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Editor

Dr. R.K. Sharma
Institute of Medico-legal Publications
501, Manisha Building, 75-76, Nehru Place,
New Delhi-110019

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Contents

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Obesity as an Actual Problem: Spatial Research in Kazakhstan (2011-2016)

Fursov Roman Alexandrovich (Fursov RA)[1,2,3], Ospanov Oral Bazarbaevich (Ospanov OB)[1,2,3], Fursov Alexandr Borisovich (Fursov AB)[1,3,4]

[1]Department of Endosurgery, Medical University of Astana, Astana, Kazakhstan, [2]Society of Bariatric and Metabolic Surgeons of Kazakhstan, [3]Kazakhstan Association of Endoscopic Surgeons, [4]Russian Academy of Natural History

ABSTRACT

Background: Obesity is a growing problem. The dynamics of this disease spreading is changing in different regions, it is poorly investigated and, therefore, contradictory.

Objective: To scrutinize the spatial rates of obesity in various regions of Kazakhstan.

Methodology: The operation of preventive medicine clinics, family health centers on the study of obesity rates was investigated. Furthermore, the relationship between the growth of diabetes and obesity with population growth rates, demographic indicators in cities and rural areas was considered.

Results: Investigations demonstrated an epidemiological picture of obesity, diabetes and other pathologies related to nutrition. The activities of 4 050 medical organizations has been studied since 2011.

Conclusions: The investigation revealed a stable growth in obesity, diabetes, metabolic and nutritional disorders. The rates of diabetes and obesity according to the data of preventive medical observations in the city are higher than in rural areas. The annual increase in obesity rates during the study period amounted to 3.9%. South-Kazakhstan, Astana and Almaty were identified as the regions with the highest obesity rates.

Keywords: *Spatial research, Obesity, Diabetes, Demography, Family Health Centre*

INTRODUCTION

To decrease the morbidity in the Republic of Kazakhstan (RK), the state has strengthened financial support for preventive treatment medical organizations for the last 5 years.[1] The main function is to coordinate medical specialists of Kazakhstan in the field of diagnostics and prevention of various diseases.[2,3]

Introduction/general information: Our observations on the development of the healthcare system in Kazakhstan indicate that the coordination of efforts has not yet reached the required level.

The results of national statistics are significantly variable including international data. For example, the findings of the 5th national research in Kazakhstan indicate that 31.2% of adults suffer from obesity[4] whereas the statistics of international observers indicate: "Obesity Adult incidence rate - 23.5%".[5] However, obesity rate in interconnection with endocrinological diseases, nutrition deficiencies in respect of demographic and geographical features of the country, has not been investigated yet.

OBJECTIVES OF THE RESEARCH

To scrutinize the spatial rates of obesity in various regions of Kazakhstan. To study the dynamics of these indicators' growth for the last 5 years, in comparison with diabetes mellitus.

METHOD OF THE RESEARCH

Investigations are epidemiological, continuous (covering the entire territory of the state). They are carried out by means of mass medical examination. In addition, the studies are descriptive (descriptive-evaluative) and analytical.

The body of data included the total number of population living in the country in respect of the demographic growth. Cases of morbidity on the studied nosology and in the regions of Kazakhstan came to be in the test group. The morbidity was investigated by means of retrospective and prospective method. The analysis of the dynamics of the epidemiological process was carried out selectively with respect to obesity and diseases related to malnutrition, diabetes.

The objectives of the analysis: Statistic data has been selected in accordance with the following criteria: the diagnosed cases of obesity, diabetes, morbidity related to malnutrition in accordance with the International Classification of Diseases (ICD-10); The demographic survey in the country during the last 5 years; the morbidity rate per 100 000 population.

Statistical analysis: The processing of information was carried out with the help of "Medstat" and "Statistica 10" software. The information was taken into account from the statistic registers of all governmental and non-governmental medical outpatient hospitals and clinics, hospitals. During the statistic processing of information, quantitative and qualitative statistical features were identified.

Continuous variables are expressed as the mean ± standard deviation. The chi-square test was used to test differences in categorical variables between the cases and controls, and analysis of variance (ANOVA) or the Student's t-test was used for comparisons of continuous variables. Spearman's rank correlation and univariate regression analysis were used to determine the strength of the relationship between obesity and diabetes. A significance level of $P<0.001$ was used in this test.

Methodological approaches to achieve the aim: For the implementation of the State Healthcare Development Program (SHDP) in the primary division of Healthcare (namely, outpatient and polyclinic organizations), Family Health Centres (FHC) were established.[2,6,7,8] Their basic mission is to improve the coordinated efforts of the medical community in identifying and preventing risk factors of diseases.

In section №3 of the SHDP, it was deduced that the man's health 50% depends on his or her lifestyle. This provision is recommended to be taken into account by medical staff while dealing with the population of the country promoting sanitary knowledge. The above mentioned principles were pursued in our investigation very consistently and precisely.

RESULTS

According to the research, in respect of the state statistics in 2016, 4 050 medical organizations were registered in Kazakhstan including outpatient – polyclinics – 3 149 and hospitals - 901.

Based on the results of the first year of Program realization, we have selectively conducted an experienced pilot analysis of medical staff activity in medical organizations in Astana and the surrounding suburbs. By means of questioning, the opinion of 1 000 patients and 125 doctors was inquired in the HFC. The research group was interested in a mutual opinion (patients and doctors) on the motivating aspects of their intercommunion, on the principles of medical staff activities and prospects of its realization. It was clarified that the medical staff of HFC preventive branches defined the main challenges of their initial stage activities. They pursue the following principles: determiners of diseases related to the lifestyle depend on the social environment. However, mostly they depend on the behavior of a person and, hence, can be changed and the risk of morbidity development will be significantly reduced.

Based on the questionnaire results, the majority of patients (85%) turned out to have common interests with doctors' principles. Besides this, in 77.2% of cases they supported participate in preventive activities, and even involve other interested patients. The rest of patients were skeptical in success of medical staff intercommunion with patients in the framework of the prevention program.

93.1% of medical staff is sure in close intercommunion and only 6.9% doubted in its effectiveness, particularly, in patients' discipline, for instance, refusal to harmful habits, behavior changing, etc. However, the main result of the pilot analysis reported the support and successful realization principles of HFC preventive measures.[7]

Three basic methods were used to investigate the general morbidity:

- Data on patient treatment (actual morbidity or primary morbidity, spread of diseases, sickness or general morbidity);

- Data on medical examinations (pathologic lesion);
- Data on causes of death.

In some cases, the fourth additional method (survey of population, questioning) was used. The primary treatment of the patient in a medical institution and a morbidity identified by home sick call was considered as the observation element in measuring the total morbidity in each year. To calculate the total incidence rate (TM), the following formula was used: TM=the total number of registered diseases in the reporting year×100 000/average annual population.

During the investigation, the demographic survey (total population) of the country was analyzed. Besides this, the dynamics of demographic growth in Kazakhstan and its relationship with the population health rates was determined. It was revealed that the number of population by January 1, 2011 amounted to 16 442 000 whereas this rate increased to 16 675 400 by January 1, 2012.[9]

However, at the end of 2016, the population reached over 17 754.1. Urban population (54.1%) prevails over rural (45.9%).[10,11,12] In addition, the population increase over 5 years of the research turned out to be over 1.2 million people or 7.47%. The annual growth rate, on average, amounted to 1.5%.

The total morbidity (in absolute numbers) for all classes of diseases listed in "ICD-10" over the five-year period increased only by 1%. However, a morbidity related to endocrinological disorders, malnutrition and metabolic disorders (E00-E89) increased significantly by 19.7%. If this rate is compared with the population growth, it turns out that it exceeds it by almost 2.6 times (7.47% to 19.7%). Moreover, with further analysis of the statistical results (in terms of 100 000 people), it turned out that the endocrine morbidity with malnutrition and metabolic disorders increased by 13% namely from 3 745.1 to 4 232.7.

The data analysis received from various regions of Kazakhstan illustrated that the morbidity of diabetes (the number of diseases registered for the first time, per 100 000 people) is gradually increasing. In addition, the same is noted with obesity. (Table 1.)

Table 1. Morbidity of diabetes and obesity in Kazakhstan (the number of diseases registered for the first time per 100 000 people in 2011 and 2016)

Category of population	Total morbidity*		Diabetes*		Overweight and obesity*	
	2011	2016	2011	2016	2011	2016
Rural	**575.4** (11.2)	**575.8** (10.0)	**116.1** (8.1)	**138.4** (7.2)	**115.9** (7.4)	**140.3** (5.3)
(% from total morbidity)	*(100%)*	*(100%)*	*(20.2%)*	*(23.5%)*	*(20.1%)*	*(24.4%)*
Urban	**1269.5** (23.1)	**1104.8** (17.1)	**193.5** (5,2)	**198.7** (3.2)	**197.4** (2.4)	**203.1** (2.6)
(% from total morbidity)	*(100%)*	*(100%)*	*(15.2%)*	*(18.0%)*	*(15.5%)*	*(18.4%)*

Note to Table 1:

* - number of diseases SD, registered for the first time, per 100 000 people of the population with a confidential interval of 95% and a statistical significance level, $p \leq 0.05$

It was revealed that the number of patients with diabetes mellitus, registered five years after the start of the investigation, significantly and authentically increased: in rural areas by 19.2%, in cities by 2.7%. Moreover, the investigation demonstrated the similar growth with obesity. In addition, the dynamics of obesity growth in cities was significantly higher than in rural areas. Conversely, the specific gravity of diabetes and

obesity in relation to the total morbidity (in percentage) among urban population turned out to be lower than that of rural areas.

According to the official data (published in the statistical volume on health in 2015), the average morbidity of diabetes in Kazakhstan was 168.6 (per 100 000 people). However, the morbidity of obesity in relation of overweight people was 171.7 (per 100 000). These incidence rates of diabetes and obesity in the regions of Kazakhstan were calculated and presented by the regional boards. According to the results of our additional analysis in relation of 2016, the incidence rates turned out to be somewhat higher. For instance, the incidence rate of diabetes in early 2016 was 180.7 (per 100 000 people). But the morbidity of obesity, without consideration of overweight patients, rose to the level of 91.2 (per 100 000 people). (Table 2.)

Table 2. Incidence rate of obesity and diabetes in the regions of Kazakhstan from 2011 to 2016

№	Regions of Kazakhstan, cities	Obesity*			Diabetes*		
		2011	2016	R., %	2011	2016	R., %
1	Akmola	56.1 (0.01)	69.6 (0,01)	4.8	183.0 (0.01)	203.8 (0.01)	2.3
2	Aktobe	71.2 (0.01)	75.3 (0.01)	1.2	107.1 (0.01)	127.4 (0.01)	3.8
3	Almaty	46.3 (0.01)	53.9 (0.01)	3.3	192.5 (0.01)	207.0 (0.01)	1.5
4	Atyrau	63.0 (0.01)	82.1 (0.01)	6.1	138.5 (0.01)	144.7 (0.01)	0.9
5	East-Kazakhstan	63.5 (0.02)	101.2 (0.01)	11.9	192.7 (0.02)	132.2 (0.01)	-6.3
6	Zhambyl	32.9 (0.01)	56.3 (0.01)	14.2	140.6 (0.01)	177.9 (0.01)	5.3
7	West-Kazakhstan	56.3 (0.01)	75.6 (0.01)	6.9	112.2 (0.01)	171.9 (0.01)	10.7
8	Karaganda	61.2 (0.01)	63.4 (0.01)	0.7	190.3 (0.01)	244.0 (0.02)	5.6
9	Kostanay	70.2 (0.01)	82.3 (0.01)	3.4	175.7 (0.01)	140.1 (0.01)	-4.1
10	Kyzylorda	62.1 (0.01)	66.9 (0.01)	1.5	100.7 (0.01)	190.8 (0.01)	17.9
11	Mangystau	129.1 (0.01)	109.9 (0.01)	-3.0	118.3 (0.01)	134.3 (0.01)	2.7
12	Pavlodar	132.8 (0.01)	108.5 (0.01)	-3.7	162,2 (0.01)	174,7 (0.01)	1.5
13	North-Kazakhstan	85.3 (0.01)	102.1 (0.01)	3.9	266.8 (0.01)	271.6 (0.01)	0.4
14	South-Kazakhstan	96.7 (0.01)	145.8 (0.01)	10.2	133.7 (0.01)	213.1 (0.01)	11.9
15	Almaty city	119.8 (0.01)	122.8 (0.01)	0.5	174.9 (0.01)	182.1 (0.01)	0.8
16	Astana city	136.4 (0.01)	143.2 (0.01)	1.0	153.6 (0.01)	176.1 (0.01)	2.9

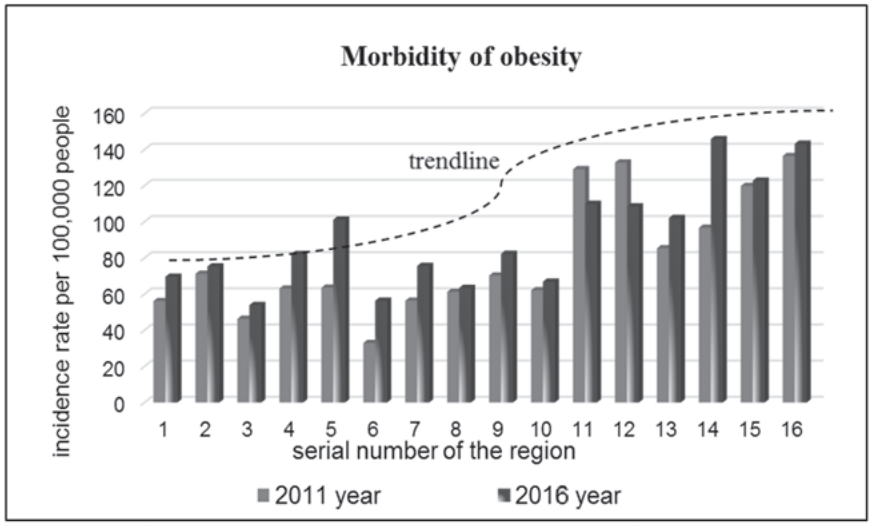
Note to Table 2:

* - number of diseases SD, registered for the first time, per 100 000 people of the population with a confidential interval of 95% and a statistical significance level, $p \leq 0.05$;

R., % - the annual increase in obesity; (….) - SD.

The results are indicated for comparison at the beginning and at the end of the investigation. Besides this, the rate increase of morbidity in percentage in each region during the observation period was determined (R., %).

The results of the analysis are visually represented in color mapping (Fig. 1, Fig. 2).



Regions: 1. Akmola 2. Aktobe, 3. Almaty, 4 Atyrau, 5. East-Kazakhstan, 6. Zhambyl, 7. West-Kazakhstan, 8. Karaganda, 9. Kostanay, 10. Kyzylorda, 11. Mangystau, 12. Pavlodar, 13. North-Kazakhstan, 14. South-Kazakhstan, 15. Almaty city, 16. Astana city.

Fig. 1: Morbidity of obesity in different regions of the Kazakhstan (2011-2016)

Regions: 1. Akmola 2. Aktobe, 3. Almaty, 4 Atyrau, 5. East Kazakhstan, 6. Zhambyl, 7. West Kazakhstan, 8. Karaganda, 9. Kostanay, 10. Kyzylorda, 11. Mangystau, 12. Pavlodar, 13. North Kazakhstan, 14. South Kazakhstan, 15. Almaty city, 16. Astana city.

Fig. 2: Regions with a high incidence of obesity (2016 year)

DISCUSSION

The results of a five-year investigation, such as the incidence rate distinction in rural and urban areas, uneven correlation of diabetes rate with the obesity growth, the different rates of obesity growth in Kazakhstani regions can be estimated as somewhat paradoxical. However, to explain it, it is necessary to take into consideration the following peculiarities of state's development.

Firstly, the specific gravity of identified patients in rural areas is increasing as a result of the extensive and

intensive activities of HFC medical staff. Moreover, it is because of the active identification of overweight people and their inclusion in statistical reports (where many patients were not registered).

Secondly, this process occurs because of intensive migration of the population from rural areas to large cities and it increases the total number of people (including healthy and sick people) in absolute numbers.[13,14]

Furthermore, the treatment rate of patients to medical organizations in the cities is traditionally higher, which also affects the statistical data. Population involvement in preventive activities, prevention of morbidity development, the enhancement of healthy lifestyle increased the treatment of obesity patients to doctors in regions and changed our analyzed medical reports. The results of studying correlation Pearson depicted that obesity rates are closely related to diabetes mellitus. The highest correlation (r) was in 2011 (0.97). In 2016, it decreased slightly (0.96). Moreover, comparing the level of obesity correlation in regions and observation years, the rate (r) turned out to be 0.83. Calculation and comparison of the obesity rate (r) showed an unexpected result with the growth of diabetes as for the years from 2011 to 2016 and regions. This correlation was less expected at the level of (0.58).

The regions with the highest incidence of obesity by the end of 2016 were South-Kazakhstan (146.2), Astana (144.0) and Almaty (123.8). Kostanay and Atyrau regions were registered in average (82-83.0). At the lowest levels were Almaty (54.3), Zhambyl (57.1) and Karaganda (64.2).

Comparing the results obtained in a similar investigation, it can be noted that the situation of some regions at that time were somewhat different on the territory of Kazakhstan (from 2004 to 2008). [15]

Regions with high rates in 2008 (from 94.9 and higher) - Almaty (118.5), Astana (135.5), Mangystau (139.7) and Pavlodar (143.0). With average rate (from 57.9 to 94.9) - Kyzylorda (59.0), Karaganda (60.6), Kostanai (67.4), Aktobe (69.3) East Kazakhstan (74.0) and North-Kazakhstan (80.6). Regions with low rate (up to 57.9) are Zhambyl (28.4), West Kazakhstan (41.2), Almaty (45.8), Atyrau (50.6), Akmola (52.0) And South Kazakhstan (56.9).

Alongside, other statistical results should be indicated. According to the research of G.A. Musina and co-authors from the Republican Center for Development of Healthcare, rates are noticeably different.[16] Should Almaty, Pavlodar and Astana are referred to cities with a high extensive rate of obesity - 13.7%, the lowest extensive obesity rates, according to the data of the authors, are registered in Atyrau (2,2%). Moreover, researchers note that the main part of examinees are not aware of their exact weight and level of fatness. In their conclusions, the authors of the report urge the medical organizations of Kazakhstan: to strengthen preventive measures among the population; to organize activities explaining the harm of this disease for health; to instruct with regular nutrition and form a healthy lifestyle.

CONCLUSIONS

The rates of diabetes and obesity according to the data of preventive medical observations in the city are higher than in rural areas. It can be accounted for intensive internal migration of the population from rural areas to large cities. The annual increase in obesity rates during the study period amounted to 3.9%. The highest correlation (Pearson) of obesity value and diabetes is (r, 0.96). However, the correlation with the growth of diabetes from 2011 to 2016, as well as in respect to specific regions was not expressed (in some cases, it decreased to 0.58). South-Kazakhstan, Astana and Almaty were identified as the regions with the highest obesity rates. The reasons for such obesity rating in Kazakhstan should be clarified.

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Author contributions: FRA and FAB conceived and designed the study, OOB and FRA carried out studies of patients with visits to cities and regions. FAB and MA prepared the project. All authors collected and processed statistical information. All authors made significant intellectual contributions in finalising the manuscript, and read and approved the final version for submission.

Ethical considerations: The proceeding paper for investigation related to obesity problems was approved by the Ethics Research Committee of the Medical University (№1, Jan. 25, 2014 and №3, Dec. 24, 2015).

The permission for receiving statistical information from the regional Health Departments of the Republic

of Kazakhstan was not required. The reason is that data on demographic changes in the country, the population treatment to medical institutions, morbidity classification are published in free access. This data does not point out patient's personal information in accordance with inviolability of private life (Article 142 of the Criminal Code of the Republic of Kazakhstan, dated 9.11.2011, No. 490-IV).

Conflict of Interest: No

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Medication Errors in Critical Care Units in a Tertiary Hospital

Anil Pandit[1], Jyoti Joshi[2], Megha Koul[3]

[1]Professor, Symbiosis Institute of Health Sciences, S B Road, PUNE, [2]Gynaecologist, Private Practitioner, Nagar Road, PUNE, [3]Student, MBA (HHM), Symbiosis Institute of Health Sciences, S B Road, PUNE

ABSTRACT

Medication errors in critical care are frequent, serious, and predictable. Critically ill patients are prescribed, twice as many medications, as patients outside of the intensive care unit (ICU) and nearly all of them suffer, a potentially life-threatening error at some point during their hospitalization.

