaration of Helsinki as a statement of ethical principles for medical research involving human subjects

Conflict of Interest: Author declare none

Source of Funding: Self-funded

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Effectiveness of Video Assisted Teaching Programme on Toilet Training of Toddlers among Parents in a Selected Rural Area in Shimla, Himachal Pradesh, India

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ABSTRACT

Introduction: The family is the central focus in the life of toddlers. A toddler in turn exerts considerable influence on all other family members, regardless of the size and form of the family unit. As the toddlers begin to interact with others outside the family, the parents help the child to conform to the expectations of the society. The most important societal demand made on the child during this period is the control of elimination⁵.

Materials and Method: In order to achieve the objectives of the study, a pre experimental study approach was adopted for the study. Purposive sampling technique was used to select the sample. The sample consisted of 40 parents of toddlers. The main study was conducted in the Anganwadi, situated in Shimla area. The data collected were systematically tabulated to facilitate the data analysis. The collected data analyzed by using descriptive and inferential statistics.

Results: The analysis of the demographic variables revealed that majority (40%) of the participants are in the age group of 26-30. The assessment of the knowledge among parents on toilet training revealed that majority (60%) of the parents had moderate knowledge, 35% had poor knowledge, and five percentages had good knowledge.

The overall mean knowledge score was 14.03 ± 2.665 , with a mean percentage of 46.75. % revealing that the overall knowledge of the parents regarding toilet training is moderate. The assessment of the Effectiveness of video assisted teaching programme on toilet training revealed that the total mean knowledge score is increased by 25.83% with mean $\pm$ SD of 7.75 ± 2.55 after the administration of Video assisted teaching programme. The cumulative frequency distribution of pre-test and post test knowledge scores shown in the O gives shows significant difference between the pre-test and post test scores. The knowledge pre-test median was 13.50 where as the post test median score was 21.50. It shows a difference of 9 in knowledge. Association between pre-test knowledge with demographic variables revealed that there was significant association between the pre-existing knowledge with these demographic variables on toilet training

Conclusion: The experts suggests that it is easier to train a child on toileting skills when he/she is at least 18 months old, and for boys it is better to wait even longer since they usually lack the necessary language and fine motor skills. This time frame is much easier to use because of the child wanting to please his/her parents¹¹

Keywords: *Effectiveness, Video assisted programme, Toilet training, Toddler*

INTRODUCTION

Today's society is complex and ever changing. Growing up emotionally is complicated and difficult under any circumstances⁴. Children are blooming buds. They are important asset of nation. Children are expected to grow and learn to their fullest potential. Parents serve as advocates for children in order to meet needs of all

children for access to education and health care process⁴.

All the stages in human life are exposed to challenges, difficulties and success as a gain. One of such stages is the toddler period. Fundamental learning process develops in the child as the child begins to seek autonomy and explores the world. It learns how to tolerate, express desires and develop relationships⁷.

MATERIALS AND METHOD

The objectives of the study were to a) Determine the existing knowledge of parents regarding toilet training using a structured knowledge questionnaire b) Find the effectiveness of video assisted teaching programme on toilet training among parents using the same structured knowledge questionnaire. c) Find the association between pre-test knowledge scores of parents on toilet training with selected demographic variables.

In view of the nature of the problem under study and to accomplish the objectives of the study an evaluative approach was found to be appropriate to describe the effectiveness of video assisted teaching programme on toilet training among parents of Toddlers.

Pre-experimental, i.e., one group pre-test post-test design was adopted for the study. Here only one group was observed twice, before and after introducing the independent variable. The effect of treatment would be equal to the level of the phenomenon after the treatment minus the level of phenomenon before treatment. In this study the Video assisted teaching programme on toilet

training was the independent variable. Dependent variable is the effect of action of the independent variable and cannot exist by itself. The study was conducted at Anganwadi in Shimla which is a rural area under Surathkal PHC. The samples were selected using purposive sampling method. The population and the sample selected for the study comprised of 40 parents of toddlers staying in Shimla's rural area at Himachal Pradesh.

RESULTS

Part I: Description of demographic characteristics of the parents of toddlers: The demographic data shows that majority (40%) of the participants are in the age group of 26-30. Among participants most (52.5%) of the parents has high school education. Highest (90%) of the samples were females. Majority of the participants (80%) are Hindus and 20% are Muslims. Most of them (57.5%) were having two children and 67.5% of them have second child as toddler. All the participants have received information regarding toilet training and among them 40% got information from elders, relatives or friends.

Part II: Knowledge of parents regarding toilet training.

Table 1: Percentage and distribution of level of knowledge of parents regarding toilet training

Range of score %	Level of knowledge	Number of respondents	Percentage (%)
0-12	Poor	14	35
13-18	Moderate	24	60
19-24	Good	2	5
25-30	Very good	0	0
Total		40	100

Data in the Table 1 show that majority (60%) of the parents had moderate knowledge, 35% had poor knowledge and five percentages had good knowledge. Nobody had very good knowledge.

Section B: Area-wise analysis of the knowledge scores: This part deals with area-wise mean, SD and mean percentage of pre test knowledge scores of parents regarding toilet training

Table 2: Area-wise mean, SD and mean percentage of pre test knowledge scores of parents regarding toilet training

Areas	Minimum score	Maximum Score	Mean	SD	Mean%
Area I	1	9	5.70	2.233	57
Area II	3	8	5.80	1.324	41.43
Area III	0	2	1.25	0.588	41.67
Area IV	0	3	1.28	0.716	42.50
Overall knowledge	9	19	14.03	2.665	46.75

Data in the Table 2 revealed that parents had highest knowledge in the Area I that is, Meaning of toilet training and its Readiness with a mean percentage of 57% followed by Area II which is do's and don'ts of toilet training & Guidelines for night time control with a mean percentage of 42.50%, then the Area III that is, the effects of faulty toilet training practice with a mean percentage of 41.67%, and least in the area IV that is, in the steps of toilet training with a mean percentage of 41.43%.

Part III: Effectiveness of video assisted teaching programme on toilet training.

Section A: Area-wise, Mean, SD, and Mean percentages of pre test and post test: This part deals with Area-wise Mean, SD, and Mean percentages of pre test and post test knowledge scores

Table 3: Mean, SD, Mean difference of pre test and post test

Areas	No. of items	Knowledge score								
		Pre-test(A)			Post-test (B)			Effectiveness (B-A)		
		Mean	SD ±	Mean %	Mean	SD ±	Mean %	Mean	SD (±)	Mean %
Area I	10	5.70	2.233	57	8.18	1.412	81.75	2.48	2.30	24.75
Area II	14	5.80	1.324	41.43	9.20	1.181	65.71	3.40	1.39	24.29
Area III	3	1.25	0.588	41.67	2.10	0.709	70	0.85	0.66	28.33
Area IV	3	1.28	0.716	42.50	2.30	0.516	76.67	1.03	0.86	34.17
Total	30	14.03	2.665	46.75	21.78	2.616	72.58	7.75	2.55	25.83

The data presented in the Table 3 shows that the total mean knowledge score is increased by 25.83% with mean $\pm$ SD of 7.75 ± 2.55 after the administration of Video assisted teaching programme.

Comparison of the area wise mean and SD of the knowledge scores showed that, the effectiveness of video assisted teaching programme in the area of 'Meaning of toilet training and its Readiness' had 24.75% increase in the mean percentage knowledge scores with the mean and SD of 2.48 ± 2.30 was observed with that of 57% in pre-test and 81.75% in the post test.

Section B: Comparison of level of knowledge in pre-test with post test and effectiveness of the study: This part compares level of knowledge and mean of pre test and post test and it also deals with mean difference in pre test and post test and 't' value thus finds the effectiveness of the study. To evaluate the effectiveness of video assisted teaching programme, a null hypothesis was formulated. A paired 't' test was used to find the effectiveness. The value of 't' was calculated to analyses the difference in knowledge score of parents in pre-test and post-test.

H_{01} : There is no significant difference between the pre-test and post test mean knowledge of parents on toilet training

Table 4: Comparison of level of knowledge and effectiveness in pre-test with post test and effectiveness of the study

Level of Knowledge	Pre-test		Mean	Post-test		Mean	Mean Difference	t-test
	Frequency	Percentage		Frequency	Percentage			
Poor	14	35		0	0			
Moderate	24	60	14.03	5	12.5	21.78	7.75	19.23*
Good	2	5		30	75			
Very good	0	0		5	12.5			

$p < 0.05$; * = Significant

The data presented in the Table 4 show that the pre-test knowledge level of all the parents was Moderate 60%, poor 35% and good 2%, and post test knowledge level very good 12.5%, good 70.5% and moderate 12.5%.

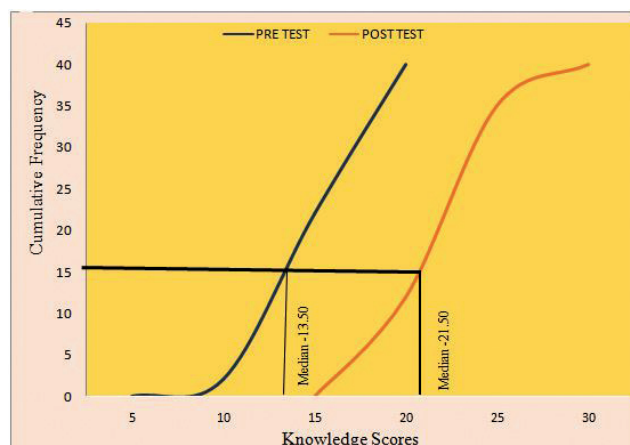


Figure 1: O give of the pre-test and post-test knowledge scores of parents regarding toilet training

The data presented in figure 1 ie: - the O gives shows significant difference between the pre-test and post test scores. The knowledge pre-test median was 13.50 where as the post test median score was 21.50. The O gives plotted shows that the first quartile score of post-test is higher than third quartile score of pre-test. This indicates that there is a significant increase in the knowledge of parents regarding toilet training

Part IV: Association between Pre-test knowledge scores of parents on toilet training with selected demographic variables: Chi-square test was computed to test the association between the knowledge of the subjects and selected demographic variables; the following null hypothesis was formulated.

H_{02} : There will be no significant association between knowledge score with selected demographic variables.

Table 5: Association between pre-test knowledge with demographic variables

N = 50

Demographic variable	χ^2	Knowledge		
		df	p-value	Inference
Age	0.102	1	0.749	NS
Education	1.071	1	0.301	NS
Gender	0	1	1	NS
Religion	0	1	1	NS
No: of children	1.071	1	0.301	NS
Birth order of the toddler	1.20	1	0.273	NS
Occupation	0	1	1	NS
Type of family	0	1	1	NS
Monthly income	0.156	1	0.693	NS
Any previous information on toilet training	0	1	-	NS
Source of information	5.104	1	0.024	S

Table value= 3.84, df=1, S = Significant; NS=Not significant

Data presented in Table 5 reveals that the calculated chi-Square value of source of information (5.014) is greater than that of table value (3.84) at 0.05 level of significance, hence the null hypothesis can be rejected and concluded that there was significant association between the pre-existing knowledge with these demographic variables on toilet training.

DISCUSSION

Level of knowledge of parents regarding Toilet Training: Majority (60%) of the parents had moderate

knowledge regarding toilet training. None of the participants had very good knowledge. The findings of this study were supported by a study conducted in Korea Toilet training status of Korean toddlers and their mother's knowledge of toilet training. The result shows that 68% of mothers are unaware of proper toilet training techniques. There was a significant correlation between toilet training and mother's level of knowledge on toilet training³.

Area-wise analysis of the knowledge scores: The area-wise analysis revealed that the parents scored highest in the area of Meaning of toilet training and it's Readiness

(Mean percentage 57%). The area-wise analysis revealed that the parents scored lowest in the area of steps of Toilet Training (Mean percentage 41.43%).

The study findings were supported by a descriptive study conducted on 'the knowledge and practices regarding the toilet training among mothers of preschool children in a selected urban community at Bangalore city. The highest mean knowledge (78.3%) found in the aspect of physiological readiness followed by psychological readiness (67.1%)⁶

Effectiveness of video assisted teaching programme on toilet training: The results shows that the total mean knowledge score is increased by 25.83% with mean SD of 7.75 ± 2.55 after the administration of Video assisted teaching programme. Hence it is concluded that there is very highly significant gain in knowledge of parents on toilet training after the video assisted teaching programme. The study findings were supported by a pre experimental study on 'the effectiveness of a planned teaching program on toilet training to mothers of children between one to three years of age in selected day care centers at Mangalore. The researcher reaches the conclusion that a planned teaching program helps to improve the knowledge of mothers regarding toilet training⁸.

Quartile distribution of pre-test and post-test knowledge score of parents regarding toilet training: The plotted "o" gives show significant difference between the pre-test and post test scores. The knowledge pre-test median of knowledge was 13.50 where as the post test median score was 21.50. Hence it is concluded that there is very highly significant gain in knowledge of parents on toilet training after the video assisted teaching programme.

Association between Pre-test knowledge scores of parents on toilet training with selected demographic variables: There was significant association between the knowledge and the demographic variables.

The null hypotheses were rejected. The study findings were supported by a cross sectional study was done to determine the association of toilet training with child and environmental factors in USA. Significant factors predicting toilet training completion were older age, non Caucasian race, female gender and single parenthood⁹.

CONCLUSION

Learning to use the toilet is a big event in a young child's life—a sure sign of growing up. Most of the

children are eager about learning how to use the "potty" and are quite proud of their achievement. The parents need guidance in recognizing the signs of readiness, in helping their child achieve the necessary skills and in addressing the problems when they occur. Proper toilet training will help to make a well disciplined hygienic generation¹²

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from the college of nursing ethical committee.

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***Ex vivo* Cytopathic Effect Study of Human *Acanthamoeba keratitis* and Use of *E. coli* in Parasitic Culture**

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ABSTRACT

Acanthamoeba is free living amoeba and can cause *Acanthamoeba keratitis*, a serious disease which affects the cornea. It is widely existing in fresh water and soil. *Acanthamoeba* has three phases during the life cycle; trophozoite and a resistant double walled cyst and protocysts. The pathogenesis starts when the trophozoites bind to the surface of cornea by expressing mannose-binding protein which can bind to mannose glycoproteins on the corneal surface. The contaminated contact lenses can increase the infection by increasing the binding ability of the trophozoites. This project aimed to study the cytopathic effect of different stages *Acanthamoeba keratitis*. Study strains of *Acanthamoeba castellanii* (ATCC 50370) was cultured and seeded in Hep2 cell lines. *E. coli* (strain M12) was used to isolate the trophozoites. The third stage, protocysts was made using Neff's medium. The cytopathic effect was checked trophozoites invasion to monolayer cells cultured in a small flask and in 24 well tissue culture plate. The time of destroying Hep2 cells by the trophozoites is less than that of other *Acanthamoeba* stages. The double ring-shaped cell wall of the cysts may increase the time-kill of Hep2 due to their resistant which was very slow to hatch. Reactivating the trophozoites from cysts then seeding in Hep2 destroyed the cells at less time compared fresh trophozoites as the virulence of the reactivated trophozoites being higher. The result could suggest that the infection of corneas with reactivated trophozoites may be more complex. Finally, the study found that the number of the trophozoites can limit the cytopathic effect of *Acanthamoeba*.

Keywords: *Acanthamoeba keratitis*, trophozoites, protocysts, cysts, cytopathic effect, *E. coli*, cornea

INTRODUCTION

Acanthamoeba keratitis is a serious disease which affects the cornea and caused by a genus of free living amoeba called *Acanthamoeba*, widely existing in fresh water and soil¹. *Acanthamoeba* has two phases during the life cycle: a vegetative infective stage (trophozoite) and a resistant double walled cyst¹ and recently an intermediate stage was discovered and known as protocysts². *Acanthamoeba* is an aerobic protozoon. It can be cultured in axenic agar (Ac#6) which contains

yeast extract, peptone and glucose^{2,3,4}. It could also grow and isolate in Non-Nutrient Agar (NNA) plates which are seeded with *Escherichia coli*⁵.

The pathogenesis of *Acanthamoeba keratitis* starts when the trophozoites binds to the epithelial tissues of cornea. *Acanthamoeba* trophozoites can express mannose-binding protein on their surfaces which can bind to mannose glycoproteins on the corneal surface^{6,7,8}. Traumatic injuries can increase the adhesive ability of *Acanthamoeba* as the injuries could increase mannose glycoproteins expression⁶. The trophozoites could be transmitted to the cornea via the contaminated contact lenses which can increase the binding ability of the trophozoites to the corneal membrane⁹. In addition, the number of acanthopodia, tooth like structures come out from the amoeba surfaces, can play an important role in the pathogenesis of the parasite by increase the adhesive

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ability to the cornea surface^{7,8}. Invasion of the trophozoites to epithelial layer of cornea leads to penetration the Bowman membrane which can be mediated by cytolysis, phagocytosis and apoptosis¹⁰. In addition, presence of sucker like structures, amoebastomes, on the surface of *Acanthamoeba* can increase the corneal cells phagocytosis by the amoeba⁷. Furthermore, trophozoites secrete several kinds of proteases such as serine proteases, cysteine proteases, metalloproteinases, elastase, collagenolytic enzyme, phospholipase A and a novel plasminogen activator^{11,12} which increase the invasion and destroy the connective tissues, stroma¹³. Impairment of the corneal stroma can lead to blindness¹⁴. The successful treatment of *Acanthamoeba* keratitis depends on its stage of the infection. In case of earlier diagnosis, debridement of the epithelium is effective to eliminate the infection^{6,15}.

This project aimed to study the cytopathic effect of different stages of *Acanthamoeba* keratitis as the pathogenesis is largely unknown. The study objectives would include maintenance of Hep2 and Vero tissue culture cell lines and their preparation in microtitre culture plates for adhesion assays. In addition, the objectives can be involved in culture and maintenance of *Acanthamoeba* (trophozoites, mature cysts and protozooids) to perform cyto-pathogenicity assays.

MATERIALS AND METHOD

Trophozoites culture: Study strains of *Acanthamoeba castellanii* (ATCC 50370) were grown in tissue culture flasks [Nunc surface (small 25 cm² and medium 75 cm² flasks) and Corning (large 225 cm²)] containing semi defined axenic medium (Ac#6).

Isolation and Maintenance of trophozoites: Trophozoites were isolated using Non-Nutrient Agar (NNA) plates seeded with *E. coli* (strain ATCC 8739) then maintained and refreshed weekly in Ac#6 media by smacking a small flask which contains the trophozoites. The flask was stored at room temperature to get confluent within 24-48 hours.

Bacteriological aspect: Bacterial stock of *Escherichia Coli* (M12) stock was grown on nutrient agar plate using streaking methods then incubated overnight at 37 °C. A colony of *E. coli* was used to plate on MacConkey agar for checking the vitality of bacteria as a selective media for *E. coli*. 10 ml of nutrient broth tube has been inoculated with a colony of bacteria on MacConkey plate

for overnight culture at 37 °C. Density of *E. coli* was examined using Spectrophotometer at OD₆₀₀ (0.5 -0.8). 3 drops of the bacterial suspension was added to NNA plates and used for isolation of the parasite.

Encystment of trophozoites: Axenic mature *Acanthamoeba* cysts were produced by encysting trophozoites on 2.5% Non-Nutrient Agar (NNA) plates. Firstly, they were grown in Ac#6 in a large 225 cm² tissue culture flask at 28°C (± 2°C). 200µl of aliquot were spread over five ENNA plates and the plates were incubated for 48 hours at 28°C (± 2°C) and then sealed in polyethylene bags for continued incubation for a further 5 days. After 7 days incubation, the presence of mature cysts formed on the ENNA plates were observed microscopically. A sterile swab moistened with ¼ Ringer's solution in order to harvest the cysts from each plate by rubbing and rotating the swab across the plates.

Making protozooids: Two milliliters of Ac#6 containing trophozoites were added to 100 ml of Neff's encystment medium¹⁶ in a storage bottle. It was put in a shaking incubator in 32 °C at 100 rpm and checked at hourly intervals of 2, 4, 6 to 24 hours. Finally, 50 µl/ml of calcaflour white was added to protozooids and incubated at 37 °C for an hour to see the light blue circles under the fluorescent microscope. Thereafter, the protozooids were counted using haemocytometer and stored in a specimen tube at 4 °C until the use.

Tissue culture technique: Hep2 cell lines (Carcinomic human cells) were used in the study. The cells were cultured into a small flask which was contained 10ml of Eagle's Minimum Essential Medium. After that, it was incubated at 36°C in 5% CO₂ for 1-2 days until confluent.

Cytopathic effect assays (CPE): Checking of trophozoites invasion to monolayer cells cultured in a small flask:

Trophozoites virulence was detected by using a small confluent tissue culture flask with Hep2 cells. The trophozoites of 50370 *Acanthamoeba* were cultured in new growth media then mixed gently and transferred again onto a small semi confluent (80-90%) tissue culture flask. The trophozoites time-kill of the cells was recorded using haemocytometer counting and photos were taken under a microscope. The count was done randomly by counting the number of intact cells in 10 different fields of each flask under the microscope (100x).

CPE of Acanthamoeba's trophozoites in 24 well tissue culture plate: A 24-well tissue culture plate was mostly confluent with Hep2 cells were used to check Acanthamoeba CPE. Firstly, growth media of the plate was changed with maintenance media (0.5 ml per well). Fresh *Acanthamoeba* trophozoites of strain 50370 were added to 24 well plates and incubated in CO₂ incubator. The time-kill for monolayer destroying was recorded and the count was done randomly.

STATISTICAL ANALYSIS

All values of counting were arranged and tabulated in Microsoft Excel program. Results were expressed as mean $\pm$ S.E.M. Statistical analysis was performed (t-test, one-way ANOVA) in GraphPad Prism version 7, P-value <0.05 was considered as significant.

RESULTS AND DISCUSSION

Trophozoites of *Acanthamoeba keratitis* were cultured in Ac#6. From that cultured stage, protocysts were made in Neff's PG medium and cysts were made in NNN agar. These stages were added to Hep2 cell line and the cytopathic effect was checked by randomly counting the number of intact cells of 10 different fields at different times and concentrations. Trophozoites of *Acanthamoeba keratitis* at concentration of 1×10^5 /ml destroyed all the Hep2 cells cultured in flask after 180 hours compared to the time-kill of the protocyst and cyst at the same concentration (1×10^5 /ml) which destroyed the cells after 240 hours of trophozoites being seeded onto epithelial cells (Figure 1 and Figure 2). These results were similar to the results obtained when the same stages

were cultured in 24 well plate but the time-kill was less as the number of Hep2 cells is much lower in case of the plate compared to the small flask (Figure 3 and Figure 4). The results in both figures showed significant differences between the different times of killing when One sample t test was used. This can confirm that the trophozoites are more virulence than other stages. This is clear as the virulence depends mainly on the presence of acanthabodia, vacuoles and adhesive proteins which found and produce in the trophozoites. The time-kill of the mature cysts were the largest (Figure 1 and Figure 3) perhaps due to their resistant double ring-shaped cell wall which was very slow to hatch.

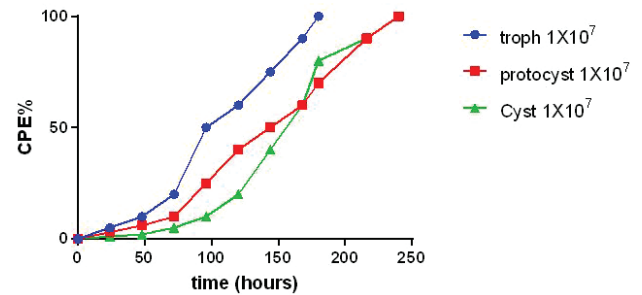


Figure 1: Cytopathic effect of trophozoites, cysts and protocysts of *Acanthamoeba keratitis* on Hep2 cells cultured in small tissue culture flask

Different stages of *Acanthamoeba keratitis* were added to Hep2 cells cultured in small flask and incubate at 36 °C in 5% CO₂. The time-kill of Hep2 by the parasite stages was recorded by checking the intact cell count using haemocytometer. Statistical analysis between the different time-kill points for each protozoan stage was done using One sample t test. Data are the means $\pm$ SEM from three independent experiments carried out.

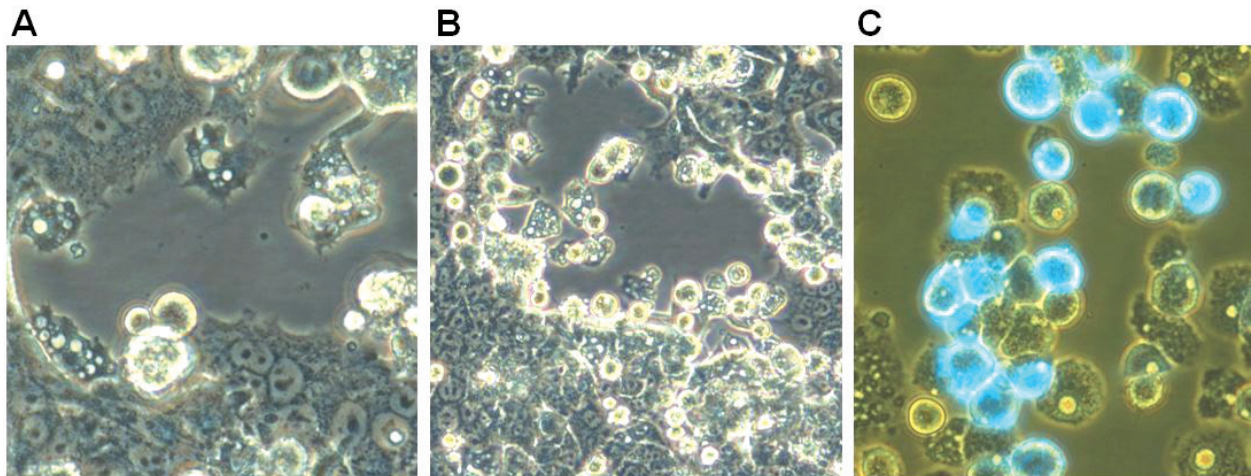


Figure 2: Different stages of *Acanthamoeba keratitis* on Hep2 cells cultured in small tissue culture flask

Different stages of *Acanthamoeba keratitis* were added to Hep2 cells cultured in small flask and incubate at 36 °C in 5% CO₂ then examined after 2 days under the microscope (100X).

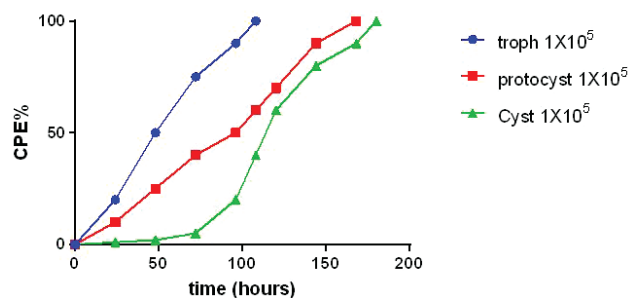


Figure 3: Cytopathic effect of different *Acanthamoeba keratitis* stages on Hep2 cells cultured in 24 well tissue culture plate

Different stages of *Acanthamoeba keratitis* were added to Hep2 cells cultured in 24well plate and incubate at 36 °C in 5% CO₂. The time-kill of Hep2 by the trophozoites, cysts and protozoa was recorded by counting the number of intact cells using haemocytometer. Statistical analysis between the different time-kill points for each parasitic stage was done using One sample t test. Data are the means $\pm$ SEM from three independent experiments carried out.

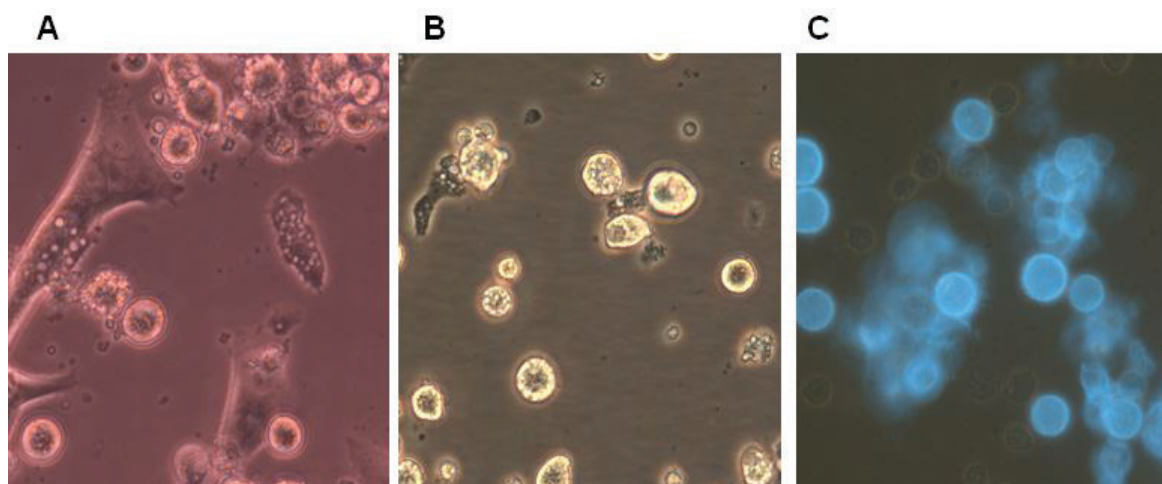


Figure 4: Different stages of *Acanthamoeba keratitis* on Hep2 cells cultured in 24 well plate

Different stages of *Acanthamoeba keratitis* were added to Hep2 cells cultured in 24 well plate and incubate at 36°C in 5% CO₂ then examined after 2days under the microscope (100X).

The cysts (1 X 10⁵/ml) destroyed 30% of the epithelial cells after 132 hours of its inoculation (Figure 5). However, when these Cysts were reactivated to trophozoites and seeded in the cell culture, 100% of the cell lines were destroyed at the same time (Figure 5). This result was statistically different when t test was used to compare between the two columns. Compared to the killing activity of the trophozoites, the time-kill of reactivated trophozoites (Figure 5) was less than that of trophozoites in Figure 1. This may be because the increase in virulence of the reactivated trophozoites. This result could suggest that the infection of corneas with reactivated trophozoites may be more complex as the trophozoites become more pathogenic.

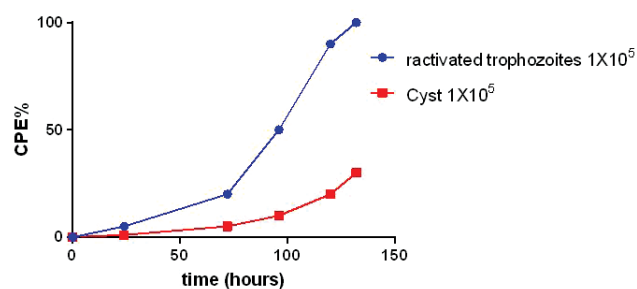


Figure 5: Comparisons of cytopathic effect of *Acanthamoeba keratitis* cysts and reactivated trophozoites on Hep2 cells cultured in 24 well tissue culture plate

Cysts of *Acanthamoeba* with different concentrations starting at 1.8X10⁵ were added to Hep2 cells cultured in 24well plate and incubate at 36 °C in 5% CO₂. At the same time, some cysts were reactivated to produce trophozoites by putting the cysts in Ac#6. Then these reactivated trophozoites were added to Hep2 cells cultured in 24well plate and incubate at 36 °C in 5% CO₂. The time-kill of Hep2 was recorded by checking the number of intact cells using haemocytometer. Statistical analysis between

the tim-kill of cysts and reactivated trophozoites was done using t test. Data are the means $\pm$ SEM from three independent experiments carried out.

To check whether the number of the trophozoites can limit the cytopathic effect of *Acanthamoeba*, different concentrations of trophozoites were seeded in 24 well plate cell culture at the same time. The time-kill was checked at different times (Figure 6). The result explained that trophozoites at concentration of 1.8×10^5 and 1.8×10^4 destroyed 100% and nearly 50% of the cells respectively after 144 hours which showed significant differences using One way ANOVA (Figure 6 and Table 1). However, other concentrations did not show high killing activity.

Trophozoites of *Acanthamoeba* with different concentrations starting at 1.8×10^5 were added to Hep2 cells cultured in 24well plate and incubate at 36°C in 5% CO_2 . The time-kill of Hep2 by the trophozoites was recorded by checking the number of intact cells using haemocytometer. The tim-kill of different trophozoites concentration was analysed using One Way ANOVA. Data are the means $\pm$ SEM from three independent experiments carried out.

This suggests that the number of the trophozoites play an important role in *Acanthamoeba* pathogenesis.

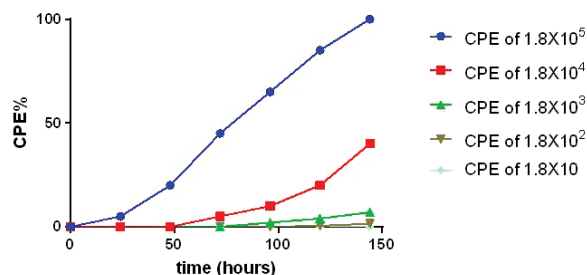


Figure 6: Comparisons of cytopathic effect of *Acanthamoeba keratitis* trophozoites with different concentrations on Hep2 cells cultured in 24 well tissue culture plate

Table 1: Statistical significance difference (One Way ANOVA) of cytopathic effect of different concentrations of *Acanthamoeba keratitis* trophozoites

Tukey's multiple comparisons test, One Way ANOVA	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value
CPE of 1.8×10^5 vs. CPE of 1.8×10^4	35	5.802 to 64.2	Yes	*	0.0126
CPE of 1.8×10^5 vs. CPE of 1.8×10^3	43.86	14.66 to 73.06	Yes	**	0.0012
CPE of 1.8×10^5 vs. CPE of 1.8×10^2	45.43	16.23 to 74.63	Yes	***	0.0008
CPE of 1.8×10^5 vs. CPE of 1.8×10	45.71	16.52 to 74.91	Yes	***	0.0008
CPE of 1.8×10^4 vs. CPE of 1.8×10^3	8.857	-20.34 to 38.06	No	ns	0.9021
CPE of 1.8×10^4 vs. CPE of 1.8×10^2	10.43	-18.77 to 39.63	No	ns	0.8367
CPE of 1.8×10^4 vs. CPE of 1.8×10	10.71	-18.48 to 39.91	No	ns	0.8230
CPE of 1.8×10^3 vs. CPE of 1.8×10^2	1.571	-27.63 to 30.77	No	ns	0.9999
CPE of 1.8×10^3 vs. CPE of 1.8×10	1.857	-27.34 to 31.06	No	ns	0.9997
CPE of 1.8×10^2 vs. CPE of 1.8×10	0.2857	-28.91 to 29.48	No	ns	>0.9999

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

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Ethical Clearance: Ethical clearance was obtained from the Faculty Scientific Committee (Department of Parasitology, College of Veterinary Medicine, Al-Muthanna university, Iraq) to Investigate the *Ex vivo* cytopathic effect study of human *Acanthamoeba keratitis* and use of *E. coli* in parasitic culture.

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Teacher's Perception of Stakeholder Support in the Peer Education Program about Drug Abuse Prevention

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ABSTRACT

The school environment is responsible for shaping student behavior through both curriculum and extra-curricular activities. One of the positive activities that must be done is prevention of drug abuse which is still high in the eastern Surabaya and central Surabaya. Schools form peer educators as an effort to empower students through collaborating with stakeholders to carry out the sustainability of the program. The purpose of this study was to determine teacher perceptions related to stakeholder support in the peer education program in 10 schools in Surabaya area. Data were analyzed using descriptive qualitative studies. The results of interviews conducted by the researcher to 10 teachers as peer educator counselors stated that stakeholder support for the peer education program was still limited to informative support and instrumental support. Whereas for emotional support, social networking support and reward support have not been done by the stakeholders.

Keywords: *teacher's perception, peer education, drug abuse prevention*

INTRODUCTION

Overcoming the abuse of narcotics and illegal drugs in adolescents is the responsibility of the school as a provider of quality education and also the responsibility of the government and other stakeholders that facilitate the sustainability of the school programs. In Law Number 35 of 2009^[1], all activities related to drugs will be the responsibility of the government. Then the regulation is transmitted to the National Narcotics Agency, which is a Non-Ministerial Government Institution (LPNK), which has jurisdiction under the President and is responsible to the President. The National Narcotics Agency has the duty to coordinate relevant government agencies in formulating policies and implementing them in the field of availability, prevention and eradication of illicit abuse and circulation of narcotics, psychotropic substances, precursors and other addictive substances especially in the education environment.

Based on data obtained through BNN of East Java Province that the number of drug abuse in 2016 reached 568,304 people, while in the city of Surabaya, the number of drug abuse reached 364 people and dominated by teenagers.

To realize a quality and capable of bringing about adolescents, the government created a prevention program for the dangers of drugs through peer counselors as stipulated in Mayor's Regulation Number 65 of 2014 in the Implementation of *Sekolah Bersih Narkoba* (Drugs-free School).

Based on interviews with teachers in several Surabaya High Schools, stated that in 2014 the Surabaya City Education Service held a Peer Educator program in several schools with the aim that students who were peer educators were able to embrace friends away from drug abuse behavior. In the program, students as peer educators are given training that also works with stakeholders from both the National Narcotics Agency, the Health Office and the Police.

The program is said by the counseling teacher as a peer educator guide that only runs for one year. However, the program is no longer running. The peer educator program in several schools was formed at the initiative

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of the school in various ways such as the establishment of health ambassadors until the election through students participating in the school organization.

The commitment of the regional government is the main motive in the prevention and treatment of drugs in the education environment. With the existence of regional programs that focus on P4GN in adolescents, all stakeholders are expected to be able to commit and work together in a comprehensive and integrated manner in order to realize an educational environment that is far from drug abuse.

In this study the researcher wanted to see the support given by stakeholders to the High School in Surabaya regarding the program to prevent drug abuse in students based on the teacher's perception as a peer educator in the school environment.

METHOD

The method in this study uses a qualitative descriptive approach where the researcher is a key instrument and emphasizes meaning rather than generalization. In this case, researchers want to explore the phenomena related to drug abuse programs that are given to students through the solid angle of teacher perceptions of stakeholders.

Informant: In this study, the researcher selected 10 teachers who served as peer educator assistants from 10 high schools in the Surabaya City area. The researcher chose a sample in the Surabaya area because there was a peer education program in the school, but drug abuse was still rampant.

The peer educator teacher was the key informant in this study. The researcher takes data by conducting in-depth interviews with each teacher to explore information from a group of subjects. Determination of informants with purposive sampling that has certain characteristics in accordance with the objectives of the study.

FINDINGS

The peer educator program was last carried out by the Surabaya City Education Office in 2014 with representatives from each school attending. The teacher as the peer educator guide explained that at that time there was training for students as peer educators in collaboration with the Surabaya City Government.

So at the beginning, 2 or 3 years ago we had been training peer counselors by the City Government, we were still participating in the municipal government at that time, 3 years ago [...] There was training from the Surabaya City Government asking 10 students from each school and one teacher to conduct peer-counseling training, 10 of these students were trained for 3 days or more. We were trained at the municipal government, and students came home with 10 materials, there was one material drugs. [Teacher 1]

It was also stated by several teachers that the National Narcotics Agency was previously a stakeholder who provided guidance for students who were peer educators. The training lasted several days by giving some material, one of which was about preventing drug abuse.

In the past we have had the last two years of cooperation, the National Narcotics Agency is cooperating with us [...] Yes, it was peer cadres, P4GN. That was the last time the BNN had been gone for the past two years. That was even named like a group whose job is to give information to their friends what the dangers of the drug are, and what the impacts are [Teacher 2]

The supervising teacher also explained that when there had been a drug abuse case about 2 years ago, the Plato sheltered by the BNN provided rehabilitation services for students who were positive for using drugs.

After 3 months the students who had been invited to the drug seminar was the same as the BNN. They have received all certificates, the last one has been tested negatively, this one is the one that went home but the first one stayed there for 3 months, because it was too severe, going home, in the morning, he was taken by someone from the Plato, and was picked up on the afternoon [Teacher 3]

Other teachers also added that stakeholder support from Dispora (Department of Youth and Sports) was also given even though it was not directly focused on the peer educator program. The form of support provided is more about the dangers of drugs.

Yes, depending on the theme, if drugs are drugs. The dispora is often about drugs, so they bring one student who is really an addict as

a tutor, sometimes they have been invited like the Muhammadiyah teacher's faculty about the cultural empowerment [Teacher 4]

Dispora (The Department of Youth and Sports Education) was also mentioned by the teacher, who once gave activities to delegates from several schools as a form of support provided for peer tutoring.

Every school is sometimes delegated by 15 people, sometimes only 6 people depending on what activities are written later. Sometimes at SMK 5, there was a peer tutor about discipline in school [Teacher 5]

In addition, the teacher also explained that support for the prevention of the dangers of drugs had been given by the Airlangga University by involving students as extension agents for the dangers of drugs.

I was also invited in UNAIR. [Teacher 1]

Some schools also state that within one year, there are stakeholders who come for counseling, and that is not only the focus of drug problems. But there are also legal information, family planning, and so on.

NGOs were also told that they had come to several target schools to conduct counseling on the dangers of drugs, but not all schools. The NGO was delivered by the guidance teacher also in collaboration with the Faculty of Psychology of Airlangga University.

NGOs collaborate with the Faculty of Psychology of UNAIR [Teacher 1]

However, in the past few years the teacher said that support from the government and stakeholders was not as intense as it used to be. Since the program is to prevent the dangers of drugs by students has been transferred to the East Java Provincial Education Office, programs that were previously regularly monitored are no longer being carried out. This was conveyed due to several obstacles, starting from the lack of commitment from the government to the number of counseling teachers in each school, which was still very minimal to be able to monitor the running of the peer education program.

There was no trainer, but I was a coach, but also counseling teacher, SPAIN trainer, task force, and also peer counselor, [...] It should be 150 students for 1 teacher, but we have almost 400-500. [...] the task force and the counselor were not there [Teacher 3].

Constraints experienced by peer educator tutors also related to funding, support for peer educator assistance in counseling activities is rarely done because they feel that these activities now require funding.

It has been a long time ago. It was because of the cost, miss. At that time he gave it for free. Then if we ask again, we are asked for a fee. And also we are like a private school and it's a risk if we hold it like that, if the problem turns out that there really is something like that, our school will get the damage outside. Well [Teacher 6]

If the connection with the existence of funds must be paid, it must be discussed with the capability to pay first [Teacher 1]

I think it's just the funds, miss [Teacher 4]

Although the support obtained at this time is no longer incessant, the teacher stated that support from the school for the peer educator continues to be carried out, such as giving handkerchief identity to youth health cadres who later also act as peer educators.

Youth health cadres are selected 10% of the total number of students, it must be for example, if we have 1000 students, there must be 100 peer educators, it is too expensive to make vests, so we make handkerchief [Teacher 7]

Some teachers stated that support for the peer educator was by installing drug hazard posters in the school environment, in addition to including peer educators when there were invitations from outside parties and also attempting to collaborate with NGOs to provide socialization to all students, even though this activity was not focused on the peer educator.

If that is the case, like the installation of a poster is still there, if there is no direct movement [...] But to socialize about drugs we never stop here [Teacher 4]

In addition, the teacher also stated that the school cooperates with the health center to provide counseling to all students as a form of support to students, especially peer educators, so that knowledge about drug abuse increases.

Yes sometimes it is not in the program that has been submitted, so in the end we collaborate with institutions, such as directives from the Health Center, then, it is the Health Center that provides food [Teacher 5].

I don't know much, because the most frequent is from the Health Center. The Health Center has a meeting every few months, usually the target is the 10th grade, given information about drugs [Teacher 8]

DISCUSSION AND IMPLICATION

Perception is the process of someone organizing and interpreting the impression of censorship in an effort to give something specific meaning to the environment [2].

Perception is defined as an individual process organizing and interpreting their sense impressions in order to give meaning to their environment[3].

In the context of the school, stakeholders are the ranks of government and community institutions that deal directly or indirectly with school management, have social awareness and have an influence on schools. Stakeholders are all related components that have the same rights and obligations in planning, implementing and supervising educational programs. In general the term stakeholder is defined as a stakeholder.

In implementing the peer-education program there needs to be support from various parties. The existence of social support from various parties will make the program run smoothly.

There are five types of social support including informative support, instrumental support, emotional support, social network support and reward support[4].

a. Informative support: The informative support provided by the stakeholders' aims to expand the peer educator's insight and understanding of the problems at hand. This information includes giving advice, instructions, suggestions, information or feedback regarding drug abuse.

The provision of information carried out continuously about drug abuse and its impact on addicts through counseling will increase the role of counseling service providers[5].

In realizing students who are clean of drug abuse, it is necessary to have continuous activities so that students, especially peer educators, in each school understand the latest issues of drug abuse.

b. Instrumental Support: This aspect includes the provision of facilities to facilitate or assist the peer

educator in carrying out his role. Instrumental support that can be provided in the form of supporting facilities including providing time, funds, educator educators, facilities and so forth.

The presence of instrumental support has a high influence on individuals. If individuals get that support intensively, then positively make individuals feel cared for and also valued[6].

The instrumental support provided by stakeholders such as Narcotics Agency, in the form of rehabilitation facilities for students who abuse drugs is also felt to be very helpful for the school in the handling process.

c. Emotional Support: Emotional support is an expression of affection, trust, attention, and feeling to be heard. Emotional support includes expressions of empathy, concern and attention to the person concerned[7].

The support given to individuals has a strong influence and becomes a separate resource that can be utilized to meet social needs while reducing perceived emotions [8].

Teacher's experience is also needed to support problem-solving strategy[9]. In this case, experience's teacher can help peer educator to do their jobs in peer education.

d. Social Network Support: The support of social networks will help adolescents improve performance in carrying out their roles[10].

success in a service program could only be successful if each stakeholder made an optimal contribution. In other words, the success of social capital linking lies in the awareness to show active participation and optimal contribution from each stakeholder[11].

Social network support for peer-education programs can be in the form of a gathering held with the aim of bonding between stakeholders, teachers, and peer-educators from various schools and the presence of online communication forums through groups on social media.

e. Reward Support: Reward support can be given through expressing positive appreciation for individuals concerned with individual ideas or feelings and positive comparison of individuals with other people.

If the award given to the individual is large, it will increase self-confidence because of the praise obtained from the results of the activities carried out by these individuals^[12].

Until now, both the school and stakeholders have never given a special award to the peer educator. This can reduce the performance of peer educators because they feel no attention is given.

Award support can actually be done by various stakeholders, through the school because the school is directly related to students. Award support can be given such as awarding a trophy or certificate for dedication from a peer educator.

CONCLUSION

Based on the results of the study, it is known that according to the perception of the teacher, support from stakeholders is currently only limited to informative support and also instrumental support.

Conflicts of Interest: None declared.

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Ethical Clearance: Ethics approval was received from Faculty of Ners, Universitas Airlangga with certificate number 940-KEPK.

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Functional Analysis of Beta 2 Microglobulin Protein in Patients with Prostate Cancer Using Bioinformatics Methods

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ABSTRACT

Objective: The present study aimed to use bioinformatics methods for analysis function of Beta 2 microglobulin (B2M) protein in patients with prostate cancer.

Materials and Method: This present study included 10 patients with prostate cancer. The human DNA was extracted and the three exons of B2M gene were amplified using three primers.

Results: The results revealed 24 mutations in the sequence of exon 1 and exon 2 while in exon 3 for B2M gene of patients did not determined a mutations. In exon 1, appeared a point mutation at the position 44,711,557 in more samples of patients. Also in exon 2, appeared a point mutation at the position 44,715,448 in more samples of patients, these mutations recorded in ENA, DDBJ and GenBank at NCBI databases with the number LC424499 and LC424500, respectively. The results showed using STRING program that the mutations had effect on the function of B2M protein for patients compared to B2M retrieved from NCBI.

Conclusions: A point mutations were determined in exon 1 or exon 2 of B2M gene at the site 44711557 or site 44715448 respectively, may be considered as the cause of prostate cancer. The mutations in B2M gene sequence affected the function of B2M protein by lost its linked with HLA-1.

Keywords: B2M gene, Bioinformatics Methods, Prostate Cancer, STRING program, point mutation

INTRODUCTION

Bioinformatics is a multi-disciplinary research fields integration of among biological, computer, mathematics and statistics sciences to employ the technology that utilize computers for manipulation, distribution, retrieval and storage of information related to biological large molecules like proteins and DNA¹. Beta 2 microglobulin (B2M) protein has a low molecular weight encoded by B2M gene located on the long arm of chromosome 15 at site 15q21². Structurally, B2M protein is a light chain that binds with the polymorphic major histocompatibility complex class-1 (MHC-1) heavy chains, also known as human leukocyte antigen HLA

class 1 in human, and it is normally expressed on the cell surface as an integral part of MHC-1 and produced by all cells that contains nucleus to perform the function by presentation of peptides fragments of intracellular antigens to CD8+ cytotoxic T cells^{3, 4}, also acts as a chaperone during the folding of MHC-1 structure⁵. Prostate cancer is consider the most frequently male cancer and it represents a main cause of mortality in men which related to this type of cancer⁶. The aim of the present study is to analyze function of B2M protein in patients with prostate cancer using bioinformatics methods.

METHOD

The present study included ten patients with prostate cancer, their ages ranged from 60 to 77 years. During the October 2017, patient's samples chosen from Al-Amal National Hospital for Cancer Treatment in Baghdad-Iraq. Blood samples collected from each patient then stored at -20°C until the analysis⁷. The DNA extracted from blood using gSYNCTM DNA Extraction Kit (Cat.

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No.: GS100) Geneaid company/Taiwan according to the manufacturer's instruction. Then the extracted DNA was evaluated using agarose gel electrophoresis to confirm the presence and integrity of extracted DNA^{8,9}.

The sequences of B2M gene were taken from the GenBank at "national center for biotechnology

information" NCBI according to the reference sequence: NC_000015.10, where primer3 plus program was used to design three primers for three exons of B2M gene (B2M -1 primer for exon 1, B2M -2 primer for exon 2 and B2M -3 primer for exon 3) and supplied by Bioneer Corporation/Korea¹⁰. The names of primers and their sequences are shown in Table (1).

Table 1: The primers and their sequences used for amplification three exons of B2M gene

No. of Exon	Primer Name	Primer Sequence (Forward F/ Reverse R)	Product Size
1.	B2M-1	Forward 5'-GGC ATT CCT GAA GCT GAC A-3'	113 bp
		Reverse 5'-AGG AGA GAC TCA CGC TGG AT-3'	
2.	B2M-2	Forward 5'-TTT TCC CGA TAT TCC TCA GGT-3'	337 bp
		Reverse 5'-CAC AAC TTT CAG CAG CTT ACA AA-3'	
3.	B2M-3	Forward 5'-TTT TTC TCC ACT GTC TTT TTC AT-3'	101 bp
		Reverse 5'-TCC TCA GGA CAG TGA AAC AAA A-3'	

The polymerase chain reaction (PCR) accomplished using AccuPower[®] PCR PreMix kit (Bioneer Corporation/Korea) according to the manufacturer's protocol, by three primers for amplification three exons of B2M gene. The PCR reaction carried out under the conditions to amplify the target DNA as shown in Table (2). The PCR products were electrophoresed with DNA ladder 100 bp on 2% agarose gel to detect the size of amplicons, the gel was visualized by UV-transilluminator, where the amplicons were checked then photographed.

Table 2: The PCR conditions to amplify three exons of B2M gene

Steps of PCR	Temperature	Time	No. of Cycles
Pre-Denaturation	95°C	5 min	1
Denaturation	95°C	30 sec	30
Annealing	58°C ⁽¹⁾ , 57°C ⁽²⁾ and 54.6°C ⁽³⁾	45 sec	
Extension	72°C	1 min	
Final Extension	72°C	5 min	1

⁽¹⁾Annealing temperature for B2M-1 primer: 58°C,

⁽²⁾Annealing temperature for B2M-2 primer: 57°C and ⁽³⁾Annealing temperature for B2M-3 primer: 54.6°C.

Amplified PCR products sent to Macrogen Corporation/Korea for sequencing of B2M gene. Basic Local Alignment Search Tool (BLAST) program was used to compare B2M gene sequences for patients with the reference sequence of B2M gene in the GenBank at NCBI¹¹.

Translation of B2M gene nucleotides sequence for patients to sequence of amino acids by European Molecular Biology Open Software Suite Translate nucleic acid sequences (EMBOSS Transeq) program (https://www.ebi.ac.uk/Tools/st/emboss_transeq/)¹², while sequence of amino acids for B2M protein was retrieved from NCBI. Also the function of B2M protein was predicted by "Search Tool for the Retrieval of Interacting Genes/Proteins" STRING¹³.

PCR Technique for Detection Three Exons of B2M Gene: PCR technique used to amplify the sequence of exon 1, exon 2 and exon 3 of B2M gene for patients using B2M-1, B2M-2 and B2M-3 primers, respectively, the results revealed that the amplicons gave a clear bands using the electrophoresis on 2% agarose gel and it had size 113 bp for exon 1, 337 bp for exon 2 and 101 bp for exon 3 as shown in Figures (1), (2) and (3).

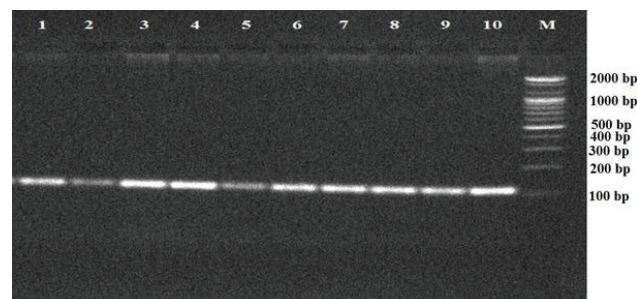


Figure 1: The size of DNA bands (113 bp) for exon 1 of B2M gene using electrophoresis on 2% agarose gel. Lane M: DNA Ladder 100 bp. Lane (1-10): Bands of amplified region for patients

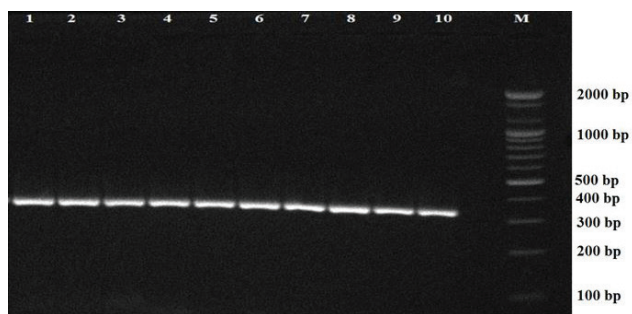


Figure 2: The size of DNA bands (337 bp) for exon 2 of B2M gene using electrophoresis on 2% agarose gel. Lane M: DNA Ladder 100 bp. Lane (1-10): Bands of amplified region for patients

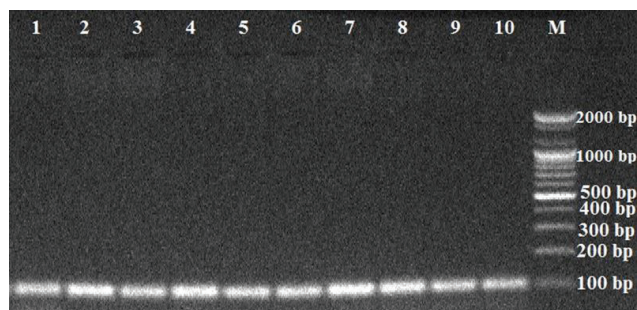


Figure 3: The size of DNA bands (101 bp) for exon 3 of B2M gene using electrophoresis on 2% agarose gel. Lane M: DNA Ladder 100 bp. Lane (1-10): Bands of amplified region for patients

RESULTS

Sequencing and Sequence Alignment of B2M Gene:

The results showed presence of 24 mutations in the sequence of exon 1 and exon 2 for all patients while in exon 3 no mutation detected. In exon 1 for all patients except (patient No.5) were detected a point mutation at the same site and it had the same impact, where the cytosine (C) was deleted from the codon which encoded for amino acid serine at the position 44711557 and affected the translation process of protein causing frameshift mutation. In addition to, a point mutation was detected at the site 44711548, where the thymine (T) was deleted from the codon which encoded for amino acid methionine causing frameshift mutation in patient No.1. Also a point mutation was detected in the sequence of exon 1 in patient No.5, where the thymine (T) was inserted between the site 44711549 and site 44711550 causing frameshift mutation.

Also in exon 2 for all patients except (patient No.2 and No.6) were determined a point mutation at the same site and it had the same impact, where the adenine (A)

was deleted from the codon which encoded for amino acid serine at the position 44715448 and affected the translation process of protein causing frameshift mutation. In addition to, a point mutation was detected at the site 44715448, where the adenine (A) was replaced with the guanine (G) for the codon which encoded for amino acid serine causing silent mutation in patient No.2 and No.6. Also the cytosine (C) was replaced with the guanine (G) for the codon which encoded for amino acid tyrosine causing nonsense mutation in patient No.2. Additionally, double substitution were determined in the same codon for the amino acid histidine, where the cytosine (C) replaced with the guanine (G) at site 44715452, and the thymine (T) replaced with the guanine (G) at the site 44715454 causing missense mutation in patient No.6.

FUNCTION ANALYSIS

Results of STRING program showed that B2M, is component of MHC-I, involved in the presentation of peptide antigens to the immune system. Additionally, B2M binds with other proteins such as MHC-I to perform its function in (patient No.1 and No.5) and B2M retrieved from NCBI, this means that mutations did not affect B2M function for these samples of patients as shown in Figure (4). While in other patients (patient number 2, 3, 4, 6, 7, 8, 9 and 10), B2M had lost its bound with HLA-1, this means that mutations affected the B2M thus loss its.

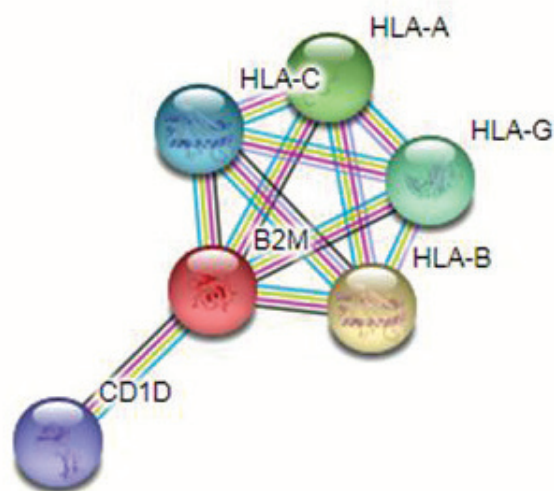


Figure 4: The network interaction of B2M protein (red color node) with other proteins such as (HLA) for patients with prostate cancer (patient No. 1 and No. 5) and B2M retrieved from NCBI predicted by STRING program

DISCUSSION

In the sequences of exon 1 or exon 2 of B2M gene appeared to have a point mutation at the position 44,711,557 or at position 44,715,448, respectively in more samples of patients, this indicates a relationship between these mutations in nucleotide sequence of B2M gene of patients and cancer. Therefore, these mutations can be consider as a possible cause of prostate cancer. These results were compatible with Myerowitz study which revealed that Tay–Sachs disease caused by “genetic mutation” in the HEXA gene ¹⁴. Also in agreement with Scriver study which revealed that Phenylketonuria was caused by a point mutations in the PAH gene ¹⁵.