Today, in the health care profession, all types of medication errors including missed dose, wrong dosage forms, wrong time interval, wrong route, etc., are a big deal, for quality patient care. Problems related to medications, are common in the healthcare profession, and are responsible for significant morbidity, mortality, and cost. Several recent studies have demonstrated that patients frequently have difficulty in reading and understanding medication labels. According to the Institute of Medicine report, "Preventing Medication Errors", cited poor labeling as a top most cause of medication errors in the USA. Evidence suggests that specific content and format of prescription drug labels, facilitate a better communication to minimize apprehension by patients regarding medication errors.

Although majority of these errors are without any serious adverse outcome but some of them are associated with increased morbidity and mortality leading to prolonged hospital stay, high cost of treatment and potential for litigation.

The aim of this study was undertaken to know the basic points of medication errors in the ICU set up, to identify risk factors for medication errors, and suggest strategies to prevent errors and manage their consequences.

Keywords: *Medication errors; prescription audit; prescription errors; patient medication safety*

INTRODUCTION

Health care delivery is not infallible. Errors are common in most health care systems and are reported to be the seventh most common cause of overall death[1]. The 1999 Institute of Medicine (IOM) report, "To Err is Human. Building a Safer Health System", drew public attention to the importance of patient safety .The Institute of Medicine (IOM) report highlights that 44000 - 98000 patients die each year as a result of medical errors, a large portion of these being medication related.[2]

This was followed with considerable interest by the medical community However, to date, there is little evidence that patient safety has improved [3]. In the Intensive Care Unit (ICU), on average, patients experience 1.7 errors per day[4] and nearly all suffer a potentially life-threatening error at some point during their stay. Medication errors account for 78% of serious medical errors in the ICU[5]

A hospitalized patient with a single dose of a single medication requires many right steps [6]. This hospital medication use process can be categorized into five broad stages: prescription, transcription, preparation, dispensation, and administration.[7]An error can occur at any point in this process. A medication error is any error in the medication process, whether there are adverse consequences or not.[8]

AIM

To study the medication errors in critical care in a tertiary care hospital and determining the areas where

Corresponding Author:
Dr (Brig) Anil Pandit. MD (HA) DNB (H &HA)
Professor, Symbiosis Institute of Health Sciences,
S B Road, PUNE-411004
Mobile: 9423212709
E-mail: apandit70@hotmail.com

errors occur in order to take measures to prevent recurrence of errors.

OBJECTIVES

- To rectify the medication errors occurring in the ICU and other critical care units in hospitals.
- To prepare guidelines for correct method of giving medication and patient medication safety.

Limitations of this study: Those patients who were discharged from hospital against medical advice before the study could be completed and those who were transferred to another healthcare facility for treatment were excluded from the study.

REVIEW OF LITERATURE

Medication error is a major cause of morbidity and mortality in medical profession, and critical care areas are no exception. Man, medicine, machine and modus operandi are the main contributory factors.[9]

In India, a proper reporting of medication errors in the hospital is not available. Drugs worth crores of rupee are consumed every year but a substantial part of these drugs are irrationally prescribed[10] In order to promote rational drug usage, standard policies on use of drugs must be set, and this can be done only after the current prescription practices have been audited.[11]

The main purpose of conducting a prescription audit is to enhance the quality of care in the hospitals. Improvement in the prescribing practices of doctors working in hospitals is one of the initiatives taken up, to improve the quality of care.[12]

A prescription audit is considered appropriate to improve the usage of drugs by the doctors.[13]

The World Health Organization (WHO) proposed core-prescribing indicators [14] for prescription audit and drug utilization studies. The focus of Indian studies has mainly been on the WHO core-prescribing indicators such as the range and number of drugs per prescription. Another study reported that half of the patients received more than one antibiotic. [15]

Chemist- and hospital pharmacy–based studies reported that, poly-pharmacy was the norm and about 75 percent of the prescriptions contained Fixed Dose Combinations (FDCs) ·An analysis of prescriptions for diarrhea also revealed that about 60 percent contained FDCs. Another study of 292 prescriptions for diarrhea reported use of 63 different drugs.

Medication errors, defined as any error in the medication process regardless of whether a patient experiences an adverse consequence, can occur at any step. It is important to have an understanding of the risk factors for medication errors and the evidence base for preventing medication errors and disclosure norm must be there, should an error occur.

Although the medication process is similar for all patients in hospital, we have restricted our study to focus on critically ill adult patients because the environment, patient characteristics, and because of types of medications used in the ICU, are substantially different from those in other hospital units. The ICU brings together high-risk patients who require urgent, complex interventions from multiple health care professionals in a complex environment where patients are exposed to twice as many medications as those in general wards. In addition, critically ill patients differ from most other hospital patients because they have limited ability to participate in their medical care and lack the physiologic reserve to tolerate additional injury.

Critically ill patients admitted to an ICU experience, on average, 1.7 medical errors each day and many patients suffer a potentially life-threatening error during their stay. Medication errors are the most common type of error and account for 78% of serious medical errors in the ICU. Providing a critically ill patient with a single dose of a single medication requires correctly executing many steps. The medication process involves 5 broad stages: prescription, transcription, preparation, dispensation and administration.

The earlier in the medication process an error occurs, the more likely it is to be intercepted. Administration appears to be particularly vulnerable to error because of a paucity of system checks, as most medications are administered by a single nurse. Nurses and pharmacists cause up to 70% of prescription errors Preparation errors occur when there is a difference between the ordered amount or concentration of a medication and what is actually prepared and administered. The industry standard for pharmaceutical preparations is

a concentration difference of less than 10%.However, approximately two thirds of infusions prepared by nurses are outside industry-accepted standards and 6% contain a greater than two-fold concentration error. Transcription errors are usually attributed to handwriting, abbreviation use, unit misinterpretation ('mg' for 'mcg'), and mistakes in reading. James Reason developed a well-recognized system for human error classification based on observations from industries that have become highly reliable such as aviation and nuclear power. He states that errors arise for two reasons:1) active failures and 2) latent conditions.

Types of Medication Errors:

- Prescribing error : Incorrect drug selection (based on indications, contraindications, known allergies, existing drug therapy, and other factors), dose, dosage form, quantity, route, concentration, rate of administration, or instructions for use of a drug product ordered or authorized by physician(or other legitimate prescriber)
- Illegible prescriptions or medication orders that lead to errors that reach the patient
- Omission error: The failure to administer an ordered dose to a patient before the next scheduled dose, if any.
- Wrong time error: Administration of medication outside a predefined time interval from its scheduled administration time (this interval should be established by each individual health care facility).
- Unauthorized drug error: Administration to the patient of medication not authorized by a legitimate prescriber for the patient.
- Improper dose error: Administration to the patient of a dose that is greater than or less than the amount ordered by the prescriber or administration of duplicate doses to the patient, i.e., one or more dosage units in addition to those that were ordered.
- Wrong dosage-form error: Administration to the patient of a drug product in a different dosage form than ordered by the prescribers.
- Wrong drug-preparation error: Drug product incorrectly formulated or manipulated before administration.
- Wrong administration-technique error: Inappropriate procedure or improper technique in the administration of a drug.
- Deteriorated drug error: Administration of a drug that has expired or for which the physical or chemical dosage-form integrity has been compromised.
- Monitoring error: Failure to review a prescribed regimen for appropriateness and detection of problems, or failure to use appropriate clinical or laboratory data for adequate assessment of patient response to prescribed therapy.
- Compliance error: Inappropriate patient behavior regarding adherence to a prescribed medication regimen.
- Other medication error: Any medication error that does not fall into one of above predefined categories.

METHODOLOGY

The cross sectional study was carried out at a tertiary care hospital in the critical care Departments like ICU and High dependency units and in the neurosurgery wards. The patient records were checked with due permission from the hospital authorities.

Both prospective study as well as retrospective studies was carried out.

Prospective studies were done by checking the patients' medication charts and retrospective studies were carried out by checking medical files in the medical records department.

Place and Duration of the study: The study was carried out for duration of 3 months in a tertiary care hospital in Pune in the critical care departments.

Study Sample: The convenient sample of 294 patients in critical care units as well as OPD patients in the hospital receiving follow up were selected.

Observation and discussion: 294 prescriptions were analyzed, in which, prescriptions were 1058. Therefore average number of drugs/prescription is 4.22. Of 294 patients 65.3%were males and 34.7% were females. A total of 72 medication errors were identified from 44 cases, 32(73%) were males and 12(27%) were females. Our study showed a high incidence of medication errors in males (16.6%) over females (11.7%). It showed (41%) of medication errors in patients between 20-40 years of age. Drugs were prescribed by generic names in 3.79% of cases, drugs from EDL were; 53.25% and fixed dose

combinations are 26.87% of total drugs. Dosage forms used were mostly oral -93.51%. Injectable were only 6.19% and topical forms were least 0.299%. Doctors profile indicates that maximum number i.e. 93.67% were general practitioners. Basic information of patient was written in 72.57% prescriptions.

Out of 294 patients, 44 (15%) patients showed 72 medication errors. The omission error was the most frequently (40.3%) occurring error, followed by prescribing (19.4%) and wrong time error (18 %).Majority of errors were due to nurses 78% followed by physicians 22%. Errors that did not reach patient were 19.6% which comes under sub-category A and B, and errors that reach patient but cause no harm adds to 80.4% which comes under subcategory C.

Complete diagnoses were written in 70.04% prescriptions. Only 88.61% prescriptions were legible and only 76.79% prescriptions were complete in terms of dose, route, strength, frequency and dosage forms. Disease pattern seen was variable. Diseases of respiratory system were maximum 44.72 % followed by infectious and parasitic diseases. 16.03 % and diseases of digestive system - 13.92 %. The most common drug groups prescribed were NSAIDs± serrati peptidases, antibiotics, antihistaminic, multivitamins, minerals, enzymes and expectorants & bronchodilators. The incidence of poly-pharmacy was also common with maximum number of drugs which were prescribed per prescription were four in 39.24% of prescriptions. The prescriptions also had other minor anomalies.

This study showed that there is scope for improvement in prescribing patterns in areas of writing generic names of drugs, essential drugs, writing legible and complete prescriptions.

Overall, it is clear that prescribing errors are a common occurrence, affecting 2% of patient days and 50% of hospital admissions. However, the reported rates of prescribing errors varied greatly and this could be partly explained by variations in the definition of a prescribing error, and the methods used to collect error data. Furthermore, a lack of standardization between severity scales prevented any comparison of error severity across studies.

In recent years, the extent and impact of adverse events in healthcare settings has made patient safety, a key aspect of healthcare policy.

The higher prevalence of these errors in the prescribing process indicated a need for improvement in ordering stage of the medication use process. None of the errors identified were fatal, but approximately one-third was assessed as being potentially significant or serious.

RECOMMENDATIONS

- This study has proven that there is an urgent need of clinical pharmacist in specialized units like MICU, where poly-pharmacy is practiced.
- The results of our study are important not only for safety of patients and the economics of health care system, but future role of pharmacy personnel in ICU.
- The present results point to the establishment of a medication error reporting system at each hospital and to share data with other healthcare settings to prevent further occurrence of same.
- And the clinical pharmacist, initially, could only confine to identification of the errors before the medication is administered to the patient by checking over all the charts in
- each critical care unit.
- Improved medication safety can be accomplished by optimizing the safety of the medication process, eliminating situational risk factors, and providing strategies to both intercept errors and mitigate their consequences.
- Several interventions have been shown to decrease medical error in the ICU.
- Establishment and implementation of appropriate clinical guidelines, use of essential medicines list, public education about medicines and regular update to the clinicians will help in implementing the principles of rational use of drugs.

CONCLUSION

Medication errors occur frequently in ICUs of tertiary care hospitals. Therefore it is essential to establish medication error reporting system at each hospital.

It was found that there was marked prevalence of medication errors related to antibiotics in ICUs. Omission errors were most frequent one.

Most of errors in MICU were not measurable and result in harmful consequences for the patients.

This study had presented a pattern of types of medication errors related to antibiotics in ICUs in tertiary care hospital and suggested areas for quality improvement. This study has proven that there is an urgent need of clinical pharmacist in specialized units like ICUs, where poly-pharmacy is practiced.

There is an urgent need for establishing of a medication error reporting system at each hospital and to share data with other healthcare settings to prevent further occurrence of the same.

Conflicts of Interest: There is no conflict of interest.

Financial support and Sponsorship: Study is not funded by any agencies.

Ethical Approval: The study was under taken as a part of summer internship of management studies. There was no direct/indirect intervention on medication study of any human beings or animals and hence there was no ethical issues involved.

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Knowledge, Perception and Psychosocial Preparedness for Menarche among Adolescent Girls of Udupi District, Karnataka

Charmaine Crystal Salins[1], Anjalin D'Souza[2], Malathi G Nayak[3]

[1]MSc Nursing in Child Health Nursing, Manipal College of Nursing Manipal, Manipal Academy of Higher Education; [2]Assistant Professor, Department of Child Health Nursing, [3]Assistant Professor, Department of Community Health Nursing, Manipal College of Nursing Manipal, Manipal Academy of Higher Education, Manipal

ABSTRACT

Background: Adolescence is a crucial phase of growth extending from puberty to adulthood spanning much of the second decade. It is the critical period of biological and psychosocial changes. They lack adequate knowledge about the physical changes during the pubertal period and which in turn leads to undue anxiety.

Objectives: The objectives of the study were to assess the knowledge, perception, psycho social preparedness for menarche and the problems experienced by the adolescent girls.

Methods: A descriptive survey study was conducted among 200 adolescents aged 11-13 years from 10 higher primary schools of Udupi district. Adolescents who met the sampling criteria were selected by purposive sampling. Structured questionnaire was used to assess the knowledge on menarche. A rating scale was used to assess the perception, psychosocial preparedness towards menarche and predesigned questionnaire was used to assess the problems experienced at the time of menstruation. Descriptive and inferential statistics were used for data analysis.

Results: Results shows that, out of 200 adolescents, 88% of the adolescents had average knowledge, 95.5% had negative perception, most of them 52.5% were well prepared for menarche. The most common problems experienced by the adolescents were abdominal pain (75%), heavy bleeding (73.5%) and white discharge few days before menstruation.

Conclusion: Social prohibitions and restrictions from attaining religious rituals have created a negative impact on adolescents and have blocked the access to the right kind of information. Therefore much more efforts are needed to curb the misbeliefs and taboos among the adolescent school girls.

Keywords: *Menarche, knowledge, perception, psychosocial preparedness.*

INTRODUCTION

Menarche is a normal physiological process in the reproductive phase of woman's life that occurs at regular monthly intervals. Menarche typically occurs around the age of 12 years. Menarche marks the onset of physical and sexual maturation in adolescent girls known as puberty[1].

Corresponding Author:
Anjalin Dsouza,
Asst.professor, Manipl College of NursingManipal,
Manipal Academy of Higher Education, Karnataka, India
Email-anjeline.d@manipal.edu

India has the largest population of adolescents in the world which comprises about 243 million aged 10 -19 years of age. Adolescence is regarded as unique phase of human development [2]**.** Adolescence is a period where vital physical and psycho- sexual changes take place. In this regard, the older child that is the pre adolescents between the age of 10 and 12 years should also receive adequate attention as a preparation for pubertal changes and menarche[3].

The gap between problems during menstruation among adolescents is due to lack of knowledge and proper guidance[4]. Young adolescents experience significant physical and emotional difficulties during menstruation which stem from poor information and the reactions of

their peer group to menstrual activity. Role of school nurses in imparting education on pubertal changes is significant and schools should explore the manner in which nurses can contribute to this area of health education [5]. Hence the present study focuses on assessing the knowledge, perception, psychosocial preparedness for menarche and the problems experienced by the adolescent girls in selected schools of Udupi district.

MATERIALS AND METHOD

A descriptive survey was conducted among 200 adolescent girls in the age group of 11-13 years from selected schools of Udupi district, Karnataka. Udupi district is located in the coastal region of Western Ghats about 60 kms from Mangalore and has many prominent educational centers. All adolescent girls who were studying in VI and VII standard, who had attained menarche one year prior to the data collection and willing to participate were included in the study.

Sample size was calculated based on pilot study results. Psychosocial preparedness towards menarche (one of the objectives of the main study) was 66.7%. This proportion was considered as the key variable in sample size determination. Out of 226 higher primary schools of Udupi district, ten schools were selected randomly to get the required number of adolescents. From these schools the adolescents who met the inclusion criteria were selected by purposive sampling.

Four tools were used to collect data from the participants. Demographic proforma was used for the purpose of collecting background information of the adolescents. Structured knowledge questionnaire on menarche was used to assess the knowledge of adolescents. Knowledge scores were classified as poor knowledge (0-15), average knowledge (16-21) and good knowledge (22-30). A five point rating scale was used to assess the perception of adolescent girls towards menarche. Inferences were drawn according to the scores obtained: Positive perception score towards menarche was (31-50), and negative perception towards menarche was (10-30). To find out the psychosocial preparedness for menarche a five point scale was prepared by the researcher. Inferences were drawn according to the scores obtained: well prepared (37-60) and poorly prepared (12- 36).To identify the problems experienced by the adolescent girls at the time of menstruation, a questionnaire was used, which mainly focused on common problems faced by adolescent girls. The tools were validated, translated into Kannada and pretested. The reliability of knowledge questionnaire was computed by split half method and the value was 0.81.The tool on perception towards menarche and psychosocial preparedness towards menarche was computed using Cronbach's formula and the reliability scores were 0.88 and 0.89 respectively. The test re test reliability coefficient was 0.96 for the tool on health problem experienced by the adolescents during menstruation. The statistical software SPSS 16.0 version was used for data analysis.

The main study was conducted among 200 adolescents after obtaining the ethical approval from Institutional Ethical Committee, Kasturba Hospital, Manipal (IEC794/2016) and permission from the selected schools of Udupi District, Karnataka. The purpose of the study was explained to the adolescents and informed consent from the parents and informed assent from adolescents was taken. Anonymity and confidentiality were ensured throughout the study.

RESULTS

Description of sample characteristics: It was found that, out of 200 adolescents, 45% belonged to the age group of 12 years. Concerning mother's educational status nearly, 38.5% of mothers had secondary education and 66% of adolescents' mothers were house wives. Majority of the adolescents 73.5% belonged to nuclear family. The major source of information were mothers. (Table 1)

Table 1: Frequency and percentage distribution of sample characteristics related to adolescents N = 200

Sample characteristics	Frequency	Percentage
Age in years		
11	50	25
12	90	45
12	60	30
Mother's educational status		
No formal education	13	6.5
Primary (I-VII standard)	19	9.5
Secondary VIII- X standard)	39	19.5
Higher secondary	37	18.5
Diploma	15	7.5
Degree	77	38.5

Contd…

Mother's occupation		
House wife	132	66
Skilled	60	30
Semi-skilled	8	4
Type of family		
Extended	2	1
Joint	51	25.5
Nuclear	147	73.5
Mother's explanation about menarche		
Yes	179	89.5
No	21	10.5
Source of information		
Mother	170	85
Sibling	6	3
Friends	15	7.5
Teacher	6	3
No information	3	1.5

Description of knowledge, perception and psychosocial preparedness for menarche among adolescents

Majority of the adolescents 176 (88%) had average knowledge, whereas, 21 (10.5%) had good knowledge and only 3 (1.5%) had poor knowledge on menarche (Table 2).

Majority of the adolescents 191 (95.5%) had negative perception towards menarche whereas, only 9 (4.5%) of the adolescents had positive perception towards menarche. (Figure 1)

The study findings on psychosocial preparedness for menarche among adolescents shows that majority of the adolescents 105 (52.5%) were well prepared for menarche, whereas 95 (47.5%) of the adolescents were poorly prepared for menarche. (Figure 2)

Table 2: Frequency and percentage distribution of knowledge on menarche N = 200

Knowledge score	Frequency	Percentage
Good (22-30)	21	10.5
Average (16-21)	176	88
Poor (0-15)	3	1.5

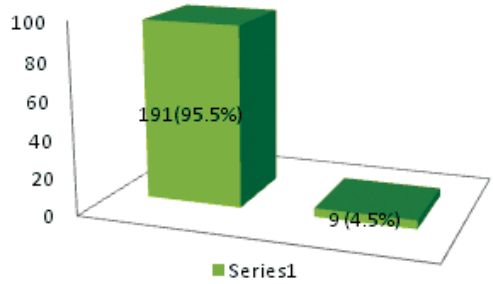

Figure 1: Bar diagram showing frequency and percentage distribution of perception towards menarche.

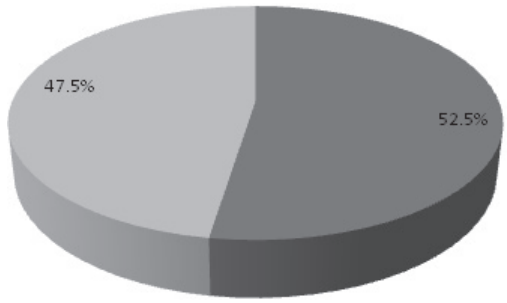

Figure 2: Pie diagram showing percentage distribution of psychosocial preparedness for menarche among adolescents.

Description of health problems experienced by the adolescents during menstruation: The description of health problems experienced by the adolescents during menstruation is depicted in table 3.

Table 3: Frequency and percentage distribution of health problems N = 200

Health problems	Frequency	Percentage
Regularity of menstruation (n = 200)		
No	78	39
Yes	122	61
Abdominal pain/cramping (n = 200)		
No	50	25
Yes	150	75
Backache (n = 200)		
No	111	55.5
Yes	88	44.5
Often feeling tired (n = 200)		
No	80	40
Yes	120	60
Bleeding more than seven days (n = 200)		
No	161	80.5
Yes	39	19.5

Contd…

Heavy bleeding (n = 200)		
No	53	26.5
Yes	147	73.5
If yes, changing of sanitary pads (n = 147)		
Hourly	6	3
Every 2 hourly	30	15
Every 3 hourly	38	19
Every 4 hourly	73	36.5
Missing school due to heavy menstruation (n = 200)		
No	155	77.5
Yes	45	22.5
Itching over genital region few days before menstruation (n = 200)		
No	108	54
Yes	92	46
White discharge (n = 200)		
No	68	34.5
Yes	131	65.5
Breast tenderness (n = 200)		
No	164	82
Yes	36	18
Nausea/vomiting (n = 200)		
No	184	92
Yes	16	8
Diarrhoea (n = 200)		
No	180	90
Yes	20	10
Headache (n = 200)		
No	112	56
Yes	88	44

The study findings on health problems experienced by the adolescents during menstruation shows that, most of the adolescents (61%) had irregular menstruation. Majority of the adolescents (75%) had experienced abdominal pain during menstruation, out of which 10.5% had severe abdominal pain. Forty four percent of the adolescents experienced back pain during menstruation. Most of the adolescents (60%) felt tired during menstruation. Bleeding for more than seven days accounted for 19.5% where, 73.5% had heavy bleeding during menstruation and the data showed 22.5% of the adolescents missed their school due to heavy menstruation. About 3% of the adolescents had to change their pads hourly due to heavy bleeding, 15% of the adolescents had to change the sanitary pads every 2 hourly. As per the data, 18% of the adolescents had breast tenderness, nearly 8% of the adolescents experienced nausea/vomiting, 10% had diarrhoea and 44% had experienced headache during menstruation.

DISCUSSION

There is a substantial lacuna in the knowledge about menstruation among adolescent girls. The present study revealed that majority of adolescents 62% had average knowledge on menstruation. Whereas, 33% had poor knowledge and only 5% had good knowledge on menstruation which is in consistent with findings of the study conducted by Thakre, Reddy in 2011, disclosed that 36.95% of the girls had good knowledge on menstruation, whereas, 63.05% had poor knowledge on menstruation [6]. Mothers were the major source of information regarding menstruation/pubertal changes for majority of the adolescents[7].

Social prohibitions and restrictions from attaining religious rituals have created a negative impact on adolescents and have blocked the access to the right kind of information. Present study revealed that majority of the adolescents 95.5% had negative perception towards menarche and only 4.5% had positive perception towards menarche. The findings of the present study are in harmony with the results of the study conducted by Sowmya & Sequeira in 2016.It was found that 82% of adolescents were not offering pooja, 66% were taking special food items during menstruation, 83% were restricted from visiting religious places, 41% were sleeping in a separate room during menstruation and 64% of the adolescents reported that menstruation is unclean and they followed different practices [8]. The findings of cross sectional study disclosed that 84.9% of adolescents thought that swimming and running during menstruation is dangerous, 53% had false belief that girls get cranky during menstruation, 66% believed that blood loss during menstruation makes them weak[9].

Lack of preparedness for menarche will lead to undue anxiety in adolescents. Present study showed that majority of adolescents (52.5%) were well prepared for menarche and (47.5%) were poorly prepared for menarche. The findings are in agreement with the cross sectional study which showed that 25.5% of the adolescents expressed anxiety when they had their first menstruation, 18.78% expressed fear, 10.3% experienced

ashamed and embarrassment feelings, 14.24% had concerns about abnormality of menstruation, 10% of them were crying along with their first menstruation and 21.5% felt excited [10].

Most of the adolescents suffer from health related problems during menstruation and experience menstrual problems for one or more occasions. Present study showed that majority of the adolescents (75%) experienced abdominal pain, whereas 44% of the adolescents experienced back pain during menstruation. The findings are in agreement with the findings of which showed that, about 70.1% of adolescents had problems related to menstruation; of which dysmenorrhea was the major problem (88.8%) other problems were menorrhea, polymenorrhea (11.2%). Nearly 23% had missed school days for 1-3 days [11]. Dysmenorrhoea was the common problem experienced by 87.87% of adolescent girls. Other associated physical symptoms were headache, sleeplessness, fullness and tenderness of breasts, feeling of heaviness in the lower abdomen and swelling of face[12].

The findings of the study would provide a baseline data for the health professionals to create awareness among the adolescents regarding menstruation and its management as menstrual problems among girls are highly prevalent among adolescent girls, an action to promote a healthy reproductive life amongst the girls is required. There is an urgent need to create awareness of menstrual problems and safe menstrual practices among girls as well as mothers.

CONCLUSION

The findings of the study showed that majority of the adolescents had negative perception and misconception regarding menstruation. The common problems experienced by the adolescents during menstruation were abdominal pain, back pain, tiredness, heavy bleeding, and white discharge few days before the onset of menstruation. Therefore this suggests that there is a need for accurate education programme among adolescents and their parents on menstruation and the associated misconception and adolescent girls should be offered possible treatment options with adolescent friendly approach.

Conflicts of Interest: None

Source of Funding: None

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Measles Rubella Immunization Campaign: Challenges Faced in an Urban Area of Chennai

Barathalakshmi J[1], Rashmi Gour Patel[2], Kanimozhi S[3], Sudha V[4]

[1]Associate Professor, Department of Community Medicine, Sri Lakshmi Narayana Institute of Medical Science, Puducherry, [2]Associate Professor, Sree Balaji Medical College Hospital & Research Institute, Chennai, [3,4]Assistant Professor, Department of Community Medicine, Sri Lakshmi Narayana Institute of Medical Science, Puducherry,

ABSTRACT

Background: Like other countries in Asia, measles-rubella (MR) vaccine coverage in India is suboptimal whereas 90–95 % coverage is needed for elimination of these diseases. The Ministry of Health and Family Welfare (MOHFW) of the Government of Tamilnadu implemented MR campaign in February 2017 to increase MR vaccination coverage. Strategically, the MOHFW used both routine immunization centres and educational institutions for providing vaccine to the children aged 9 months to <15 years. This evaluation was carried out to assess the MR vaccination coverage.

Objectives: To assess the MR vaccination coverage and barriers of vaccine coverage in the community

Methods: A community based cross-sectional study was carried out in March and April 2017. Household visits were made to collect the data from 330 children using a pre-structured questionnaire. The data was analyzed by SPSS 20 using Proportions and Chi square tests.

Results: Of the total 330 children surveyed, MR immunization coverage was 77.2% (255). Among the 255 vaccinated children 6.3% of them had mild fever after vaccination. 74.5% and 25.5% of them got the vaccination in their schools and government health centres respectively. Among the 75 non-immunized children, 62.8% and 29.4% were denied vaccination due to inflated information about the adverse events following immunization shared in television and social media respectively

Conclusion: The results of our evaluation indicated that the campaign was suboptimal in terms of Measles Rubella immunization coverage. Achieving measles and rubella elimination worldwide will be an important milestone in public health, and every effort toward elimination, including vaccination campaigns should be of high quality and ensure adequate information regarding immunization and its effects to the community.

Keywords: *Campaign, Coverage, Measles, Rubella, Barriers*

INTRODUCTION

Measles is one of the most infectious human diseases and can cause serious illness, long term complications and death. Prior to the availability of measles vaccine, the virus infected over 90% of children before they reached 15 years of age[1]. Immunization is one of the most effective public health tools reducing the infant and childhood morbidity and mortality, caused by vaccine preventable diseases worldwide. However, outbreaks of vaccine preventable diseases continue to occur in developing countries[2,3]. Good routine immunization levels and campaigns to vaccinate children are thought to be behind the figures. The WHO says measles is still a global threat and some populations remain unprotected. We need to move beyond 84% global routine immunization coverage. It's also vital that parents are fully aware of the benefits of immunization and the risks associated with not vaccinating children[4].

The World Health Organization estimated that global deaths from measles dropped 78% between 2000

Coresponding Author:
Barathalakshmi J,
Associate Professor, Department of Community Medicine,
Sri Lakshmi Narayana Institute of Medical Science,
Puducherry

and 2015. New figures from the WHO suggest that around 13.8 million deaths were prevented during this time and reported cases declined by 77%.The Measles and Rubella Initiative wants to reduce measles deaths by 95% by 2015 and get rid of measles and rubella in at least five regions of the world by 2020[5].The GAVI Alliance is investing more than US$ 600 million in the fight against measles and rubella through large-scale campaigns. The Alliance targets over 700 million children in 49 countries aged 9 months to 14 years to immunize against measles and rubella.

High level of herd immunity is required for the elimination of measles. Studies on sero prevalence of measles suggest that vaccine coverage in the range of 90–95 % is needed. Early vaccination is also suboptimal, because children who receive the measles vaccination too early are at increased risk for vaccine failure. Low measles vaccination coverage in a community can also have a deleterious effect on children who have been adequately vaccinated, putting them at elevated risk for contracting measles[6].Measles and rubella are vaccine-preventable diseases with similar symptoms and are frequently confused with each other. Both viruses cause rash and fever. Measles can be deadly for children with poor nutrition and weakened immune systems[7, 8].

Rubella is also very contagious but causes relatively mild disease in children; in pregnant women, rubella can lead to miscarriage or severe birth defects congenital rubella syndrome (CRS), including blindness, deafness, and heart problems[9, 10]. Rubella can become a major public health issue when infection occurs during first trimester of pregnancy. Most anomalies occur if rubella infection occur before 11 weeks of pregnancy; however studies show that up to 25% of congenital cataract follows rubella infection in pregnancy[11, 12].

Rubella and measles are a public health problem in poor countries in Africa and Asia, where uptake of the measles and rubella vaccine is relatively low and increasing access to immunization through large scale vaccination campaigns can significantly reduce deaths and illnesses[13].In India, places like Delhi, Goa, Puducherry and Sikkim have higher vaccine coverage since they have taken the initiative and lead to the two dose schedule of measles mumps and rubella (MMR) at 9 months and at 15 months respectively. Now a days there is a distinct change in the measles and mumps disease pattern due to measles and MMR vaccination[14]. Maintaining high levels of routine immunization coverage each year reduces the accumulation of susceptible populations, thereby lengthening the interval needed between Supplementary Immunization Activity and conceivably eliminating the need for them altogether if validated routine coverage with two doses of measles vaccine were to exceed 90–95% for at least three consecutive years[15]

A higher level of education and increased parental awareness would facilitate increased vaccination coverage because they ensure increased awareness of health issues and provide individuals with increased access to services, information, and the skills to interact with professionals and health care services[16, 17, 19]

METHODOLOGY

A community based cross-sectional study was carried out in Anakaputhur, urban field practice area of Sree Balaji Medical College Hospital & Research Centre, Chennai. The required sample size of 236 children was obtained from the global coverage of 82% for MR vaccine. A total of 218 households with 330 children were included in the survey.

A house to house survey was done immediately after the MR vaccination campaign which was conducted all over Tamilnadu in the month of February 2017 in order to reduce the recall bias. Data was collected in the month of March and April.The mothers were interviewed individually to collect the data regarding the details of their children's MR vaccination status, demographic information like birth order, parent's education, their attitude, occupation, place of vaccination, source of information about vaccination and the reasons for not vaccinating their children.

Research tool used was a pretested and semi structured questionnaire. The data was collected and then analyzed using SPSS 20 version. The results were expressed in proportion and association by applying Chi square test.

RESULTS

A total of 330 children was included in the study, of whom171 (51.8%) were males and 159 (48.2 %) females.50% of children were aged between 9 months and 6 years.237 (71.8 %) of mothers had attained only secondary level of education.

Table 1: Demographic characteristics of the participants n = 330

Age in years	No	Percent %	MR coverage (%)	Chi square 'p'value
< 3	82	24.8	58(22.7)	0.46
3-6	81	24.5	66(25.9)	
6-9	79	23.9	64(25.1)	
9-12	60	18.1	45(17.6)	
>12	28	8.4	22(8.6)	
Total	330	100		
Sex				
Male	171	51.8	135(52.9)	0.45
Female	159	48.2	120(47.1)	
Total	330	100		
Mother educational status				
< Secondary level (10thstd)	237	71.8	183(71.8)	0.97
> Secondary level	93	28.2	72(28.2)	
Mother occupation status				
Employed	219	66.4	180(70.6)	0.003
Unemployed	111	33.6	75(29.4)	
Father educational status				
< Secondary level (10thstd)	253	76.7	195(76.5)	0.87
> Secondary level	77	23.3	60(23.5)	

The MR vaccine coverage rate in the present study was 77.2% (255). Among the vaccinated children, 190 (74.5%) and 65 (25.5%) received their vaccination in educational institutions and government health centres respectively.

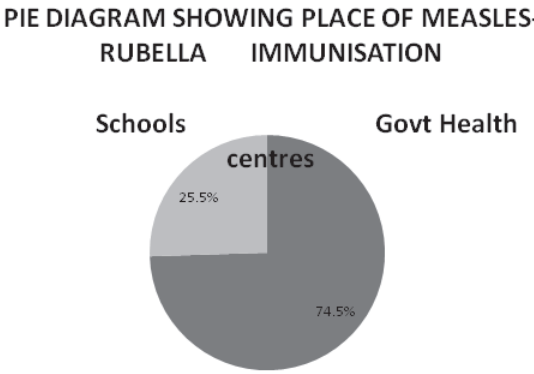

Fig. 1

Among the 255 vaccinated children 6.3% had mild fever following immunization. Among the 22.8% of non-immunized children, 57.4 % were not immunized because of the fear of side effects and major source of information was through television (62.8%). About 77.5% of the mothers had taken special advice before getting their children vaccinated.

Table 2: Source and Barriers (reasons) of Non Immunization according to respondents

Sources	n = 75	Percent %
Television	47	62.8
Social media	22	29.4
Neighbours	2	2.6
Friends	2	2.6
Healthcare professionals	2	2.6
Reasons for not vaccinating		
Fear of side effects	43	57.4
Child was sick	17	22.6
Child refused	5	6.7
Absent on vaccination day	4	5.3
Child is young to receive	3	4
Mother had no time	3	4
Mother is not aware of the place of vaccination	2	2.6

Only 18.4% of the mothers had known that rubella vaccine is available already as optional vaccine. Only few mothers (9.1%) of the were aware of the Congenital Rubella Syndrome.

Table 3: Attitude and Knowledge of mothers on MR immunization

Awareness	n = 330	Percent %
Already available vaccine as optional one	61	18.4
Newly introduced vaccine	269	81.5
Congenital Rubella Syndrome		
Aware	30	9.1
Not aware	300	90.9
Attitude		
Vaccine will benefit my child	239	72.4
Will be of no benefit	91	27.6

DISCUSSION

The study found that the MR immunization coverage rate was 77.2%which is lower than the WHO target coverage of 90-95% for elimination of Measles. The strategy of inclusion of educational institutes as campaign centre for giving vaccine to the school children showed significant positive impact on MR vaccine coverage. However the estimate is less but still it is comparable with the rates in Delhi[17]. This sub optimal coverage of 77.2% might lead to an epidemic in future. Rubella occurs as epidemics every 5 to 9 years. The WHO estimates incidence of CRS between 0.5–2.2/1000 live births during epidemics in developing countries

In the present study, the various reasons for non-immunization were evaluated. The most common reason for non-immunization was the fear of side effects (57.4%) following immunization which is similar to a study in Bangaladesh[18]. The other reasons for not immunizing were child refusal, mothers thought that the measles vaccination is done already, their child is too young to receive it and even few mothers stated that their child was sick (22.6%) were absent on the day of vaccination in spite of adequate announcement regarding the availability of vaccine in the nearby government health centres for the entire month of February. In the present study, mother's occupation was one of the factors significantly associated with the immunization coverage.

The exaggerated information about the adverse events that occurred in few children and in few places were shared in television and social media extensively which had significant negative impact about the immunization campaign and the vaccine coverage.

Though the attitude of the mothers were found to be positive, two hundred and ninety five (90.9%)of the mothers were not aware of the benefits like prevention of Congenital Rubella Syndrome. Hence elaborate information about the eligible age of recipients, place of vaccination, mass immunization duration and alternate places from where they can get vaccinated if they miss in their schools has to clearly reach the community

Majority (81.5%) of the participants were not aware that measles and rubella vaccines are already in the immunization schedule of some states like Delhi, Puducherry, Sikkim and Goa. For the rest of the states the same measles and rubella vaccines are available as optional vaccines[8]. The participants are still in belief that MR vaccine is a new vaccine which is tried on people for the first time. Correct and detailed information about the vaccine has to be provided to the public which will really make a difference in their attitude and practice.

About 77.5% of the mothers had sought second opinion from health care professionals after witnessing vomiting and faint attacks which were shared in television and social media. This reflects the amount anxiety and negative impact created by the media. The media can be used effectively to spread the correct facts about the immunization campaign. The responses to the frequently asked questions by the community covering the particular mass campaign clearing all possible doubts about the concerned vaccination should actually reach the community before the campaign.

Government has to be prepared with adequate ground work anticipating wrong propagandas through television and social media which could virally spread to thousands of people within a fraction of time ultimately affecting the success of the mass campaign.

Earlier the mother's literacy level and the media communication was not as good as now and those were main reasons for immunization coverage[19].But now both literacy level and media communication have improved and if the media is used appropriately, the vaccine coverage rate can even surpass the WHO target of 95% coverage which is mandatory for elimination of measles and rubella.

CONCLUSION

The results of our evaluation indicated that the

campaign was suboptimal in terms of Measles Rubella immunization coverage. This is the first mass campaign of a rubella containing vaccine and was only recently introduced into the routine EPI system. Enhancing population awareness about rubella disease and prevention of congenital rubella syndrome is an important mechanism for increasing understanding of the rationale of the MR vaccine over traditional measles vaccine. The possibility and the nature of adverse events should also be explained to the community during the pre-campaign activities to avoid such suboptimal coverage.

STUDY LIMITATIONS AND STRENGTHS

The present study had few limitations. It was conducted locally, among families of low and middle income and is, therefore, not representative of the whole city. The coverage was estimated based the mother response instead of direct examination by the investigator. However the reach of the media is so viral and uniform throughout the state, the reasons for non-immunization can be generalized. Therefore it could be used as a model for designing strategies in order to improve the content and quality of pre vaccination campaign.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Obtained from the ethical committee

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Factors Influencing the Sleep Quality among the Undergraduate Nursing Students of Udupi District

Sally Jane J. K.[1], Binu Margaret[2], Priyanka Chandy[3]

[1]MSc, Nursing in Child Health Nursing, [2]Assistant Professor, Department of Child Health Nursing, [3]Lecturer, Department of Mental Health Nursing, Manipal College of Nursing Manipal, Manipal Academy of Higher Education, Manipal

ABSTRACT

Background: Sleep is a physiological phenomenon and is very essential for the healthy functioning of the individual. Many factors like study habits, personal factors, life style, mass media, usage of electronic media, academic schedules can influence the quality of sleep.

Objective: To find association between sleep quality and factors influencing sleep quality.

Material and Methods: The study was done among undergraduate nursing students who were in the age of 19 to 24 years from Udupi District, Karnataka**.** The study used a cross sectional design. Pittsburg Sleep Quality Index and a semi-structured questionnaire was used to obtain the data.

Result: There was an association between sleep quality and selected factors like duration of sleep at night, did not often wake up at night, no difficulty in falling asleep, good environment, studying till late at night after 11 pm, writing assignments late at nights, did not work continuously the whole night, get enough sleep before examination, performance in the current year II Sessional examination, not engaging in social activities late at nights ($p<0.05$).

Conclusion: Sleep quality was dependent on selected factors influencing sleep quality. Interventions promoting heath awareness for the undergraduate students to adopt good study habits and to manage the time effectively is utmost recommended for developing good sleep habits.