The mutations in the sequence of B2M gene for patients had a significant effect on the function of B2M protein led to non-binding of B2M protein with HLA-1 heavy chain to form (B2M/ HLA-1 complex), hence, the function of this complex fails to introduce foreign antigens to the CD8⁺ T cells by formation (B2M/ HLA-1/ foreign antigen complex), also it fails to stimulate the immune system (CD8⁺ T cells) to eliminate the mutated cell, which may be a cancerous cell, which lead to the division of this cell randomly without the actual function and in large numbers it's difficult to be eliminated by the immune system by CD8⁺ T cells, leading to the development of cancer. The results are in agreement with the Del Campo et al study demonstrating that mutations in B2M gene sequences led to B2M protein inability to form a functional complex with HLA-1 heavy chain ¹⁶. Also the results are in agreement with the Bernal et al study ¹⁷ demonstrating that B2M is the light chain and an essential constant component of MHC-1, this (B2M/ MHC-1 complex) presenting endogenous protein antigens on the surface cell, which allows CD8⁺ T cells to recognize and respond to the foreign antigen repertoire of hazardous cells, including tumor cells. In addition B2M protein deficiency because of a mutations in B2M gene sequence may be sufficient to generate tumor cell precommitted to escape from immunological surveillance.

CONCLUSIONS

The mutations in exon 1 at the position 44,711,557 and exon 2 at position 44,715,448 for B2M gene were determined to be related with prostate cancer. The mutations in B2M gene sequence of patients influenced the function of B2M protein by absent it's linked with HLA-1 heavy chain as compared with B2M retrieved from NCBI.

Conflict of Interest: None

Ethical Clearance: Informed written consent was obtained from all the participants in the study, and the study and all its procedure were done in accordance with the Helsinki Declaration of 1975, as revised in 2000. The study was approved by Al-Amal National Hospital.

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Use of Bipolar Cautery in Thyroidectomy

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ABSTRACT

Introduction: Thyroidectomy has most performed surgeries all through the world, which has a low morbidity rate.

Aim: To study the impact of bipolar burning amid thyroid surgery with respect to the duration of surgery and blood misfortune at the time of surgery.

Material and Method: In this investigation, 50 patients with thyroid swelling who underwent outpatient surgery from 2013 to 2017 were enrolled. The thyroid surgeries were finished using bipolar cautery and its outcomes were investigated.

Results: The majority of patients were 30-40 years of age. Surgery time ranged from 50 minutes to 135 minutes. The more drawn-out surgery times, contrasted with different examinations, were attributed to the learning curve associated with this new procedure. The blood loss ranged from 25-50ml. Complication rates were less with bipolar thyroidectomy such as postoperative discharge (2%), transitory recurrent laryngeal nerve paralysis (2%), a minor level of wound contamination (2%) and signs of hypocalcemia (6%). The mean term of stay in the healing facility was four days. The cost of the bipolar burning is less in comparison with symphonious surgical blade and LigaSure. Also, post-agent complications are less with bipolar cautery.

Conclusion: The bipolar cautery method was found to be effective then other thyroidectomy methods.

Keywords: *Thyroidectomy, bipolar burning, bipolar cautery, thyroid illnesses*

INTRODUCTION

Thyroidectomy is a normal surgery performed, as a rule, in the surgery division. It is a standout amongst the most generally performed surgeries all through the world, which has much to do with its low mortality rate. Presently, with the appearance of more up-to-date procedures, the length and intricacy of the surgery have diminished. Commonly, thyroidectomy surgery was finished by a suture hitch-tying system, which can diminish recuperation and build wound disease, causing damage to neighboring structures and outer body reactions. Thyroidectomy utilizing bipolar cautery is sutureless and less tedious; additionally,

blood misfortune amid surgery is insignificant¹. Wound-mending is better and the post-agent intricacies are less with thyroidectomy done by bipolar cautery.

Bipolar burning has advantages over monopolar cautery because it doesn't influence the neighboring tissues. In a bipolar cautery, tissues stick to the anode tip; this is because of movement of contrarily charged erythrocytes to the positive shaft amid coagulation. The odds of harming the tip are greater because of rehashed cleaning to expel the roasted particles in the tip². The power expected to coagulate a surface point relies upon the impedance of the circuit (the burning tip to a ground plate in monopolar and, in bipolar, from one cautery tip to the next). This impedance relies on numerous elements; the essential components are the separation between the two anodes and the conductance of the tissue.

The adequacy of bipolar cautery is expanded when joined with a saline water system for coagulation of tissues. In a few papers, isotonic mannitol was utilized for water system reasons in the midst of the operation.

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King and Worpole³ clarified that the water system consequently flooded bipolar cautery. Dujovny et al.⁴ created a model utilizing bipolar forceps with an inbuilt suction channel, as well as a flooding pump with a self-outlined system coupled with the cautery unit, to provide a water system to the forceps' tip.

The first thyroid surgery was performed in the twelfth century; it was related to high mortality and dismalness, in light of which it was not routinely performed¹. With the utilization of general anesthesia and antisepsis, death rates decreased to 8% by the nineteenth century⁵. With the coming of new advances like LigaSure, the symphonious surgical blade, and bipolar surgical diathermy, the rate of morbidity and complications have diminished. Numerous examinations have been performed looking at ligature and suture hitch-tying or consonant surgical tools with traditional bunch-tying⁶. In this investigation, the researchers picked the utilization of bipolar electrocautery for performing thyroid surgeries - that is, a sutureless thyroidectomy. The water system, coupled with the bipolar cautery gadgets, is expensive; they are accessible only in exceptionally prepared doctors' facilities.

Thyroidectomy activities were finished by specialists of differing types and levels of training and in various clinical practice settings. Contrasts exist in light of cutting-edge preparation, knowledge, caseload, and work in the setting. The goal of this study was to think about the impact of bipolar burning amid thyroid surgery with respect to the duration of surgery (in minutes) and blood misfortune at the time of surgery (no of gauze used).

MATERIALS AND METHOD

This clinical observational investigation was held with 50 patients experiencing thyroidectomy in Tikrit city, from 2013 to 2017. This investigation was directed over a period of seven months.

Consideration Criteria: Patients with favorable, harmful thyroid illnesses were chosen after analgesic fitness. Patients of both genders, aged 18 years and older, were selected. Oral consent was taken from the patients before enrolled in the present study.

RESULTS

Age and gender distribution of patients: During this investigation, the majority of patients were 30–40 years

of age, with 41–50 years representing the next largest group. In two cases where the patients over 60 years. The mean age for thyroid infections is 41–50 years. Of the 50 patients examined, 48 were female, and two patients were male. The male-to-female ratio was 1:25. Thyroid issues are more typical in females.

Surgery Type: Of the aggregate 50 patients examined, 13 patients with single nodular goiter (SNG) experienced hemithyroidectomy, and 37 patients experienced aggregate thyroidectomy; of those, 30 patients had multinodular goiters and seven patients had Hashimoto's thyroiditis. Surgery was performed in euthyroid patients (86%) and on hypo/hyperthyroid patients subsequent to making them euthyroid with drugs (14%).

Duration: Of the 13 hemithyroidectomies with bipolar surgical burning, in eight patients the length of surgery time was 45–60 minutes (n=8), in one patient, the term of surgery was 30–35 minutes, and in four patients, the span of surgery was 60–75 minutes. Hence, the mean span of surgery was 45–57 minutes. Of the aggregate 13 hemithyroidectomies, three were finished by postgraduates, eight were finished by collaborators, and two were finished by the chief of surgery. The researchers have utilized bipolar diathermy for as long as two years, and the more drawn-out surgery times are attributed to the learning curve of doctors new to the procedure.

Of the 37 patients who experienced thyroidectomy with bipolar surgical burning, the aggregate time length differed from 50 minutes to 135 minutes. The variation in the surgery time is given in the Table 1. The mean length for thyroidectomy was 82.5–97.5 minutes. Of 37 thyroidectomies, 10 were done by postgraduates in 120–135 minutes, 20 were done by colleagues in 105–120, and seven were done by the chief of surgery in 60–75 minutes.

Of the 50 patients studied, 43 patients presented with the euthyroid state, six patients presented with hypothyroid, and one patient presented with the hyperthyroid state. In the aggregate, 13 patients experienced a hemithyroidectomy surgery length of 45–60 minutes.

Table 1: The variation in the surgery time of enrolled patients

Sr. No.	Number of patients	Surgery time length (minutes)
1.	13	75–90
2.	2	120–135
3.	2	45–60
4.	2	60–75
5.	10	90–105
6.	21	105–120

Blood loss: For the 13 patients who experienced hemithyroidectomy, the blood loss differed from 20–40 ml. In five patients, the blood misfortune amid surgery was 25 ml (n=5); in one patient, it was 40 ml; another one lost 35 ml; two patients lost 30 ml; and four patients had 20 ml of blood misfortune. Mean blood misfortune in hemithyroidectomy patients was 30 ml. Of the 37 patients who experienced aggregate thyroidectomy, the blood misfortune ranged from 25–50 ml. Of those, 10 patients had 30 ml of blood misfortune, in three patients it was 25 ml, and it was 50 ml in another three patients.

Of the 50 patients who experienced thyroidectomy, one experienced unnecessary postoperative injury soakage (2%). It was minor and did not require re-investigation, and the patient recuperated with preservationist treatment. One patient experienced impermanent RLN paralysis (2%); that subject recuperated completely after a month and a half. Three patients (6%) showed signs and manifestations of hypocalcemia, which also diminished with intravenous calcium gluconate and oral calcium.

The length of stay in the doctor's facility for 30 patients was three days, five patients stayed for two days, six patients for four days, six patients for five days, and three patients stayed for six days. The mean length of stay at the healing facility was four days.

DISCUSSION

Thyroidectomy is a common surgical methodology worldwide, yet at the same time it is a test for specialists. The task isn't just troublesome, it is incredibly intricate. This operation is very difficult to perform, but it carries high morbidity if complications are not considered.

This examination reports the utilization of bipolar surgical burning for thyroidectomy, which makes

the simple activity with fewer complexities and, furthermore, lessens the span of surgery. Manouras et al.⁵ found that, in contrast to the exemplary method, surgical time was diminished altogether by around 20% when the bipolar/vessel sealer was utilized. The more drawn-out term of surgery in this study, in addition to comparing different examinations, is credited to the learning curve of utilizing this new procedure. The researchers began utilizing bipolar diathermy in 2013. In their examinations they have found that the mean working time for hemithyroidectomy and aggregate thyroidectomy is 45–57 minutes working in a team and 82.5–97.5 minutes individually. Govindaraj et al.⁷ showed that the average working time for lobectomy was 20 minutes, 45 minutes for thyroidectomy, and 180 minutes for thyroidectomy with neck analyzation.

Sandonato et al.⁸ tested the utilization of electrothermal cautery in thyroid surgery, assessing its viability in hemostasis and its ability to diminish post-agent entanglements like hypoparathyroidism and intermittent laryngeal nerve palsy. Bipolar burning decreases the blood misfortune in the surgical field, making the surgical field clearer, thus the working specialist can improve the situation better than with the regular bunch-tying strategy. Govindaraj et al.⁷ indicated a complication rate of 10.18%, in which 1.85% of complications were because of surgical site contaminations, 1.85% were because of one-sided intermittent laryngeal nerve injuries, and 3.7% were because of hypoparathyroidism (75% transient, 25% perpetual). Challa and Surapaneni⁹ found that, out of 40 patients who experienced sutureless thyroidectomy, none had any essential, auxiliary/reactionary hemorrhage. One patient experienced an aggregate thyroidectomy for follicular carcinoma-created transient hypocalcemia. Bove et al.¹ demonstrated the frequency of transient hypocalcemia to be 24.5%. In this investigation, of 50 patients who experienced a thyroidectomy, six patients experienced complications (12%): one patient had post-operative injury soakage (2%), one experienced voice change (2%), one had a persistent seroma (2%), and three patients had side effects indicative of hypocalcemia (6%).

An analysis by Challa and Surapaneni⁹ demonstrated that bipolar surgical diathermy for thyroidectomy is better than LigaSure and symphonious surgical tools, which are expensive and accessible primarily in private, high-tech surgery centers.

CONCLUSION

Thyroidectomy utilizing bipolar burning is a protective and powerful technique and is less tedious. Bipolar burning is accessible in government-funded hospitals. Thyroidectomy utilizing bipolar cautery is less tedious and the blood misfortune at the time of surgery is less than with the standard knot-tying method. Also, post-agent entanglements are less with bipolar cautery. The gear utilized for monopolar cautery supports bipolar diathermy with no alterations. There is no danger of burn injury, not at all like monopolar diathermy. It is safe to use close to imperative structures. Just the tissue held in the middle of the two appendages is seared. Bipolar cautery is utilized with a saline water system to avoid singing and, along these lines, to expand viability and productivity. Bipolar cautery is a safe, successful, and accessible strategy that can bring down surgery costs. It delivers less complications than traditional techniques.

Ethical Clearance: The ethical clearance was taken from College of Medicine, Tikrit University, Tikrit Iraq. Oral consent was taken before enrolled the patients in the study.

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Analysis of Occupational and Non-Occupational Fatigue Risk Factors among Commercial Pilots in PT XYZ, Jakarta

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ABSTRACT

Potential accidents and health problems related to fatigue remain a tremendous problem in commercial flight. This study was conducted to investigate fatigue risk factors among pilots in PT XYZ. There were 196 participants in the study. In order to gather more information, a questionnaire was administered, and a systematic in-depth interview was performed on each pilot individually. The Samn-Perelli Subjective Scale, designed specifically to measure fatigue, was used, and the measurements were analysed using regression and correlation analysis. Of the participants, 60.5% frequently experienced post-flight fatigue. Measurement of fatigue levels showed that 26 participants (13%) experienced physical fatigue, 61 participants (30.5%) experienced mental fatigue and 47 participants (23.5%) experienced emotional fatigue. Occupational and non-occupational factors played a substantial role in the occurrence of fatigue. Of the various risk factors (such as quality of sleep, quantity of sleep and working hours), the number of flight sectors showed a positive correlation with fatigue. In contrast, smoking habits, exercise, caffeine consumption, flight duration and napping showed negative correlations with fatigue. To reduce the occurrence of fatigue, the current established programmes at PT XYZ (which include limitations on flight time and working hours, and provision of resting time) should be continued.

Keywords: *fatigue, pilot, commercial flight, occupational and non-occupational factors*

INTRODUCTION

Nowadays, the issue of fatigue is a significant concern in commercial flight. Fatigue is defined as an acute or chronic condition of tiredness that leads to mental or physical exhaustion and limits a worker's ability to work under normal conditions¹. Some researchers have demonstrated that occupational factors contribute to fatigue-related incidents in commercial flight. Scheduled night flights and prolonged flight times affect fatigue and contribute directly to accidents and health problem among pilots. Empirical analysis of aviation studies shows a correlation between work schedules and accidents on commercial flights².

A study conducted by Neville et al.³ on army aviation crew members during Operation Desert Storm showed that pilots who experienced extended work periods, night shifts, reduced sleep and circadian dysrhythmia due to crossing time zones were prone to improper decision-making. Under short-haul conditions, long working hours and a higher number of flight sectors were common among pilots and contributed significantly to fatigue⁴. According to the Civil Aviation Authority⁵, Britain's pilots experience fatigue initiated by the length of time and the number of sectors during shift work in short-haul conditions.

In order to overcome excessive working hours, Indonesia has stated in Civil Aviation Safety Regulation No. 121 that the standard flight duty time for pilots in commercial airlines is 14 hours in any consecutive 24 hours. Long flight duration has a significant correlation with fatigue because it is associated with undesirable environmental conditions, such as limited workspace, limited air flow, poor illumination level, noise and vibration⁶.

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In addition to the aforementioned factors, non-occupational factors play an important role in fatigue. In terms of quantity of sleep, eight hours is the average time required by a person to obtain normal vigilance levels during the daytime without drowsiness⁷. Poor quality of sleep is a considerable indicator of sleep disturbance and medical problems⁸ and has a direct association with death⁹.

Other factors contribute to the quantity of sleep, as studied by Wetter and Young¹⁰ in their cohort research, where male and female smokers were more likely to experience sleep disturbance and non-restorative sleep than non-smokers. Caffeine consumption also affected cognitive performance by reducing sleep time¹¹. In contrast, napping for about ten minutes was found to improve wakefulness for the following 155 minutes and was the most effective way to reduce fatigue¹². Another study stated that a short rest period of about fifteen minutes per hour resulted in decreased levels of drowsiness and undesirable sleep¹³. The present study is intended to scrutinise occupational and non-occupational factors that contribute to fatigue in pilots in commercial flight so that companies can set up priority programmes for reducing fatigue among their pilots.

METHOD

The study involved 196 participants and used a hypothesis-testing design²⁶. Self-administered questionnaires and in-depth interviews were used to gather information about occupational and non-occupational factors among the pilots. Specifically, the Samn-Perelli Subjective Fatigue Check Card was used to determine the degree of fatigue, the Epworth Sleepiness Scale (ESS) was used to measure the level of drowsiness, and the Pittsburgh Sleep Quality Index (PSQI) was used to determine the quality of sleep in a recent month. The data was then analysed to determine the frequency and distribution of fatigue among the pilots. Further analysis used regression and correlation analysis tests to identify correlations between fatigue and its contributing factors.

RESULTS

As presented in Table 1, non-occupational factors, including quantity and quality of sleep, showed a positive correlation with the occurrence of fatigue. In line with the results of other studies, it was found that poor quality and quantity of sleep led people to experience fatigue more frequently than people who had better quality and quantity of sleep. As shown in Table 2, occupational factors, such as flight sectors and working hours, demonstrated a similar correlation: having long working hours and more flight sectors made participants more likely to experience fatigue. However, flight time and several personal habit factors (such as smoking habits, exercise, caffeine consumption and napping) showed a negative correlation. These findings will be explored further in the discussion section.

Table 1: Correlation and Regresion Analysis of Non-Occupational Fatigue Factors in PT XYZ Jakarta

Parameter	Fatigue		Correlation	Regression
	Yes	No		
Quality of Sleep				
Poor	56.2%	40.5%	0.153	Y = 0.53 + 0.15X
Good	43.8%	59.5%		
Quantity of Sleep				
<8 hours	66.9%	50.6%	0.054	Y = 0.545 + 0.071X
≥8 hours	33.1%	49.4%		
Smoking Habit				
No	74.4%	67.1%	-0.079	Y = 0.629 + (-0.086)X
Yes	25.6%	32.9%		
Caffeine Consumption				
No	74.4%	67.1%	-0.079	Y = 0.629 + (-0.086)X
Yes	25.6%	32.9%		
Exercise				
No	56.2%	62%	-0.058	Y = 0.639 + (-0.057)X
Yes	43.8%	38%		
Napping				
No	87.6%	91.1%	-0.055	Y = 0.681 + (-0.086)X
Yes	12.4%	8.9%		

Table 2: Correlation and Regresion Analysis of Occupational Fatigue Factors in PT XYZ Jakarta

Parameter	Fatigue	Average Time (hour/week)	Standard Deviation	Correlation	Regression
Working Hours	No	40	22.717	0.053	$Y = 0.558 + 0.003X$
	Yes	37.1	17.527		
Flight Sectors	≥2	33.1%	17.7%	0.169	$Y = 0.554 + 0.186X$
	<2	71.9%	82.3%		

In addition to the data shown in Table 1, the results of the study also demonstrated that as many as 26 participants (13%) experienced physical fatigue, 61 participants (30.5%) experienced mental fatigue, and 47 participants (23.5%) experienced emotional fatigue. The majority of participants (as many as 60.5%) frequently experienced post-flight fatigue. This study, however, focuses on the correlation and regression analysis for occupational and non-occupational fatigue-related factors.

DISCUSSION

It is widely recognised that poor quantity and quality of sleep affects people's ability to recover from fatigue. Table 1 shows that as many as 66.9% of the pilots had experienced fatigue due to lack of sleep, leading to an accumulation of sleep debt. Recovery from fatigue can be achieved in the first six hours of sleep, whereas sleeping for more than six hours increases sensitivity, energy and brain capacity for dealing with normal situations in the long term¹⁴. Nine hours of sleep are required to enable a high level of vigilance¹⁵.

Of the participants in the present study, 56.2% had experienced fatigue due to the poor quality of sleep. It has already been demonstrated that mental and physical fatigue are caused by poor quality of sleep¹⁶ and are associated with an increase in stress in the workplace¹⁷. Inability to recover from fatigue may lead to a detrimental cycle, in which an accumulation of fatigue results in a greater need for recovery after working time¹⁸. This study highlights the fact that recovery from fatigue can be attained by balancing adequate sleep time with good quality of sleep.

This study demonstrates that long working hours are positively associated with fatigue in pilots. This is in line with a study conducted by Goode², which found that long working hours have a significant association with fatigue. Factors such as long working hours, early start times, long-time completion of duty and one-night deadlines led to an accumulation of fatigue and caused people to have anomalous sleep patterns. In addition, working for 10–12 hours makes the relative risk of accident 1.7 times greater; working for 13 hours makes it 5.5 times greater¹⁹.

Working hours and flight sectors have a close association with fatigue. Of the respondents in the present study, 74.1% who operated more than two sectors

experienced fatigue more frequently than those who operated one or two sectors. An increase of flight sectors from one to four sectors is equivalent to an increase in working time of about 2.77 hours²⁰. Another association is related to the availability of time for sleep. Operating excessive flight sectors causes longer working hours, which in turn reduces the amount of time available for sleep. At this point, adequate dedicated time for sleeping is still an important factor in recuperating from fatigue.

In contrast, personal habits such as exercise, smoking habits, caffeine consumption and napping presented different correlations from the previous factors. Exercise is capable of reducing sleep disturbance by releasing tension and contributing to a decrease in body temperature²¹. However, the present study found that pilots still had inadequate time and bad quality of sleep, which makes it more difficult to recover from fatigue. Hence, when the pilots exercised, they were already in a fatigued state. A similar explanation applies to napping and caffeine consumption. Napping affects an individual's vigilance and performance²², while caffeine improves performance by decreasing sleeping time²³ and by acting as a mood booster²⁴. However, the effects are only short-term and insufficient to prevent the occurrence of fatigue.

In terms of smoking habits, the results showed that non-smokers experienced fatigue more regularly than smokers. It is already recognised that smoking habits influence fatigue indirectly by reducing the quality and quantity of sleep²⁵, factors that are known to contribute to fatigue. However, the sample in this study might be not representative of the wider population, because the majority of respondents were non-smokers. Thus, even though the respondents did not smoke, they already experienced fatigue due to other factors.

As for flight duration, there was a negative correlation with the occurrence of fatigue. In 2012, Indonesia established in Civil Aviation Safety Regulation No. 121 that two pilots are allowed to fly a flight for nine hours or less within a 24-hour period and must not exceed 30 hours in seven consecutive days. The present study shows that the flight duration (hours per week) that contributed to fatigue or not fatigue (see Table 1) did not exceed the threshold limits established in the regulation. This meant that, even though the pilots had shorter flight durations, they were already in a state of fatigue.

CONCLUSION

This study concludes that occupational and non-occupational factors affect the occurrence of fatigue among pilots in commercial flight. Balancing adequate sleep and proper quality of sleep helps pilots to recuperate from the fatigue that they might experience in the workplace. In addition, limitations on working hours and flight sectors also benefit pilots by preventing fatigue in the workplace. Aligning all the contributing factors to prevent fatigue is an appropriate element in planning and a suitable way forward to reduce health problems and accidents related to fatigue. The current Fatigue Program at PT XYZ, with its limitations on flight time and working hours and the provision of resting time in the workplace, should be continued.

Conflict of Interest: Hereby the authors declared that there is no conflict of interest in this research with any other parties.

Ethical Clearance: This research has been approved by Ethical Board Committee, Faculty of Public Health University Indonesia and has been approved for ethical clearance by Ethical Board Committee, Faculty of Public Health University Indonesia.

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Correlation between Serology and Molecular Diagnostic Tests for HCV in Children Receiving Blood or Blood Products Experience of Single Institute, Wasit Province-Iraq 2016

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ABSTRACT

Studies about transfusion transmitted HCV infections are limited and very important to make insight about this burden health problem which are the main route of transmission for HCV in the developing countries and to improve blood banks practices for blood donations by implementation of maximally sensitive screen for HCV.

Patients and Methods: A cross sectional study done at the hemato-oncology center in Al-Karama Teaching Hospital, Wasit-Iraq. The patients included have different Hemato-oncological diseases over a period from the 1st of January 2016 to the 31st of May 2016.

The patients were classified according to age, sex, disease and number of blood or blood products transfusion. HCV serological screen done by specific enzyme immunoassays (EIA) antibody detection and by Molecular Nucleic Acid Amplification Technique (NAT) viral load in Al-Karama Teaching Hospital Lab.

Results: 59 patients included in this study. 61% of them was male, 50% of them were below 10 years of age. Leukemia, hemophilia and Von Willebrand diseases constitute around 70 % of the studied patients. About 70% of the patients were received more than 25 time as blood or blood products before time of investigation.

13 (22%) of the studied patient were positive for HCV by serology and 17 (28.8%) of them were positive for HCV by molecular viral load.

From the 13 patients with Serologically positive test, two of them were negative in molecular viral load study. While the serological study was negative in 40 patients, six of them were positive in viral load study. Seventeen patients were diagnosis to have hepatitis C virus by viral load study, eleven of them were serologically positive. This difference was statistically significant with P value 0.0001.

Conclusion: The methods of blood screen in Iraq, as other developing countries still mainly depend on serology which not enough to give safe blood. There are urgent needs to adapt increasingly sensitive serology with introduction of Molecular Nucleic Acid Amplification Technology (NAT) side to side in blood donations screen.

Keywords: hepatitis, viral load. Blood transfusion

INTRODUCTION

Globally, HCV has an estimated prevalence of 2.5%,⁽¹⁾ with ~170 million people are chronically infected with the hepatitis C virus, with 3 to 4 million new infections per year and over 350,000 deaths due to hepatitis C virus (HCV)-related liver disease each year.^(1,2)

The long-term impact of HCV infection is highly variable, ranging from minimal effects to chronic hepatitis, advanced fibrosis, cirrhosis, and hepatocellular carcinoma.^(1,3) Transfusion transmission of HCV is still a significant route of infection in the developing world.⁽⁴⁾

In 1989 HCV discovered and in 1990 the implementation of HCV antibody screening greatly participates in the prevention of transfusion-transmitted HCV.^(4,5)

Although the serological tests were able to reduce the number of cases of Transfusion Transmitted HCV, the window period from viremia before seroconversion and detection of anti-HCV antibodies even with more advances serological assays (third-generation specific enzyme-immunoassays, EIA) remained around 7-8 weeks, but also may be delayed to 13 weeks (90 days).⁽⁴⁾ This long window period prior to detection of anti-HCV antibodies was an impetus to adopt nucleic acid amplification technology (NAT) assays for screening donors that made the residual infectious window period less than 3 days.^(7,8) NAT technology assays adapted by blood banks in U.S as routine blood screen for HCV in 1999.⁽⁶⁾

As of 2010, 33 countries in the world reported that they had introduced NAT for HCV testing.⁽⁴⁾

In almost all cases, serological assays are performed in parallel to NAT testing that allows discernment of the “stage” of HCV infected donors as: acute (RNA-positive/Ab-negative), chronic (RNA-positive/Ab-positive) or presumptive resolved (RNA-negative/Ab-positive) infections.^(4,9)

In Iraq blood screening done by serological test only through specific enzyme-immunoassays (EIA) for detection of anti-HCV antibody.

Thousands of patients with different hematological diseases such thalassemia's, hemophilia's, malignancies such as leukemias...etc. still greatly exposed to the of transfusion transmitted infection of HCV because we still depend on anti-body screen in blood banks.⁽¹⁰⁻¹²⁾

PATIENTS AND METHOD

A cross sectional study of the medical records of 59 patients, who have hemato oncology diseases in hematology center in AlKarama teaching hospital in the city of AlKut, the state of Wasit, Iraq. Over a period from the 1st of January 2016 to the 31st of May 2016.

All those patients with history of blood or blood products transfusion

The medical records of the patients were retrospectively reviewed from the department of statistics and the records that are present in the consultant clinic for specific demographic, diagnostic and therapeutic information. A comprehensive chart review was performed to determine the age, gender, clinical diagnosis, and the result of investigations.

The patients were classified according to age, sex, disease and number of blood or blood products transfusion

HCV serological screen done by specific enzyme immunoassays (EIA) and by Molecular Nucliec Acid Amplification Technique (NAT) viral load in Al-Karama Teaching Hospital, wasit-Iraq.

Patient data were tabulated and processed using SPSS (Statistical Package for the Social Sciences 20) for windows. Qualitative data are expressed as frequency and percentage, Data are presented as mean $\pm$ SD and range for quantitative variables.

RESULTS

From 59 patients whom enrolled in the study, the male was 36 (61%) of the total patients, and female 23 (39%). Half of the patients were less than 10 years of age. Leukemia was the majority of case where 18 patients were known case of leukemia, followed by 12 patients with hemophilia and 10 patients have Von Willebrand disease. Nine patients have thalassemia and three cases were spherocytosis and thrombasthenia. One case was reported as Wilms tumor, pure red cell aplasia, MDS and immune thrombocytopenia purpura. About 70% of the patients were received more than 25 time as blood or blood products before time of investigation.

Thirty-three patients were managed by blood transfusion only while others were treated by blood or blood products such as cryoprecipitate or platelet or others blood products.

Table No. one shows the demographic data of the patients.

Table 1: Demographic data of the patients

Item	No	Frequency
Sex		
Male	36	61
Female	23	39
Age		
< 10 years	30	50.8
≥ 10 years	29	49.2
Disease		
Leukemia	18	30.5
Hemophilia	12	20.1

Contd...

Von Willebrand disease	10	16.9
Thalassemia	9	15.3
Thrombasthenia	3	5.1
Spherocytosis	3	5.1
Others	4	7
No. of pints received		
<25	18	30.5
≥25	41	69.5
Type of recipient		
Blood	33	55.9
Blood product	26	44.1

The mean of patients age was 11.4 year (1-33 years), the mean TSB was 1.1 mg/dl, but many patients have high level of bilirubin as highest level was 21 mg/dl. Liver enzymes were variable as ALT mean level was 54 IU/L and mean of AST was 45.5 IU/L, ALP mean level was 204 IU/L.

Regarding viral load results was for Hepatitis C was 1949836.475 copies/ml. laboratory finding of the patients is shows in table No. two.

Table 2: Laboratory finding of the patients

Item	Mean	St. Deviation	Range
Age (years)	11.4	0.68	1-33
Liver function test			
TSB (mg/dl)	1.17	0.37	0.1-21
ALT (IU/L)	54.4	0.8	14-556
AST(IU/L)	45.5	0.5	17-247
ALP(IU/L)	204	1.2	87-523
Hepatitis C viral load copies/ml	1949836.475	9092405.504	0-56900000

Table number three shows the patients whom had C viral infection according to type of tests, as serological study for hepatitis C virus study was reported positive in 13 patients (22%) respectively. While viral load for virus type C was reported in 17 (28.8%) patients.

Table 3: Number of infected patients with hepatitis C according to type of test

Item	No.	Percent
Serological hepatitis C infection	13	22
Viral load of hepatitis C detection	17	28.8

Correlation between serological test and viral load for C viral shows in table No. four. Serological test was reported 13 patients, two of them were negative in viral load study. While serological study was negative in 40 patients, six of them were positive in viral load study. Seventeen patients were diagnosis to have hepatitis C virus by viral load study, eleven of them were serologically positive. This difference was statistically significant with P value 0.0001.

Table 4: Correlation between serological test and viral load test for hepatitis C infection

Type of test		C virus load yes or no		Total	P value
		Not infected (%)	Infected (%)		
Serological test	Not infected (%)	40 (67.8)	6(10.2)	46(78)	0.0001
	Infected (%)	2(3.4)	11(18.6)	13(22)	
Total		42(71.2)	17(28.8)	59(100)	

Table number five shows the correlation between type of blood product or number of transfusions with infection.

For hepatitis C infection, thirteen patients from seventeen positive patients were received more than 25 pints, with no statistical significance (p value 0.5). Nine patients from seventeen positive patients were received blood rather than blood product. With no statistical significance (p value 0.7).

Table 5: Correlation between number of transfusion and type of transfusion and Hepatitis C infection

Item	Viral load positive	Viral load negative	P value
Hepatitis C virus			
More than 25 pint	13	28	0.5
Blood	9	24	0.7

DISCUSSION

The available studies about HCV prevalence and risk factors in the developing countries is still vague.^(13, 14)

In our study there were no significant effect of age, sex, diagnosis, level of liver enzymes and number of blood or blood product transfusion.

There was significant difference between the result of serology and Molecular Nucleic Acid Amplification assays by viral load for HCV.

The presence of HCV RNA in the peripheral blood is a reliable marker for HCV replication and is the main marker used to confirm active infection.⁽¹⁵⁾

HCV positive anti-bodies was reported in 13 (22%) of the studied patients. While the result of molecular NAT was positive in 17 (28.8%) of the same studied patients.

The correlation between the result of serology and Molecular NAT (viral load) was significant, two patients with positive serology were negative in viral load study which probably means presumptive resolved HCV infection.

Approximately 15 % to 30% of patients spontaneously clear HCV within 6 to 12 months of initial exposure. Such individuals remain anti-HCV antibody positive, but have no detectable viremia, without long term sequel.⁽¹⁵⁾

Six from forty patients with negative serology were positive in NAT (p value 0.0001)

Theses finding can be explained as either these patients had acute HCV infection and they are in the window period of HCV infection or the initial serological test was incorrect or improper techniques.

The same happened when 17 patients with positive NAT, eleven only were positive in serology (p value

0.0001) and this means either these patients had acute infection in the window period of serology or the antibody screening results are incorrect.

There are urgent needs to better understand HCV prevalence and incidence in Iraq to help in decrease transmission from preventable causes, and especially through blood and blood product donations.

Blood and other parenteral exposures in health care settings are still the major routes for HCV transmission in the developing countries compared to the rest of the world where the major route of transmission is currently Intravenous Drug User (IDU).⁽⁴⁾

Based on WHO studies, blood banks in developing countries depend on EIA assays are unable to perform similar sensitivity to EIA assays in the developed countries, because blood banks in developing countries are poorly regulated and lacks systems to assure that standardized testing is performed.⁽¹⁰⁾

The addition of NAT assays in developed countries effectively reduced the Transfusion Transmitted HCV infection should encourage the developing countries to do the similar strategies that will reduce the long window period before EIA assays reactivity. The main problem of molecular NAT assays is the technical training and reagents costs.⁽⁴⁾

Currently in USA the incidence of transfusion transmitted HCV is very low around one in million (0.0001%) per unit transfused and so in most of the developed countries.⁽⁴⁾

In a study for American Red Cross in USA to evaluate the benefit of NAT on prevalence of HCV during the period 1999 to 2008, Reveal over 300.000 HCV antibodies positive blood units before donation, 244 were NAT positive before seroconversion.^(11,12)

The finding of our study should focus attention to physician practicing in Iraq, that serological test for viral infection evaluation especially for patients whom received blood or blood product may not reflect the real infection state of the patients.

In our country there are thousands of human beings suffering from many inherited and non-inherited diseases, such as thalassemia, leukemia and bleeding tendency. They are exposed for frequent blood or blood product transfusions and facing a great risk to be infected by serious life-threatening infection from blood or blood products.

We are, as a part of the developing countries we are in urgent needs to develop an effective blood bank practices with continual screening to give safe blood as a part of individual rights by serological assays and Molecular Nucleic Acid Amplification Technique (NAT).

The Government of Iraq, represented by the Prime Minister and health authority should pay a great and real attention for this burden health problem, through maintaining high standards for blood screening and adapt several viruses analysis by using Molecular Nucleic Acid Amplification for HBV and HIV and HCV viruses in blood and blood product screen.

CONCLUSION

The message to Iraqi doctors, Keep the indications of blood or blood product transfusions limited to strong scientific base and by specialized team to decrease the risk of transfusion transmitted diseases including HCV, HBV, and HIV.

Larger studies are needed to evaluate the real burden risk of transfusion –transmitted infections to treat them early to decrease possible complications and to know the subtypes distribution of HCV infection and the response to treatment.

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Conflict of Interest: Nil

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The Effect of Extension Methods on Knowledge and Attitude of Young Women About “Sadari” at Immim High School of Pangkep District

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ABSTRACT

This study aims to determine the effect of counseling methods on the knowledge and attitudes of young women about breast self-check (*Periksa Payudara Sendiri = SADARI*) at IMMIM High School of Pangkep Regency. This study used a quasi-experimental design with a case control approach. Respondents in this study were 74 young women. The sample was divided into two, namely 37 people in the experimental group and 37 people in the control group. Based on the results of the study, it can be concluded that there is an increase in knowledge in the experimental and control groups. The pretest results in both groups showed an increase of 94.6% in the experimental group and 97.3% in the control group, with a sig value. 0.00. While the attitude has also increased 70.3% in the experimental group and 67.6% in the control group with sig. 0.203 and 0.626. There was an increase in attitude, but it was not significant. This is based on the attitude of young women who know about SADARI procedures but still lack the practice because they have no time and are considered complicated.

Keywords: SADARI, extension, youth, knowledge, attitude

INTRODUCTION

About 8.2 million people die from cancer. According to WHO in the Ministry of Health of the Republic of Indonesia ¹ states that, 12% of all deaths in the world are caused by cancer and are number 2 killers after cardiovascular disease. Cancer can attack all groups of people without exception and without recognizing social status, age and gender. Children, adolescents and adults do not escape this deadly attack but women are most affected by cancer ²⁻⁴.

Indonesia as one of the countries in Asia is also not immune from this disease. Breast cancer is a cancer with the highest prevalence in Indonesia in 2013, breast cancer by 0.5% with a total of 61,682 breast cancer sufferers and this number is predicted to continue to increase. This increase in cases also occurred in South Sulawesi and Pangkep District where this study was conducted. Indonesian teenagers are currently experiencing rapid social change from traditional societies towards modern society, which also changes their norms, values and lifestyles ⁵.

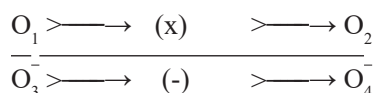
There are still a few case discoveries in the early stages causing early detection and screening efforts to be very important. The low awareness of self-examination does not only occur in women with low education and economics, but also occurs in women who are highly educated and well-established. The exact cause of breast cancer is unknown. However, a number of factors can be triggers, including an unhealthy lifestyle, such as consuming foods rich in fat, carbohydrates, and low in fiber, as well as smoking habits and lack of exercise. By doing SADARI, the rate of death from breast cancer can be reduced by up to 20%, but there are still many women do not understand what SADARI is ⁶.

This study aims to determine the effect of counseling on whatsapp's method of using social media to increase the knowledge and attitudes of young women regarding SADARI.

MATERIALS AND METHOD

This study uses experimental research methods, which aim to find out a symptom or effect that arises as a result of certain treatments.

The design of this study can be described as follows:



Keterangan:

X : Exsperiment (Extension via whatsapp)

- : Control (Extension with lecture)

O₁ and O₃: Pre-test scores (before intervention)

O₂ and O₄: Post-test (after intervention)

The study population was young women with samples divided into 2 groups: the intervention group and the control group with 37 people each. The intervention group was given counseling treatment through the whatsapp method while the control group was given counseling through the lecture method.

Data collection is done through interview techniques with structured questionnaire instruments. Data analysis used the independent sample t-test to determine the average differences between the two groups of unrelated samples. If the two groups of samples have further differences, it will be known that the sample group has a higher average value.

RESULTS

Table 1: Distribution Analysis Based on the Characteristics of Young Women in the Control and Intervention Group

Intervention Group	n	%	Control Group	n	%
Age (years)			Age (years)		
16	4	10.8	15	4	10.8
17	32	86.5	16	30	81.1
18	1	2.7	17	3	8.1
Classes			Classes		
XXI IPA (Natural Sciences)	23	62.2	XXI IPA	25	67.6
XXI IPS (Social Sciences)	14	37.8	XXI IPS	12	32.4
Total	37	100	Total	37	100

Source: Primary Data, 2017

Table 1 shows that the proportion of young women based on the highest age was in the intervention group, namely young women aged 17 years (86.5%) and the lowest among 18-year-old adolescents (2.7%). The proportion of adolescent girls based on class in the highest intervention group was in class XXI IPA (62.2%) and lowest XXI IPS (37.8%). The proportion of young women based on age was highest in the control group, namely girls aged 16 years (81.1%) and the lowest was adolescents aged 17 years (8.1%). The proportion of adolescent girls based on class in the highest intervention group was in class XXI IPA (67.6%) and the lowest was XXI IPS (27.0%).

Table 2: Average Analysis of Pre-test and Post-Test Scores in Intervention and Control Groups

Scores	Min	Max	Mean ± SD
Intervention Group			
Pre-test Knowledge	33	80	56.31 ± 11.75
Post-test Knowledge	67	87	80.18 ± 4.71

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Pre-test Attitude	30	79	60.61 ± 10.62
Post-test Attitude	58	73	63.68 ± 3.52
Control Group			
Pretest Knowledge	40	73	58.38 ± 9.25
Posttest Knowledge	63	93	84.41 ± 6.34
Pretest Attitude	25	78	61.11 ± 12.50
Posttest Attitude	55	73	63.04 ± 4.04

Source: Primary Data, 2017.

Table 2 shows that the mean knowledge score in the highest intervention group was in the post-test with a mean of 80.18 and standard deviation of 4.71. The highest attitudinal score in the intervention group was in the post-test with a mean value of 63.68 with a standard deviation of 3.52. Thus, all variable scores in the intervention group experienced a mean increase from pre-test to post-test. The highest knowledge score in the control group was in the post-test with a mean of 84.41 with a standard deviation of 6.34. The highest attitudinal

score in the control group is in the post-test with a mean value of 63.04 with a standard deviation of 4.04. Thus, all variable scores in the control group experienced an increase in the average from the pre-test to the post-test.

Table 3: Analysis of Distribution of Status of Respondents Based on Knowledge and Attitudes of Intervention Groups

Variable	Intervention				Control			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
Knowledge								
High	6	16.2	35	94.6	6	16.2	36	97.3
Low	31	83.8	2	5.4	31	83.8	1	2.7
Attitude								
Good	23	62.2	26	70.3	21	56.8	25	67.6
Not Good	14	37.8	11	29.7	16	43.2	12	32.4
Total	37	100.0	37	100.0	37	100.0	37	100.0

Source: Primary Data, 2017

Table 3 shows that the pre-test distribution of respondents 'knowledge in the highest intervention group was in the low category by 31 (83.8%), while the post-test distribution of respondents' knowledge in the highest intervention group was in the high category of 35 (94.6 %). The distribution of respondents' pre-test attitudes in the highest intervention group was in the good category, 23 (62.2%), while the post-test distribution of the attitudes of the respondents in the highest intervention group was 26 (70.3%). The

distribution of pre-test knowledge of the respondents in the highest control group was in the low category of 31 (83.8%), while the post-test distribution of knowledge of the respondents in the highest control group was in the high category of 36 (97.3%). The distribution of the pre-test attitudes of the respondents in the highest control group was in the good category by 21 (56.8%), while the post-test distribution of the attitudes of the respondents in the highest control group was in the good category of 25 (67.6%).

Table 4: Analysis of Changes in Pre-test/Post-test Knowledge and Attitudes In the Control Group and Intervention Group Using the Wilcoxon Test

Variable	Intervention		P	Control		P
	n	%		n	%	
Knowledge						
Decline	0	0	0.000	0	0	0.000
Increase	36	90		37	100	
Stay	1	10		0	0	
Attitude						
Decline	15	39	0.203	17	35	0.626
Increase	21	51		17	35	
Stay	1	10		3	30	
Total	37	100		37	100	

Source: Primary Data, 2017

Table 4 shows that the analysis of changes in knowledge of pre-test/post-test in the highest intervention group was respondents who experienced an increase of 36 respondents with sig. 0,000. It means

that there is an influence of knowledge on the provision of health education using social media (WhatsApp) at Putri Pangkep IMMIM High School. Changes in pre-test/post-test knowledge in the highest control group

were respondents who experienced an increase of 37 respondents with sig. 0,000. This means that there is an influence of knowledge on the provision of health education using the lecture method at Putri Pangkep IMMIM High School.

Changes in the pre-test/post-test attitude in the highest intervention group were respondents who experienced an increase of 21 respondents with a sig

value. 0.203. This means that there is no influence of attitudes towards the provision of health education using social media (WhatsApp) at Putri Pangkep IMMIM High School, while the change in pre-test/post-test attitude in the highest control group is respondents who experienced an increase of 17 respondents with sig. 0.626. This means that there is no influence on attitudes towards the provision of health education using the lecture method at Putri IMMIM High School in Pangkep.

Table 5: Analysis of Knowledge and Attitudes Differences in Intervention Groups and Control Groups Using the Mann Whitney Test

	Groups	N	Mean Ranks	Sig.
Pre-test Knowledge	Intervention	37	35.16	0.347
	Control	37	39.84	
Post-test Knowledge	Intervention	37	28.62	0.000
	Control	37	46.38	
Pre-test Attitude	Intervention	37	36.54	0.701
	Control	37	38.46	
Post-test Attitude	Intervention	37	38.82	0.593
	Control	37	36.18	

Source: Primary Data, 2017

Analysis of differences in pre-test about knowledge shows a value of 0.347. This means that there is no significant difference in the score of the knowledge pre-test between the intervention group and the control group, while the analysis of the difference in post-test knowledge shows a significant value of 0,000. This means that there are significant differences in the scores of knowledge post-test scores between the intervention group and the control group.

Analysis of the difference in attitude pre-test shows a value of 0.701, while the analysis of differences in post-test attitudes in the intervention and control groups with a significant value of 0.593.

DISCUSSION

The influence of counseling by methods (whatsapp and lecture) on increasing the knowledge of young women: The results showed the distribution of the level of knowledge of respondents before being given health education. The low level of knowledge of respondents is related to the absence of the habit of respondents seeking information about health, especially about SADARI. Some respondents did not know what SADARI meant, which was an early detection of breast cancer.

In addition, there has never been any health education specifically regarding SADARI at the IMMIM High School in Pangkep Regency. The school has also never collaborated in delivering health information with the relevant agencies.

The results of the study using the Wilcoxon Test obtained the results of analysis with sig values. 0,000 which means that there is a difference in the level of knowledge before and after giving health education about SADARI, for the experimental group (whatsapp) and the control group (lecture). Increased knowledge because counseling in this study is supported by counseling material which is a student's need. Innovative delivery methods using the WhatsApp and lecture methods with question and answer sessions. Through a method like this, it can develop two-way communication between those who provide counseling with the target of counseling and it is expected that the level of understanding of students towards the material delivered will be clearer and easier to understand.

The effect of counseling by methods (whatsapp and lecture) on increasing attitudes of young women: Attitudes are divided into two categories, namely good and not good. After being given health counseling, there

was a change in attitude for the experimental group, but the change in attitude that occurred did not experience significant changes.

Personal experience is one of the factors that influence a person's attitude. Theory states that in order to be the basis of attitude formation, personal experience must leave a strong impression. Mass media also influences a person's attitude because the news that is supposed to be factually conveyed objectively tends to be influenced by the attitude of the author, consequently it will affect the attitude of the consumer. Besides the factors of personal experience and mass media, there is a stage of motivation that changes a person after attending health education to truly change daily behavior.

The effect of counseling by methods (whatsapp and lecture) on the knowledge and attitudes of young women: The results of this study showed that there were no significant differences in the score of the pre-test knowledge between the intervention group and the control group while the analysis of differences in post-test knowledge in the intervention and control groups with a significant value of 0,000. It means that there was a significant difference in the value of the post-test score of knowledge between the intervention group and the control group.

The results of this study are not in accordance with the theory which states that attitudes based on knowledge will be more lasting than attitudes that are not based on knowledge. In addition, changes in attitude are carried out through health education so as to instill knowledge in the hope that it will shape attitudes that will influence behavior (Picket and George, 2008). This is due to other factors that can influence a behavior including knowledge, beliefs, attitudes, resources ⁷.

The behavior of a person or community about health is determined by the knowledge, attitudes, and beliefs, traditions, and so on of the person or community concerned ^{8,9}. In addition, the availability of facilities, attitudes, and behavior of health workers on health will also support and strengthen the formation of behavior. Knowledge or cognitive is a very important domain in shaping one's actions. The formation of new behaviors especially for adults is preceded by the existence of knowledge and then becomes an attitude that finally materializes into a behavior both positive and negative behavior.

Sufficient or high knowledge without sufficient or high motivation, so that a positive or positive attitude will not be formed which will then manifest in behavior. In addition to motivational factors, there are also many other factors that can affect a person's behavior, in this case, SADARI behavior, which is lazy, does not have time because of a lot of busyness, forgetting, feeling no complaints, fear of detecting breast cancer. It is even more ironic that SADARI is not important to do because many other jobs are more important.

CONCLUSIONS AND RECOMMENDATIONS

1. There is an extension effect on increasing the knowledge of young women, before and after being counseling for the experimental group using the Whatsapp method, while the lecture method is given to the control group has increased from 83.8% to 97.3%.
2. There is an influence of counseling on increasing attitudes in both groups
3. There is an influence of counseling (whatsapp and lecture) on increasing knowledge so that young women understand more about SADARI but for attitude, the increase obtained is not significant.

This study suggests that the school can do a form of counseling as a more innovative health promotion media. The school can include SADARI material on the subject of education.

Conflict of Interest: Nil

External Funding: Nil

Ethical Clearance: Taken from the School of Public Health, Universitas Pejuang RI, Makassar, Indonesia

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Understanding the Delayed Factors for Reducing Maternal and Neonatal Mortality in Indonesia: Based on the 2015 Inter-Censal Population Survey and the 2014 Village Potential Statistics

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ABSTRACT

Background: Maternal and neonatal mortality in Indonesia are still high compared to countries with the same economic level. The cause of death of both the most common causes were delayed getting medical services. This study aims to understanding the delayed factors to reducing maternal and neonatal mortality in Indonesia.

Method: Data were derived from two cross-sectional studies, the 2015 Intercensal Population Survey (SUPAS) and the 2014 Village Potential Statistics. The study population was women of reproductive age (15-49 years) who lived in the households located within the 40,750 census blocks of the 2015 SUPAS. There were 652,000 households. Information of all maternal and neonatal deaths (singleton live births) that occurred between 2010 and 2015. The unit analysis was a census block, and each census block consisted of 16 households. The analysis used equalized block census level of socio-economic and health program factors on the natural log of unadjusted measures of maternal and neonatal mortality.

Results: Risk of mortality were women of low education (lower than secondary high school), poor household, longer average distance to hospital, a large number of traditional birth attendants and residing in out Jawa Bali, Use of contraceptives, delivery attended by trained health workers are significantly associated with lower maternal and neonatal mortality.

Conclusion: socio-economic and geographic differentials contribute to delayed of health services and causes high maternal and neonatal mortality in Indonesia.

Keywords: maternal mortality, neonatal mortality, determinant social, geographic factor, delays factor

INTRODUCTION

Maternal and neonatal mortality in Indonesia are still high compared to countries with the same economic level. It will be detrimental, because the country will lose a group that is still productive and who will build the nation. Moreover, maternal mortality is also a tragic event for families, because the loss of family members who love and care for their families. In developing countries, maternal deaths are almost certain that deaths

occur in their babies⁽¹⁾. Actually, maternal and neonatal deaths can be prevented.

The results of the evaluation of the MDGs in 2015, the maternal mortality rate is quite far from the target of 305 per 100,000 than it should have been at 102 per 100,000 ⁽²⁾. Target SDGs (Sustainable Development Goals), maternal mortality less than 70 per 100,000 live births in 2030 ⁽³⁾. To achieve this target, annual maternal mortality is required at 9.5% while the trend of decreasing maternal mortality in Indonesia is 5% per year⁽⁴⁾.

The neonatal mortality rate in Indonesia is also still high⁽⁵⁾. Another problem, the estimated neonatal mortality rate is 19 per 1000 live births, but the decline has stagnated in the past nine years, from 20/1000 in 2003

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and only decreased to 19/1000 in 2012 ⁽²⁾. Other studies have shown an increasing trend ⁽⁶⁾. Needs understanding to reducing maternal dan neonatal mortality.

Maternal deaths occur because of the delay in receiving adequate health services. The theory of Thaddeus and Deborah Maine mentions the delays are caused by socioeconomic/cultural factors, accessibility of facilities and quality of care ⁽⁷⁾. Indonesia, the fourth most populous country in the world, consists of approximately 17,000 islands, and 4,918 sub districts, and 70,460 villages ⁽⁸⁾, so this geographic factor can be an obstacle to access health services.

The background of these, this study aims to understanding the delays factors to reducing maternal and neonatal mortality in Indonesia. Delay in accessing services through geographic analysis: urban rural residential, Java Bali and Outer Java Bali, average distance to health facilities, health workers. Delay due to socio-economic factors: poorest kuintil and low education. Delay due to quality care : ratio of hospitals, health centers, physician, midwives and exposure to health programs: childbirth by health workers and use of contraception.

This study used two cross-sectional studies, the 2015 Intercensal Population Survey (SUPAS) and the 2014 Village Potential Statistics/PODES. Information of all maternal and neonatal deaths (singleton live births) that occurred between 2010 and 2015. Analysis is carried out using census blocks as an analysis unit. This method is never done in SUPAS 2015 and PODES 2014.

METHOD

This study uses the two surveys data files, the 2015 Intercensal Population Survey (SUPAS) and the 2014 Village Potential Statistics (PODES), were merged to obtain the needed variables. The SUPAS data covered the national fertility and mortality indicators such as crude death rates, maternal mortality rates, infant mortality, and under-five mortality⁽⁹⁾.

Total samples included all 40,750 census block, each block consisted of 16 households, making a total of 652,000 households. A cut-off sampling procedure was used to obtain a representative population, using 'take all and take some' assumptions (Glaser 1962). The population was first partitioned in two strata: household

strata with death cases and household strata without any death. Among the strata with death cases (or n1), 'take all' was applied when there were 1-8 households and 'take some' was applied when there were more than 8 households. However, there were no census blocks that have more than 8 households in strata with death cases. Among the strata without death (n2), 'take some' was applied, so that the sample size is $n_2 = n - n_1$ (where $n=16$ households) ⁽⁹⁾.

Birth and death histories between 2010 and 2015 were obtained, and the adequacy of sample size was calculated based on maternal deaths during pregnancy, delivery and post-partum at the 2010 census, hoping that the result would be accurate at regional and national levels. Data on the barriers in accessing health services, were derived from the 2014 Village Potential Statistics (PODES), since the Central Agency for Statistics (BPS) included information on village's facilities and infrastructures as well as economic, social, cultural and other conditions in PODES ⁽¹⁰⁾.

Variables outcome are unadjusted maternal mortality (number of maternal death per 100.000 live births) and unadjusted neonatal mortality rate (number of neonatal death per 100.000 live births). Variables covariat are place of residence in urban rural, in Jawa Bali or out Jawa Bali. Variable independen include age of mother, parity, poor household, women using contraceptive, delivery by health worker, ratio hospital, ratio health center, ratio physician' practice, ratio midwives' practice, number traditional birth attendants, average distance to hospital, and average distance to health center.

Statistical analysis based on the valid data obtained, we performed a descriptive analysis of both the independent and dependent variables of interest by using centralisation and dispersion measures. The normality of the quantitative variables was verified using the Kolmogorov-Smirnov test. In order to reach normality, log transformation was used for the non normal variables. All hypothesis testing to determine differences, associations and relationships was deemed significant at $p < 0.05$. Statistical data analyses were performed using the STATA version 14.0.

FINDING

The results of the analysis show there is a mortality gap according to the region. Sumatra and Java Bali Region is located in the western region of Indonesia.

NTB, NTT, Maluku and Papua are regions that are located in eastern Indonesia. NTB, NTT, Maluku and Papua regions have the highest ratio of maternal and neonatal deaths compared to other regions (figure 1).

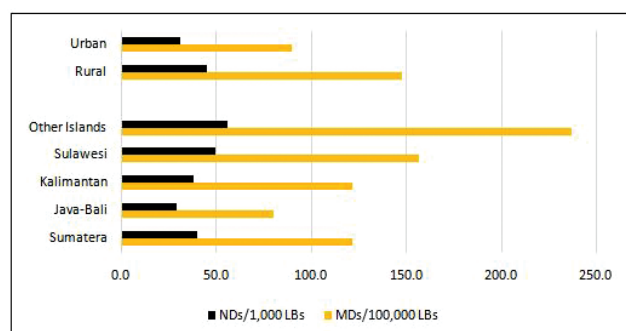


Figure 1: Unadjusted Maternal and Neonatal Mortality by Region and Urban Rural, 2010-2015

Source: analysis of Supas data

Note: These numbers and statistics are unadjusted not for citation for MMR (Maternal Mortality Ratio and Neonatal Mortality Rate)

The results (Table 1) show differences in mortality according to socio-economic factors, and exposure to health programs and availability of facilities and health workers. Socio-economic factors are explained through the level of low-educated mothers and the level of well-being measured by quintiles 1 and 2.

Table 1: Characteristic of Undjusted Maternal and Neonatal Mortality

Characteristic	Unadjusted Maternal and Neonatal Mortality*
Proportion of women with lower education	
Low	37.29
High	54.83
Proportion of poor households	
Low	35.32
High	56.93
Proportion of women using contraceptive	
Low	50.19
High	43.44
Delivery by health workers	
Low	61.5
High	38.45

Conted...

Ratio hospital per 1000 population in a district	
Low	44.16
High	35.27
Ratio health center per 1000 population in a district	
Low	40.75
High	52.34
Ratio practice-physician per population in a sub-district	
Low	52.75
High	40.25
Ratio practice-midwife per 1000 population in a subdistrict	
Low	43.5
High	35.53
Ratio traditional birth attendant per 1000 population in a village	
Low	38.69
High	53.94
Total	46.79

Source: analysis of Supas data

***Note:** These numbers and statistics are unadjusted not for citation for Maternal Mortality Ratio or Neonatal Mortality Rate.

Mothers who are low educated tend to lack knowledge about diseases and nutrients needed during pregnancy. Mothers also don't understand the importance of antenatal care so they don't get information on symptoms and danger signs that can occur during pregnancy or childbirth. Ignorance of the dangers and symptoms of this complication causes late deciding to seek medical services which can lead to death. IDHS 2012, show that low-educated mothers have a low level of antenatal care and delivery in health facilities, so that causes the mother to be less informed about the dangers and implications of pregnancy⁽¹¹⁾. Other studies that also show low education and poorest levels have high maternal or neonatal mortality^{(12),(13), (14),(15),(16), (17)}.

The meaning, to prevent delays, the community that has many low educated women and poorly must to get intervention/health program exposure. In communities that have a lot of traditional birth attendants, maternal and neonatal mortality was higher. The presence of traditional birth attendants suspect delays in accessing the modern services. This means that the government must be intensive to promoting to use services in health facilities.