Keywords: *Factors influencing sleep quality, undergraduate nursing students, sleep quality, Udupi*

INTRODUCTION

Sleep is a function of physical and mental restoration and is a physiological phenomenon. Sleep, which is inadequate, causes emotional instability, daytime sleepiness and decreased concentration leading to memory loss. Mood dysregulation, increased dissatisfaction in daytime functioning, decrease in cognitive functions and obesity are caused by sleep deprivation, which in turn affects the academic performance.[1]

Corresponding Author:
Binu Margaret
Assistant Professor, Department of Child Health Nursing,
Manipal College of Nursing, Manipal,
Manipal Academy of Higher Education, Manipal,
Udupi District, Karnataka, India. Pin: 576104
Email: binumarg@gmail.com

Increasing sleep problems in adolescents are an obstacle in the learning process of an individual, which in turn negatively affects their behavior, accomplishment of societal capability and excellence of life.[2] Many factors affect the quality of sleep in the individual. A descriptive survey done among 400 undergraduate students of Hong Kong showed that 57.5% had poor quality of sleep, and had an association with the factors such as sex, class of study, and sufficient sleep in the former month.[3] Students had slept 7.95±1.34 hours at night, and (12.3%) students had sleep less than 6.5 hours and a majority were poor sleepers. Poor sleep quality among 540 undergraduates had an association with inadequate sleep which was prevalent among the undergraduates in Lebanon.[4]

The incidence of poor sleep quality among 2854 undergraduates of Thailand was 48.1%. Poor sleep quality had a significant association with a maximum (58.0%)

of students who took beverages.[5] Also, a cross sectional study done in Peru among 418 undergraduates showed a significant association with dependence of Facebook and poor quality of sleep by dysfunction at daytime.[6]

Students of a medical college (19.17%) had poor quality of sleep. There was no difference in the sleep quality among the genders (p>0.05) but a difference was found among the year of study. Anxiety and depression among the students also had a significant correlation. Many factors like stress, health condition, relationship with classmates, irregular work/rest, late to bed, environment of the place of stay, worry of examination and sleep had a significant association with sleep quality.[7] Irregular bedtimes, average sleep in day and inadequate sleep resulted in poor sleep quality.[8]

Inadequate sleep indeed does, however, disturb the roles of the central nervous system. Persistent sleeplessness is frequently related with progressive failure of the thought processes and occasionally even leading to unusual behavioral activities. Increased sluggishness of thought occur heading the end of a lengthy sleepless period, but in adding, an individual can become short tempered or even psychotic after enforced sleeplessness.[1]

Literature review showed different results between the sleep quality and its selected factors influencing sleep quality, and hence an attempt was made to assess an association.

METHOD

Two hundred twenty four undergraduate nursing students were surveyed using a semi-structured questionnaire on factors influencing sleep quality and Pittsburg Sleep Quality Index (PSQI). All the students of second, third and fourth year from a selected college of nursing from Udupi district, Karnataka state, who have given the informed consent and willing to participate in the study were included. The study used a cross-sectional design. The students were in the age group of 19 to 24 years. Ethical clearance was taken from the Institutional Ethical Committee. Formal administrative permission was taken from the concerned authorities.

The data were collected by using valid, pretested and reliable questionnaires. The sleep quality was assessed using PSQI (r=0.70) and a tool on factors influencing sleep quality (r=0.75) was used to assess the factors. The tool assessed the various factors such as, personal factors, familial factors, environmental factors, academic schedules and study habits, performance in the examination, usage of electronic media, and peer influence. The questionnaires were given to the participants and were asked to fill all the items.

The data were categorized and analyzed using SPSS version 23.0. Descriptive statistics was used for sample characteristics and the inferential statistics to find the association.

RESULTS

Out of 224 undergraduate students, majority 206 (92.0%) were females and 175 (78.1%) of the students were hostelites. Eighty two (36.6%) students from fourth year and 71 (31.7%) students each from second and third year respectively. Majority 144 (64.3%) students followed Christianity, 14 (18.3%) were Hindus and 1 (0.4%) was Muslim. Maximum 80 (35.7%) students were in the age group of 21 years. Maximum 80 (35.7%) and 70 (31.3%) of students had their mother's and father's education as higher secondary.

Majority 123 (54.9%) of the students had poor sleep quality and 101 (45.1%) had good quality of sleep. The mean sleep quality was 4.98 ± 2.705. Majority of students 130 (58%) can get to sleep within 30 minutes in the last month, 50 (22.3%) did not get sleep less than once a week, 29 (12.9%) once or twice a week and 15 (6.7%) three or more times a week. Maximum of students 108 (48.2%) did not wake up in the middle of night in the last month, 42 (18.8%) woke up less than once a week, 53 (23.7%) once or twice a week and 21 (9.4%) three or more times a week.

The sleep quality is influenced by various factors. The factors influencing sleep quality that are included in the study are the demographic factors, environmental factors, personal factors, familial factors, academic schedules and habits, performance in previous examination, usage of electronic media and peer influence. The association of these factors with the sleep quality was computed by chisquare test and is given in table 1, 2,3 and 4.

Table 1: Association between sleep quality and the demographic factors using Chi square test

Demographic factors	Good sleep quality	Poor sleep quality	χ2	df	p value
Age in years					
19	23	15	5.644	3	0.227
20	29	45			
21	36	44			
>=22	13	19			
Gender					
Male	4	14	4.134	1	0.042*
Female	97	109			
Class of study					
II Year BSc Nursing	33	38	0.114	2	0.945
III Year BSc Nursing	31	40			
IV Year BSc Nursing	37	45			
Current place of stay					
Home	25	24	0.891	1	0.345
Hostel	76	99			

* - Significant; ($p<0.05$)

Table 2: Association of sleep quality with the personal factors and familial factors using Chi square test

Personal Factors	Good sleep Quality	Poor sleep Quality	χ2	df	p value
Sleep peacefully at night					
No	2	18	10.921	1	0.001*
Yes	99	105			
Get enough sleep at night					
No	2	26	18.611	1	0.001*
Yes	99	97			
Duration of sleep at night					
>7 hours	55	11	72.301	3	0.001*
6-7 hours	42	60			
5-6 hours	4	47			
< 5 hours	0	5			
Often wake up at night					
No	92	90	11.688	1	0.001*
Yes	9	33			
Difficulty in falling asleep					
No	96	103	7.155	1	0.007*
Yes	5	20			
Drinking beverages at night					
No	91	111	0.001	1	0.971
Yes	10	12			

Contd…

Late evening physical activity					
No	95	106	3.738	1	0.053
Yes	6	17			
Familial Factors	**Good sleep quality**	**Poor sleep quality**	**χ2**	**df**	**p value**
Family problems					
No	98	117	0.523	1	0.469
Yes	3	6			
Financial concerns					
No	96	115	0.245	1	0.621
Yes	5	8			

* - Significant; ($p<0.05$)

Table 3: Association between sleep quality and the academic schedules, study habits and performance in previous examination computed using Chi square test

Academic schedules and study habits	Good sleep quality	Poor sleep quality	χ2	df	p value
Studying late night after 11 pm					
No	39	29	5.931	1	0.015*
Yes	62	94			
Writing assignments at late nights					
No	48	37	7.166	1	0.007*
Yes	53	86			
Work continuously the whole night					
No	88	88	8.000	1	0.005*
Yes	13	35			
Get enough sleep before examination					
No	22	59	16.473	1	0.001*
Yes	79	64			
Lack of confidence during examination					
No	73	73	4.084	1	0.043*
Yes	28	50			
Performance in the previous university					
Not satisfactory performance	33	48	0.969	1	0.325
Satisfactory performance	68	75			
Performance in the current I sessional					
Not satisfactory performance	45	64	1.241	1	0.265
Satisfactory performance	56	59			
Performance in the current II sessional					
Not satisfactory performance	22	48	7.674	1	0.006*
Satisfactory performance	79	75			

* - Significant; ($p<0.05$)

Table 4: Association between sleep quality and usage of electronic media, peer influence and environmental factors using Chi square test

Usage of electronic media	Good sleep quality	Poor sleep quality	χ2	df	p value
Listen to music till late at night					
No	49	69	1.279	1	0.258
Yes	52	54			
Chat with friends till late night					
No	60	66	0.744	1	0.388
Yes	41	57			
Peer Influence	**Good sleep quality**	**Poor sleep quality**	**χ2**	**df**	**p value**
Engage in social activities at late nights					
No	92	100	4.339	1	0.037*
Yes	9	23			
Extracurricular activities late at nights					
No	84	94	1.546	1	0.214
Yes	17	29			
Environmental Factors	**Good sleep quality**	**Poor sleep quality**	**χ2**	**df**	**p value**
Good environment for sleep					
No	2	19	11.839	1	0.001*
Yes	99	104			
Put on lights when going to bed					
No	80	103	0.762	1	0.383
Yes	21	20			
Noise disturbance at night					
No	71	79	0.924	1	0.337
Yes	30	44			
Snoring of roommate at night					
No	96	116	0.060	1	0.807
Yes	5	7			

($p<0.05$); * - Significant

The data presented in table 1 and 2 showed a significant association of sleep quality with the selected factors like, gender (p=0.042), sleep peacefully at night (p<0.001), get enough sleep at night (p<0.001), duration of sleep at night (p<0.001) and did not often wake up at night (p<0.001). Studying late night after 11pm (p=0.015), writing assignments late at nights (p=0.001), get enough sleep before examination (p<0.001), lack confidence during examination (p=0.043), performance in the current year II Sessional examination (p=0.006) were the academic factors which were dependent on sleep quality (Table 3). The table 4 shows that sleep quality had a significant association with good environment for sleep and engaging in social activities late night (p<0.05).

DISCUSSION

Sleep is a very essential physiological process in the human being. Many factors could distort this sleep process which inturn can affect the health and wellbeing of the individual. Undergraduate students in the nursing profession also could face the problems related to sleep due to their academic schedules, poor management of time, study habits and other environmental factors, which could influence them. The present study revealed that sleep quality was dependent on certain academic, personal and environmental factors and was found to have a statistical significant association with these selected factors. It could be due to that, most of the students, inspite of having a good environment of living and sleep, they are continuously exposed to a rigid curriculum pattern whereby, the students start adapting themselves slowly according to their schedules in order to excel themselves.

The findings of this study are supported by few studies. In the present study, gender had an association with sleep quality. A cross-sectional survey conducted among 2,551 University students in which, the female students of second and third year had poor sleep quality. The students had apparent anxiety level which had a strong association with sleep quality.[9] Another study was conducted in examining the risk factors associated with poor sleep quality among 4318 students in Taiwan which showed that, poor sleep quality had a significant association with

the undergraduates, among the females, who had skipped breakfast and had the habit of drinking tea, frequent users of internet and those who had a poor social support.[10]

In a study done by Shelly D H and Ronald D C revealed that, most college students (70.6%) were deprived of sleep, of having less than eight hours of sleep, which led to the negative impact in their academic performance.[11] Another cross-sectional study conducted among 1,444 students in China also revealed that, more than half of the students who used social media exhibited poor sleep quality. These studies contradict the findings of the present study, which showed that quality of sleep was independent of usage of social media.[12]

The results of this study, enables us to identify and explore the factors which influences the sleep quality among the undergraduates, by which we could prevent the risk factors or the areas where a student feels uncomfortable or hazardous in their perspectives of health and education in their everyday lives.

CONCLUSION

Sleep quality was dependent on the selected factors like gender, academic schedules, study habits, sleep habits of the undergraduate students. Nursing students should manage their time effectively and adopt good study habits to improve the sleep quality. Health care professionals should focus their intervention to empower and motivate the undergraduate nursing students to manage their time effectively and balance between the academic schedules, clinical schedules and study habits, thereby adopting healthy sleep habits to improve the quality of sleep.

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Identification of Positive Deviant Behaviours Regarding Infant and Young Child Feeding (IYCF) among Rural Mothers for Improving Child Health and Nutrition-A Cross Sectional Study

Chitrarpita Saha[1], Vanisha S Nambiar[2]

[1]Research Scholar, [2]Professor, Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India

ABSTRACT

Aims: The present study aimed to identify positive deviant behaviour (PDB) regarding IYCF practices among mothers and correlate with the nutritional status of children (<5y).

Methods: Cross sectional study conducted in 2 rural clusters of Vadodara district, Western India, covering all mothers with children (<5y), enrolled in the ongoing ICDS program. Data regarding IYCF practices based on UNICEF guidelines, were elicited by interviewing mothers using semi structured questionnaires, scored using a10-point scale, categorized as Positively Deviant (PD) (scored ≥6) and Negatively Deviant (ND) (scored<6) and correlated with the current nutritional status of children determined by anthropometric assessment.

Results: Overall poor IYCF practices were observed in the study area as incidence of timely initiation of breastfeeding was 48%, colostrum feeding 72%, exclusive breastfeeding (EBF) 32%, pre-lacteal, water and top milk feeding for 1st 6m 50%, 61% and 20% respectively, timely initiation of complementary feeding 64%, continued breast feeding upto 2 years 36%, breastfeeding during illness 88% and active feeding 37% only. Among 96 mothers, 47 **(**48**.**9**%)** were identified as positively deviant **(**PD**)** who practiced ≥6 PDBs**.** Incidence of child undernutrition was significantly ($p<0.05$) higher among ND mothers (44% wasted, 61% stunted, 61% underweight) as compared to PD mothers (40% wasted, 53% stunted 61% underweight)**.** EBF had the highest impact on PD score according to OR value at 95**%** CI**.**

Conclusion: Improving child nutrition using Positive deviance approach by mobilizing community mothers can be an effective, replicable and sustainable strategy if properly planned and implicated.

Keywords: *IYCF practices, Positive Deviant Behaviours, stunting, wasting*

BACKGROUND

Globally approximately 162 million children under the age of 5 years are affected by stunting and 52 million children are severely wasted **(**WHO, 2012**).** UNICEF 2013[1] report made it very clear that irrespective of the regions rural people in all over the world are much more affected by malnutrition than urban people**.**

Nearly half of the stunted children live in south Asia **(**WHO, 2012**)** and though India has made progress towards the international hunger targets, its progress in improving nutrition is unacceptably slow and it still has the second-highest estimated number **(**194**.**6millions**)** of undernourished people in the world **(**FAO 2015**).**

Many programs do not give sufficient attention to the constraints that can prevent caregivers from feeding their children properly, like beliefs that colostrum is bad for a new born baby, family pressures to feed water instead of exclusive breastfeeding, or a heavy workload

Corresponding Author:
Prof. Vanisha S Nambiar
Department of Foods and Nutrition,
Faculty of Family and Community Sciences,
The Maharaja Sayajirao University of Baroda,
Vadodara-390002, Gujarat, India
Email: schitrarpita@gmail.com,
vanishanambiar@gmail.com

that gives mothers little time to prepare appropriate and nutritious complementary foods (USAID). In India about 44.2% 0-23months children were breastfed within 1hr of birth, 65.1% 0-5months were exclusively breastfed, 47.1% 6-8months were fed complementary food.

It is often seen that in communities there are a few 'deviant' individuals whose uncommon behaviors or practices enable them to outperform their neighbors with whom they share the same resources. Identification of these "positive deviants" can be crucial to bring sustainable change as their behaviors are likely to be affordable and acceptable by the wider community. Identification of positive deviant behaviour helps to understand the psychosocial environment that effects behaviour change and the valuable role of self-efficacious Positive deviant mothers/family members as counselors[2].

Therefore, the present study aimed to identify positive deviant behaviours (PDB) regarding Infant and Young Child Feeding (IYCF) among rural mothers for improving child health and nutrition.

MATERIALS AND METHOD

Ethical clearance: Ethical approval was obtained from the ethical committee of the Food and Nutrition Department of the university (Approval No: IECHR/2015/16). Local community leaders were informed about the aim and procedures of the study. All study participants gave their verbal consent to participate after the study objectives were explained to them.

Study design: It was a cross sectional study conducted for 6months at Ekalbara village of Padra taluka, rural Vadodara, western India. Two clusters of Ekalbara village were selected for the study location. All the children who were less than 5 years old along with their mothers were selected (N=96) as target group and enrolled in the study after giving consent.

Experimental procedure: Data collection occurred in the year 2015 from July to December (6months duration). Mothers were interviewed personally using a pre-tested semi structured questionnaire to elicit data on IYCF practices. Details of IYCF practices were noted down as they align with current, age-specific feeding recommendations for young children (World Health Organization 2010).

Anthropometric measurement (Height and weight) of children was taken and z-scores were calculated for weight/age (Underweight), height/age (Stunting) and weight/height (Wasting) using WHO Anthro software (WHO, 2006).

Using the UNICEF guidelines for IYCF, the identification of the positive deviant behaviours was done. The mothers were scored using a 10 point scale, categorized as PD (≥6) and ND (<6) and correlated with nutritional status of their children

Statistical analysis: Collected and calculated data was entered in excel 2010 datasheet and SPSS23 datasheet and analysed to determine the survey results as per the objectives. Graphs and tables were made to show the results clearly for better understanding.

RESULTS

The study showed that the IYCF practices in the area were very poor and 48% positive deviant mothers were identified who practiced 6 or more than 6 positive IYCF practices.

Table 1: 10 ideal IYCF practices in the study area and their impact on overall IYCF score of PD and ND

Code No.	Criteria	N = 96	PD (≥6) = 47 ND (<6) = 49	N value	%	OR value at 95% CI
PDB1	Timely initiation of breastfeeding	46 (48%)	PD	32	68	5.33
			ND	29	29	
PDB2	Colostrum Feeding	69 (72%)	PD	41	87	5.12
			ND	28	57	
PDB3	No Pre-lacteal feeding of honey or patasa water	498 (50%)	PD	39	83	21.67
			ND	9	18	
PDB4	No Practice of providing water at 1st 6 months	37 (38.5%)	PD	35	74	68.54
			ND	2	4	

Contd…

PDB5	No Practice of providing top milk at 1st 6 months	76 (79%)	PD	45	96	13.06
			ND	31	63	
PDB6	Exclusive breastfeeding practice	31 (32%)	PD	31	66	100
			ND	0	0	
PDB7	Continued breastfeeding upto 2 years	35 (36.5%)	PD	23	49	2.95
			ND	12	24	
PDB8	Breastfeeding during illness	85 (88.5%)	PD	45	96	5.06
			ND	40	82	
PDB9	Timely initiation of complementary feeding	62 (64.5%)	PD	39	83	5.51
			ND	23	47	
PDB10	Active feeding	36 (37.5%)	PD	26	55	4.83
			ND	10	20	

Table 1 shows only 48% mothers initiated breastfeeding within 1 hour after birth. Colostrum feeding rate in the area was comparatively better as 71% mothers fed colostrum to their children after birth. Pre-lacteal feeding was carried out in case of 50% children; water and top milk were provided to 61% and 20% children respectively within 1st 6 months after birth. As a result only 32% children were exclusively breastfed which was not at all satisfactory. Only 36% mothers continued breastfeeding upto 2years and 64% mothers initiated complementary feeding after 6 months. Only 37% mothers practiced active feeding but the rate of breastfeeding during illness was quite high (88%). Table 1 also shows exclusive breastfeeding; practice of pre-lacteals and water feeding were main PDBs identified among PD mothers which had higher impact on the PD score according to their respective OR value at 95% confidence interval (CI). Therefore, these practices can be easily promoted through PD approach as they are the major PD behaviours present among the study population.

Figure 1

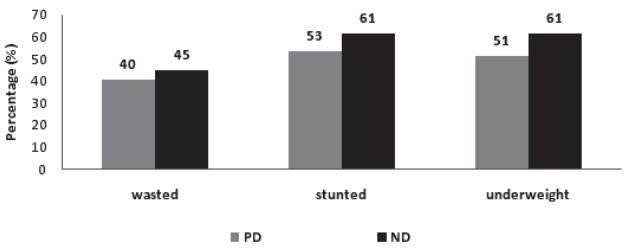

Figure 1: Incidence of child undernutrition among PD and ND groups

Figure 1 shows incidence of child undernutrition was higher among ND mothers (44% wasted, 61% stunted, 61% underweight) as compared to PD mothers (40% wasted, 53% stunted 61% underweight). Statistical analysis in SPSS23 software showed significant correlation between PD score and weight for age (Underweight status) of the children.

DISCUSSION

Previous studies in rural India, In villages of UP[2], West Bengal[3] , and Tamil Nadu[4], *positive deviance* and normal growth of children was enhanced under conditions of small family size (<5), parity below 3, family support to mother, timely initiation of breast feeding, higher frequency of breastfeeding.

Desirable IYCF practices such as frequent breast feeding, timely initiation of Complementary Food (CF), active feeding, giving foods of thicker consistency etc[5] are some major factors contributing better nutritional status.

Viewed collectively, available evidence shows that whether rural or urban, key child feeding and hygiene healthcare practices contributing to normal child growth are similar in most regions. Following the recommendations is not only important for child growth and development, but evidence from observational studies suggests that sub-optimal infant and young children feeding practices can increase the risk of morbidity and mortality in young children[6].

Another study done in Indonesia stated that PDA could be a community based solution to improve child's nutritional status. Nutritional surveys are needed to identify most significant malnutrition determinants to

see adoption of new behaviours and sustainability of outcomes[7]. Study done in rural Uttar Pradesh, India stated using PD helps in promoting indigenous positive correlates of child growth by using community wisdom through people who promote positive practices in concern with technical interventions[8].

Considering the programmatic applications of the findings of this study and make the approach sustainable and replicable, CDPO, supervisors, Anganwadi workers and other grass-root level community workers need to be sensitized so that they can promote the identified positive deviant behaviours among the negatively deviant households. Our previous study suggested that it is necessary to make the community mothers and other family members of a child to understand the direct correlation of wrong IYCF practices with occurrence of infectious diseases and rapid growth faltering of their children[9].

CONCLUSION

Promotion of PDBs can be crucial to bring sustainable change as these behaviours are likely to be affordable and acceptable by the wider community. Interaction of similar cohorts is important for promotion of PDBs. Positive deviance behaviours regarding quality and quantity of complementary foods, dietary diversity, sanitation and hygiene, quality of care, health care access and stimulations for various domains of development are also need to be identified and promoted. Service, delivery and utilization of the existing government programme need to be studied and empowerment of community workers has to be initiated to bring a sustainable change in the situation

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Conflicts of Interest: The authors declare that they have no conflicts of interest.

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The Compliance to Occupational Radiation Safety to the Baggage Fluoroscopy System in International Airport

Siti Daryati[1], M. Irwan Katili[2], Jeffri Ardiyanto[2], Rini Indrati[2], Gatot MW[2], Ismi Rajiani[3]

[1]Assistant Professor, [2]Associate Professor, Politeknik Kesehata Kementrian Kesehatan, Semarang, Indonesia; [3]Deputy to Chairman, STIAMAK Barunawati, Surabaya, Indonesia

ABSTRACT

Background: Radiation safety program applied on the X-ray fluoroscopic screening baggage unit at Airport is important to detect and identify any of the prohibited goods or things that thread the aviation's world. This study aims to evaluate on site dose rates and occupational dose when the fluoroscopic screening baggage is on duty.

Method: A total 25 sample of dose measurements obtained from the population by purposive random sampling. The radiation dose rates and occupational doses selectively monitored with the TLD incorporated with Survey meter. Descriptive statistics and interactive models were blended in analyzing the acquired data.

Results: The X-ray baggage unit at gate-1 contributes the minimum dose rates at 0.00017 mSv/h. The gate-5 shows the highest maximum value at 0.00133 mSv/h. Occupational doses (operator and metal detector personnel) were within the safe limit at 0.00001 mSv. The estimated occupational dose received by each worker/year was made up of 0.95 mSv.

Conclusion: Most employees who work in the X-ray baggage section had lack understanding about radiation safety and its biological effect on human cells. Possible biological effects could be reduced amongst responsible personnel in duty if they create the safety radiation program based on this study recommendations

Keywords: *Radiation safety program, dose rate, occupational dose, X-ray fluoroscopic baggage*

INTRODUCTION

The application of X-ray in radiography industry is closely similar to that of the medical field. One of the requests of industrial radiographic technic is the utilization of baggage fluoroscopy as X-ray device for passengers and crews' luggage safety at the airport. The implementation of X-ray used to baggage fluoroscopy is intended to detect passengers' baggage before entering the airport. Nevertheless, caution should be exercised when using baggage fluoroscopy due to its utilization of relatively high electromagnetic radiation (140 – 180 kV) which can cause biological effect toward the people surrounding the device[(1)]

Corresponding Author:
Siti Daryati,
Politeknik Kesehatan Kementrian Kesehatan Semarang, Indonesia

High doses of ionizing radiation apparently produce deleterious consequences in humans, including cancer induction[(2)]. Similarities in cellular effects lead to the assumption of a common mechanism and the DNA double strand break is identified as the severe radiation-induced lesion. A cancer model extends the cellular consequences of the main radiation risk confirming the dose effect for cancer at low doses[(3)].

Ahmad Yani International Airport of Semarang has six baggage X-ray devices, 2 for baggage and 4 for cabin materials wherein they are operated to monitor incoming things to the aircraft. These devices are operational from 06:00 AM WIB to 21:00 WIB, causing a big amount of radiation but the monitoring of the measurement of exposure and dosage rates is not yet to be optimized. Therefore this research is highlighting the compliance to the safety as regulated.

METHODOLOGY

This study was performed in quantitative and qualitative ways. The quantitative approach is used to measure the exposure rates on baggage cabin fluoroscopy and operators' occupational radiation doses. Radiation exposure rates of the five units of baggage fluoroscopy (two baggage X-ray, two domestic Cabin X-ray, and one international Cabin X-ray) were measured by survey meter (Babyland, USA) and occupational doses of 25 operators on duty were measured by personal dosimeter of Thermo Luminescence Dosimetry (TLD) Chip. The qualitative method was performed by conducting a deep interview to assess workers' knowledge about X-ray utilization. Five respondents were involved in giving information concerning operators' knowledge about X-ray use. The analysis outcome of exposure and dose rates of radiation workers was compared to an international publication[4] and national value of Dose Reference Limit (DRL) standard[5].

RESULTS

Dosage Exposure Rate: The measurement of radiation exposure was done on 5 scanner fluoroscopy devices with the following detail: 2 Baggage X-ray, 2 domestic Cabin X-ray, and 1 international Cabin X-ray. In Gate 1, the lowest exposure rate happened to F (passengers) which amounts to 0.00017 mSv/h and the highest exposure rate happened to E (scanner operators of outgoing goods) which amounts to 0.00067 mSv/h. The average of the five measurement points is 0.00047 mSv/h with a standard deviation of 0.00021 mSv/h resulting in the lowest average rate of 0.00038 mSv/h and highest average rate of 0.00088 mSv/h.

In Gate 2, lowest exposure rate happened to E (scanner operators of outgoing goods) which amounts to 0.00013 mSv/h, and the highest exposure rate happened to B (scanner operators of incoming goods) which amounts to 0.0008 mSv/h. The average of the five measurement points is 0.00041 mSv/h with a standard deviation of 0.00027 mSv/h resulting in the lowest average rate of 0.0004 mSv/h and highest average rate of 0.00107 mSv/h.

In Gate 3, the lowest exposure rate happened to C (scanner operators of outgoing goods) which amounts to 0.00010 mSv/h, and the highest exposure rate happened to D (scanner operators of incoming goods) which amounts to 0.00077 mSv/h. The average of the five measurement points is 0.00039 mSv/h with a standard deviation of 0.00026 mSv/h resulting in the lowest average rate of 0.00036 mSv/h and highest average rate of 0.00103 mSv/h.

Gate 4 is used for scanning hand-carries such as handbags, souvenirs, and hand-carried items.

The lowest exposure rate happened to A (baggage X-ray operator) which amounts to 0.00013 mSv/h, and the highest exposure rate happened to D (scanner operators of incoming goods) which amounts to 0.00093 mSv/h. The average of the five measurement points is 0.00036 mSv/h with a standard deviation of 0.00031 mSv/h resulting in the lowest average rate of 0.00044 mSv/h and highest average rate of 0.00124 mSv/h.

Gate 5 is the international flight scanner. To sum up, the summary of all measurement is shown in Table 1.

Table 1: Summary of the lowest and the highest exposure rates

No.	Measurement Location	Lowest Rate (mSv/h)	Highest Rate (m Sv/h)	Remark
1.	Gate 1	0.00017	0.00067	Baggage X-ray, 1-meter distance from X-ray source
2.	Gate 2	0.00013	0.00080	Baggage X-ray, 1-meter distance from X-ray source
3.	Gate 3	0.00010	0.00077	Domestic cabin X-ray 1-meter distance from X-ray source
4.	Gate 4	0.00013	0.00093	Domestic cabin X-ray 1-meter distance from X-ray source
5.	Gate 5	0.00010	0.00133	International cabin X-ray 1-meter distance from X-ray source

The average exposure rates at seven measurements are shown in Table 2.

Table 2: Exposure rate average

Location	
Gate 1	0.00047 ± 0.00021
Gate 2	0.00041 ± 0.00027
Gate 3	0.00039 ± 0.00026
Gate 4	0.00036 ± 0.00031
Gate 5	0.00039 ± 0.00053

The mean and standard deviation values resulting from the highest exposure rate measurement at Gate 1 (Astrophysics Baggage X-ray) show the value of (0.00047 ± 0.000212) mSv/h. The mean and standard deviation values resulting from the lowest exposure rate measurements at Gate 4 (Fiscan Domestic Cabin X-ray) show the value of (0,00036 ± 0,00031) mSv/h. Deviation value resulting from the measurement is quite low between (0,00021 ± 0,00053) mSv/h.

Table 1 shows that the Astrophysics Baggage X-ray (Gate 1) gets the highest minimum score of 0.00017mSv/h as compared to other gates (0.00010 – 0.00013 mSv/h). Gate 5 obtains the highest maximum score of 0.00133 mSv/h as compared to other gates (0.00067 - 0,00093 mSv/h). The highest mean and standard deviation of the exposure rate measurement at Gate 1 shows the value of 0,00047 ± 0,00021 mSv/h. The effective dosage outcome of the monitor and the metal detector operators using TLD dosimeter is 0,00001 mSv.

The minimum exposure rate of Gate 1 gets a high score because it has a device with voltage specification of 165-180 kV. Gate 1 scanner is utilized to check materials that are inside numerous items of baggage. Therefore a higher X-ray energy is required to penetrate them. Higher voltage produces potentially higher penetrating power so that the shield of the device is not sufficiently effective to protect the radiation scatters.

The measurement of exposure rate conducted at the area of 1-meter distance from the radiation source shows a leak of the X-ray around at a distance. Therefore, the operators should not stand too close to the scanner device. The mean of exposure rate as compared to the standard is 1 mGy/h which is still within the safe boundary. The effective radiation doses of the monitor and the metal detector operators worked for 1 month shows a much too small a value where the result of the effective dose score for Dosage Limit (DL) of 20 mSv/year [6] is still within a safe boundary.

Personnel Dosage: Personnel Dosage is measured using Thermo Luminescence Dosimetry (TLD) for 1 month toward 12 staffs of licensed operators and 13 outsourced (supporting) metal detector personnel, altogether 25 personnel. Based on the TLD reading of the airport 1274 001 T up to 1274 025 T series on staff using TLD on their waists.

The above result is collected by Safety Guide Test Method[6], and the element was read by TLD reader BARC type TL 1010. The reading was converted into the radiation dose based on appropriate calibration curve/factors.

Airport operators work daily for 8.5 hours for the morning shift and 7.5 hours for the afternoon shift, and the radiation collected is accumulative. Within 168.5 hours a month and 2022 hours a year under the mean score of 0.00047 mSv/h, the accumulated annual dosage is 0.95 mSv/year, and it is still below the safe boundary.

Operators Knowledge in X-ray Utilization: The operators' opinion during their work with X-ray so far are they work according to schedule, but they are not aware of the impact of the danger of X-ray to health. According to respondent, operator for X-ray monitor must have a license of Junior Av Sec while metal detector operator must have Basic Av Sec. Medical check-up for baggage and cabin X-ray operators is given once a year for each employee, consisting of blood and urine test, yet there is no first check-up for X-ray operators. Formerly radiation dosage Monitor was given to operators in the form of a filmed badge to be put on their trousers, but it has been 5 years they don't use it anymore because the company does not provide it anymore.

From the interview result it was found that operators' knowledge about radiation is still lacking, yet from the measurement outcome of the exposure rate and personal effective dosage, their dose levels are still within the safe boundary.

By the regulation [6] if a radiation operator receives excessive dosage, he/she should be given a break or transferred to radiation-free section. One of the efforts is by scheduling the work shift for each operator beginning with morning shift, afternoon shift and then taking an off day, in the attempt to minimize radiation dose received by the operator. Despite the existence of shield protection within the fluoroscopy device, new

Pb protection curtain should be provided for X-ray operators. Besides, at present situation operators are not using a radiation monitoring tool. This practice is against the regulation[6] that every radiation worker must use radiation monitoring tool and be periodically monitored.

CONCLUSION

The baggage X-ray at gate 1 (domestic passengers) of Ahmad Yani Airport, Semarang, Indonesia shows the highest level of average dose rates per hour (0.00047 ± 0.00021) compared to that of the rest baggage X-rays at gate 2-5. For all baggage X-rays, however, their average dose rates per hour are declared still within the safe boundary. Similarly, the effective personal dose of monitor and metal detector operators using TLD dosimeter device is 0.00001 mSv, which is also still within a safe edge.

Shortly, although all domestic and international baggage X-rays are run within recommended radiation dose limit, a relatively small radiation dose received by the operators would still have a potential danger to the human cells as it accumulates, absorbs and is deposited in the human tissues in the long term. Additional protective barriers should be placed appropriately around the baggage X-rays so that the low energy radiation levels would be absorbed by the barrier and protect the operators from stochastic biological effects.

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Ethical Clearance: The research received permission of ethical approval from the Health Research Ethics Committee of Poltekkes Kemenkes Semarang, Indonesia.

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The Nutrition Care Process (NCP) Impact to the Dietary Behavior of Diabetes Mellitus Patients

Setyo Prihatin[1], Sri Noormintarsih[1], Ana Yuliana Rahmawati[1], J. Supadi[1], Asep Tata Gunawan[2], Ismi Rajiani[3]

[1]Assistant Professor, [2]Associate Professor, Politeknik Kesehatan Kementrian Kesehatan Semarang, Indonesia; [3]Deputy to Chairman, STIAMAK Barunawati, Surabaya, Indonesia

ABSTRACT

Background: The regulation number 24 in 2015 obliging the Community Health Center or *Pusat Kesehatan Masyarakat* in Indonesia to handle Diabetic patients affects the changing in nutritional care system including the Diabetes Mellitus management.

Objective: The purpose of the study is to know the effect of the Nutrition Care Process (NPC) on knowledge, attitude, behavior and blood glucose of patients with DM.

Method: This experimental study used the Pre and Post Test Control Groups Randomized Design to 44 diabetic patients of treatment and control groups. The treatment group was given the NCP and the data of knowledge, altitude, and behavior and blood glucose were measured twice. The independent T-Test was applied to analyze the effect of NCP.

Result: The study found that no differences between control and treatment group at the beginning of the survey. The independent T-Test showed that the NCP affect attitude and behavior of Diabetic patients significantly, but the knowledge did not produce any different result between control and treatment group. Fasting blood glucose level was significantly different while the 2-hour postprandial blood glucose level shows no difference.

Conclusion: It is concluded that NCP should be applied in the Community Health Center as one of procedures to provide the high-quality nutritional care.

Keywords: *NCP, Behavior, Diabetes Mellitus*

INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease that cannot be cured, but blood sugar levels can be stabilized to normal. Maintaining blood sugar levels require medication adherence and diet as a self-management process [(1)]. Useful independent DM management is possible if individuals have the knowledge, skills to perform DM control behaviors independently [(2), (3)]. Compliance of DM patient diet in many studies conducted was still small, for example, the research carried out in Banyumanik Sub-district of Semarang showed the high percentage of respondents who did not become obedient in the implementation of DM diet achieving 91.4% [(4)]. Another study conducted on 100 Indonesian DM patients visiting the Diabetes Polyclinic, who adhered to the implementation of diabetes mellitus diet only 37% of patients and non-adherent to the implementation of DM diet as much as 63%[(5)].

The Nutrition Care Process (NCP) is a comprehensive and individualist approach to increased awareness and behavioral change. The role of nutritionists is crucial in helping the process of healing the patient through nutritional services. Effective, efficient, and integrated nutrition services through Nutrition Care Process (NCP) are proven to reduce disease complications [(6)]. The application of NCP has so far had a positive impact on the patient's nutrition service system at the Hospital. Research at Sultan Agung Semarang Islamic Hospital showed that there was an increase of energy and protein

Corresponding Author:
Setyo Prihatin,
Politeknik Kesehatan Kementrian Kesehatan
Semarang, Indonesia

intake of chronic renal failure patients after nutritional intervention following NCP procedures at 12% average. Increased intake of nutrients will positively affect improving the nutrition of patients so that it may help speed up the healing process of patients [7].

This study is to determine the effect of food treatment through NCP on changes in attitude knowledge, diet compliance and blood sugar levels in patients with Diabetes Mellitus in Community Health Centers.

METHODOLOGY

This experimental study used pre and post randomized controlled randomized design. The study was conducted at two health community centers in Genuk sub-district, Semarang city. The test was performed on forty four participants under chronic disease service program who have met the inclusion criteria of Diabetes Mellitus. The selected samples were then randomly assigned to the control and treatment groups. The data collected include identity data, knowledge, attitude, diet behavior and blood sugar level of patients taken before and after treatment by interview method. In the treatment group after the data were taken at the next stage 1, Nutrition Care Process (NCP) was given a treatment of nutritional care service. NCPs included nutrition assessment, diagnosis of food, dietary interventions based on the diagnosis of nutrition and evaluation monitoring. Nutrition intervention includes nutrition education, nutrition counseling. In the other hand, the control group only gets the standard service of chronic disease service program. Hypothesis test employed the independent t-test analysis with 0.05 confidence level.

RESULTS

Nutrition service standards at Community Health Centers, especially in patients of chronic disease service program of Diabetes Mellitus patient at Bangetayu and Genuk Health Center, include assessment of patient's nutritional status, investigation (blood pressure and blood glucose level) and nutritional counseling. Thus, the nutritional services undertaken have not been based on the nutritional problems experienced by patients but based on medical therapy. The nutrition services using Nutrition Care Process model (NCP) given to the treatment group in this study are:

1. Assessment: i.e., identification of nutritional problems related to nutrient intake and bioactive substance, clinical aspects (observing the results of nutritional status measurement, laboratory examination, and support), behavioral and environmental issues and causes.
2. Diagnosis of nutrition: determining the nutritional problems based on assessment results.
3. Interventions: given nutritional counseling according to the patient's nutritional diagnosis and nutrition education about DM diet.
4. Monitoring and evaluation: results of the interventions provided are monitored and evaluated through diet after the intervention, laboratory outcomes and changes in knowledge, attitudes, and behavior.

The treatment group of women mostly equal to 36,4% and in control group mostly women as big as 34,1% Scores of nutritional knowledge, attitudes and dietary compliance of study subjects before treatment presented in Table 1.

Table 1: Knowledge, attitudes, and adherence to treatment

Variables	Treatment (n = 22)		Control (n = 22)		p
	Mean	SD	Mean	SD	
Knowledge	8	3.8	10.6	6.0	0.095
Attitude	26.5	2.8	27.3	4.3	0.481
Dietary compliance	26.9	3.9	27.1	4.3	0.885

The mean score of knowledge before treatment in control group was higher than treatment group that was 10.6 + 6.0, but statistically there was no difference (p = 0.095). Similarly, the mean scores of attitudinal and obedience scores were also greater in the control group with the mean of 27.3 + 4.3 and 27.1 + 4.3 respectively. These results show the sample at the beginning of the study was not different between control and treatment groups (homogeneous). Blood sugar levels of the subjects of the study before treatment were presented in Table 2.

Table 2: Fasting blood sugar and blood sugar Levels before treatment

Variables	Treatment (n = 22)		Control (n = 22)		P
	Mean	SD	Mean	SD	
Fasting blood sugar	186.8	62.3	150	59.9	0.060
Blood sugar 2 hours postprandial	186.5	66.7	158.4	58.8	0.145

Table 2 shows the mean fasting blood glucose level in the treatment group was higher than the control group that was 186.8 g / dl + 62.3. Similarly, the average blood glucose level of 2 hours postprandial was also greater in the treatment group with the mean of 186,5 + 66,7. However, statistically there was no difference (p = 0.060 and p = 0.145). Research subjects both in the treatment and control group were re-measured for nutritional knowledge, attitude, and diet compliance after being treated where the results were presented in Table 3.

Table 3: Knowledge, attitudes and diet compliance of study subjects after treatment

Variables	Treatment (n = 22)		Control (n = 22)		P
	Mean	SD	Mean	SD	
Knowledge	10.36	3.7	10.36	5.6	1
Attitude	30.86	2.4	26.86	3.7	0.040
Dietary compliance	31.22	2.97	28.18	4.69	0.014

Table 3 shows that the mean score of knowledge was almost the same score of 10.36 + 3.7 and in the treatment group and 10.36 + 5.6 in the control group. Statistical analysis showed no difference in both groups (p = 1). The average score of attitudes and diet compliance was higher than the control group that was 30.86 + 2.4, and 31.22 + 2.97 Statistical analysis showed that there was a difference in both groups after treatment (p = 0.04 and p = 0.014).

The influence of nutrition service model NCP on group treatment knowledge increased compared to control group that decreased. There was an increase in the mean of knowledge scores in both control and treatment groups after receiving treatment of nutritional services with NCP. The result of the statistical test showed inconsistent results where the result is not significant at P-value = 1.00. These results contradict previous studies that found a significant relationship between counseling and knowledge [(3)]. The influence of nutrition service model NCP on the attitude of treatment group increased more than with control group. There is an increase in the normal view stance in case and control groups after receiving NCP nutritional services. The result of hypothesis test shows that there is a significant influence of attitude on control group and treatment after receiving Nutritional Care with NCP model (P Value = 0.04) Hypothesis test demonstrated a major impact of the provision of NCP with dietary compliance of DM patients in the Health Community Center with P value = 0.014. Table 4 shows the mean fasting blood glucose level and 2 hours post prandial blood glucose concentrations in the lower treatment group after being given NCP model nutrition services compared to controls that received the standard nutritional services of the Health Community Center.