Further analysis shows there is a correlation between the higher of maternal and neonatal mortality

with the higher of poor and low educated mothers (Figure 2, Figure 3). The farther away from the hospital, the maternal and neonatal mortality is higher (Figure 4). This eviden gives an understanding: referral system must be easy to accessible and provide the ability for poor mothers to be able to get the opportunity to obtain quality services.

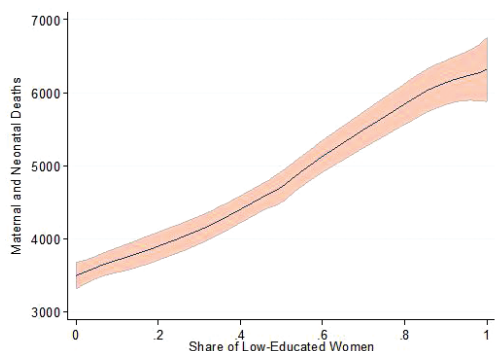


Figure 2: Maternal & Neonatal Mortality by Low Educated Women

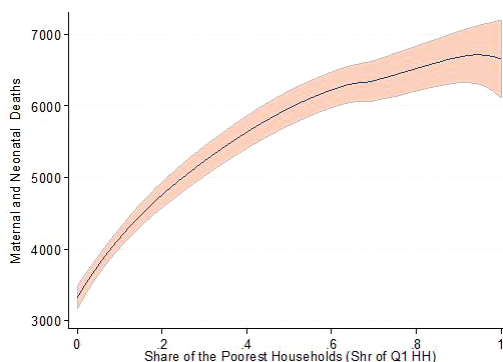


Figure 3: Maternal & Neonatal Mortality by Poor Household

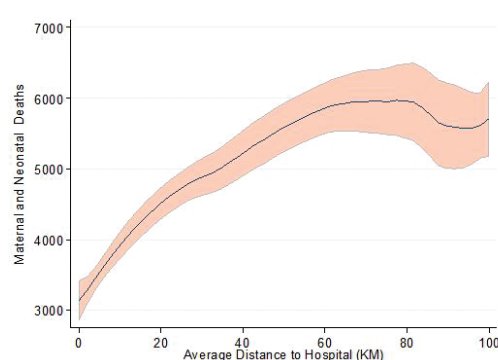


Figure 4: Maternal & Neonatal Mortality by Average Distance to Hospital

The results (Table 2), Socio-economics is an underlying factor and multidimensional. Overall, poverty, low education and rural are interrelated. Poverty is an obstacle in accessing better education. These obstacles occur because to get a better education requires higher costs. The risk of low-educated women is having less knowledge in maintaining pregnancy, both knowledge of the disease and the intake / nutrition needed during pregnancy. Diseases during pregnancy or nutrition that are not optimal can interfere with the growth and development of the fetus. As a result the fetus can be stillborn, low birth weight, or preterm birth. These are all major risk factors for neonatal death ⁽¹³⁾ ⁽¹⁸⁾ ⁽¹⁹⁾ ⁽²⁰⁾,⁽²¹⁾,⁽²²⁾,⁽²³⁾.

Tables 2: Determinan of Maternal and Neonatal Mortality, 2010-2015

Maternal and Neonatal Mortality	Coefficient	P value	[95% CI)	
High share of low-educated women	0.3303582	0,000	0.2449854	0.4157311
High share of poor households	0.1731712	0.001	0.0721394	0.2742029
High share of women used contraceptives	-0.0879624	0.028	-0.1666142	-0.0093106
High-density hospitals per 1000 pop in district	-0.0654879	0.125	-0.1492413	0.0182654
High-density health center per 1000 population	0.0116431	0.792	-0.0749312	0.0982174
High-density of practice physician per 1000 population	0.0244147	0.604	-0.0679055	0.1167348
High share of practice midwife per 1000 population	-0.1020309	0.013	-0.1829248	-0.021137
High share of delivery by health worker	-0.9355149	0,000	-1.031558	-0.8394713
High number traditional birth attendants per 1000 pop	0.0893283	0.044	0.0025398	0.1761167
Average Distance to Hospital	0.0020786	0.019	0.0003432	0.0038141
Average Distance to Health Center	-0.0027171	0.175	-0.0066458	0.0012115
Urban	0.0567581	0.295	-0.0495084	0.1630247
Jawa Bali	-0.712754	0,000	-0.8060269	-0.6194812
constant	2.659951	0,00	2.486883	2.83302

Morbidity and mortality will burden and drain a country's economy. So it is important to do preventive efforts. Minimize risk through prevention of maternal morbidity that will reduce neonatal mortality. The results of this analysis indicate that the poor, and low-educated woman population groups are vulnerable groups. A good health system must be able to guarantee the availability of facilities, personnel, health information in the vulnerable groups.

In addition to minimizing risk factors, improvements in facility services are also needed. Strategies for facilities services at the global level in reducing neonatal deaths due to small infants and having infections through corticosteroid use, resuscitation, Kangaroo mother care, neonatal sepsis management. We recommend that these services be an indicator of quality services at facilities in Indonesia.

CONCLUSIONS

Socio-economic and geographic differentials contribute to delayed of health services and causes high maternal and neonatal mortality in Indonesia. To prevent delays requires more intervention in the risk groups: women of low education, poor, living in rural areas, outside Java Bali. The use of contraception, childbirth by health workers, improve the effective referrals system by nearest hospital that is capable of emergency services will decrease maternal and neonatal mortality. It is important to promote the use of modern facilities in the regions which have number traditional birth attendants is high.

Conflict of Interest: The authors declare that they have no competing interests.

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Ethical Clearance: This research has received ethical approval from the University of Indonesia and for the use of secondary data used (No.letter of ethical approval : 223/H2.F10/PPM.00.02/2018) and permission from National Institution of Health Research and Development, Ministry of Health of Republic Indonesia.

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Study of Hematological Changes in The Experimentally Infected Sheep with Ticks *Hyalomma spp.*

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ABSTRACT

This study was aimed to find out the variables in some blood parameters. A series of experiments were conducted for evaluation the changes in some blood parameters of 16 of female's sheep that divided into two groups. First group included 8 animals that infected with *Hyalomma spp* ticks & the another group included 8 of non- infected animals that represent control group. The results of the total counts of red blood and the measurement of hemoglobin counts showed no significant differences between the two groups. Also, there is no signs of any type of anemia were observed in the experimental animals. In conclusion, no significant changes in blood parameters of tick-infected animals. The absence of any type of anemia in animals infected with ticks. We observed high percentages of Eosinophils and Basophils in tick-infected animals.

Keywords: Hematological Changes, Sheep, Ticks, *Hyalomma spp.*

INTRODUCTION

Ticks are important external parasites that cause large economic losses in herds when they release the saliva in the infected body. This is because they contain immunosuppressive materials and then they absorb a quantity blood from the infected body¹. *Hyalomma anatolicum* is a type of hard tick that affects some farm animals and transmit the pathogens that it may carry, such as parasitic protozoa, viruses, bacteria and Rectasia^{2,3,4,5}. *Hyalomma anatolicum* is the dominant and most common of other species of *Hyalomma species* in Iraq^{6,7} and it is the main carrier of the parasite *Theileria hirci*⁸ which causes the Yellow fever in Iraq that affects humans and domestic animals⁹.

The researchers confirmed that tick-infected animals may be resistant to subsequent infection due to predisposition to certain antigens or previous predisposition to ticks^{10,11,12}. The acquisition of infected ticks or resistance depends on several factors that may be due to the added immune factors¹³.

The increase in the cost of some anti-ticks and the development of tick resistance has made it difficult to control the ticks and diseases transmitted in the fields, prompting researchers and scientists to look for alternatives to control them. They also confirmed the possibility that protein extracts may play an active role in immunization and inducing body's resistance against some ticks¹⁴.

The current study aimed on studying and evaluating the changes in some blood indices in sheep infected with ticks.

MATERIALS AND METHOD

Experimental animals: In the current study, two groups of female congenital sheep were selected with similar ages in the reconstruction. The first group included 8 animals belonging to one of the breeders and were infected with ticks (*Hyalomma spp*), which was diagnosed in laboratory and was filled with blood.

The second group also included 8 animals selected from one of the farmer fields in Karbala governorate and treated with insecticides, which did not notice any sign of tick injury and was selected as a control group to compare with the infected group above.

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Blood tests: Blood was drawn from all experimental animals for one time under the same conditions, where 2 ml of blood was drawn from every animal and placed in a tube containing the anticoagulant (EDTA) to study the changes in blood indices. Using glass slides with blood samples and dyeing them with Giemsa stain. The performed tests in relation to blood by using^{16,17} methods to study the hematological traits.

Statistical Analysis: All the results of the study were subjected to statistical analysis and the differences were compared between statistical means using the statistical program SAS¹⁸ and Duncan polynomials test to infer the least significant difference at 0.01 and 0.05.

RESULTS

Total number of red blood cells (TRBCs): There was no significant difference in the occurrence of red blood cells in experimental animal groups during the study period. They were 9.46 ± 0.31 , 9.14 ± 0.13 cell/ml³ blood for both infected groups and the control group respectively. There was no statistically significant difference between the studied groups $p > 0.05$.

Total number of white blood cells (TWBCs): White blood cells increased in the animals of the infected group compared to the animals of control group which were not infected with ticks. The average values of the animals in the two groups had 8.65 ± 0.55 cells/ml³ in the infected group. While it was 5.88 ± 0.48 cells/ml³ of blood was in the control group with differences between the two groups.

Table 1: Variables of the total count of white blood cells in experimental animals (number $\times 10^3$ cells/mm³ blood)

No.	Groups	Value (cell/ml ³ blood)
1.	Infected with ticks	8.65 ± 0.55
2.	Control group (non-infected)	5.88 ± 0.48

$\pm$ standard error

p-Value= ($p > 0.01$, $p > 0.05$)

Differential count of white blood cells (Diff.WBC)

Neutrophils (N%): The percentage of neutrophil cells in the infected group decreased to $40.1\% \pm 4.84$ compared to the non-infected animals group, which had a ratio of $47\% \pm 1.41$. No significant statistical difference was observed between the two groups ($p > 0.05$), Table (2).

Lymphocytes (L%): There was a slight decrease in the percentage of lymphocytes in the infected group and reached $42.6\% \pm 2.1$. While in the animals of the second group, they were close to the natural ones and reached $46.45\% \pm 2.89$. There was no significant statistical difference between the experimental animals $P > 0.05$, $p > 0.01$ (Table 2).

Single-core cells (M%) Monocytes: The percentages of these cells increased in infected animals and reached $6.33\% \pm 1.51$. However, there was little change in the case of non-infected control animals, where they were $4.15\% \pm 0.96$. However, there were no significant statistical differences between the groups $P > 0.05$, $p > 0.01$ (Table 2).

Bacterial cells (B%) Basophils: In the first group of infected animals, the percentage of cells in the first group increased to $4.67\% \pm 0.52$, while the control group had a slight decrease of $0.87\% \pm 0.58$. A significant statistical difference was found at 5% 0.05% between the experimental groups. Table (2).

Acid cells (E%) Eosinophils: The percentage of acid cells in infected animals increased to $5\% \pm 0.63$, compared with non-tick control animals with $1.5\% \pm 0.58\%$. Significant statistical difference was found between the infected group and control group at $P < 0.05$. Table (2).

Table 2: Percentages of the rates of white blood cells in experimental animals

Types of blood cells					Groups
Acid cells	Basophil	Single-core cells	Lymphocytes	Neuromuscular cells	
$5\% \pm 0.63$	$4.67\% \pm 0.52$	$6.33\% \pm 1.51$	$42.6\% \pm 2.1$	$40.1\% \pm 4.84$	Infected
$1.5\% \pm 0.58$	$0.87\% \pm 0.58$	$4.15\% \pm 0.96$	$46.45\% \pm 2.89$	$47\% \pm 1.41$	Control group

$\pm$ = standard error.

p-Value = ($P > 0.05$, $p > 0.01$)

Packed Cell Volume (PCV): The PCV in the experiment was close in both the tick infected and non-infected groups (control group) and reached $28.67 \pm 3.26 \pm 28.5 \pm 0.58$, respectively. There were no significant statistical differences between the two groups.

Hemoglobinopathy (Hb): Stabilization and convergence of hemoglobin in group I and II animals was also observed, and there was no significant change, with 9.5 ± 1.1 g in the group of infected animals. Compared to the control animals in the second group where it was 9.7 ± 0.5 g%. No significant differences were observed between the two groups.

Red blood cell markers: Blood Indications: MCHC, MCH, and MCV markers were determined by red blood cells, hemoglobin counts, and percentage of red blood cell counts. No type of anemia was observed in animals in the first two ticked and non-infected groups.

DISCUSSION

There were no significant differences between the infected groups and the control group when reviewing the results of the blood samples for these groups in the total number of red blood cells, hemoglobin counts and packed cell volume of red blood cells. No type of anemia was observed, according to the results. None of the types of anemia, as indicated by the results, were shown by calculating the parameters of the red blood cell markers MCHC, MCH, MCV. This may be due to the small number of ticks fed to the experimental animals as well as the short duration of tick feeding on these animals.

The values of blood parameters in control animals have been more affected than those of infected animals. The role of Antibodies formed in the bloodstream of infected animals, which destroy the digestive tract of ticks feeding, which reduces the feeding process and incomplete and lack of blood absorption compared with control animals, which have low standards of these antibodies^{19,20}.

In addition to the histological changes that occur in places where ticks are applied to treated animals that may cause the tick to be infected.

The incidence of white blood cells in the infected animals was relatively small compared to control animals without significant statistical differences between the groups. However, other observed the low rates after a

long period of infection, although we did not notice this in our current study of the possibility of shortening the feeding period.

Many have confirmed the high percentage of diphtheria and acidic cells in response to tick infection. This increase supports the results of the present study on this aspect with respect to the increase in the percentage of diphtheria and acid cells in infected animals, but this increase was higher than that recorded in rabbits with antigen Larvae ticks *Hyalomma a. Anatolicum* may be due to difference in the host user due to the differences between the host and the host's immune status²². The skin reactions in the tick adhesion area of the resistant animals stimulates the infiltration of the cells to induce allergic reactions. He noted²³ the introduction of echinoderms to the skin of rabbits protected by *Ixodes ricinus* after the infection type.

As discussed^{24,25}, the importance of dengue and bacteriophagee in resistance against infection was determined by the criteria of resistance deficiency in guinea pigs that are protected by *Rhipicephalus appendiculatus* antiperspirants after treatment with antimicrobial and antacids.

There was no role for the neutrophils in the tick-infected animals, which were gradually reduced during the experiment. This was consistent with the results of²⁶ which observed a slight increase in percentage in the early weeks of the experiment.

The difference may be due to the limited duration of the study and the type of animal used studying. Neutrophil cells are phagocytic cells that attack the microorganisms entering the body, but a small effect has been observed against *S. sanguineus* ticks, while diphtheria and acid cells have contributed to the resistance of guinea pigs against this type of tick^{27,28}.

CONCLUSIONS

No significant changes in blood parameters of tick-infected animals. The absence of any type of anemia in animals infected with ticks. We observed high percentages of Eosinophils and Basophils in tick-infected animals.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None

Ethical Clearance: Ethical clearance was obtained from the Faculty Scientific Committee (Faculty of Veterinary Medicine, University of Kerbala) to Study of hematological changes in the experimentally infected sheep with ticks *Hyalomma spp.*

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Study the Antioxidant Activity of Sage (*Salvia Officinalis*) Leaves Extract

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ABSTRACT

This study was carried out to evaluate two type of sage (*salvia officinalis*) leaves extracts (Ethanolic and Water extracts) by using two methods (reducing power and chelating ability). So this study shows the high content of phenolic compound of ethanolic and water extract of sage (15.8 and 14.6) % respectively. The leaves of sag were locally obtained, twenty gram of ground material was extracted by 250 ml ethanol 95% or distilled water at boiling point, under reflux for one hr. The extractive was filtered and evaporated at 50 C° to the complete dryness. Total phenol assay, total flavonoid assay, reducing power assay, and chelating ability assay were observed in this study. Results revealed that the ethanoic extract had highest percentage of reducing power than water extract of sage leaves as so as the chelating ability percentage.

Keyword: extracts, sage, flavonoids, chelating ability, reducing power

INTRODUCTION

Salvia is the largest genus of Lamiaceae family, includes about nine hundred species which are widespread in the world. *Salvia officinalis* the common sage, is the most representative species within the genus *Salvia*. It has been credited with a long list of medicinal uses: e.g. antiplasmodial, anti-inflammatory and antiseptic activities¹.

The *Lamiaceae* family includes large number of plants, known for their antioxidant properties. Among these, salvia has been widely used and the antioxidant components have been identified. It has been established that the antioxidant effects of salvia are mainly due to the polyphenolic compounds^{2,3}. The major phenolic compounds identified in the extract of salvia are carnosic acid, rosmarinic acid, salvianolic acid and its derivatives – rosmanol, carnosol, epirosmanol, rosmadial and methyl carnosate^{4,5}. The rosmanol is a major constituent among these, having strong antioxidant activities because these groups cause phenols to donate the hydrogen atoms

more easily to activate the free radicals, which interrupt the ant oxidation chain reaction⁶.

The most widely used synthetic antioxidants in food (butylated hydroxyanisole BHA, butylated hydroxytoluene BHT) are very effective as antioxidants but their use in food products has been failing off due to their instability, also due to a suspected action as promoters of carcinogenesis. For this reason, there is a growing interest in the studies of natural healthy additives as potential antioxidants^{7,8}. In the present study, we focused on evaluating the antioxidant activity from natural source, in aqueous and ethanolic extracts of sag.

MATERIALS AND METHOD

The leaves of sag were locally obtained, twenty gram of ground material was extracted by 250 ml ethanol 95% or distilled water at boiling point, under reflux for one hr. The extractive was filtered and evaporated at 50 C° to the complete dryness.

Assays for the Antioxidant activity of Sage Extracts

Total phenol assay: A Folin-ciocalteu's colorimetric method was used as described by (Ayoola et al 2008)⁹ a 2.5 ml of a ten-fold diluted Folin-ciocalteu's reagent and 2ml of 7.5% sodium carbonate solution were added to 0.5 ml of (1mg/ml)extract before the reaction allowed

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standing for 30 min at room temperature. The absorbance was recorded at 760nm by using UV/VIS Spectroscan 80 D spectrophotometer. The total phenolic compounds were determined according to gallic acid standard curve (0.01 to 1 mg/ml) (fig.1).

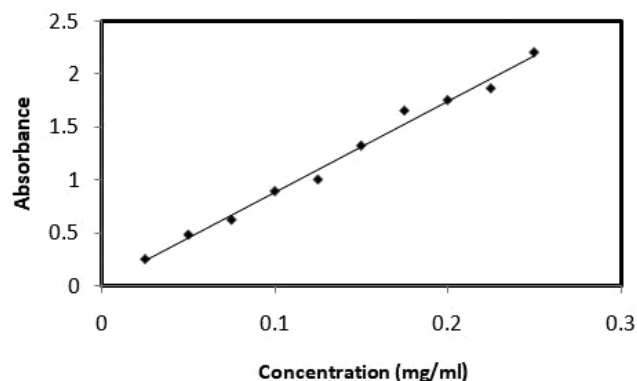


Figure 1: Concentration–response curve for gallic acid at 760 nm

Total flavonoid assay: Total flavonoids in ethanolic and aqueous extracts of sag were determined according to (Rao et al, 2012)¹⁰. One ml extract solution (1mg/ml) was placed in 10 ml volumetric flask. 0.3 ml of 5% NaNO_2 solution and 5 ml of distilled water were added. After 5 min 0.6 ml of 10% AlCl_3 was added. 2 ml of 1M NaOH solution was added after another 5 min, and the volume was made up to 10 ml with distilled water. The mixture was mixed and the absorbance was measured at 510 nm. Total flavonoids were expressed as μg catechin equivalents per gram dry matter according to catechin standard curve (fig.2).

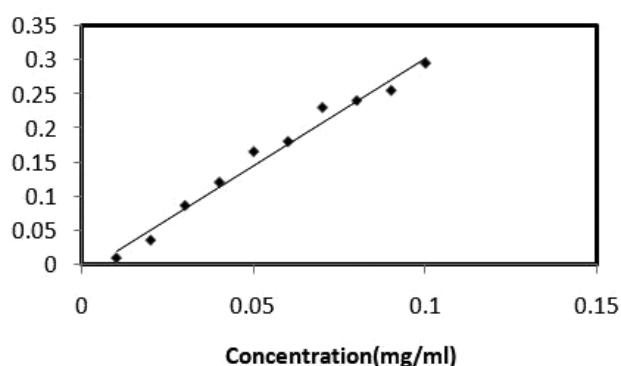


Figure 2: Concentration –response curve for catechine at 510 nm

Reducing power assay: The reducing power was estimated as described by (Chou et al,2009)¹¹. 1 ml extract of (0.5-10 mg/ml) was mixed with 2.5 ml of 1% potassium ferric cyanide and 2.5 ml of 0.2 M (pH. 6.6) of sodium phosphate buffer, and incubated at

50 C° for 20 min. To stop the reaction, 2.5 ml of 1% trichloroacetic acid (TCA) was added to the mixture and centrifuge for 10 min at 3000 rpm. 0.5 ml of the supernatant was mixed with 1 ml of 1% ferric chloride and stand for 10 min. The absorbance was measured at 700 nm. BHT used as standard.

Chelating ability assay: Chelating ability was determined according to (Su et al,)¹² with some modification. 1 ml of (0.5-10 mg/ml) extract was mixed with 0.2 ml ferric chloride of 2 mM and 0.2 ml 8-Hydroxyquinoline(5mM). After 10 min at room temperature, the absorbance was determined at 562 nm. The EDTA- Na_2 was used as reference.

RESULTS AND DISCUSSION

Polyphenols are aromatic compounds from the plant kingdom. They are important due to positive correlation with antioxidant activity. They are responsible for medicinal worth of plants¹³. Phenolic components show antioxidant potential due to their reduction potential^{14,15}. Flavonoids are most important polyphenols. They have the ability to trap free radicals which causes a number of diseases¹⁶.

Table-1, shows the percentages of flavonoids and total phenolic compounds. The total phenolic compounds which expressed as gallic acid and flavonoids as catechins were determined according to standard curves, flavonoids were determined by aluminum chloride colorimetric method and phenols by Folin-Ciocalteu's colorimetric method

Table 1: Phenolic and Flavonoids content in sag extracts

Extraction	Type of plant	Phenolic content %	Flavonoids content%
Aqueous	Sag extract	14.6	7.9
Ethanolic		15.8	9.6

As shown in fig 3, the high percentages of the flavonoids and total phenolic in alcoholic extract mean that, the ethanol as extracting solvent (due to the chemical composition of phenolic compounds) is more effective than water. These results are in accordance with those of (Nagwa et al)¹

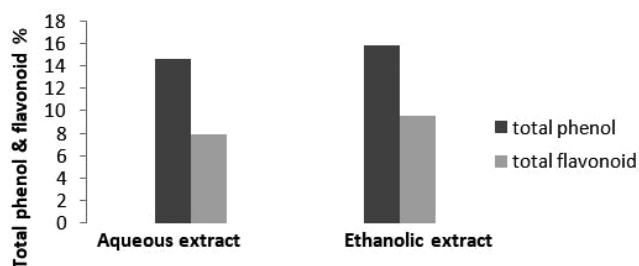


Figure 3: Comparison of total phenol and flavonoid contents of sage extracts

In this study, reducing power and chelating ability methods were used to determine the antioxidant activity, the results were summarized in Figures 4 and 5.

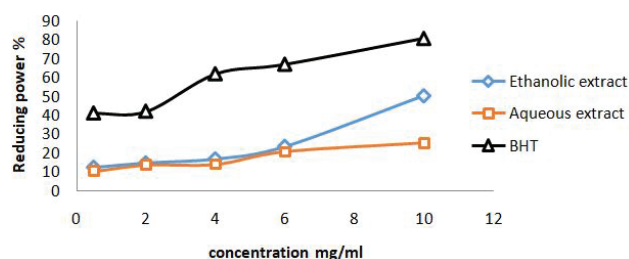


Figure 4: Reducing power of aqueous & ethanolic extracts of sage as compared with BHT at the same concentration

Reducing power indicates the compounds that are electron donors which act as primary and secondary antioxidants¹⁷. Fig 4 shows the reducing power of aqueous and ethanolic extracts of *sage* (as compared with BHT). From these results we can see that the reducing power was enhanced by increase concentration of samples. Higher reducing power might be due to higher amounts of total phenolic and flavonoid and the reducing power of a compound may reflect the antioxidant potential¹⁸. The phenolic compounds have been recognized as antioxidant agents which work as free radical oxidation terminators¹⁹, the reducing properties are associated with the presence of reductions²⁰.

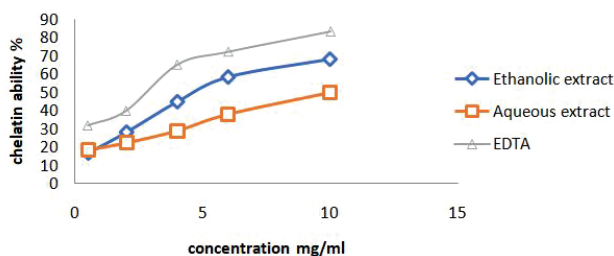


Figure 5: Chelating ability of aqueous & ethanolic extracts of sage as comparad with EDTA at the same concentration

Metal ions can play an important role in the acceleration the oxidation of biological molecules, therefore they may catalyze the formation of first few radicals that lead to propagation of the radical chain reaction in lipid peroxidation^{21,22}. FIG 5 shows the Iron chelating ability of the ethanolic and aqueous extract of sage. The highest chelating activity was observed in ethanol extract.

CONCLUSIONS

The results of the present study showed that ethanolic extract was higher than aqueous extract in both reducing power and chelating ability assays. the ethanolic extracts of sage is high in phenolic compounds as compared with aqueous extracts. As a result, we are fully recommended the extract of sage as a natural preservative in the food systems.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the College Scientific Committee (College of Agriculture, University of Baghdad) to use the leaves of sage plant for extracting 250 ml ethanol 95% or distilled water at boiling point

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Effect of Winter Nutrition with Dietary Supplements on Activities of Honey Bees' Colonies

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ABSTRACT

The study was conducted in the apiary which belonging to Al-Mussaib Technical College from the period of 2017/12/31 until 21/4/2018 in order to test the attractiveness of bees to three concentrations of sugar solution added to it the lemon and bitter orange. The results of the study showed that the average attractiveness of bees to the sugar solution was different and was dependent on the concentration of additives to the sugar solution. As for the sugar solution that the lemon added to it. The results showed that the highest average of attractiveness amounted of (234.93 bee.day⁻¹), while the highest average of attractiveness amounted of (215.30 bee.day⁻¹), While the percentage of sugar solution added to it the Bitter orange, where the highest percentage at concentration of 15% which amounted of (345.44 bee.day⁻¹), while the lowest percentage for it at the concentration of 5% was amounted (317.444 bee.day⁻¹). As for the relationships between the period and days, it has observed that the highest average of attractiveness was (2.58 bee.day⁻¹) in the morning at 10% concentration, while the average of attractiveness was (2.33 bee.day⁻¹) in the morning at 5% concentration. In the afternoon, the highest average of attractiveness was (15.36 bee.day⁻¹) at a 15% concentration, and the lowest average of attractiveness was (7.58 bee.day⁻¹) at a concentration of 5%. In conclusion, the bees were attracted to both solutions with different densities. Preferring bees for the sugar solution that added to it the lemon with low concentrations compared to the sugar solution added bitter orange to it.

Keywords: bee insect, lemon, honey bees, bitter orange.

INTRODUCTION

Western honey bee (*Apis mellifera* L.) is a living insect living in the form of a colony, consisting of a group of individuals called workers, Their numbers reaches from hundreds to thousands with one queen, May be male with them or may be absent, They live together in a natural nest or in a man - made nest that is continuously active throughout the year¹. Studies showed that honey limits the risk of cancer, where it turns out that the bee produces chemicals materials that prevent the growth and division of pollen grains cells found in honey and showed the non-division of cancer cells and spread. This study was followed by a scientific medical test, which was tested by a group of beekeepers who proved that their bodies

were free from this disease. Where they continued to consume honey in their daily diet, whether the Royal jelly or pollen grains. These experts have instructed that the lack of cancer because of the containment honey of pollen grain². Honey is considered one of the most important bee products besides its products of pollen grains, Royal jelly, wax, polypropylene and honey bee venom. It is a sweet sugary substance with a flavor and aromatic aroma collected by the bee workers from the plant nectar glands as well as the sugary secretions of some insects belonging to the Homoptera order as well as fruit juices (Honey dew). The bees mature and turn it into honey stored in the honeycomb, on the other hand, the bees are social insects, which are distributing of work among the colonies of the community and that the work conducted by the workers are according to their age, where those who are 1-21 days old are called house bee workers because they do not go out of the beehive and work inside the beehive. They clean the beehive, take care of the incubation and queen, produce Royal jelly and wax to build the honeycomb, guard and defend the beehive. After the 21st day they turn to field

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duties where they gather food (pollen), nectar and water from the plants after conducting a pre-exploration process. These duties depend on the activity of bee workers in their ability to Grazing and on different levels, and this comes through the amount of food it supplies, which gives it the necessary energy. It is known that carbohydrates is the main food that provides energy to the body. Therefore, it is dependent on the industrial feeding of water and sugar in the supplying of bee colonies with supplied food for energy in the case of lack of food sources, lack of stored honey in the beehive and may be or lack of food sources in the pasture as a result of environmental changes (heat - humidity - rain - wind), leading to effect on the flowering date of flowers and the Nectar secretion sometimes and the dryness of the secluded nectar at other times, this makes the colonies of the community consume honey and stored pollen in the beehive and reduce its quantity, forcing the beekeeper to intervene and transfer honey tablets and pollen excess of the need of the community to the needy community, but such this work cannot be done at all times of the year because of lack of its availability in sufficient quantities The feeding process requires with honey and pollen alternatives^{3,4}. The percentage of water in honey ranges between 23-13% and with average about 17% and may reach up to 9% in dry areas where the relative humidity of air is low. The concentration of water in honey is influenced by environmental factors such as temperature and humidity ratios present in the nectar and the degree of honey maturity and its storage conditions after harvesting and sorting⁵. Honey bees, like any living organism, also require the availability of carbohydrates, proteins, fats, minerals and water for their growth, development and reproduction, and obtain them by collecting water, nectar and pollen. The nectar is a sugar source. The pollen is a source of proteins, fats, vitamins, minerals, Sterols and other nutritional requirements. The beehive consumes some of what it collects to sustain its various activities and stores more than its needs in the honeycomb to benefit from it when needed. When more food stocks are available, the colonies get less strong before the onset of the honey-pollen season, while the opposite occurs in food-insecure colonies⁶. Studies have shown that the colonies during the times of the year and especially in the spring requires at least 6.8 kg of honey and 19.9 kg of pollen and that one larva needs 100 mg pollens to grow and develop into a complete insect. The basic color of the honey is the result of the components of water dissolving from the plant origin is Secreted

from the nectar, which are the extracts of chlorophyll, carotene, Xanthophylls and other depends on the type of plant and weather conditions⁷. The main goal of honey bee breeders is to maintain the strength and activity of honey bee colonies because it is important in increasing their productivity and requires a sufficient stock of pollen and honey, which encourages the queen and push them to continue to ovulation, which led to increasing the number of bees and the growth and development of the colonies. Most studies indicated that the sugar solution was more receptive to the bee colonies and was widely used as an alternative to honey or nectar, and that some protein sources were used as alternatives and supplements for pollen, which contributed to activating the colonies and maintaining their strength¹. The present study aims to study the effect of winter nutrition on the attractiveness of bee colonies and knowing the best and most nutritional supplements for bees during the winter period.