Table 4: Fasting blood sugar and 2 hours postprandial blood sugar

Variables	Treatment (n = 22)		Control (n = 22)		P
	Mean	SD	Mean	SD	
Fasting blood glucose	126.09	32.7	175.63	66.07	0.04
Blood glucose 2 hours postprandial	180.82	76.89	198.64	76.09	0.44

The mean fasting blood glucose level of the treatment group was 126.09 g / dl + 32.7 lower than the control group, and there was statistically different in both groups. The mean blood glucose level of 2 hours postprandial treatment group was 180,82gr/dl + 76,89 lower than the control group, and statistically, there was no difference in both groups.

The results of statistical tests showed a significant effect of NCP nutrition service on fasting blood glucose level (P Value = 0.04) while at 2-hour polyurethane postprandial level although there was a decrease in gum sugar statistically did not show a significant effect (p-value = 0.44).

DISCUSSIONS

The results of the study found that chronic disease service system performed in the two Health Community Centers is a medical service in the form of drug services and medical examination. Nutrition services that run in the kind of group services are counseling. Food services in the form of NCP should be applied to patients with chronic diseases that are more individual. This personal service will give positive results both on knowledge, attitude, and behavior. There is one fundamental difference between the standard of the nutritional service of the Health Community Centers and the NCP. The level of nutrition services in Health Community Centers is located on "what should be done" and is a component of care in certain diseases. Nutrition Care Process (NCP) is a standardized process, further demonstrating "how nutritional care is done." In essence, the NCP accurately displays the nutritional care spectrum that emphasizes the consistent and accurate steps of dietitians when delivering nutritional care, as well as guidelines in nutrition education and other preventive nutrition care venues.

Although the results of the study were statistically no difference between the control group and the treatment of knowledge, there was an increase in the mean of knowledge scores between the baseline data and the final data. Experience as an individual's cognitive part is influenced by adequate information from anyone. An increase in the knowledge scores provides evidence of the development of disease-related information obtained by the sample.

The NCP which is a standardized nutrition service begins with a nutritional assessment to find nutritional problems in samples that are technically made in a nutritional diagnosis. The Nutrition intervention given is based on the etiology present in the nutritional diagnosis, so the approach is so specific and individual that it will encourage a change of attitude. According to the theoretical model of persuasion communication with the cognitive theoretical approach, that stimulus that produces cognitive responses such as nutrition education will produce behavioral changes. Inadequacy with previous studies is possible because the interventions given in NCPs depend on approaches and objectives where the emphasis is focused on behavior change rather than on knowledge change. This occurrence is in line with a finding [8] that with the NCP service can improve changes in drug-taking behavior in Diabetes Mellitus patients.

According to Theory of Reasoned Action (TRA), individual attitudes and norms towards a disease affect dietary adherence. Decision theory also mentions the patients themselves make decisions about what to do in the treatment business. This notion is related to the communication that exists between the patient and the health professional. If patients are well informed about procedures, risks, and effectiveness of the engagement as done in the NCP intervention, then they will make the right decision. In the NCP nutrition assessment carried out not only leads to the proper enforcement but also in nutritional diagnoses.

CONCLUSIONS

1. There is an increase in attitude score, knowledge, dietary behavior after being given a nutritional service model NCP. Also, there is an improved dietary adherence after being given a nutritional service of NCP model.
2. There is a decrease in fasting blood glucose levels after being given a dietary service model NCP, and also there is a reduction in fasting blood glucose levels after being given a nutritional service of NCP model.
3. There is an influence between the application of NCP in chronic Diabetes Mellitus patients with knowledge, attitude and dietary behavior as well as increased blood sugar after being given NPC model of nutrition service.

Nutrition officers of Community Health Centers are recommended to provide food services as echoed by NCP model, especially in patients of chronic disease service program because it proved to increase knowledge, attitudes and dietary compliance of Diabetes Mellitus patients. Given these changes will have an impact on the achievement of healthy blood sugar levels.

Conflict of Interest: The author has no conflict of interests related to the conduct and reporting of this research.

Source of Funding: Source of the fund for this project was by Politeknik Kesehatan Kementrian Kesehatan Semarang.

Ethical Clearance: Before conduct of the study written permission was obtained from Politeknik Kesehatan Kementrian Kesehatan Semarang, Indonesia. Consent and willingness were established from all the subjects who meet inclusion criteria of this study.

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Association between Maternal Folate Intake and Polymorphism MTHFR A1298C as Risk Factor of Non-Syndromic Cleft Lips

Yayun Siti Rochmah[1], Stefani Harumsari[2], Agung Sosiawan[3], Ismi Rajiani[4]

[1]Departement of Oral and Maxillofacial Surgery Faculty of Dentistry, [2]Departement of Biology Faculty of Medicine, Sultan Agung Islamic University, Semarang, Indonesia; [3]Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga, Surabaya Indonesia; [4]Deputy to Chairman, STIAMAK Barunawati, Surabaya, Indonesia

ABSTRACT

Background: Methylenetetrahydrofolate reductase (MTHFR) is often associated with the incidence of orofacial clefts. Folic acid deficiency has gained considerable attention because of its promising role in modulating diverse clinical condition such as cleft. The objective of the study is to describe the association of MTHFR A1298C polymorphism and maternal folate intake with an orofacial cleft in Sasak Population.

Method: This study used control case design, the number of the subjects were 148 who were divided into case groups and their mother (70 issues) and control groups and their mother (78 items). The detection of Polymorphism MTHFR A1298C used PCR-RFLP and sequencing for confirmation. The information on the dietary pattern and folic acid intake used FFQ (Food Frequency Questionnaire).

Results: MTHFR A1298C polymorphism was associated with maternal folic acid intake in Sasak (p = 0,001), OR = 14,7 CI 95% (2,49-85,53) for cases and (p= 0,041), OR = 4,4 CI 95%(0,9-19,16) for control group. Maternal folic acid intake was associated with cleft (p=0,037) OR= 2,7 CI 95% (1,06-6,94) in Sasak Population.

Conclusion: Maternal folic acid was as the risk factor cleft lip/palate in Sasak population and association with MTHFR A1298C Polymorphism.

Keywords: *Polymorphism MTHFR A1298C, folic acid, orofacial clefts*

INTRODUCTION

The incidence of nonsyndromic cleft lip with or without cleft palate (NS CL/P) remains high in all over the world. In Indonesia, there will be 3000 to 6000 new cases of cleft lip annually accounting for 2.4% or 1.7 per 1,000 live births [(1)]. In Asian countries such as India, the incidence of cleft lip is high in which 35. 000 babies were born with the cleft [(2)]. In Africa, the number of people with cleft lip tends to be less (1: 2,500 births) [(3)]. Multifactorial factors including genetic and environmental are contributing in cleft lips [(4)]. Methyltetrahydrofolate Reductase (*MTHFR*) A1298C is *MTHFR* genotype variants that are thought to contribute to cleft lip, or palate [(5)]. *MTHFR* is an enzyme that converts 5, 10-methylenetetrahydrofolate from folic acid into 5-methyltetrahydrofolate in folate cycle, The endogenous folate cycle is a predominant methyl donor to remethylate homocysteine (Hcy) into methionine [(6)]. Pregnant women with MTHFR polymorphism have a higher risk to get folate deficiency [(7)]. The food sources that rich in folate are liver, fish, and meat, mushroom, green leafy vegetables such as spinach, bean leaves, nuts, and yeast. Food processing can destroy 50-90% of folate content by heating, oxidation, and exposure to ultraviolet light [(8)]. Dietary folates are conjugated by Gamma-*glutamyl hydrolase*/folate into monoglutamate assisted by Zink [(9)]. Folate deficiency and abnormal metabolism of folic acid and Hcy play a significant role in the incidence

Corresponding Author:
Yayun Siti Rochmah,
Jl Raya Kaligawe Km.4,
PO BOX 1054, Semarang Central Java of Indonesia.

of neural tube defect (NTB), facial cleft, congenital heart disease, pregnancy complications, and other congenital abnormalities [10]. Because of foods high in folic acid are found from an animal source that is quite expensive for most Indonesian including Sasak population.

To ensure that pregnant women folic acid intake is sufficient a folic acid supplementation program began after 2002. The supplementation programme has just been set by the government in 2014 but still lack of monitoring report. Hence, this study assessed the relationship between maternal genetic background and folate status with or without supplementation.

MATERIALS AND METHOD

Study design: The study design was a case control. Subjects were 70 children and their mother from Sasak Tribe population with a non-syndromic cleft lip with or without cleft palate. The control population was enrolled from 78 healthy normal children and their mother. The clinical examination of the subjects was done by Lips - Alveolar - Hard palate - Soft palate - Alveolar – Lips (LAHSAL). Inclusion criteria that obtain in this study were the mother and her child less than five years old, average weight and body length at birth, without other congenital abnormalities associated with cleft lip/ palate syndrome. The exclusion criteria were orphaned children, and the mother had undergone chemotherapy or radiotherapy.

Blood Sampling: Blood Ethylenediaminetetraacetic Acid (EDTA) samples were withdrawn for 5 ml from all of the study subjects for salting out DNA (Deoxyribonucleic Acid). Extraction.

Genotyping: The *MTHFR* were amplified with three-step Polymerize Chain Reaction (PCR) followed by Restriction Lenght Fragment Polymorphism (RFLP). The PCR RFLP was done at Cebior Laboratory Faculty of Medicine Diponegoro University, Semarang Indonesia. MTHFR A1298C forward primer 5'-CAA GGA GCG GCT GAG GAA GA-3 'and reverse primer 5'-CCA CTC CAG CAT CAC TCA CT-3 '. *MboII*, restriction enzymes were used in the identification of *MTHFR* genotype. The enzyme will digest the PCR product of 128 bp into two fragments measuring 100 bp and 50 bp.

Folate status: data were obtained with the administration of Frequency Questionnaire (FFQ) [10] and analyzed by Nutrisoft 10.1 software.

Statistical analysis: The relationship between *MTHFR* gene and cleft lip were analyzed by using a Chi-Square test and the Odd Ratio (OR), Confidence Intervals 95%. If the relationship between folate status and cleft lip had normally been distributed, data were analyzed by T-independent Test. Otherwise, Mann Withney analysis was performed.

RESULTS

The distribution of variant cleft for case subjects was unilateral cleft lips (31.4%), bilateral cleft lips (21,5%), cleft palates (28.5%) and cleft lips with palates (18,6%). The FFQ data analysis with Nutrisoft Software was used to determine the Odd Ratios (OR) of folic acid in 2.7 (95% CI: 1, 1-6,9). Mann Whitney test was applied to determine the difference between the subjects with the cleft lip the control resulting in $p = 0.037$ which (<0.05) meaning that there was a significant difference in folic acid between the case and oversight group.

Table 1: Genotype distribution of MTHFR A1298C gene

Genotype	case (n = 70) N (%)	control (n = 78) N (%)	P value	OR (CI 95%)
A1298C/AA	30(42.9%)	27 (34.6%)	--	--
A1298C/AC	31 (44.3%)	41(52.6%)	0.036	2.7(1.1-7.0)
A1298C/CC	9 (12.9%)	10 (14.3%)	0.041	2.7(1.0-7.0)

CI: Confidence Interval, N: Number, OR: Odd Ratio

Table 1 showed the distribution of *MTHFR* A1298C genes. In the MTHFR A1298C gene showed a uniform distribution of genotype between the common allele, mutant heterozygotes, and mutant homozygotes and there was a significant difference between cases and controls.

Table 2: The relationship between maternal folate status during pregnancy and polymorphism MTHFR A1298C

MaternalFolate Status	MTHFR A1298C gene		P Value	OR (CI:95%)
	Polymorphism	Normal Allele		
Case				
Poor	16 (88.9%)	6 (35.3%)	0.001	14.7 (2.49-85,53)
Good	2 (11.1%)	11 (64.7%)		
Control				
Poor	7 (63.6%)	8 (28.6%)	0.046	4.4 (0.9-19.16)
Good	4 (36.4%)	20 (71.4%)		

CI: Confidence Interval, OR: Odd Ratio

Table 2 shows that in the protective case group (mothers of children with cleft lip), folate status (both poor and good), there was a significant relationship between the maternal folate status and the occurrence of polymorphism MTHFR A1298C in both case and control group.

Table 3: Relationship between maternal folate status during pregnancy and cleft lip

Maternal folate status	Cleft lip/palate		P Value	OR (CI: 95%)
	case(celah)	control (normal)		
Poor	22(62.9%)	15(38.5%)	0.037	2.7 (1.06-6.94)
Good	13(37.1%)	24(61.5%)		

CI: Confidence Interval, OR: Odd Ratio

Table 3 showed that the number of women with poor and good folate status 22 subjects (62.9%) and 13 subjects (37.1%) respectively, in cases compared to 15 subjects (38.5%) and 24 subjects (61.5%), respectively among the control group.

DISCUSSION

Non-syndromic cleft lip with or without palate is caused by multifactional factors both intrinsic and extrinsic. Intrinsic factor includes genes and heredity, external factors include nutrition during pregnancy, smoking and drinking alcohol in the mother during pregnancy, drinking herbal medicine during pregnancy, environmental pollution[11]. The results of the study showed that the most common maternal age during pregnancy was more than 35 years old, a hight age for pregnancy, the maternal age was not a risk factor for cleft lip in Sasak population. in women aged more than 35 years, biological and environmental changes occur[12,13]. Besides the failure of vascularization of the uterus during pregnancy, that can affect the transfer of nutrients to the fetus[14,15] also, the pregnant woman above 35 years old are at a higher risk of preeclampsia, chronic hypertension, placental abnormalities[16]. Under 19 years is a high risk for pregnancy due to immature biological organs besides socioeconomic factors and the lack of responsibility leading to the development of fetal disorders [17]. Low educational and economic level of the elderly on the Sasak population can be risk factors for cleft lip. The low level of education may lead to poor parental knowledge on the importance of maternal and fetal health, and low socioeconomic factors may lead to the inability to provide proper nutrition to the fetus[18].

We found that the maternal folate status during pregnancy was associated with cleft lip development. There was a significant difference between maternal folate status in both cases (p = 0.001) and control subjects and *MTHFR* A1298 gene polymorphism (p = 0.046). Folic acid deficiency can be detected by a decrease in *MTHFR* (methyltetrahydrofolate reductase), causing deficient remethylation of homocysteine into methionine and reducing the production of SAM (S-adenosylmethionine) [19]. This results in disruption of the methylation reaction leading to disturbance of that

DNA methylation. Methylation defect causes disruption of the expression with the result of inhibited fetal development and the of some malignancies[20].

Table 3 shows that the maternal folate status during pregnancy affects cleft lip incidence in the Sasak population in Lombok (p: 0.037) in which poor maternal folate status during pregnancy tend to have a 2.7 times higher risk to cause cleft lip compared to that of real maternal folate status. This incidence shows that the maternal diet during pregnancy affect the state and health of the fetus and can modulate their offspring through epigenetic mechanisms [21]. Folic acid is required for the metabolism of carbon playing a role in several cellular reactions including in the metabolism of amino acids, the biosynthesis of purine and pyrimidine, the formation of agent methylation primer S-adenosyl-methionine (SAM) which is a methyl donor DNA, histones, proteins, and fats. Natural dietary folic acid is absorbed in the intestine or liver and metabolized to *5*-methyltetrahydrofolate (5-methylTHF) resulting in polyglutamate for cell retention. However, the fortified folic acid can reduce the dihydrofolate by the enzyme dihydrofolate reductase in the liver and converted into tetrahydrofolate, a substrate for synthesis polyglutamate[22].

Deficiency of folic acid as an epigenetic nutrient, a co-factor of one-carbon metabolism, during pregnancy can have an effect on the fetal program and can modulate the genome, a pattern of DNA methylation and lead to dysregulation of gene expression. The administration of folic acid supplements is often combined with other vitamins (multivitamin) causing a difficulty in analyzing whether the effects are due to folic acid or other vitamins. Thus, studies on the administration of supplemental folic acid alone are needed[23].

A different area may show a different result in the relationship between folate status and polymorphism. This is because the diverse population has a different allele variation and different gene involved in folate metabolism[24].

Conflict of Interests: The authors have no conflict of interests related to the conduct and reporting of this research.

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Ethical Clearance: Informed consent was obtained from all of the participants. The research protocol was approved by Medical Research Ethics Commission Faculty of Medicine, Diponegoro University and Dr. Karijadi Hospital, Semarang Indonesia No. 023/EC/FK-RSDK/2016.

CONCLUSION

In Sasak population living in Lombok Indonesia, *MTHFR* A1298C gene polymorphism is a risk factor for cleft lip, and maternal folic acid status during pregnancy is associated with the cleft lip and polymorphism of the *MTHFR* A1298C gene.

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Prevalence of Postural Problems among the Nurses in Chennai

Jinu Merlin Koshy[1], Amit Biswas[3], Sreelekshmi[2], W M S Johnson[4], Archana R[5], Bini Markose[6]

[1]Professor, Department of Anatomy, Sree Balaji Dental College and Hospital, BIHER, Chennai; [2]Professor, [3]Post Doctoral Fellow, SQC & QR, ISI Institute, Chennai; [4]Professor & HOD, Department of Anatomy, [5]Associate Professor, Department of Anatomy, Sree Balaji Medical College and Hospital, BIHER, Chennai; [6]Research Fellow, Department of Anatomy, BIHER, Chennai

ABSTRACT

Aim & Objective: The aim of the present study was to evaluate the postural problems arising due to the working posture among nurses in Chennai, with an objective to determine the prevalence of musculo skeletal disorders.

Materials and Methods: The study was conducted on 176 nurses working in different hospitals. The randomly selected subjects were given the Standardized Nordic Questionnaire to find out the perception of musculoskeletal symptoms. Ergonomic assessment tools such as Rapid Upper Limb Assessment (RULA) Rapid entire body assessment (REBA) was used to assess the type of unpredictable working postures. The data were analyzed with Binary Logistic Regression using the Mini Tab (14) statistical software.

Results: The RULA score for most of the subjects (84%) were left, 4 & 5 and right 6 & 7. The REBA score for 85% of the subjects were 7 and above which indicates the risk level is medium to high. There were significant association with socio demographic variables like age, work experience, patients attended per day, height, weight and BMI with the musculo skeletal disorders.

Conclusion: The study revealed that various socio demographic variables contributed to the musculoskeletal symptoms experienced by the nurses.

Keywords: *Musculoskeletal disorders; Standardized Nordic Questionnaire; Posture; REBA; RULA;*

INTRODUCTION

Musculoskeletal disorders (MSD) refer to more than 200 conditions that affect the body causing ache, pain and functional impairment[1]. Since the beginning of 18th century, it has been shown that MSDs may have occupational causes.[2] In recent years investigations of work- related musculoskeletal disorders (WRMSD) has attracted considerable attention because of its importance in assessing ergonomics risk factor involved in workplaces. Occupational risk factors such as force, posture, movement and vibration can affect the WRMSD[3]. Physical factors such as height of equipments used in work affects the posture[4]. The risk of work related upper limb disorders (WRULD) may be caused by the postural stress and demands of work.[5]

Nursing profession focused on the care of individuals, families and communities to attain optimal health and quality of life. Work hours in healthcare often involve long work hours, on-call work, compulsory overtime and shift work to meet the patient care round the clock[6]. Nursing profession is established as a physically and psychologically demanding profession with high prevalence rate of musculoskeletal complaints[7]. Working condition of the nurses differs from corner to corner around the world[8]. In India some healthcare organizations have the modern infrastructure facilities, most of the healthcare unit personnel have to work without proper infrastructure. There is always heavy demand for medical services in both the government and private hospitals[9].

Corresponding Author:
Dr. W M S Johnson
Professor & HOD, Department of Anatomy,
Sree Balaji Medical College and Hospital,
BIHER, Tamil Nadu-600100
Phone: 9962055993
Email: jinumerlinkoshy@gmail.com

The present study aimed at evaluating the working posture and the different ergonomical problems among nurses.

MATERIAL & METHOD

Randomly selected 176 nurses employed in different hospitals in Chennai participated in the study. The study proposal was submitted to the Institutional Ethics Committee and due clearance was obtained. Persons within 20-45 years with a work experience of 3-20 years experience were included. Persons with systemic diseases and pregnant women were excluded from this study.

Body weight and height of the subjects were measured with the help of a properly calibrated weighing scale and Freemans measuring tape. Body Mass Index (BMI) was calculated from the stature and body weight of the respective subjects.

A self-administered questionnaire was used to collect data after obtaining a written consent from the participant. The method for answering the questionnaire was explained in a general meeting of nurses before dissemination of the questionnaire. A pilot study was performed among the nurses before commencing the study. The instrument used in this study is the Standardized Nordic Questionnaire (SNQ) (License No. 3316900588799). SNQ consists of structured, forced, binary or multiple choice variants. After completion of the questionnaire, the candidates were interviewed to clarify any confusion and to furnish any missing data. We assigned '1' to each positive response to each question and a '0' to each negative response.

Rapid Entire Body Assessment {REBA}: Rapid entire body assessment (REBA) was developed to assess the type of unpredictable working postures found in health-care and other service industries. Data were collected about the body posture, forces used, type of movement or action, repetition, and coupling. A final REBA score was generated to give an indication of the level of risk & urgency with which action should be taken.

Rapid Upper Limb Assessment (RULA): The RULA ergonomic assessment tool considers biomechanical and postural load requirements of job tasks/demands on the neck, trunk and upper extremities. After the data for each region were collected and scored, tables on the form are then used to compile the risk factor variables generating a single score that represents the level of MSD risk.

The reliability of Nordic questionnaire for MSD measured by Cronbach's alpha test was 89.5%.

The collected data were thoroughly screened and entered into MS-Excel spread sheets and statistically analyzed. Descriptive statistics were reported for socio demographic variables. The prevalence of postural problems in the study population was computed as percentages. Binary logistic regression was done as pain in different regions as the dependent variable. The independent variables entered were age, height, weight, BMI, work experience, working hours per day and number of patients attended per day. The acquired data was statistically analyzed by using the Mini Tab statistical software version 14. A value of $P < 0.05$ was considered as statistically significant.

RESULTS

The study population included 176 with an average age of 30 years and average work experience of 8 years working in different hospitals in Chennai. The general characteristics of the study population are shown in Table 1.

Table1: Demographic characteristics

Age	30 ± 3.589
work experience	8 ± 3.707
working hr/day	8 ± 0.237
Height	158 ± 6.281
Weight	63 ± 5.252
BMI	24.836 ± 2.18

n = 176, data are mean ± Standard deviation

Table 2 and Table 3 represent the REBA and RULA score of the subject group respectively. The REBA score for the nurses group were 6 and above. RULA score ranges between 4 and 7.

Table 2: Reba Score of Nurses

REBA SCORE OF NURSES N = 176	
Number of Persons	**SCORE**
2	11
23	10
54	9
59	8
37	7
1	6

n = 176

Table 3: Rula Score of Nurses

RULA		
No. of Persons	**Left Score**	**Right Score**
16	3	4
35	4	5
97	4	6
15	5	6
13	5	7

n = 176

The association between the frequency of pain and discomfort in different regions of the body for the past 12 months, trouble causing prevention of work and the trouble in the last seven days shows there was a significant association between age (*P*=0.03), patients attended per day(*P*=0.038) and wrist pain for the past one year data (Table 4).

The intensity of elbow pain which caused the prevention of work was having statistically significant association with the work experience (*P* =0.05) (Table 4).The wrist pain which caused the prevention of work and the socio demographic variables like age (*P* =0.01), work experience (*P* =0.02), patients attended per day (*P*=0.008), height (*P* =0.04), weight (*P* =0.05) and BMI (*P* =0.03) were having significant association (Table 4). It was also found that there was statistically significant association between the upper back pain which prevented the nurses from work and the patients attended per day (*P* =0.04) (Table 4).

Patients attended per day by the nurse (*P* =0.037) and elbow pain experienced during the past seven days were having significant association (Table 4). The socio demographic variables like age (*P* =0.01) work experience (*P* =0.02), height (*P* =0.04), weight (*P* =0.05) and BMI (*P* =0.05) were having significant association with the knee pain for the last seven days (Table 4).

Table 4: Association between the frequency of pain and discomfort in different regions of the body in respect to the past 12 months, trouble causing prevention of work and the trouble in the last seven days

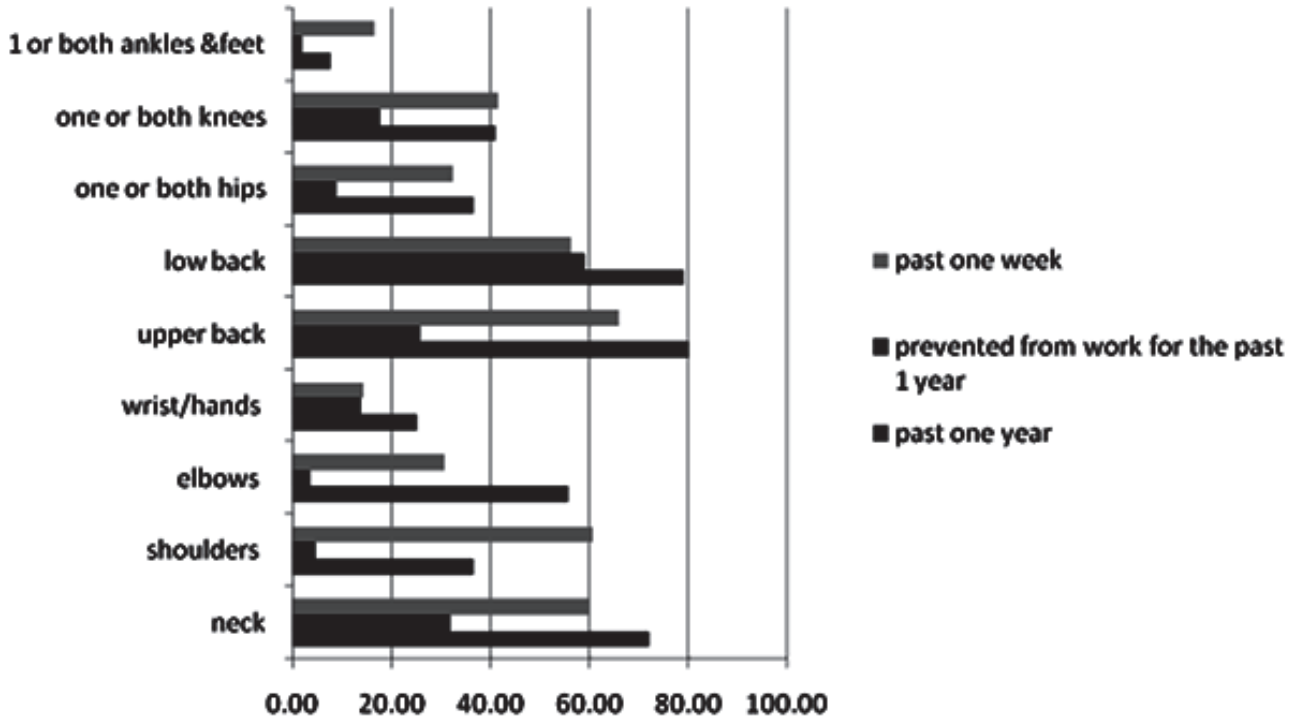
Variables	**Past 12 months**								
	Neck	**Shoulders**	**Elbow**	**Wrist/ hand**	**Upper back**	**Low back**	**One or both hips**	**One or both knees**	**Ankles**
Age	0.168	0.4	0.13	0.03*	0.7	0.8	0.31	0.18	0.21
Gender	0.34	0.16	0.71	0.8	0.89	0.45	0.29	0.16	0.99
Work experience	0.19	0.34	0.12	0.06	0.62	0.97	0.41	0.17	0.19
Working hours/day	0.301	0.99	0.33	0.7	0.67	0.633	0.72	0.99	0.66
Patients/day	0.66	0.12	0.48	.038*	0.44	0.21	0.2	0.01	0.22
Height	0.17	0.09	0.9	0.071	0.5	0.26	0.18	0.44	0.3
Weight	0.18	0.11	0.8	0.075	0.5	0.25	0.21	0.47	0.34
BMI	0.19	0.11	0.94	0.066	0.49	0.245	0.18	0.46	0.34
Prevented from work									
	Neck	**Shoulders**	**Elbow**	**Wrist/ hand**	**Upper back**	**Low back**	**One or both hips**	**One or both knees**	**Ankles**
Age	0.49	0.03*	.03*	.01*	0.5	0.45	0.65	0.68	0.9
Gender	0.28	0.33	0.14	0.6	0.28	0.66	0.11	0.21	0.9
Work experience	0.76	0.04	.05*	0.02*	0.75	0.42	0.47	0.55	0.99
Working hours/day	0.75	0.45	0.52	0.5	0.58	0.29	0.68	0.82	1

Contd…

Patients/day	0.49	0.72	0.81	.008*	.04*	0.76	0.26	0.53	1
Height	0.952	0.29	0.16	.04*	0.69	0.7	0.44	0.21	0.99
Weight	0.9	0.26	0.14	.05*	0.72	0.87	0.42	0.21	0.99
BMI	0.98	0.3	0.17	.03*	0.61	0.77	0.49	0.31	0.99
Last 7 days									
	Neck	**Shoulders**	**Elbow**	**Wrist/ hand**	**Upper back**	**Low back**	**One or both hips**	**One or both knees**	**Ankles**
Age	0.73	0.36	0.68	0.43	0.65	0.8	0.23	.002*	0.16
Gender	0.37	0.44	0.94	0.39	0.92	0.69	0.44	0.44	0.51
Work experience	0.82	0.25	0.91	0.41	0.89	0.88	0.3	.005*	0.34
Working hours/day	0.56	0.9	0.72	0.19	0.07	0.976	0.75	0.27	0.27
Patients/day	0.28	0.77	.037*	0.37	0.63	0.622	0.3	0.25	0.019
Height	0.7	0.44	0.4	0.75	0.31	0.3	0.88	.021*	0.23
Weight	0.69	0.39	0.39	0.7	0.32	0.33	0.9	.022*	0.238
BMI	0.63	0.38	0.49	0.68	0.36	0.34	0.95	.024*	0.196

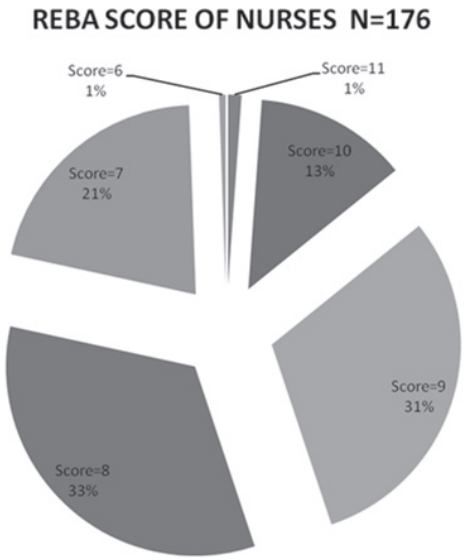
Statistically significant $p < 0.05$

The percentile of subjects having the persistence of the pain for the past 12 months, persistence of pain which prevented the subjects from work , and the persistence of pain for the past 7 days were shown in Graph1. Frequency of pain in the neck, lower back and hip were independent of the socio demographic variables.

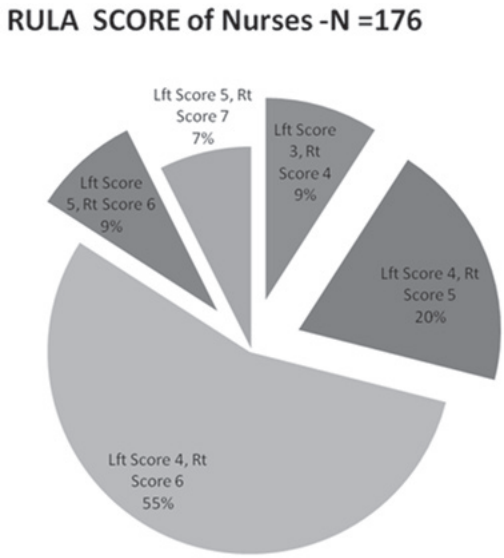


Graph 1: Distribution of MSDs reported in different sites during past one year, prevented from work for the past one year and during the past one week.

Graph 2 and graph 3 depicts the percentile distribution of REBA and RULA score respectively.



Graph 2: Percentile distribution of REBA score



Graph 3: percentile distribution of RULA score

DISCUSSION

Nurses perform a wide range of clinical and non-clinical functions necessary to the delivery of health care and therfore musculoskeletal disorders (MSD) represent a significant problem among nurses[13]. The reported prevalence of the present study was very high, as 80% of the subjects were reported with at least one MSD in the last one year which is less than 90% reported by K. R. Shafiezadeh[14].

Silverstein et al reported repetitious movement, awkward postures and high force levels as the three primary risk factors that have been associated with WRMSD[15]. Ando et al reported the prevalences of low back, shoulder,neck and arm pain among hospital nures to be 54.7%, 42.8%, 31.3% and 18.6% respectively[16]. Larese and Fiorito found that 48% of ward nurses and 33% out patient nurses reported back pain due to work, 29·4 and 16·1% respectively have had X-ray or orthopaedic examinations, 19·2% and 9·1% had been absent from work because of back pain[17]. In another study among nurses in India by Goswami et al studied the occurrence of symptoms of the neck pain, shoulder pain, hand pain and knee pain and was reported that 73% of nurses complained about pain after returning back home and 21% during work [13].The results of the present study were similar as the reported prevalence of pain and discomfort during the last one year were found to be high in the upper back(80.11%),low back (78.98%) neck (72.3%) and knee (40.25%) (Graph 1). The present study also indicates the the pain was continous as the last seven days data shows comparitively higher prevalence in some regions like neck (60%), upper back (65.91), low back (56.25%) and knee (41.48%). Pain in different body parts of nurses were related to different ergonomic risk factors at work, namely, bending and twisting of the waist and standing for extended periods of time. Similar observations were made by Hou JY e in Taiwan among nurses.[18]

The REBA score for 85% of the subjects were 7 and above which indicates the risk level is medium to high. The RULA score for most of the subjects (84%) were left, 4 & 5 and right 6 & 7. This score indicates investigation and changes were required soon in their posture. Transferring and changing the body position of the patients were set up to be the most physically challenging and postural strenuous task.

Daraiseh et al reported that MSD in various body regions of nurses were influenced by stressful working conditions[19]. It was reported that low back pain of the nurses was not only associated with physical factors but also with a complex interaction of working conditions.[9,13,20].

The Pan-European research suggests that early detection and intervention of MSD, eventually reduces the burden on governments' health and disability budgets[21]. Intervention and management of work place and outside work place risk factors can reduce the

prevalence of MSD and their consequences. There are some evidence which indicate that some simple and practical participatory action-oriented training can prevent or reduce the prevalence of MSD[22]

CONCLUSION

The goal of ergonomics is to reduce work related musculoskeletal disorders by adapting the work to fit the person, instead of forcing the person to adapt to the work. Design of successful work methods requires the use of ergonomic principles that best match human capabilities with job demands.

Conflict of interest: Nil

Source of Funding: Self

Ethical clearance: Institutional Ethical Committee

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Applications of Internet of things in Non-Communicable Disease Prevention and Management: A Review

Legia Emantha Shabong Lyngdoh

State Programme Coordinator, National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases & Stroke, National Health Mission, Government of Meghalaya, India

ABSTRACT

Objectives: The gravity of the burden of Non-Communicable Diseases (NCDs) has been recognised globally. India has introduced the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular disease & Stroke (NPCDCS) to tackle NCDs which accounts for 60% of all deaths. However, there are major constraints in the implementation of the programme which significantly can be overcome by the adoption of the Internet of Things (IoT) in healthcare delivery. The paper aims to looks at IoT as a viable option for remote health monitoring of patients with NCDs, giving room to more effective and timely treatment which leads to better health outcomes.

Methods: Content analysis of textual data from multiple sources such as journals, reports and electronic source was applied in the paper.

Results: Given the nature and outcome of studies conducted, benefits of IoT in NCD management is indicated.

Conclusions: In the context of India, the advancement of the digital technologies coupled with the growth of the health care sector raise the scope for enhancing healthcare services, with ample opportunities for the development of IoT for healthcare. With regards to NCDs, this would mean access to better coverage, surveillance and monitoring, and disease prevention.

Keywords: *Internet of Things, Non-Communicable Diseases, digital healthcare, India.*

INTRODUCTION

The burden of NCDs is sweeping the entire globe, with an increasing trend in developing countries. In 1990, 47% of all mortality related to NCDs was in developing countries[1]; in 2005 an estimated 35 million deaths were caused by NCDs representing 60% of all deaths globally, with 80% of deaths due to NCDs occurring in low- income and middle-income countries.

Corresponding Author:
Legia Emantha Shabong Lyngdoh
State Programme Coordinator,
National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases & Stroke,
National Health Mission,
Government of Meghalaya, India
Mobile: +91 9774751740
Email: gia_lyng@yahoo.com

India, following 2011 High Level Meeting convened by the United Nations General Assembly began to recognise NCDs as issues of development and launched the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular disease & Stroke in 2010.

Despite these attempts there has been major drawbacks in terms of diseases surveillance and management. To point out a few, firstly the public health system faces enormous constraints in terms of financial and human resources. Secondly, the NCD surveillance system is significantly weak, case reporting follows no protocols or guidelines which limits the effective use of data for decision making. Thirdly, coverage is a clear problem as NPCDCS emphasis on facility based opportunistic screenings. Referrals, treatments and follow up of patients diagnosed with NCDs is a major hurdle that need to be addressed.

To counter some of these issues, the introduction and implementation of the Internet of Things (IoT) can be a viable option. The IoT has potential to give rise to many medical applications, up-to-date healthcare networks driven by wireless technologies are expected to support chronic diseases, early diagnosis, real time monitoring, medical emergencies and elderly care. Gateways, medical servers, and health database are instrumental in creating health records and delivering on-demand health services to authorised stakeholders. IoT based healthcare services are expected to reduce costs, increase the quality of life, and enrich the user's experience. From the perspective of healthcare providers, the IoT has the potential to reduce device downtime through remote provision. Furthermore, the IoT can correctly identify optimum times for replenishing supplies for various devices for their smooth and continuous operation. IoT provides for the efficient scheduling of limited resources by ensuring their best use and service of more patients[2].

METHODOLOGY

Content analysis with conventional approach was used.

Data collection: the paper incorporated multiple sources of data such as journal articles, reports, conference proceeding and electronic sources.

Data analysis: the analytical strategy used is that of Coffey & Atkinson, 1996; Miles & Huberman, 1994 and Sandelowski, 1995 whereby the approach is to divide the content analysis into three phases: immersion, reduction and interpretation[3].

DISCUSSION

IoT Architecture: in remote health monitoring, most proposed frameworks leverage a three-tier architecture a perception layer, gateway/network layer and service layer.

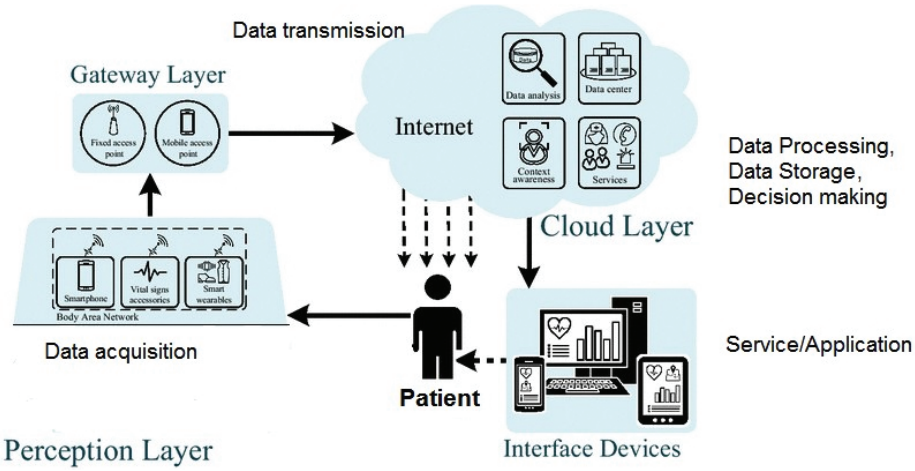

Figure 1: IoT Architecture for remote health monitoring

To understand the architeture, here a wearable IoT network is proposed. A Wireless Body Area Network (WBAN) consisting of werable sensors measure physiological markers such as heart rate and respiratory rate, the data acquired is then connected the data aggregator or concentrator usually a smartphone through Zigbee or low power Bluetooth. The agrregated data is then transmitted to healthcare server using internet connectivity on the aggregator, via the smartphone WiFi or cellular data connection. The server then turns the data into an observation and measurement file for processing and later stores the data in a remote server or cloud which can be retrived by health professionals, family members of patients who may alert emergency services professionals should need arise forming the service layer. Here sensors form an IoT based architecture as each indicidual sensor's data can be acessed through the internet via the concentrator[4].