MATERIALS AND METHOD

Preparation of Beehives: This study was conducted in the apiary of the Department of Biological Resistance, Al-Mussaib Technical College for 2017-2018 on the local honey bee colonies where the beehives were divided into three replicates for each replicate containing three beehives. Where each beehive contains 6 honeycombs covered with bees, where it was considered to be the same strength and the queen at the age of one years (according to the log of the beekeeper that was purchased the beehive from which).

Preparation of Solutions

Preparation of the Sugar Solution: The sugar solution was prepared with a concentration of 1 water: 2 sugar. The water was boiled, sugar added and stirred until a homogeneous solution was obtained.

Preparation of Additives: Three treatments were prepared adding to the sugar solution for the study, as follows:

Sugar solution added to it the natural lemon solution after the age and purification it from impurities and the three concentrations of 5 ml, 10 ml, 15 ml per liter of the sugar solution according to the equation of concentration

$$H1 \times V1 = H2 \times V2$$

Sugar solution added to it the natural Bitter orange solution after the age and purification it from impurities

and the three concentrations of 5 ml, 10 ml, 15 ml per liter of the sugar solution according to the equation of concentration

$$H1 \times V1 = H2 \times V2$$

Method of Taking Readings: For the purpose of determining the attractiveness of bees and its preference for different sugary structures, the readings were taken from 31/12/2017 until 21/4/ 2018, with the rate of two readings per week divided by two days to determine the effect of the time on the attractiveness from 9 to 10 am and from 12 to 1pm, Where one honeycomb was assigned to each beehive (feeding) where the lemon solution is placed in concentrations of (5, 10, 15 ml.L⁻¹ sugar solution), with one liter per dish in the beehive.

Statistical Analysis: The experiment was designed according to the Randomized Complete Block Design (RCBD). The results were statistically analyzed

according to the ANOVA method and the average was measured according to the least significant difference (L.S.D) at a significant level of 0.05%⁸.

RESULTS AND DISCUSSION

Table (1) shows that the honey bee workers were more attracted to the sugar solution added to it the lemon at a concentration of 15% which amounted the highest average of (251.30 bees.day⁻¹) while the lowest average attraction of workers for the sugar solution added to it the lemon was at 5% concentration which amounted (234.93 bees.day⁻¹). The reason for the different averages of attractiveness of honey bee workers for feeding solutions is due to the difference of bees' ability to palatability these substances and attract to them. This results agree with⁹ indicated that bees do not collect nectar that cannot be palatability and the sugar content is not less than 20%.

Table 1: shows the effect of the sugar solution added to it lemon and the attractiveness of honey bees during winter feeding

Treatment	Concentration	Readings					Average
		1/2	1/9	1/16	1/23	1/30	
sugar solution with lemon	5%	355.67	22.83	145.17	305.17	345.8	234.93
	10%	370.00	34.0	125.5	356.6	362.62	250.56
	15%	371.33	35.50	123.00	361.50	367.17	251.30
Average		366.66	30.44	131.22	341.11	358.5	—

LSD=11.776 for periods, L.S.D=9.251 for concentration, L.S.D=9.362 for interaction

Table (2) shows that the honey bees workers have more likely preferred the sugar solution added to it Bitter orange a concentration of 51% where the highest attractiveness for it at this concentration which amounted of (345.44 bee.day⁻¹), while the lowest average of attractiveness at concentration of 5% which amounted of (317.44 bee.day⁻¹). As for the average time period, where the highest average of attracting workers on 2018/2/13 was amounted (232.67 bee.day⁻¹). The previous results show that bees can distinguish the concentration of the sugar solution so that it is first attracted to high concentrations and then the lowest. These results agree with¹.

Table 2: shows the effect of the sugar solution added to it Bitter orange and the attractiveness of honey bees during winter feeding

Treatment	Concentration	Readings					Average
		2/6	2/13	2/20	2/27	3/6	
sugar solution with lemon	5%	337.17	195.50	400.83	293.50	368.50	345.44
	10%	313.8	261.00	316.67	288.50	331.00	342.028
	15%	321.50	241.50	368.67	251.33	431.17	317.444
Average		324.1	232.67	362.06	277.7	376.8	—

LSD= 27.625 for periods, L.S.D= 9.311 for concentration, L.S.D= 8.412 for interaction

Table (3) shows the interaction among of the treatments, daylight hours and concentration, Where the highest average was at 12 pm, with concentration of 15% which amounted (15.36 bee.day⁻¹), while the lowest average of attractiveness at 9 Am, with concentration

of 5% which amounted (2.33 bee.day⁻¹), Where at the afternoon, we noted that the number of bees has increased to suit the weather conditions, where the intensity of the work of bees at this period was increased. This results agree with¹⁰.

Table 3: Shows the interaction between the hours of the day and the treatments in attracting honey bee workers during winter feeding

Treatment	Concentration	lemon					Bitter orange					Average
		1\2	1\9	1\16	1\23	1\30	2\6	2\13	2\20	2\27	3\6	
9 Am	5%	2.66	4.16	2.00	1.50	2.33	1.33	1.33	1.17	2.44	1.44	2.33
	10%	5	3.83	1.82	0.83	2.67	1.33	2.58	1.04	3.14	3.10	2.58
	15%	4.69	2.0	2.17	2.17	2.33	1.17	1.34	1.07	1.17	1.31	2.35
12 Pm	5%	7.33	7.17	5.67	8.83	9.83	6.67	7.58	5.15	6.73	4.13	7.58
	10%	11.50	10.17	10.0	16.67	12.83	31.0	11.10	11.04	12.03	9.11	12.11
	15%	13.19	10.17	10.0	16.67	12.83	31.0	10.15	9.18	13.04	8.13	15.36
Average		12.1	23.1	16.5	26.3	22.17	27.0	21.2	20.13	23.1	24.5	—

LSD= 19.533 for days, L.S.D= 19.422 for periods, L.S.D= 16.515 for interaction

CONCLUSION

The bees were attracted to both solutions with different densities. Preferring bees for the sugar solution that added to it the lemon with low concentrations compared to the sugar solution added bitter orange to it.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the College Scientific Committee (Furat Al-Awsat Technical University, Al-Mussaib Technical College, Iraq) to study effect of winter nutrition with dietary supplements to test the attractiveness of bees to three concentrations of sugar solution added to it the lemon and bitter orange on activities of honey bees' colonies.

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Use Autologous Platelets Rich Plasma in Treatment of Skin Wounds in Rabbits

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ABSTRACT

This experiment was designed to study effect of plasma-rich platelets (PRP) on tissue healing rates of skin lesions in rabbits. Sixteen healthy adult rabbits were used clinically from both sex (weight from 1.1 to 1.9 kg). All animals (4 cm²) were formed in the abdomen. Group (A) was injected with a single-dose PRP dose. While a control (group B) was injected with saline solution injected into the wound position in both groups. On day 3, 7, 14 and 21 posts samples of skin tissue samples were collected to examine the tissue each time two rabbits. The results revealed, clinically, that the wound healing rate was the same in two groups, no differences when the section was taken from the edge of the wounds, and the histological result showed: On the third day of the wound healing group (A) (control group) a demarcation line consisting of polymorph nuclear), The skin was thick at the edges of the cut with the inflammatory cell group (B) (treatment group) inflammatory responses were detected in the lesser frequency range of the control group. On the seventh day of the wound healing group in the skin (A) shows the presence of a few small vessels, and the collagen fibers organized give a tightening force of the tissues, Group B is shown in small vessels, good tensile strength and improved wound healing. On the fourteenth day of the A-group, the density of the blood vessels is noticeable. Group B shows an increased blood vessel density in group A. On the 21st day of the wound healing group (A), there is an increase in blood vessel density and collagen bundle. The wounds of group (B) contain an abundance of fiber and collagen bundles, through the expansion of the rich blood vessels.

Keywords: Platelets, platelets rich plasma, Rabbits, Skin, wound healing.

INTRODUCTION

The main aim of wound attention is to achieve rapid and purposeful recovery with a cosmetic scar¹. Wound healing involves a series of events (coagulation, inflammation, regulation of granular tissue, epithelial structure and repair). These proceedings are created by encouragement and regulation of cellular activities through the communication between signals made by cytokines and growth factors^{1,2}. (PDGF), change factor beta-alpha (TGF- β and TGF- α), thrombocytopenic growth hormone (PDEGH), growth factor fibroblast (FGF) The vascular endothelial growth factor (VEGF), interleukin 1 (IL-1), interleukin 2 (IL-2), and platelet stimulation factor 4 (PAF-4) are released^{1,2,3}.

These factors play a special role in tissue repair (re-sedimentation and vascular proliferation), extracellular matrix production, and enrolment of mesenchymal cells². PRP is a concentrated platelet creation used in clinical trials to quicken wound healing^{4,5}.

Platelet-rich plasma (PRP) or platelet center (PC) are easy and cheap products to get and expose important growth factors involved in tissue renovation. An example of a growth factor is alpha granules of triggered plates, which stimulate chemical attraction, bone fibrosis and angiogenesis⁶. Growth factor production occurs in many cells and tissues such as fibroblasts, plaques, endothelial cells, bone structures, leukocytes, saliva, lacrimal glands, and others. However, in many studies, the most interesting goal is platelets, where they are moderately easy to get and have other important materials for restoration and tissue repair⁷.

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Growth factors of platelet growth factor (PDGF), conversion of beta growth factor (TGF β), endothelial

growth factor (VEGF), endothelial growth factor (EGF), fibroblast growth factor (FGF) and insulin-like growth factor)⁸. Among the most abundant growth factors present in alpha granules of platelets, thrombocytopenic growth factor (PDGF) and TGFb. Both have specific activities such as angiogenesis, valve formation and activation of macrophages⁹. The functions performed by these agents are very important for body functions and angiography, for healing surgical wounds and for reducing postoperative complications¹⁰. Therefore, this study was aimed to evaluate the benefits of self-PRP in skin healing in rabbits

MATERIALS AND METHOD

Sixteen adult clinically healthy rabbits of both sexes weigh from 1.1 to 1.9 kg. The animals were housed in the Animal Farm of the College of Veterinary Medicine at Karbala University and were kept in individual cages in a natural environment including climate, management and nutrition. All animals were subjected to the creation of a full wound (4 cm 2) in the abdomen after preparation for sterile surgery¹¹.

General anesthesia was induced by diazepam (diazepam 10). The ampoule contains 2 ml (10 mg/ml²), Aleppo, pharmaceutical industries, Aleppo - Syria) as surgery at 1 mg/kg body weight. After 10 min syringe with zylazine (2% zylazine® contains 50 ml (20 mg/1 ml), Ceva Saute animal, Spain) at a dose rate of 10 mg/kg body weight. Ketamine® (10%) contains 10 ml Vet.Injection, Kepro Pharmaceuticals, Netherlands) at a dose rate of 50 mg/kg body weight. All these drugs are injectable¹².

On each animal, one full thickness (4 cm 2) was created in the abdominal area using a mold made from X-ray film for all animals and the wound tailor was sewn by 3-0 silk by intermittent horizontal stitching. PRP was injected into the wound seat immediately after establishment Wound in treatment group (B) during injection of the control group (A) with a normal saline solution.

On day 3, 7, 14, and 21 processes after skin tissue biopsy samples were collected for histological examination of groups A and B group treated each time two rabbits. The samples were fixed in 10% neutral formalin, cut into 5 µm thick sections, stained with hematoxylin and eosin (H & E), and investigated for microscopy¹³.

RESULTS AND DISCUSSION

During the postoperative period, the animals remained intact, without clinical indication of infection. Microscopy also confirmed sterile conditions during wound in all groups. Wound healing is a complex biological process that occurs in all tissues in all organs of the body. Various types of cells, including keratinocytes, spores, plaques, lymphocytes, fibroblasts and endothelial cells, are involved in this process¹⁴.

On the third day of the wound healing group (A) (control group) was the dominant inflammatory reaction. On the surface of the skin, necrosis of the skin tissue has been satisfied due to mechanical damage. This phase was also observed under tissue necrosis. The demarcation line consists of polymorphonuclear (PMN), thick-skinned at the edges of the cut with inflammatory cells, while inflammatory group reactions were observed in the lower frequency range of the control groups (Figure 1).

The inflammatory response began shortly after the shock on the wound event, the first stage of wound healing. During this response the wound and surrounding tissue becomes inflamed and the cells, especially the neutrophils and monocytes, are moved to infiltrate the clot and begin the processes involved in the synthesis of the granular tissue¹⁵.

On the seventh day of the onset of the wound healing group (A), Newly organized collagen bundles and relatively advanced epithelium have increased at the intersection of wounds to PRP treated wounds (group A) compared to untreated wounds (group B). Numerous small vessels (blood vessels) have also appeared in the PRP treated tissue, while only a few of the vessels are present in the control tissues. Because organized collagen fibers give snuggest strength to tissue, the arrangement of collagen observed in the experimental group will be consistent with tissue that possesses good tensile strength and improves wound healing (Figure 2).

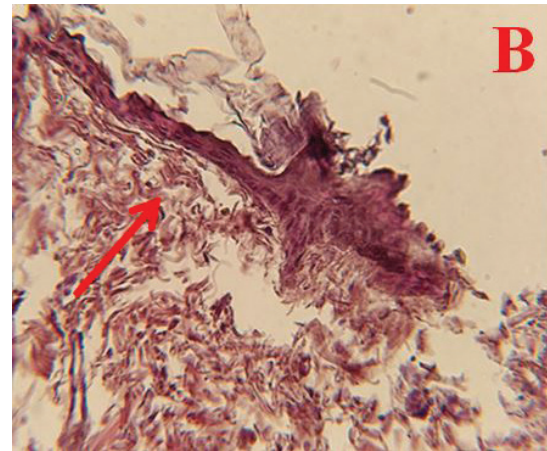
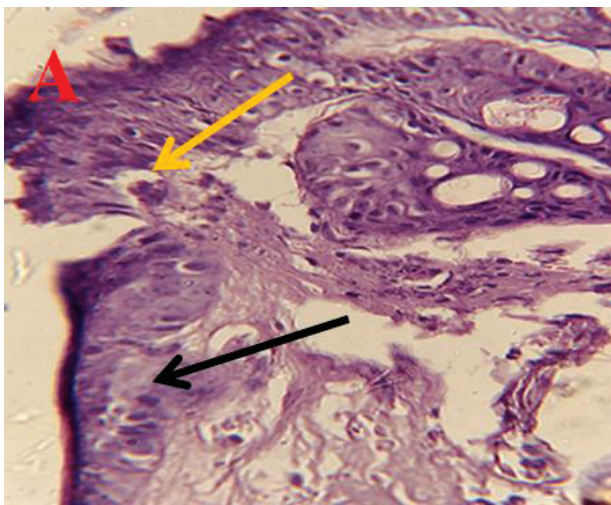
The wound edges bind the cell surface to fibroblastic contraction, also from other fibroblasts. Fibrin or fibrinogen was shown to interact specifically with platelets¹⁶.

On the fourteenth day of skin healing there was a marked increase in blood vessel density in groups treated with PRP compared to control group (B). Therefore,

it can be established that the PRP treatment group enhanced blood vessels in the wound bed compared with any treatment groups (Figure 3).

A small amount of output voltage as long as the collagen bundle was susceptible to stress and collagen arrangement was collagen¹⁷. In the 21st day of skin healing wounds all wounds containing an abundance of fibroblasts and collagen bundles, through the expansion of excessive blood vessels are only noticed in wounds treated with PRP (Figure 4). Evolving new treatments such as PRP can play auxiliary role in a homogeneous treatment design and quality. PRP self-application on soft tissue healing has been a major concern for most of the past two periods. There are many growth factors at high concentrations within the PRP. Some include PDGF, TGF- β , VEGF, EGF and IGF. PDGF, TGF- β , VEGF, and EGF have been shown to increase 3 to 7 times in self-PRP^{18,19}. In addition, thrombocytopenia contains many active total and chemical growth factors, which regulate basic procedures in tissue repair, including cell proliferation, chromium, migration, cellular differentiation, and extracellular matrix abstraction^{20,21}.

According to the current study potential, the PRP effect in wound healing has indicated positive results similar to PRP in accelerating epithelial migration, vascular response and tissue mobilization. In parallel, many clinical studies, both in human medicine and veterinary medicine, have shown the restoration of tissue integrity of the positive role of plaques in natural wound healing^{22,23}. After applied locally, platelets hasten the healing of normal tissues and encourage healing of vulnerable wounds^{24,25}.



Fig(1) histological cross section of skin show: (A) 3rd day wound healing demarcation line consisted of polymorphonuclear (PMN) (—→), the epidermis was thickened at its cut edges with inflammatory cells (—→), (B) 3rd day wound healing inflammatory responses were detected at lesser frequency range than the control groups (—→). (H & E stain) 40X

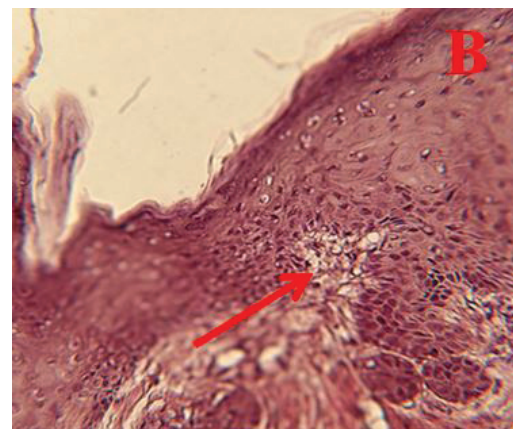
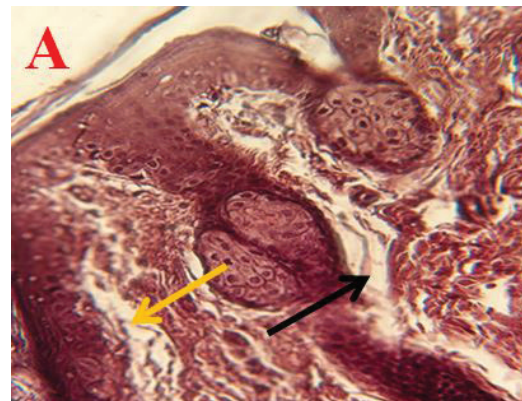


Fig. 2: Histological cross section of skin show: (A) 7th day wound healing which few small vessels were present (—→), prearranged collagen fibers give tensile strength to the tissue (—→) (B) 7th day wound healing increased in small vessels, good tensile strength and enhanced wound healing (—→). ((H & E stain) 40X.

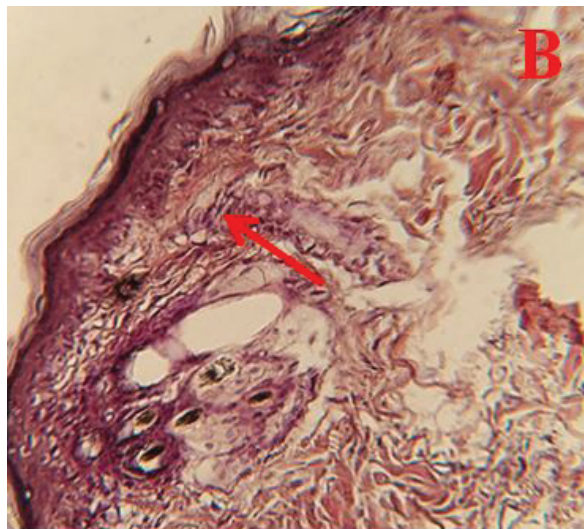
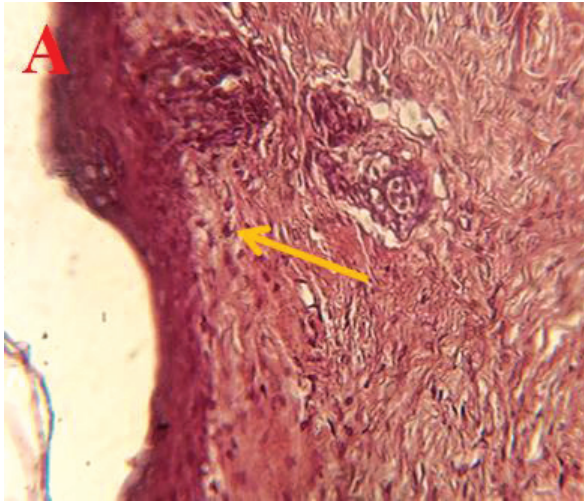


Fig. 3: Histological cross section of skin show: (A) 14th day wound healing which vascular density was noticeable (→) (B) 14th day wound healing increased vascular density than in (A) (→). (H &E stain) 40X.

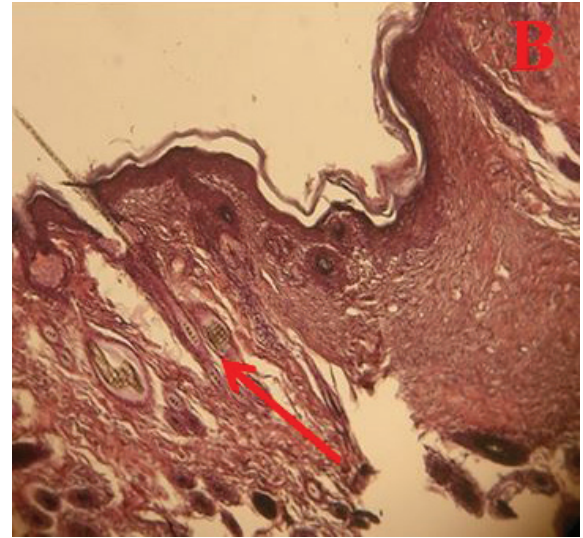
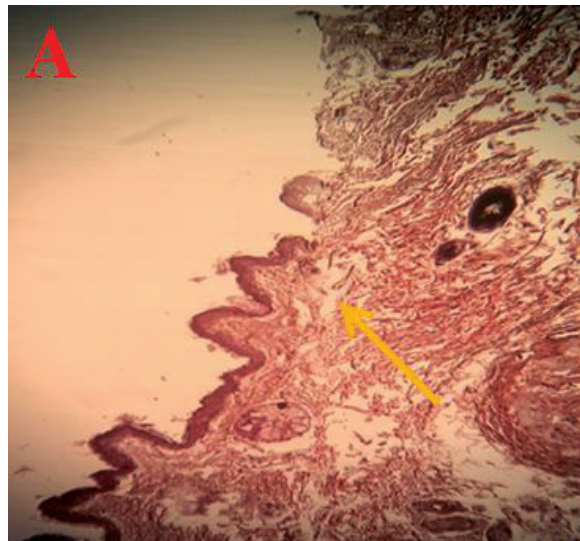


Fig. 4: Histological cross section 21th day wound healing show: (A) increase of vascular density and collagen bundle (→). (B) wounds kept plentiful fibroblasts and collagen bundles, through rich neovascularization (→) (H &E stain) 40X.

The results of the systematic evaluation and histological investigation exposed that the wound healing time for the PRP treatment group was shorter than the control group.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the College Scientific Committee (Faculty of Veterinary Medicine, University of Kerbala) to use the rabbits in this study for evaluate skin healing.

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Effect of Using Prebiotic (Dandelion) and Probiotic (*Bacillus subtilis*) on Some Physiological and Immunological Traits of Broiler Chicken

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ABSTRACT

This study was aimed to investigate the effect of probiotic (*Bacillus subtilis*), prebiotic as dandelion plant (*Taraxacum Officinale*) or combination (synbiotic) on the improvement of cellular and humeral immunity and broiler performance. A total of 320 straight run one-day broiler chicks Ross 308 were distributed randomly to four treatments were design into 4 replicates. Each replicate was subdivided to 20 birds/pen. The control group (CON) fed basal diet without any additives. The dandelion group (DA) fed (10g/kg) dandelion as prebiotic with basal diet. The *Bacillus subtilis* group (BS) fed (3×10^5 cfu/kg) (300 ppm) *Bacillus subtilis* as probiotic with basal diet. Meanwhile, the combination group (DA-BS) fed 10g/kg dandelion and 3×10^5 cfu/kg (300 ppm) *Bacillus subtilis* with basal diet. Blood samples were collected on days 9, 20, 35 of the study. The groups given (DA-BS), (DA), and (BS) respectively showed lower significance ($P \leq 0.05$) of cholesterol, triglycerides TG, LDL, and vLDL, also liver enzymes AST, ALT and ALP compare with the (CON). However, HDL was increase significantly ($P \leq 0.05$). The improvement of immune response and broiler performance was showed that CD4, CD8 and CD4/CD8 ratio and IgG titer against Newcastle Disease ND were improve significantly ($P \leq 0.05$) in the (DA-BS), (DA), and (BS) groups respectively compare with the (CON). Live body weights (BW), Body weight gain (WG), Feed intake (FI), and Feed conversion ratio (F.C.R.) were improve in the (DA-BS), (DA), and (BS) groups respectively compare with the (CON). In conclusion, adding of the probiotic and the prebiotic as combination (synbiotic) to broiler chicken' basal diet given the higher immune response by enhancing cellular and humeral immunity. In addition, improving lipid profile, liver enzymes and broiler performance.

Keywords: Broilers, probiotic, prebiotic, symbiotic, lipid profile, liver enzyme, cellular and humeral immunity.

INTRODUCTION

Antibiotic growth promoters AGPs usage in European Union were baned on 2006¹. Therefore, it has been appeared subclinical necrotic enteritis beside of dysbacteriosis that led to poor performance have been reported by (Huyghebaert *et al.*)².

Researchers focus on natural material that have positive impact on animal health and production like probiotic and prebiotic, synbiotic, essential oil, herbal and organic acids^{3,4,5,6,7,8,9,10}. Probiotics act to enhance the body health by promoting mucin secretion.

Mucin is a glycoprotein and major constituent of the epithelial mucous. It acts to improve barrier function and competitive exclusion of pathogenic bacteria¹¹. Probiotic enhance antimicrobial substances production by producing lactic acid and acetic acid which capable to lower of the intracellular PH of bacteria leading to the cell death¹². In addition, probiotic bacteria have been reported to exert an immunomodulatory effect by ability to interact with epithelial, dendritic, monocyte/macrophage and lymphocyte cells through pattern recognition receptors (PRRs)¹³. The use of probiotic can be disintegrating of bile salts and deconjugate the activity of acetic acid and lactic acid that led to reduce the PH of the intestinal tract then reducing the cholesterol concentration¹⁴. Another explanation, who found that probiotic microorganisms inhibit hydroxymethyl-glutaryl-coenzyme A (HMG-CoA). It acts as an enzyme

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responsible for in the cholesterol synthesis pathway lead to decrease cholesterol synthesis¹⁵.

Dandelion (*Taraxacum Officinale*) is a well-known herbal medicine. Inulin is the most commonly and most effective substance in dandelion⁵. The presence the β -glycosidic bond in inulin specific structure, it is not hydrolysis by the digestive enzymes in the upper GIT of monogastric animals and human¹⁶.

Prebiotic such as fructooligosaccharide and inulin are indigestible, viscous, fermented compound and soluble that participate to hypocholesterolemia by two mechanisms: short-chain fatty acid production (SCFAs) based on selective fermentation by intestinal bacterial microflora and decrease cholesterol absorption accompanied by enhanced cholesterol excretion via feces¹⁷. Also, Inulin lower the level of blood cholesterol by inhibiting the activity of HMG-CoA (hydroxymethylglutaryl-CoA) reductase¹⁸. This study was aimed to investigate the effect of probiotic, prebiotic or combination (synbiotic) on the improvement of cellular and humeral immunity, lipid profile and liver enzymes; in addition, the body health and broiler performance.

MATERIAL & METHOD

Bird, housing and feeding: A total of 320 straight run one-day broiler chicks Ross 308 were distributed randomly to four treatments were design into 4 replicates. Each replicate was subdivided to 20 birds/pen. The control group (CON) fed basal diet without any additives. The dandelion group (DA) fed 10g/kg dandelion as prebiotic with basal diet. The *Bacillus subtilis* group (BS) fed (3×10^5 cfu/kg) 300 ppm *Bacillus subtilis* as probiotic with basal diet. The combination group (DA-BS) fed 10g/kg dandelion and 3×10^5 cfu/kg 300 ppm *Bacillus subtilis* with basal diet. Feed and water provided *ad Libitum* to the end of the study. All chicks received starter diet from (1-21 days) and finisher diet from (22-35 days). The starter and finisher diet of the experiment were prepared as mash and were met the NRC requirements¹⁹ (table 1.).

Table 1: Ingredients and nutrients composition of starter and finisher diets

Ingredients	Starter % (1-21 days)	Finisher % (22-35 days)
Corn	56	59
Soybean	33.5	33

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Flour	5	2
Corn oil	1.5	2.5
Provimi Premix	2.5 (starter premix 3088)	2.5 (finisher premix 3110)
alculation composition	100%	100%
Crude protein CP%	21	20.27
Crude fiber CF%	2.77	2.74
Calcium Ca%	0.961	0.919
AV-phosphorus	0.42	0.371
ME poultry kcal/kg	2.959	3043
AV-methionine	0.47	0.42
AV-TSAA	0.74	0.68
AV-threonine	0.63	0.61
AV-Lysine	1.18	0.98
Electrolytes	263	241.12

Premixes 3088 and 3110 were used manufactured by (Provimi Jordan Co. Amman, Jordan).

Drugs therapy and vaccination program: There is no drug therapy was used on the day of hatch. All birds were vaccinated with commercial ND and IB Disease attenuated vaccine NOBILIS® MA5 + CLONE 30 at 10 days of age by spray method. Then, all birds were vaccinated with Nobilis® Gumboro D78 by drinking water at 14 days of age. All vaccines were from MSD Animal Health Company

Blood samples and laboratory analysis: All blood samples were collected at days 9, 20, and 35 of age from five birds in each replicate randomly were obtained from the wing vein in a test tube with EDTA anticoagulant and without anticoagulant. Test tubes of EDTA anticoagulant were used to estimate CD4, CD8 and CD4/CD8 ratio by using flow cytometry technique. Other tubes without anticoagulant were allowed to clot and centrifuged for 10 minute/ 3000 rpm. Serum was collected and stored in deep freeze (-20) until analysis. Blood serum were used to determine ELISA antibody titer against ND disease vaccine, liver enzymes and lipid profile²⁰.

Statistical analysis: Data were analyzed with one-way ANOVA test by using the general linear model (GLM) procedure SPSS 22.0 software²¹. Four treatment means were separated using a "protected" Duncan's analysis in level (0.05).

RESULTS & DISCUSSIONS

Our results of the current study showed a significant decreased ($P \leq 0.05$) in serum cholesterol, triglyceride, VLDL, and LDL, also liver enzymes AST, ALT and ALP of the (DA-BS), (BS), and (DA) groups respectively; however, HDL was increase significantly ($P \leq 0.05$) in the same groups (table 2).

Table 2: The effect of probiotic, prebiotic and symbiotic on liver enzymes and lipid profile at 35 days of the study (Mean $\pm$ SE)

Parameters	Treatments			
	CON	DA	BS	DA-BS
Cholesterol (mg/dl)	190.00 $\pm$ 1.83 A	116.00 $\pm$ 1.31 B	116.00 $\pm$ 2.09 B	88.60 $\pm$ 1.31 C
Triglyceride (mg/dl)	127.40 $\pm$ 2.98 A	106.40 $\pm$ 1.58 B	97.00 $\pm$ 2.73 B	94.60 $\pm$ 2.69 B
HDL-CH (mg/dl)	74.40 $\pm$ 1.72 A	57.20 $\pm$ 1.50 B	51.20 $\pm$ 2.82 B	44.00 $\pm$ 1.67 C
VLDL-CH (mg/dl)	24.68 $\pm$ 1.88 A	21.28 $\pm$.918 B	19.68 $\pm$.659 C	22.52 $\pm$ 1.41 AB
LDL-CH (mg/dl)	81.40 $\pm$ 1.20 A	51.92 $\pm$ 1.79 B	42.52 $\pm$ 1.376 C	42.64 $\pm$ 1.114 C
AST (U/100ml)	23.80 $\pm$ 1.93 A	22.40 $\pm$ 1.20 AB	21.40 $\pm$ 1.86 BC	19.40 $\pm$ 7.48 C
ALT (U/100ml)	20.20 $\pm$ 1.02 A	13.60 $\pm$ 1.96 C	17.00 $\pm$ 7.07 B	13.60 $\pm$ 9.27 C
ALP (U/100ML)	269.20 $\pm$ 1.09 A	243.60 $\pm$ 4.79 A	215.00 $\pm$ 1.69 B	200.40 $\pm$ 2.08 B

Different letters represent a significant difference at ($p \leq 0.05$).

Cellular immunity CD4, CD8 and CD4/CD8 ratio and humeral immunity IgG titer against ND were improved significantly ($P \leq 0.05$) in the (DA-BS), (DA), and (BS) groups respectively compare with the (CON) (table 3 and 4).

Table 3: The effect of probiotic, prebiotic and symbiotic on cellular immunity at 9 and 20 days of the study (Mean $\pm$ SE)

Parameters	Days	CON	DA	BS	DA-BS
CD4%	9 day	18.33 $\pm$ 0.88 C	20.07 $\pm$ 2.11 BC	25.95 $\pm$ 2.29 B	36.03 $\pm$ 3.26 A
CD8%		14.02 $\pm$ 1.38 C	19.82 $\pm$ 1.59 B	16.46 $\pm$ 0.68BC	25.86 $\pm$ 1.12 A
CD4/CD% ratio		3.98 $\pm$ 0.69 C	5.03 $\pm$ 1.15 BC	6.54 $\pm$ 0.83 AB	8.45 $\pm$ 0.22 A
CD4	20 day	0.33 $\pm$ 0.05 C	1.35 $\pm$ 0.10 B	1.88 $\pm$ 0.27 AB	2.30 $\pm$ 0.29 A
CD8		13.40 $\pm$ 0.50 C	17.94 $\pm$ 1.67 B	18.06 $\pm$ 0.65 B	29.08 $\pm$ 1.18 A
CD4/CD8% ratio		0.12 $\pm$ 0.03 C	0.72 $\pm$ 0.06 AB	0.62 $\pm$ 0.07 B	0.89 $\pm$ 0.04 A

Different letters represent a significant difference at ($p \leq 0.05$).

Table 4: The effect of probiotic, prebiotic and symbiotic on humeral immunity (IgG titer against ND vaccine) at 9 and 20 days of the study (Mean $\pm$ SE)

Parameter	Days	CON	DA	BS	DA-BS
ELIZA IgG	9 day	2039 $\pm$ 21.1 C	2533 $\pm$ 19.98 B	2491.80 $\pm$ 32.48 B	3918.20 $\pm$ 37.84 A
ELIZA IgG	20 day	4120 $\pm$ 36.19 D	6447.80 $\pm$ 21.42 B	5874.60 $\pm$ 23.99 C	7984.80 $\pm$ 34.32 A

Different letters represent a significant difference at ($p \leq 0.05$).

A significant ($P \leq 0.05$) difference was recorded for broiler chickens' performance. Live body weights (BW), Body weight gain (WG), Feed intake (FI), and Feed conversion ratio (F.C.R.) were improve in the (DA-BS), (DA), and (BS) groups respectively compare with the (CON) (table 5).

Table 5: Effect of Probiotic, Prebiotic, and Synbiotic on BW, WG, FI, and FCR at day 35 of the study (Mean $\pm$ ES)

35 days	Treatments			
	CON	DA	BS	DA-BS
BW(gm)	1815 $\pm$ 3.1C	1903 $\pm$ 2.21B	1952 $\pm$ 2.98AB	2092 $\pm$ 1.97A
WG (gm)	583 $\pm$ 2.8C	604 $\pm$ 3.12C	650 $\pm$ 3.2B	693 $\pm$ 2.85A
FI (gm)	1088 $\pm$ 2.44B	1100 $\pm$ 3.1B	1201 $\pm$ 3.44A	1222 $\pm$ 2.45A
FCR	1.87 $\pm$ 0.006A	1.82 $\pm$ 0.004AB	1.85 $\pm$ 0.006 AB	1.76 $\pm$ 0.004B

Different letters represent a significant difference at ($p \leq 0.05$).

The decrement of serum cholesterol, triglyceride, LDL and VLDL with an increment of the HDL levels may be probiotic produce short-chain fatty acids (lactic acid and acetic acid) which capable to lower the intracellular PH. Lower PH act to deconjugate of bile salt from lipid in the GIT then decrease lipid absorption and bile reabsorption. Our results are agreement with²² who reported that *B. subtilis* supplementation led to reduce abdominal fat could be result from decrease of Acetyl-Co A carboxylase enzyme activity of fatty acid synthesis.

Also, the improvement of lipid profile may be attributed to fermented of inulin in the colon by large bowel bacteria resulting in short-chain fatty acids production such as propionate, acetate and butyrate that led to reduce intestinal PH. In addition, Inulin supplement can inhibit the activity of HMG-CoA (hydroxymethylglutaryl-CoA) reductase and modified the gene expression of lipogenic enzyme. In recent studies showed that prebiotic supplementation led to reduce serum cholesterol concentration in chicken after administrated of chicory^{23,24}. The cholesterol reduction was observed with the dandelion supplementation may be dandelion have a rich with glycoside, phenolic compound, alkaloids, flavonoid and tannins.

The improvement of immune response and broiler performance may be due to probiotic increase mucin secretion which improve barrier function and competitive exclusion of pathogenic bacteria on receptor sites and availability nutrients. Probiotic enhance lactic acid and acetic acid production antimicrobial substances which capable to lower of the intracellular PH of bacteria leading to the cell death. Probiotic bacteria have exerted an immunomodulatory effect to interact with monocyte/macrophage, dendritic, epithelial and lymphocyte cells.

CONCLUSION

Adding of the probiotic and the prebiotic as combination (synbiotic) to broiler chicken' basal diet given the higher immune response by enhancing cellular

and humeral immunity. In addition, improving lipid profile, liver enzymes and broiler performance.

Conflict of Interest: This research is a personal non-profit work and there is no conflict of interest.

Source of Funding: None.

Ethical Clearance: Ethical clearance was obtained from the College Scientific Committee (Faculty of Veterinary Medicine, University of Kerbala) to use the poultry chickens in this study for evaluate humeral and cellular immunity, lipid profile, liver enzymes and broiler performance.

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The Role of Vitamin D Supplementation in Allergic Rhinitis Management

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ABSTRACT

Background: In recent years, the increase in the incidence of allergic diseases worldwide is often associated with vitamin D deficiency. This study aimed to see the effect of additional therapy of vitamin D on the specific immunoglobulin E (IgE) levels of allergic rhinitis patients.

Materials and Method: It was an experimental research with pre and post test design group control design. This study involved 40 patients with allergic rhinitis that positive for Der p allergen in skin prick test, divided into 2 groups. Group I was 20 patients receiving intranasal fluticasone spray and vitamin D 2x400IU/day for 21 days. Group II is 20 patients who only get fluticasone intranasal spray therapy for 21 days. Both groups of patients examined the levels of 25(OH)D and specific IgE Der p pre and post therapy.

Results: Examination of 25(OH)D and specific IgE Der p was done by enzyme-linked immunosorbent assay (ELISA) method. From the analysis of demographic characteristics of the subjects in each group showed no significant difference ($p > 0.05$) between the two groups based on sex and age of the patient. The results of the Mann-Whitney test showed significant difference ($p < 0.05$) between the two groups, where the specific IgE level decreased more in the vitamin D group than in the non-vitamin D group.

Conclusion: There is a significant correlation between changes in levels of 25(OH)D and specific IgE Der p levels of patients with allergic rhinitis, where the increasing levels of 25(OH)D caused decreasing of specific IgE Der p levels.

Keywords: Allergic Rhinitis, Vitamin D, 25(OH)D, Specific IgE Der p

INTRODUCTION

Today, allergic rhinitis is a global health problem that affecting 10-25% of the population worldwide where its prevalence continues to increase.^{1,2} In recent years, an increased incidence of allergic diseases worldwide is often associated with vitamin D deficiency.³ Vitamin D is an essential nutrient that humans acquire through sun exposure, diet and dietary supplements. Ultraviolet

B radiation (UVB) photolysis 7-dehydrocholesterol in the skin to previtamin D₃, which is then converted to vitamin D₃ (cholecalciferol). Cholecalciferol from the skin and diet will experience hydroxylation in the liver into 25-hydroxyvitamin D₃ (25(OH)D) and stored in the liver. Vitamin D levels are known by measuring serum or plasma levels of 25(OH)D, which is the most widely obtained form in the circulation. The half-life of 25-hydroxyvitamin D is about 3 weeks in circulation. Levels of 1,25-hydroxyvitamin D can be normal or even elevated in vitamin D deficiency states so it can not be used to measure the patient's calciferol status.^{5,6}

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Vitamin D works by binding to its high affinity receptor. This receptor is known as the Vitamin D Receptor (VDR). The association between calciferol and VDR will stimulate interaction with Retinoic acid X Receptors (RXR) to form heterodimer complex (VDR-

RXR). This complex bond will then bind to the specific DNA located in the target gene and known as VDRE. The VDR-RXR and VDRE bonding complex will caused gene transcription through the release of co-repressor (SMRT, NCOR) which subsequently withdraws the nuclear receptor co-activation protein.^{6,7}

IgE is an antibody that plays a major role in the type I hypersensitivity reaction. Regulatory resistance of IgE occurs through transcriptional mechanism of ϵ germline transcription. This process begins with the 25(OH)D binding to its receptor VDR, which then binds to RXR and VDRE on the target genes and forms a heterodimer complex. The target of the gene known as I ϵ is the area where transcription ϵ germline took place. The heterodimer bond complex will then draw the SMRT co-repressors, then draw HDAC1 and HDAC3 to join on I ϵ . It is now known that the role of HDAC in the body's immune system. HDAC has a role in maintaining the balance of Th1 and Th2. The complex of VDR-RXR-VDRE-co-repressor SMRT-HDAC1 and HDAC3 formed causes DNA chromatin condensation and transcription process ϵ germline is inhibited until CSE IgE process does not occur.^{8,14}

This study aims to examine the effect of additional therapy of vitamin D on specific IgE Der p levels of patients with allergic rhinitis.

METHOD

Research Site: This research was conducted in the outpatient unit of ENT department Dr. Wahidin Sudirohusodo hHospital Makassar starting from August 2017 until October 2017. Processing of research result is done at laboratory of Education Hospital of Hasanuddin University Makassar.

Design and Research Variables: The design of this study is experimental study with pre test design and post

test control group design. The independent variable in this study was vitamin D, while the dependent variable was specific IgE Der p levels.

Samples: The sampling technique was performed randomly. In this study patients that positive with Der p allergen in Skin Prick Test were divided into 2 groups with the number of patients each group was 20 patients, thus total patients as many as 40 people. Patients included in the first group received fluticasone nasal spray and vitamin D 2x400IU oral therapy per day for 21 days, while the second group received only fluticasone nasal spray without vitamin D for 21 days. Patients from both groups were examined for 25(OH)D and specific IgE Der p pre and post therapy.

Exclusion Criteria: Having a history of kidney disease, liver, rickets, colorectal carcinoma and mamae, as well as autoimmune diseases such as systemic lupus erythematosus, taking immunomodulators, history of immunotherapy, history of vitamin D consumption in the past 1 month.

Drugs: The drug that we used is vitamin D ® GNC VITAMIN D-3 400, with a given dose of 2x400 IU (total of 800 IU/oral/day), given for 21 days (3 weeks).

Statistical Analysis: Data were analyzed using Statistical Package for Social Sciences (SPSS) software (version 23.0 for Windows; SPSS Inc, Chicago, IL).

Research Ethics Aspect: The study was obtained from Biomedical Research Ethics Committee on Human Faculty of Medicine Universitas Hasanuddin (Register No. 600/H4.8.4.5.31/PP36-KOMETIK/2017).

RESULTS

Characteristics of Population: Characteristics of the study population were shown in Table 1. The results of the analysis showed no significant difference ($p > 0.05$) between the two groups based on gender and age of the patient.

Table 1: Demographic Characteristics of Research Subjects in Each Group

Characteristics	Groups		p
	With Vitamin D (n = 20)	Without Vitamin D (n = 20)	
Age (years)	34,8 ± 10,2	30,8 ± 8,5	0,182*
Gender (M/F)	9/11	10/10	1,000**

*independent t test; **chi-square test

Levels of 25(OH)D: The summary of the analysis of results in Table 2 showed a significant increase of 25(OH)D levels ($p < 0.05$) in the serum group of vitamin D by 13.7%, while in the group without vitamin D actually decreased 5.1% ($p < 0.05$). The results of the Mann-Whitney test showed significant difference between the two groups. Levels of 25(OH) D increased significantly in the group given vitamin D.

Table 2: Comparison of Changes in 25(OH)D Serum Between the Two Groups

Groups	Changes of 25(OH)D Serum Levels (ng/mL)				p*
	Pre (Median?)	Post	Changes	Median % of Increasing	
With Vitamin D	14,92 ± 3,40	17,37 ± 2,64	2,46 ± 1,91	13,7% ^b	<0,001
Without Vitamin D	15,26 ± 3,23	14,56 ± 3,63	0,70 ± 0,92	-5,1% ^a	0,005

*Wilcoxon test; **Mann-Whitney U test if superscript on the median % changes column is the same, it means that Mann Whitney U test results not significantly changes ($p > 0,05$); if different it means significantly difference ($p < 0,05$).

Immunoglobulin E Specific Der p: Table 3 shows a significant decrease ($p < 0.05$) at specific IgE Der p levels of serum group vitamin D by 48.7%, while in the group without vitamin D only decreased by 0.81% and not

significant ($p > 0.05$). The results of the Mann-Whitney test showed significant difference ($p < 0.05$) between the two groups. Specific IgE levels of Der p decreased more in the vitamin D group than in the non-vitamin D group.

Table 3: Comparison of changes in specific IgE levels Der p between the two groups

Groups	The Changes of Specific IgE Der p levels (kU/I)				p*
	Pre	Post	Changes	Median % of Decreasing	
With Vitamin D	21,95 ± 15,68	10,72 ± 6,89	-(11,23 ± 12,80)	48,7% ^b	<0,001
Without Vitamin D	17,97 ± 10,07	17,41 ± 9,78	-(0,56 ± 1,17)	0,81% ^a	0,078

*Wilcoxon test; **Mann-Whitey U test, if superscript median % changes column is the same, it means that the result of Mann Whitney U test not significantly different ($p > 0,05$); if different it means significantly different ($p < 0,05$).

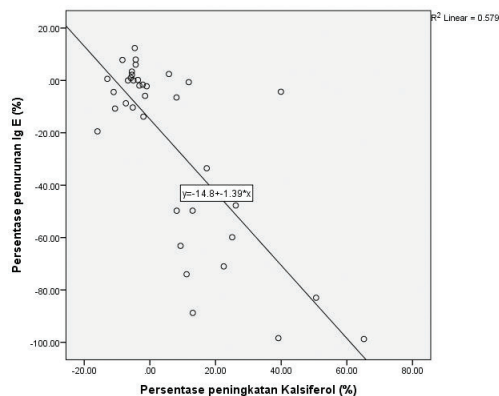
Relationship Between 25(OH)D With Specific IgE Der p: The summary results of bivariate correlation analysis (Pearson correlation) and partial correlation in table 4 show

that there was significant correlation ($p < 0.05$) between% serum calciferol level change with% change of specific IgE Der p level with partial correlation coefficient of $r = -0,503$.

Table 4: Correlation between Percentage Changes in Calciferol and IgE Specific Der p

Correlation between variables	Bivariat Correlation	Partial Correlation
	Correlation Coefficient r dan p	Correlation Coefficient r dan p
% change of klasiferol level with IgE Specific	$r = -0,746$ dan $p < 0,001$	$r = -0,503$ dan $p = 0,001$

From graph 1 can be seen the relationship between percentages increased of calciferol with decreased of specific IgE Der p. The more increasing of levels of 25(OH)D, the more decreasing the levels of specific IgE Der p.

**Graph 1: Scatter Plot Graph Between Percentage of 25(OH)D Increasing and Percentage of Specific IgE Der p Decreasing**

DISCUSSION

In this study we found insufficiency of 25(OH)D before therapy. Research conducted by Arshi⁹ (2012) showed that serum 25(OH)D levels in patients with allergic rhinitis were significantly lower than normal people. This suggests that vitamin D has a role in inflammatory regulation based on type 1 hypersensitivity reactions and mediated by specific IgE. In vitro studies conducted by Pichler¹⁰ (2002) and Staeva-Vieira¹¹ (2002) demonstrated that IL-4 production would be inhibited by 25(OH)D so that Th2 differentiation would decrease. A study conducted by Penna¹² (2008) found that IL-10 may rise up to 7-fold in dendritic cells given vitamin D, high levels of IL-10 prevent mast cell degranulation.

Most of the research sample work is office workers, students and housewives who are more in the room, causing a lack of exposure to ultraviolet light. This

may lead to low 25(OH)D levels in both groups. After therapy, there was an increase in serum 25(OH)D levels in the first group by 13.7%. While in the group not given vitamin D found a decrease in serum 25(OH)D level of 5.1%. This shows a significant difference of change between the two groups.

From the observation of specific IgE Der p, there was a significant decrease in specific IgE Der p levels in serum by 48.7% in the first group given vitamin D supplementation. While in the group not given vitamin D there was also a decrease of 0.81 % but not meaningful. Research conducted by Milovanovic⁸ (2011) suggests that vitamin D has a major role in inhibiting IgE regulation through transcriptional & germline barrier mechanisms.

In this study, bivariate correlation (Pearson correlation) and partial correlation found significant correlation between percentage change of serum vitamin D levels with percentage change of specific IgE levels which found that the higher the increasing of serum vitamin D level, the lower the specific IgE level. This is in contrast to the results of a study conducted by Tamasauskienė¹³ (2014) which states that there is no significant correlation between total IgE levels and vitamin D serum levels.

The limitations of this study are that specific IgE constraints may also be caused by IFN γ , BCR, CTLA4, and IL-21. In this study these factors are not examined. Research done by examining the above cytokines can clarify the relationship between 25(OH)D serum and specific IgE. In this study additional vitamin D therapy was given for 21 days. Same with research conducted by Modh³ (2014) which also provides vitamin D supplement for 21 days. Until now, it has not been known how long period of effective intake of vitamin D that can significantly decreasing specific IgE levels. More research is needed on this subject.

CONCLUSIONS

Through this study it can be concluded that there is a significant relationship between specific IgE of Der p levels with 25(OH)D serum levels, whereas the higher levels of 25(OH)D, the lower the specific IgE Der p levels. In this study it can also be concluded that the addition of vitamin D supplementation may decrease the specific IgE Der p level of patients with allergic rhinitis.

RECOMMENDATION

Due to the limitations in this study, further research is needed to clarify the relationship between vitamin D and specific IgE.

Conflict of Interest: There is no conflict of interest

Source of Funding: Researcher (Self)

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A Relationship between Knowledge, Attitude, and Practice about Balanced Nutrition Guidelines and Metabolic Syndrome among Central Obese Teachers in Makassar

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ABSTRACT

Metabolic Syndrome prevalence increase included in the Asia Pacific. This study aimed to assess a relationship between knowledge, attitude, and practices about balanced nutrition guidelines and metabolic syndrome (Mets) in high school teacher with central obese. This was a cross-sectional study conducted in twelve high schools in Makassar city. Subjects were 129 teachers (28 men and 101 women) diagnosed with central obese. Knowledge, attitude, and practice (KAP) assessed by a validated questionnaire. Mets was defined by measuring blood glucose, blood pressure, HDL, triglycerides, and waist circumference. Those fulfilled three parameters or above were stated as Mets group, and others were stated as Risk group. KAP was categorized according to score and divided into low (Q1), moderate (Q2), and high (Q3). Chi-square test was used to assess the relationship. Subjects were mostly women (78,3%), Buginese ethnic (66,7%), and married (96,1%). KAP was distributed evenly to three categories for each variable. The relationship between Knowledge and Mets was borderline significant ($p=0.093$). There were not significantly different between attitude and Mets ($p=0.406$). However, there were significantly different between practice and Mets ($p=0.016$). These adequate knowledge and practice were higher in Mets group compared to Risk group. This study also showed some practices of balanced nutrition guidelines were very low whereas adequate consumption of vegetables and fruits (0.8%), adequate consumption of protein (25.6%), less consume a variety of staple foods (6.2%), less consumption of sweet, salty and fatty foods (2,3%), reading labels on food packaging (32,8%), and perform adequate physical activity and maintain a normal weight (28,2%). We conclude that the teacher in Mets group showed better knowledge and practice of balanced nutrition guidelines compared to Risk group.

Keywords: *Non-communicable diseases, developing countries, vegetables, and fruits.*

INTRODUCTION

Metabolic syndrome is a collection of metabolic disorders that can increase the risk of non-communicable diseases including heart disease and diabetes mellitus.¹ Metabolic disorders that including increasing fasting blood sugar, decreases HDL levels, increasing triglyceride levels, hypertension and central obesity,

which having at least 3 of these parameters called Mets.² Data shows that there is an increase in the prevalence of Mets where 20-30% was an adult groups.³

Knowledge, attitudes and practices about nutrition that are lacking are the causes of the increasing risk of non-communicable diseases.^{4,5} Knowledge is important in determining which foods will be chosen for consumption which will have an impact on health. Practicing proper nutrition can have a positive impact on various blood metabolic parameters.^{6,7}

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Balanced nutrition guidelines are a government effort to overcome various nutritional problems in Indonesia.⁸ This guide contains 10 main messages, including messages related to food and the practice of

clean and healthy living. The application of balanced nutrition messages is expected to be able to prevent an increase in non-communicable diseases in Indonesia.

South Sulawesi is the province with the highest prevalence of stroke in Indonesia where the main risk factor is Mets.⁹ The study of the metabolic syndrome in Indonesia is still very little. Research on knowledge, attitudes and practices of balanced nutrition towards the metabolic syndrome has not been widely performed. This research will contribute to the provision of information, especially about the knowledge, attitudes and practices of balanced nutrition guidelines issued by the Indonesian Ministry of Health related metabolic syndrome in obese secondary school teachers in Makassar.⁸

MATERIALS AND METHOD

Research design: This was a cross sectional study design conducted in 12 secondary schools in the Makassar city. Of these, 386 people interviewed and measured their anthropometry (weight, height, waist circumference) for central obesity screening. As a result, 229 teachers experienced central obesity (59.3%). Only 151 teachers were willing to take blood ($n = 72$ negative responses). For analysis, we excluded samples who had been diagnosed with heart disease and diabetes mellitus ($n = 22$ people). The total number of samples we analyzed were 129 teachers (28 men and 101 women).

Knowledge, attitude and practice measure by validated questionnaire. Knowledge questionnaire ($r = 0.790$), attitude ($r = 0.737$), and practice ($r = 0.769$). Data was taken by nutrition students in Hasanuddin University Faculty of Public Health.

Metabolic Syndrome: Metabolic syndrome is defined by a joint interim of International Diabetes Federation Task Force on Epidemiology and prevention; National Heart, Lung and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; and International association for the Study of Obesity.¹ According to this definition, triglyceride levels ≥ 150 mg/dl, HDL < 40 mg/dl for men and < 50 mg/dl for women, fasting blood sugar ≥ 100 mg/dl, blood pressure $\geq 130/85$ mmHg is said to be greater risk. Central obesity is determined by Asian ethnicity which is risky if ≥ 90 cm in men and ≥ 80 cm in women. Having 3 of this parameters categorized as metabolic syndrome group and other stated as risk group. Abdominal circumference is measured using the waist

ruler of one Med Brand. Blood pressure is measured by using mercury tensiometer. HDL examination using homogenous enzymatic colorimetric assay method, triglyceride examination using enzymatic colorimetric, fasting blood glucose examination by HK method (Hexokinase).

The study was conducted in compliance with the Declaration of Helsinki. All of the procedures involving human subjects were approved by the Medical Ethics Research Board of Hasanuddin University (No. UH 16111123). Written consent was obtained from the participants before the study began.

Data analysis was performed using SPSS version 17. Descriptive analysis was conducted to describe the demographic condition of respondents, and bivariate analysis, to see the relationship between knowledge, attitudes and practice of balanced nutrition with metabolic syndrome.

RESULTS

There were 129 teachers who became respondents in this study. Most (78.3%) of respondents are women, and included in the bugis ethnicity (66,7%). Majority (92.4%) of respondents are Muslim with education was S1/S2/S3 (81.4%) and most (96.2%) of respondents had married status.

Table 1 shows the relationship between knowledge, attitudes and balanced nutrition practices with Mets. From table, it can be seen that there is a significant relationship between balanced nutrition practices and metabolic syndrome. ($p = 0.016$). Respondents who have high balanced nutrition practices experience more of the metabolic syndrome than those who have less practice (46.2% and 23.4%). Knowledge has a borderline relationship with the metabolic syndrome ($p = 0.093$) and there is no significant relationship with the metabolic syndrome ($p = 0.406$).

Table 2 shows that there are several messages of balanced nutrition guidelines which are still very poor practice, namely eat a plenty of vegetables and fruits (0.8%); adequate consumption of protein (25.6%); less consume a variety of staple foods (6,2%); less consumption of sweet, salty and fatty foods (2,3%); reading labels on food packaging (32,8%), and perform adequate physical activity and maintain a normal weight (28,2%). Knowledge and attitudes in all balanced nutrition guidelines are good ($>60\%$).

Table 1: Relationship between knowledge, attitudes, practice of Balanced Nutrition Practices and METS

Variable	Metabolic syndrome (n = 52)		Risk Metabolic syndrome (n = 79)		p-value
	n	%	n	%	
Knowledge					
Low	15	35.7	27	64.3	0.093
Moderate	11	28.9	27	71.1	
High	25	51.0	24	49.0	
Attitude					
Low	20	45.5	24	54.5	0.406
Moderate	17	41.5	24	58.5	
High	14	31.8	30	68.2	
Practice					
Low	11	23.4	36	76.6	0.016
Moderate	22	51.2	21	48.8	
High	18	46.2	21	53.8	

Table 2: The correct answer from the components of Knowledge, attitudes, and balanced nutrition practices

Variable	Knowledge (n = 129)		Attitude (n = 129)		Practice (n = 129)	
	n	%	n	%	n	%
Be grateful and eat wide variety of foods	83	64.3	79	61.2	120	93.0
Eat a plenty of vegetables and fruits	121	93.8	101	78.3	1	0.8
Adequate consumption of protein	85	65.9	95	73.6	33	25.6
Get used to consume a variety of staple foods	97	75.2	99	76.7	6	6.2
Limit intake of sweet, salty, and fatty foods	96	74.4	89	69.0	3	2.3
Get used to breakfast	47	36.4	126	97.7	73	56.6
Get used to drink enough water and safe	77	59.7	105	81.4	91	70.5
Get used to reading labels on food packaging	81	62.8	117	90.7	42	32.8
Wash your hands with soap and running water	121	93.8	110	85.3	95	73.6
Perform adequate physical activity and maintain a normal weight	111	86.0	104	80.6	36	28.2

DISCUSSIONS

Balanced nutrition practices have a significant relationship with incident of metabolic syndrome, while knowledge has a borderline relationship with the metabolic syndrome, and attitude was not significant related with incident of metabolic syndrome among Respondents. This research was conducted in a group of adults whose work was teacher. This group majority of education was quite high (S1/S2/S3 = 96.9%). Having higher education is related to high knowledge about health.^{10,11}

Respondents having metabolic syndrome have high practice of balanced nutrition guidelines. Some respondents who are experiencing pain aware and

willing to change their lifestyle, including in eating and physical activity.¹² This study was conducted in a group of teachers who have been detected as having central obesity so that balanced nutrition practices have mostly been carried out, although they have not shown positive results in the parameters of the metabolic syndrome.

This study has similarity result with a study conducted by O'Brien and Davis in Ireland. They found no relationship between knowledge and BMI. People who have obese have better knowledge of choosing food than people with normal BMI. This shows that knowledge is important, but does not directly affect behavior change.¹³

Balanced nutrition guidelines prepared by the Indonesian Ministry of Health in 2014 in an effort to reduce the prevalence of NCDs in Indonesia. This guide consists of 10 balanced nutrition messages namely be grateful and eat wide variety of nutritious foods; eat plenty of vegetables and fruits; get used to take side dishes that contain high protein; get used to consume a variety of staple foods; limit intake of sweet, salty and fatty foods; get used to breakfast; get used to drink enough water and safe; get used to reading labels on food packaging; wash your hands with soapy water and running water; perform adequate physical activity and maintain a normal weight.⁸

Balanced nutrition practice on each message is still very lacking. The habit of eating vegetables and fruit is quite the lowest practice. Consumption of 3 servings of vegetables and 2 servings of fruit a day is a sufficient condition in the message of balanced nutrition. Increasing consumption of vegetables and fruit can reduce the risk of various NCDs.¹⁴ Eating unhealthy food is often done at work, including in the group of teachers.¹⁵

Another message that is still very lacking in practice is limiting the consumption of sweet, salty and fatty foods. Consumption of sweet, salty and fatty foods is associated with increased risk NCDs.¹⁶ Our respondents was almost women that have preferred sweet foods.¹⁷

CONCLUSIONS

This study show metabolic syndrome related with practice of balanced nutrition guidelines. The results of this study can be used as a basic for developing educational media that emphasize balanced nutrition practices.

Conflict of Interest: There is no any conflict of interest within this study and publication

Ethical Clearance: Taken from Hasanuddin University Ethics Committee with number: 869/H4.8.4.5.31/PP36-KOMETIK/2017.

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Effective Audio Visual Aids Change the Behavior of Elementary School Students in Maintaining Dental and Mouth Health in Makassar City

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ABSTRACT

Audio Visual Aids (AVA) is one of the things that needs to be considered in conducting health promotion. Media commonly used in health promotion is audio aids, visual aids and audio-visual aids. This research was conducted with a quantitative approach, namely quasi experimental with randomized method design of two groups design by using purposive sampling method which is a design that reveals the effect of cause and effect by involving the experimental group, but the selection of the two groups is not by random technique. The population in this study were all grade IV elementary school students in SD InpresLanraki I as many as 57 students, and SD InpresTamalanrea VI as many as 33 students. So that the total population is 90 students, no sampling is taken in this study so that it is called Total Sampling. The results of this study using the Wilcoxon test found that audio visual aids was effective against changes in knowledge, attitudes and actions of elementary school students in maintaining dental and oral health (p value <0.005). While visual aids like posters affect the changes in students' knowledge and attitudes, but are not effective in changing the behavior of elementary school students in maintaining dental and oral health (p value > 0.005). Extension needs to be done by using audio visual aids such as videos so that students' knowledge of the importance of oral and dental health increases, and can change students' attitudes and actions in maintaining better oral and dental health.

Keywords: *Effectiveness, Audio Visual Aids, Posters, Behavior, Teeth and Mouth*

INTRODUCTION

Oral and dental health is important in the lives of every individual, including children, because damaged and untreated teeth and gums cause pain, masticatory disorders, and can interfere with other body health. Dental and oral problems in children can also affect the growth and development of children.^[1]

The source of dental health problems is generally closely related to the behavior of maintaining dental and

oral hygiene. Poor behavior in maintaining dental and oral hygiene will increase the risk of plaque formation on the tooth surface which can cause caries and periodontal disease. To change bad behavior, one of them is by intervening through education.^{[2], [3]}

Media is one of the things that need to be considered in conducting health promotion. Media commonly used in health promotion is audio media, visual media and audio-visual media. Audio visual media is a good medium to use, because the media involves more senses in the learning process.

According to the 2007 and 2013 Basic Health Research (Riskesdas), dental and oral health problems increased from 23.2% to 25.9%. From residents who have dental and oral health, the percentage of the population receiving dental care increased from 29.7% in 2007 to 31.1% in 2013.^{[4], [5]}

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Based on provincial data that has a high dental and oral health problem ($> 35\%$) is South Sulawesi Province when compared with other provinces in Indonesia, where in 2007 as many as 25.3% increased in 2013 to 36.2%.^[6]

According to profile data from the Makassar City Health Office in 2017 among 14 sub-districts in Makassar City, Subdistricts with SD/MI needing dental and oral health care were in the working area of the Makassar City Tamalanrea Health Center with 2,165 students divided into 895 male students - male and 1,270 female students.

Based on data obtained from the Tamalanrea City Health Center in Makassar in 2018 there were 15 elementary schools in the working area of the Tamalanrea health center in the city of Makassar. Among the 15 elementary schools there were 3 elementary schools that had dental and oral health problems, namely SD InpresLanraki I as many as 31 which were decayed missing filling tooth and 114 defective decayed exfoliated filling teeth, SD InpresTamalanrea VI as many as 15 DMF-T (decayed missing filling tooth) and 92 def-T (decayed exfoliated filling tooth), and SD InpresTamalanrea V of 21 DMF-T (decayed missing filling tooth) and 87 which are def-T (decayed exfoliated filling tooth).^[7]

Based on the previous description, it is necessary to conduct research on the effectiveness of audio visual aids on the behavior of elementary school children in maintaining dental and mouth health problems in the working area of the Tamalanrea Health Center.

METHOD

The type of research used was quasi-experiment with a pretest-posttest design only control group design, namely research by giving treatment (intervention) to the experimental group by comparing with the control group.^{[8],[9]} In this study, the experimental group received education with audio visual aids, while the control group was given visual aids education in the form of posters. Before the intervention, the pretest was performed in both groups. After giving the intervention, posttest was then carried out. This study uses questionnaires, namely data collection techniques that are carried out by giving a set of questions or statements written to the respondent to answer by sharing with each respondent at the pretest and posttest. Data collected through observation and interview. The population in this study were all grade IV

elementary school students in SD InpresLanraki I as many as 57 students, and SD InpresTamalanrea IV as many as 33 students. So that the total population is 90 students, no sampling is taken in this study so that it is called Total Sampling. Data analysis used Wilcoxon test because the distribution of data is not normally distributed.

To simplify the research process, the researcher presents a series of activities during the research process, namely: Preparation Phase, namely determining and making a research schedule, determining the research assistant and preparing the material. Implementation phase. In the initial stages of the implementation, first open the greeting, do the introductory stage, open the class with prayers led by the class leader, and attend the attendees and those who are unable to attend, and the researcher explains the purpose of arrival, purpose, topic and description about the material that will be brought.

Health Education Steps through audio visual aids, namely preparing material and supporting media, this material can be in the form of videos that contain the meaning of invitation and appeal, provide pre-test, explain the purpose and topic of the meeting to the respondent, provide health information in the form of health messages in audiovisual form related to the material importance of maintaining dental and oral health. Performed for 1 week given at regular intervals every day. The final stage was to post-test by distributing the same questionnaire during the pre-test with the aim of finding out whether there was a change in students' knowledge, attitudes and actions before and after the health education intervention was provided through audio visual aids.

Educational steps through visual media in the form of posters, namely preparing material and supporting media, giving pre-tests, explaining the objectives and topics of the meeting to the respondents, distributing posters to each respondent with the help of research assistants and ensuring the posters are evenly distributed, read back the contents posters that have been shared and suggest to the respondent to listen, pay attention and understand the contents of the poster and hope for changes in knowledge, attitudes and actions after reading the poster. The final stage was to post-test by distributing the same questionnaire during the pre-test with the aim of finding out whether there was a change in students' knowledge, attitudes and actions before and after health education interventions were given through visual aids.

The Final Stage of this Implementation is to evaluate the results by checking respondents' answers, scoring data, tabulating research data and concluding how the level of knowledge, attitudes and actions of students before and after being given health education through audio visual aids and visual aids.

RESULTS

The results of this study were carried out in two primary schools within the working area of the Makassar City Tamalanrea health center, the results of data analysis were presented in table form accompanied by the following narrative:

Table 1: Distribution of Respondents Based on Age and Gender Characteristics in Makassar City

Variable	Elementary School			
	Lanraki I (N = 57)		Tamalanrea VI (N = 33)	
	n	%	n	%
Age				
8	3	5,3	1	3,0
9	34	59,6	25	75,8
10	17	29,8	7	21,2
11	2	3,5	0	0
12	1	1,8	0	0
Gender				
Male	30	52,6	19	57,6
Female	27	47,4	14	42,4

Table 2: Distribution of Respondents Based on Knowledge Levels, Attitudes and Actions of Primary School Students When Pre Test and Post Test With Education Through Audio Visual Aids and Visual Aids in Makassar City

Variabel	Pre Test				Post Test				P value
	Less/Negative		Enough/Positive		Less/Negative		Enough/Positive		
	n	%	n	%	n	%	n	%	
Knowledge									
Audio Visual Aids	14	25,0	43	75,0	0	0	57	100	0,000
Visual Aids	4	12,0	29	87,0	1	3,0	32	97,0	0,000
Attitudes									
Audio Visual Aids	3	5,3	54	94,7	0	0	57	100	0,000
Visual Aids	1	3,0	32	97,0	0	0	33	100	0,000
Actions									
Audio Visual Aids	2	3,5	55	96,5	0	0	57	100	0,000
Visual Aids	3	9,1	30	91,9	2	6,1	31	93,9	0,369

DISCUSSION

Audio Visual Aids: Audio Visual Aids is an audio visual media that displays images and sounds. The message presented can be either facts (events, important events, news) or fictitious (such as stories), can be informative, educative or instructional.

The results of this study indicate that during the pre-test the majority of behaviors (knowledge, attitudes, and actions) of students in both groups were good enough to maintain oral and dental health, judging from the percentage of knowledge, attitudes and actions that included enough/positive categories between 75%-97%. This shows that students know how to maintain

dental and oral health. When the post-test knowledge, attitudes and actions of students experienced an increase of between 93.9% -100%. So that there is the influence of the use of educational media in changing knowledge, attitudes and actions of students.

The results of this study indicate that in the group given audio visual aids intervention p value was 0,000, which means that audio visual aids effectively changes the knowledge, attitudes and actions of elementary school students in maintaining oral and dental health.

This research is in line with the study of Prasko et al (2016) on counseling on audio visual methods and demonstrations on the knowledge of brushing teeth in elementary school children with the results of statistical tests with Paired Ttest obtained p.value = 0,000. this situation shows that H_0 is rejected and H_a is accepted, there is a significant difference in changes in knowledge level before and after the group of respondents who were given counseling with audio visual. Students' knowledge is increasing because the audio visual method is very interesting and audio-visual media presents learning materials using teaching media tools that can play, or demonstrate these materials so that students can watch firsthand, watching closely.^[10] This is also in line with research that says that there is a significant increase in the pre-test results measured by the level of knowledge, attitudes and actions to the post-test scores, which means that the PKG uses video media to improve children's level of knowledge, attitudes and actions in maintaining teeth and mouth health.^{[11],[12],[13],[14],[15],[16],[17],[18]}

The same study was showed that health education about personal hygiene with video media had an influence on personal hygiene knowledge, attitudes and action of elementary students.^[19]

Visual Aids: Media posters are a form of visual media in print that contains messages, which are usually posted on walls, in public places, or public transportation.

The results of this study indicate that the majority of behavior (knowledge, attitudes, and actions) of students are good enough. The results of this study indicate that the control group obtained p value 0,000 for the variable knowledge and attitudes of students which means the media poster effectively changes the knowledge and attitudes of elementary school students in maintaining dental and oral health.

The results of the same study also showed that poster media had an effect on increasing knowledge, attitudes and intentions, but showed no influence with actions in maintaining dental and oral health.^{[20],[21],[22],[23],[24],[25],[26],[27],[28]}

In the control group obtained p value 0.369, which means that there is no effect on the use of visual media such as posters on changes in the actions of elementary school children in maintaining dental and oral health in the working area of the tamalanrea health center in 2018.

CONCLUSION/RECOMMENDATION

Education through Audio Visual Aids is more effective than Visual Aids in improving the knowledge, attitudes and actions of elementary school children in maintaining oral health. So it is necessary to disseminate health information by providing health education through counseling directly to schools about maintaining dental and oral health by using appropriate educational media and delivering it in an interesting manner.

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The Impact of Marketing Information Systems on Brilliant Financial Performance in Hospital Industry

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ABSTRACT

During the past few years, there have been tremendous attempts among various organizations to implement the marketing information systems to improve their financial performance, in general, information systems are an important element to support the performance, however, to apply these systems it is necessary to be analyzed and evaluated. Accordingly, The aim of this paper is to identify the impact of marketing information systems directly on brilliant financial performance, after a brief literature review an applied study was conducted among physicians that work in private hospitals in Iraq. To this end a model of the relations has been developed to be tested by linear regression and structural equation modeling, the results showed that marketing information systems directly affect the brilliant financial performance.

Keywords: Internal Records, Marketing Decision Support System, Marketing intelligence, Marketing Research.

INTRODUCTION

Iraq has gone through decades of war and substantial sanctions from the United Nations. For example, power outages as a result of the Gulf War in the 1990s and a decade of sanctions were among the side effects on hospitals ¹. After decades of war tension and fear of the unknown ². The fight against terrorism has had a major impact on the health sector, the facility needs adequate resources to carry out its functions ³. These circumstances affected the provision of logistical and financial capabilities; therefore, the private healthcare sector emerged as a competitive alternative, And is looking for strategic tools to ensure the achievement of financial performance.

The marketing decisions that must be taken within any organization give a wide range of marketing areas,

starting with the consumer and the target market sectors, through the marketing mix ⁴, as well as the decisions related to organizing the marketing performance and controlling the products of its business. Such decisions need to collect multiple, comprehensive and renewable data on the environment and the variables that affect it ⁵. Therefore, the process of collecting information should be a continuous process according to a specific system, which led the organizations to establish the information system as a necessary tools to take effective marketing decisions in light of the development of organizations, especially health organizations, therefore, the importance of the information system has increased⁶, and the information has become a strategic resource depends on the decision-maker. Today, information systems are reshaping the rules of action on which organizations are based in the past ⁷. There is no aspect of the organization's work that has not been affected by information technology, so the study of information systems has become like studying any other functional area such as production, marketing and finance. Accordingly, it is clear that there is a need to fill gaps in knowledge, and to identify these strategic tools and their effects. To this end, this study aims to identify the impact of marketing information systems on the brilliant financial performance.

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LITERATURE REVIEW

Marketing Information Systems: The marketing information system (SIM) can be defined as a set of structured relationships, where individuals, machines, and procedures intervene, and whose purpose is to generate an orderly flow of pertinent information, coming from internal and external sources. external to the organization, intended to serve as a basis for decisions within the specific areas of marketing responsibility⁸. Information systems have become an essential part of the success of modern organizations and center for decision-making so that it can achieve its objectives.

Internal records: The internal records and reports of the organization provide many of the information required for the planning, implementation and control process⁹. The sales data for different regions, customers and products are of great importance to the marketing manager, whether in assessing the performance of those areas or products¹⁰. The sales representatives usually prepare periodic reports on the reactions of competitors in the market to the work of the organization to prepare periodic reports on the reactions of customers with complaints and satisfaction about the performance of services¹¹.

Marketing decision support system: Marketing decision support systems have emerged as a result of the growth and expansion of organizations to help marketing managers improve their capabilities, including a computer system that facilitates procedures for the marketing manager to access information in decision making¹². It is defined as an internal activity and a computerized and flexible information system that enables managers to obtain the information necessary to make marketing decisions¹³. The system includes a set of software, statistical tools, decision templates and programs designed to assist marketing managers.

Marketing intelligence: The marketing intelligence system consists of a set of procedures and resources used by managers to obtain daily information of changes in the marketing environment¹⁴.

Marketing intelligence is defined as the confidential information that marketing management collects from competitors in the market¹⁰. In the light of this information, the organization adjusts its marketing plans and programs, and the importance of this information increases as competition increases.

Marketing research: Marketing research is used to provide information that makes it possible to make decisions that are irregular and reflect problems that the organization faces from time to time, or decisions that need to collect information to help it, such as introducing a new product to the market (which connects consumers

and customers to the decision maker)¹⁵. Marketing research is defined as the collection and recording of marketing data or data relating to the marketing problems of goods and services. These problems may relate to any component of the marketing mix¹⁶. Marketing research activity is related to data collection, analysis and analysis of marketing problems itself.

Brilliant Financial Performance: Financial performance is the most important part of the organization's control, linking the cause to the effect, such as the various activities to the reduction of costs, as the main influence of organizations, as results not only for financial purposes but for quantitative performance¹⁷. Financial performance is defined as a set of financial instruments that help determine the actual status of the organization's performance, by measuring profitability and liquidity¹⁸. Brilliant performance represents the level of excellence achieved in management by providing leadership and innovation by focusing on implicit knowledge management¹⁹. Hence, the organization is able to cope with changes in the external environment, This will achieve brilliant financial performance, this term has recently developed to express the organization's ability on adapting the current situation and determining the strategic position by reducing costs, increasing profitability and providing different alternatives to liquidity²⁰. This is related to the creative and innovative capabilities that are employed within the organization.

Liquidity refers to the ability of the organization to maintain a portion of its investment assets in the form of liquid cash, and easy cash deposits²¹. Profitability is defined as the relationship between profits achieved by the company and investments, it is a key objective for all companies and investors, and important tool for measuring the efficiency of management¹⁸.

MATERIAL AND METHOD

Measurement instrument: For the development of the research, a semi-structured survey was used, consisting of 28 questions divided into 3 different sections the first one about the demographic profile and the second one about the use of marketing Information Systems (MIS), among which are: internal records (IR), marketing decision support system (MD), marketing intelligence (MI), marketing research (MR), the other section is about brilliant financial performance (BFP) with profitability and (PR), liquidity (LQ) as dependent variable.

We considered the frequency of 5-scale measurement, through (scale of 1-5), the data obtained from a questionnaire and checked the validity and analyzed in an analytical way to observe the relationship between variables.

MODEL

With the data obtained, a simple and multiple linear regression model was made through the ordinary least squares method, which are presented in Figure 1. Likewise, it is presented in regression equation, the model was estimated using ordinary minimums, with PLS and structural equation modeling. The analysis carried out for the model focused on the use of a statistic called P-value, which corresponds to the probability of accepting the null hypothesis, compared to the level of significance ($\alpha=0.05$ was used).

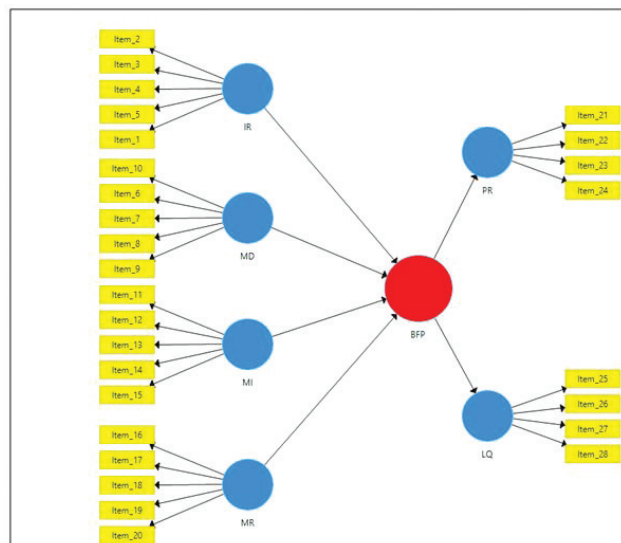


Figure 1: Study Model

Validation Tests: The validation tests conducted on the data represented on the questionnaire is valid. The test focused on validating whether or not the data used was valid, whereby the test used was whole numeric. In essence, the results obtained ascribed that the data was valid. The validity of the questionnaire was evaluated and approved by experts, and reliability was reported at Cronbach alpha, which need to be above (0.70) ²², accordingly, the result shows accepting values as it shown in Table 1.

Table 1: Reliability and Validity Results

Scale	Factor	Cronbach's Alpha
MIS	IR	0.861
	MD	0.811
	MI	0.724
	MR	0.833
BFP	PR	0.844
	LQ	0.809
All		0.841

RESULTS

Factor Analysis: The validation of the theoretical constructs of the MIS model and BFP is analyzed using a

factor analysis, with a varimax rotation. As seen in Table 2, the factor analysis indicates that all MIS factors can be grouped into four main components with 20 factors and BFP factors can be grouped into two main components with 8 factors. Each factor confirms the constructs of the theoretical models of the authors.

Table 2: Analysis of Component

	MIS				BFP	
	IR	MD	MI	MR	PR	LQ
1	0.774				0.892	
2	0.755				0.868	
3	0.731				0.608	
4	0.715				0.526	
5	0.699					0.419
6		0.857				0.439
7		0.837				0.906
8		0.813				0.900
9		0.492				
10		0.490				
11			0.747			
12			0.698			
13			0.634			
14			0.416			
15			0.409			
16				0.812		
17				0.720		
18				0.706		
19				0.558		
20				0.519		

Hypotheses Testing

Hypothesis 1: Table 3 shows that there is a correlation between the two variables (MIS, BFP), this relationship is positive and high, and the correlation coefficient is 0.770 and it is significant according to the value of (Sig<0.05) and the value of T statistic which is also acceptable value. This results supports hypothesis 1. As for the dimension, the relationship between (IR,BFP) is positive and high with correlation coefficient is 0.729 and this relationship is significant according to the value of (Sig<0.05) and the value of T statistic which was accepted. This results supports Sub-Hypothesis 1. Regarding the relationship between (MD,BFP) it appeared positive and high correlation with value of 0.624 and this relationship is significant according to the value of (Sig<0.05) and T statistic which was accepted. These results supports Sub-Hypothesis 2. And it can be noticed that the correlation between (MI,BFP) is strong and positive with value of 0.663, and the significance of this correlation revealed through T test and significance

level (Sig<0.05) These results support the Hypothesis 3. While the relation between (MR,BFP) refer to positive and strong relationship with value of 0.530 and this relationship is significant according to the value of (Sig<0.05) and T statistic which was accepted. These results supports Sub-Hypothesis 4.

Table 3: Correlation Coefficient Results

Relation	r	T	Sig
IR <...> BFP	0.729**	8.044	0.000
MD <...> BFP	0.624**	6.034	0.000
MI <...> BFP	0.663**	6.695	0.000
MR <...> BFP	0.530**	5.005	0.000
MIS <...> BFP	0.770**	9.105	0.000

Hypothesis 2: In order to contrast the hypotheses proposed in this paper, the following research models is considered: $Y_i = b_0 + b_1 IR + b_2 MD + b_3 MI + b_4 MR$. And it can be calculated by simple and multiple regression. Table 4 indicates that marketing information system has positive and significant impact for all performance models based on regression coefficients IR (0.601***), MD (0.526***), MI (0.462 **), MR (0.463 ***) and overall performance (0.732 ***). This indicates that the marketing information system generates higher financial performance in hospital industry. Regarding the global validity of the models, validity is found for those in which the values of the F were significant; this being the case of (IR(F = 64.711 *), MD(F = 36.407 **), MI(F= 44.824 ***), MR(F= 25.047 ***) and MIS(F= 82.906 ***)). Also Table 5 ,Figure 2 refer to the results of the estimates made on the relationships between the four dimensions of marketing information system (IR,MD,MI,MR) and brilliant financial performance. Estimates were obtained from multivariate linear regressions by PLS. Initially, it was found in all the models that there are two significant relations with the dimensions (IR,MD), which has (B1=0.511***, P=0.000, B2=0.379***, P=0.000), with two not significant relations with the dimensions (MD,MI), which indicates that with multiple regression MI and MR will have no significant effect on BFP. These results support H2,H21,H22.

Table 4: Regression Results

Relation	b0	b1	R2	Adj-R2	F	Sig
IR> BFP	1.815	0.601	0.532	0.523	64.711	0.000
MD> BFP	2.122	0.526	0.390	0.379	36.407	0.000
MI> BFP	2.426	0.462	0.440	0.430	44.824	0.000
MR> BFP	2.450	0.463	0.305	0.293	25.047	0.000
MIS> BFP	1.195	0.732	0.593	0.585	82.906	0.000

Table 5: Multiple Regression Results

Relation	Path	Mean	S.D	T	Sig
IR> BFP	0.511	0.521	0.064	8.028	0.000
MD> BFP	0.379	0.384	0.093	4.093	0.000
MI> BFP	0.115	0.105	0.086	1.339	0.181
MR> BFP	0.088	0.067	0.063	1.398	0.163

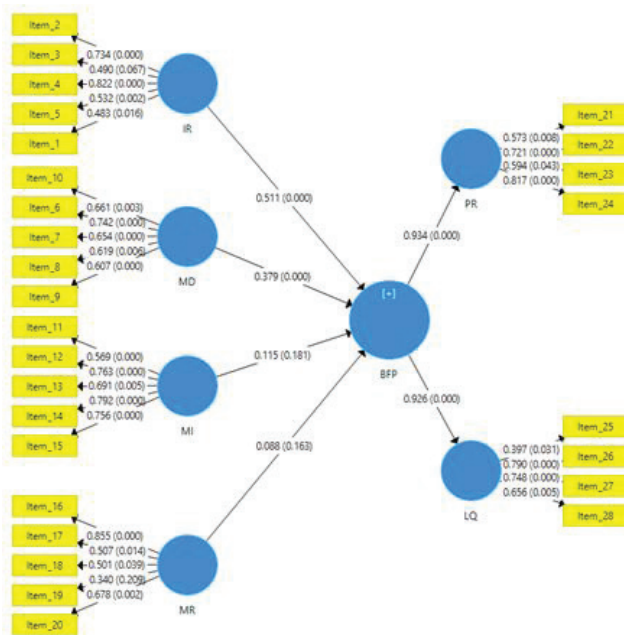


Figure 2 : Structural Effect

DISCUSSION AND CONCLUSION

Health services are one of the most important services that the individual in society is looking for, and wanted with a certain degree of excellence and thoroughness. This is mainly due to several reasons primarily related to abundance, diversity and ambiguity of organic and psychological diseases that human exposed and suffered from in modern times³. Thus, modern health institutions are giving this subject a great interest in a competitive environment which make it necessary to search for sources in which to succeed in the competitive field²³, so organizations seek to find a marketing system that contributes to high levels of marketing performance that enables to compete and improve financial performance²⁴.

The results showed that the marketing information systems affect the financial performance. The results indicated that the effectiveness of the marketing information system will lead to an increase in the brilliant financial performance indicators both profitability and liquidity. These results are consistent with the study that confirms the positive relationship between employing modern systems Improve the performance²⁵. Where marketing information systems support the administrative tasks and make marketing decisions efficiently and effectively, by providing appropriate information and processing and analysis of information.

The results have shown that the impact of internal records is positive in achieving brilliant financial

performance. Data and information contribute to the internal environment of the organization in improving decisions as well as being adopted as a system for internal reporting and internal accounting systems⁸, And the adoption of data processing system on these records and periodic reports on competitors and customers, which contributes to reducing costs and improve financial performance²⁶. Marketing systems also positively influence brilliant financial performance. The computerized system contributes to the processing of data and information processing and its use in decision making²⁷. In addition, it investigates the marketing plans of the hospitals by providing early warning of problems that can get, and provide timely and appropriate solutions, which is positively reflected in financial performance.

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