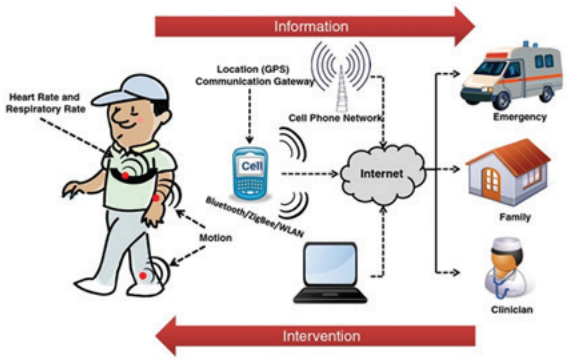

Figure 2: Wearable IoT network

Islam et al. in their publication The Internet of Things for Health Care: A comprehensive survey give an in-depth look at the subject of IoT applications in the health care setting. In their paper, they survey advances in IoT- based health care technologies and review the state-of-the-art network architectures/platforms, applications, and industrial trends in IoT-based health care solutions[2]. Similarly, Gomez, Oviedob and Zhuma, 2016[5] and Maia et al. 2014[6] among other scholars have also discussed IoT architectures and platforms.

Numerous studies have explored IoT applications for NCD management. The following pilot studies examine the utility of IoT in NCD management:

1. **Smartphone Enabled Heart Monitoring System:**

   Composition: The real-time heart monitoring system comprises of wearable device known as the Zephyr HxM-BT device (Zephyr Technology Corporation), a heart rate monitor and smartphone or tablet and a web portal.

   Working: The data acquired by the heart rate monitor is processed on a smartphone to (i) provide detailed test reports about the user's health state; (ii) store report records; (iii) generate emergency calls or SMSs; and (iv) connect to a remote telemedicine portal to relay the data to an online database. The system uses sophisticated algorithms to detect stress states, detect and classify arrhythmia events, and calculate energy consumption.

   Results: Application usability and usefulness was tested. The 10-item System Usability Scale (SUS), which is a platform-independent model widely used in subjective software evaluation was administered to 20 participants. They scored the application at 75.625 percent, corresponding to a B grade which is satisfactory[7].

2. **Smartphone enabled glucose monitoring:**

   Composition: The glucose monitoring system comprises of a smartphone, CareSens-LINK blood glucose monitor (i-SENS, Wonju, Korea), and S(M)BPM-1 blood pressure monitor (Samsung Electronics).

   Working: Thirty-five patients were provided with a smartphone device, and self-measured blood glucose data were automatically transferred to the medical staff through the smartphone application over the course of 12 weeks. The medical staff analyzed the data and sent recommendations and feedback tailored to the patient an average of once per week.

   Result: In the smartphone group, the mean HbA1c decreased after 3 months from the baseline level of 7.7%±0.7% to 7.5%±0.7% (P=0.077). In the control group, there was no change from baseline (7.7%±0.5% to 7.7%±0.7%) over the same period thus showing no intergroup difference after 3 months[8].

3. **CHRONIOUS wearable system in patients with chronic disease:**

   Composition: The CHRONIOUS system consists of a wearable shirt that integrates several body sensors, external devices (weight scale, glucometer, blood pressure monitoring device, spirometer, air quality sensor), a portable smart device and a central sub-system that is responsible for the long-term storage of the collected patient's data.

   Working: CHRONIOUS addresses a smart wearable platform, based on multi-parametric sensor data processing, for monitoring people suffering from chronic diseases in long-stay setting. It is constantly monitoring their activity using audio observation methods and activity sensors while at the same time tracking their medical condition via vital signs sensors. Any trait of abnormal health status and possible alerting incidents are detected by CHRONIOUS Intelligence. The system generates alerts in case of invalid medical data or if current activity and behaviour lay outside the well-established activity patterns and locomotion behaviour.

   Results: The COPD (Chronic obstructive pulmonary disease) trial involved 30 patients, while the CKD (Chronic kidney disease) trial involved 28 patients. Inference from analysis suggest that a large percentage of COPD (Chronic obstructive pulmonary disease) and CKD (Chronic kidney disease) patients are generally satisfied or have a positive thinking of CHRONIOUS platform. Due to the limited time period (only 4 months) that the system supports chronic disease patients, the judgment about the

reduction of the patient's medical visits as well as their health status improvements couldn't be clearly evidenced. From the clinical point of view, although some of the user's feedbacks referred to small systems contribution on clinicians every-day schedule, the consensus is that the utilization of the system in larger target groups will highlight systems' clinical value[9].

Further, systematic review undertaken by Vegesna et al. reported numerous positive health outcomes specifically in terms of reduction in symptoms severity and hospital visits or stay of NCD patient through remote monitoring using digital technologies[10]. Similarly, Goldman Sachs Global Investment Research have examined pilot studies to illustrate IoT efforts that have succeeded in engaging patients, providing key data to physicians resulting in lower rates of hospital admissions and overall costs[11].

The integration and management of IoT into remote health monitoring of NCDs comes with significant challenges. Major challenges include:

- **Managing device and their interoperability:** wearable devices poses challenges to the design of sensors. Sensor ought to be light, small, energy efficient and cause minimum hindrance to the patients' movement and mobility. Further, approved standards and certifications may not be followed by vendors in their products (devices) which is required in the interface between sensors, the aggregated devices and the backend database. This results in significant interoperability issues and increase system integration costs.
- **Data integration:** to create intelligent and meaningful applications there is a need to integrate data from multiple sources such as medical devices that monitors blood pressure, weighing scales, glucometers etc. as well as social network feeds and other web sources for patient – specific contextual data. Here, the problem lies in understanding the structure and syntax of data, understanding of semantics will enable the creation of intelligent application and mashups using techniques such as correlation, complex event processing and automated reasoning with semantics technology. The semantics of the data must be part of the data itself and not be locked up within the application logic in different application silos[12].
- **Data volume and performance:** Easy to imagine the amount of data to be taken in, stored and analysed is enormous. This will make standard architecture and platforms inadequate which calls for scaling up of applications and the backend database to adapt to the complexity of operations.
- **Data privacy:** data securitisation is of utmost importance and numerous challenges arise in the IoT device design, development and scalability of security schemes. Islam et al. in their paper address security issues analysing distinct IoT security and privacy features, as well as proposes an intelligent collaborative security model to minimise security risk[2].
- **Network capacity constraints:** Challenges may arise in developing initiatives to sustain uninterrupted networks with capacities to cater to heavy mobile data traffics.

CONCLUSION

In the context of India, factoring the Digital India Programme, India's Global Innovative Index ranking and India's growing health care sector; the deployment of IoT in remote health monitoring of NCDs in India may not be a distant dream. India is ranked 6th in income with 0.66 in efficiency ratio in the Global Innovation Index 2017 ranking[13]. India's healthcare sector is considered as one of the fastest growing industries, expected to advance at a CAGR of 22.87 per cent during 2015–20 to reach US$ 280 billion by 2020. Further, conducive policies for encouraging FDI, tax benefits, favourable government policies coupled with promising growth prospects have helped the industry attract private equity, venture capitals and foreign players. The sector registered 88 funding deals amounting to US$ 397.41 million as of September 2016[14]. In terms of internet usage, reports from the Internet and Mobile Association of India (IAMAI), titled 'Mobile Internet in India 2016', predicted that the country was estimated to have 371 million mobile Internet users by June 2016. While 71% of this number will belong to urban areas, rural India is said to hold the potential to further fuel the growth of mobile Internet in the years to come. Another notable fact that there has been growth driver for mobile internet: content in Indian languages, the number of consumers of online content in regional languages in June 2015 was

pegged at 127 million, a 47% increase from the previous year[15]. This will enable more people to effectively and critically navigate devices making optimal use of the digital technology.

With the advancement of the digital technologies coupled with the growth of the health care sector, the scope for enhancing healthcare services has increase significantly with ample opportunities for the development of IoT for healthcare. In the context of NCDs, this would mean access to better coverage, surveillance and monitoring. Real time visibility of patients' conditions, activities, context and physiological parameters; compliance monitoring of treatment, diet and exercise regime; real time feedback for patients, family and health professionals to implement corrective action for better patient outcomes.

In conclusion, the paradigm shift in the healthcare system from conventional healthcare (whereby patients with symptoms or ailments makes appointments with physicians and receives treatment), to that of digital healthcare (whereby healthcare providers take the initiative to alert potential patients of imminent health issues and provide medical interventions before disease progress) will unlock the future of development in India. To truly leverage the potential of digital healthcare numerous issues such as untapped potential, infrastructural constraints, government policies etc. need to be tackled and effectively addressed. However, considering India's leadership and capacity for collaborative innovation, digital healthcare may be a reality sooner than expected.

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Mandibular Canine Index(MCI) Not an Accurate Tool for Gender Identification:Results from a Systematic Review and Meta-Analysis

Elizabeth Dony[1], Mamatha G S Reddy[2], Pradnya Kakodkar[3]

[1]Post Graduate Student, [2]Reader, [3]Professor, Dr. D. Y. Patil Vidyapeeth's, Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune

ABSTRACT

Objective: Mandibular Canine Index(MCI) is being used by many researchers for gender identification, however the accuracy shows variations in the results. The aim of this review is to estimate the diagnostic accuracy of MCI in gender identification.

Methods: An electronic search of literature was carried out in pubmed MEDLINE database and Google scholar. 26 observational studies published from January 2000 to May 2016 in English were shortlisted using PRISMA guidelines. Study characteristics were entered in excel sheet and quality assessment was done using modified QUADAS 2. The diagnostic accuracy was assessed using sensitivity (males correctly identified) and specificity (females correctly identified) values.

Results: 37.9% percentage of the articles followed the Rao et al. guidelines in calculating MCI and rest modified the guidelines using mean of right and left canine width, right and left canine width separately and only right canine width. 25% of the studies showed high risk bias in patient selection and index test domain. In applicability, 50% of the studies showed high risk bias in patient selection domain. Overall summary measures of sensitivity was 0.65 and specificity 0.63. On subgroup analysis, high heterogeneity (I^2 >90%) was observed.

Conclusion: Few authors have already refuted the use of MCI in gender identification. The results of the present systematic review and meta-analysis showed lack of homogeneity in the data across the studies and concludes that MCI is not an accurate tool in gender identification.

Keywords: *MandibularCanines. Forensic Odontology. Gender Determination .Mandibular Canine Index. Sexual Dimorphism.*

INTRODUCTION

Gender identification plays a vital role in forensic medicine. There are various methods to correctly determine the sex of an individual, particularly in postmortem cases. Among these methods, DNA examination is regarded as an accurate and reliable technique, but is considered as a last resort due to operational complexity and high cost [1]. Anthropological measurements on the cranial and pelvic bones are helpful for gender estimation in forensic cases [2,3]. However, in massive disaster cases, the gravely damaged and disfigured corpses may restrict measurements on the skull and pelvic bones. Under such circumstances, odontometric analysis may be a good adjunct because teeth and jaws are often intact when recovered [4,5]. Thus, teeth have become increasingly significant for addressing forensic concerns as they are strong anatomical structures which have the ability to endure various insults, such as thermal, microbial degradation , air disasters, hurricanes or conflagration[6,7]. It has been found that the mandibular canines consistently exhibit greater sexual dimorphism

Corresponding Author:
Dr. Mamatha G S Reddy, MDS
Reader, Department of Oral Pathology and Microbiology
Dr. D. Y. Patil Vidyspeeth's,
Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune-18
E-mail: drmamatha78@gmail.com

in mesio-distal crown width and inter-canine distance. These teeth erupt by the age of 12 years and are least affected than other teeth by dental caries and periodontal diseases. Also, canines are the last teeth to be extracted with respect to age.

Rao et al. considered canine to be the 'key tooth' for the purpose of personal identification[8] and explored its application in gender identification. He introduced the "Mandibular Canine Index" which was calculated by obtaining the ratio of greatest mesio-distal (MD) dimension of the permanent mandibular canine and the inter-canine arch width (measured in mm). A cut-off value to differentiate the sexes was then calculated from the MCI, which was termed as the 'Standard MCI'[9].If the MCI value was less than or equal to the standard MCI, the individual was categorized as female and vice versa as male.

Rao et al., first used this MCI for gender determination in a heterogeneous sample that originated from the state of Karnataka in Southern India and obtained an accuracy of ~86% (7). Later, MCI was employed in numerous studies in large populations as it was simple, reliable, inexpensive, and easy to perform[10]. However, controversies regarding this index emerged, when a few studies proved that MCI is practically unreliable and questioned the reliability of MCI and revealed that this index was not sufficiently sensitive[7,9].

Therefore, in view of this controversial background, the present review was undertaken to systematically review the published evidence and to estimate the summary measures of diagnostic accuracy of the Mandibular Canine Index (MCI) as a tool for gender identification in adult humans.

MATERIALS AND METHOD

Search strategy: The review protocol was registered in PROSPERO (CRD42016046949). We conducted a search for relevant studies evaluating the accuracy of Mandibular Canine Index (MCI) for gender identification in a given population. The electronic search was initially conducted on the MEDLINE via PUBMED database with the following keywords: 'mandibular canine index', 'mandibular canine index AND gender determination', 'canine index AND sexual dimorphism' and 'canine index AND forensic odontology'. In addition to PUBMED, Google Scholar was also searched. We also manually searched the reference lists of eligible studies to ensure identification of relevant published and unpublished studies. We also contacted study authors to provide full text articles, wherever necessary.

Inclusion and exclusion criteria: Eligible study designs included observational studies published between 1 January 2000 and 31 May 2016 in English which evaluated the diagnostic accuracy of Mandibular Canine Index. Both, in-vitro and in-vivo studies, where percentage accuracy of gender identification was given with respect to MCI were included. We excluded studies which clearly did not mention the MCI value and the accuracy of gender identification.

Assessment of relevant studies: Two reviewers (E.CD and M.GS) independently performed the first stage of screening by titles of all the identified studies. Round 2 included screening by the abstracts. Round 3 was full text assessment.

Data extraction: A standardized, pre-piloted form was used to extract data from the included studies for evidence synthesis and assessment of study quality. One review author (E.CD) extracted data independently and second author (M.GS) cross checked the data. Discrepancy if any, was identified and resolved through discussion with a third author (P.VK) where necessary.

Quality assessment: Two review authors (E.CD and M.GS) independently assessed the quality of the included studies, where disagreements occurred, these were either resolved by discussion or by consulting a third review author (P.VK). QUADAS-2 checklist for studies of diagnostic accuracy was modified and used to assess risk of study bias.Under the **"Patient selection**":Was random sampling method employed for patient selection?, Did the study include a narrow age-range of patients?, Did the study avoid inappropriate exclusions? In **"Applicability concern**" "Was a native sample considered?"In **"Index Test":**Was the MCI calculated based on greatest canine width?, "If a threshold was used, was it pre-specified?", "Is the alignment of teeth in the study population likely to affect the Std. MCI?", "Was digital Vernier calipers used for measuring MCI?" In**"Reference standard"**: "Is the reference standards likely to correctly classify the target condition?, Were the reference standard results interpreted without knowledge of the results of the index

tests? and In **"Flow and timing of participants"**: Did all patients receive the same reference standard?, Were all patients included in the analysis? Each question were assessed as 'yes', 'no', or 'unclear'.

A 'Risk of bias' judgement ('high', 'low' or 'unclear') was made for each domain. If the answers to any two signaling questions within a domain were judged as 'yes' , it indicated low risk of bias and hence the domain was judged as low risk of bias. If any two signaling question were judged as 'no', it indicated a high risk of bias and hence the domain was scored as a high risk of bias. In case of equal distribution of 'yes' or 'no' in a domain, then the decision of high and low risk was taken by considering the questions, which can comparatively have more relevance with MCI calculation.

STATISTICAL ANALYSIS

The diagnostic accuracy was determined by assessing the sensitivity and specificity values. True positive (TP) represented the number of males identified correctly and true negative (TN) were the number of females identified correctly . Using the TP and TN values and the total number of males and females participating in the respective study, the values of false positive (FP) and false negative (FN) were ascertained. OpenMeta(analyst) software was used to present a combined forest plot. Subgroup analysis was carried out to investigate the differences in summary measures across categories of covariates. Sensitivity analysis was carried out to investigate how the risk assessment of studies affected the summary measures. A p value of <0.05 was considered to be statistically significant.

RESULTS

Table:1 PRISMA Flow chartof search results and study selection

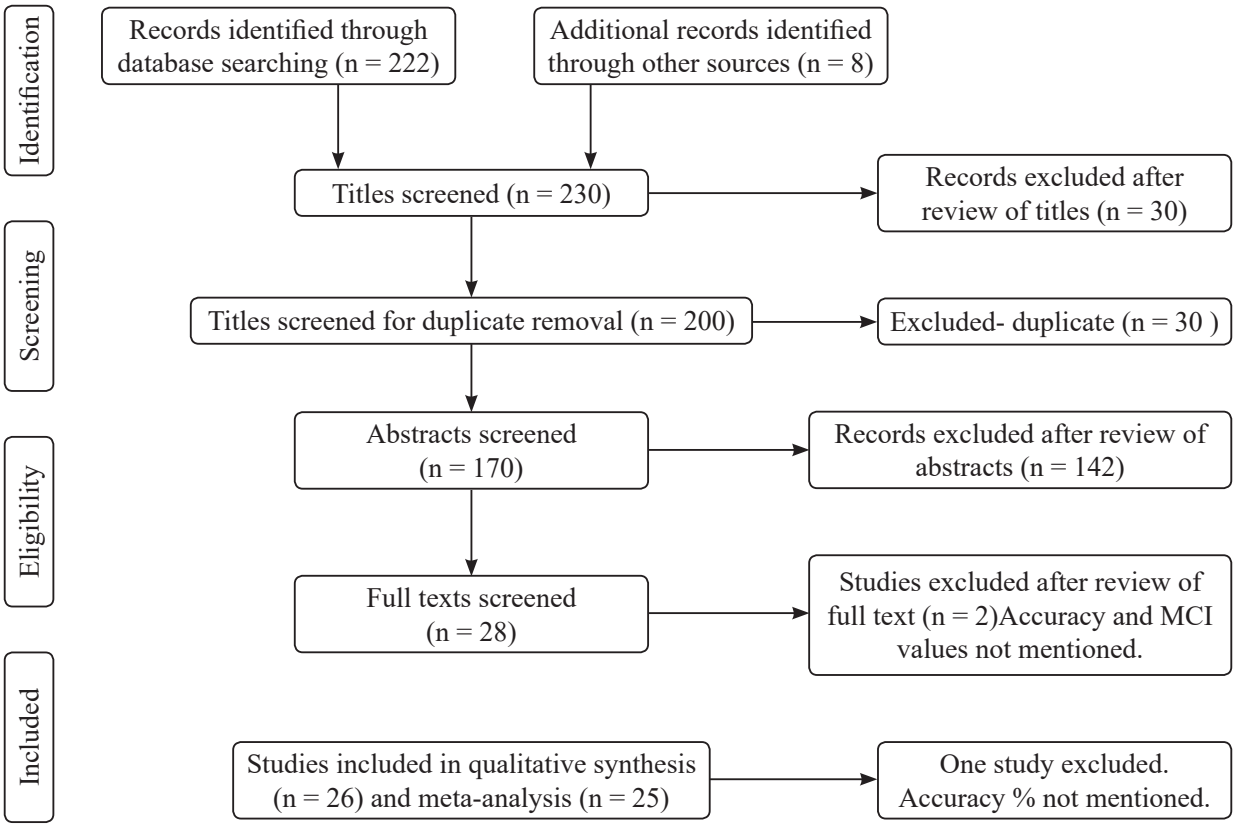

Table:1 shows the PRISMA flowchart of search results and study Finally a total of 26 articles were considered for the systematic review and 25 articles (29 estimates) for meta-analysis. Table 2, summarizes the characteristics of the individual studies. Overall, risk of bias was high in less than 25% studies for "Patient Selection" and around 25% for "Index Test. 100% studies were assessed as low risk for both the reference standard and Flow and timing. In applicability concerns, more than 50% studies reported high risk in the "Patient selection" domain. (Fig.1)

Table 2: Study Characteristics

Author name	Country	Age group(yrs)	Sample size	Population	Type of study	Method of MCI calculation	MCI used to predict gender	STD.MCI
Acharya AB et al (A)[8]	Nepal	19-28	117	Dental students	invitro	Greater canine width	MCI of greatest canine width	0.26
Acharya AB et al(B)[9]	India	19-32	203	General population	invitro	Right canine	Right MCI	0.244
Ahmed HMA[11]	Iraq	17-23	200	Dental students	invitro	Greater canine width	MCI of greatest canine width	0.26
Bakkannavar SM et al[12]	India	15-25	500	General population	invivo	MCI of both right and left canine	Rt and Lt MCI used seperately	0.281(R) ; 0.283(L)
Chukwujekwu et al[13]	Nigeria	17-30	400	Medical students	invivo	MCI of both right and left canine	Rt and Lt MCI used seperately	0.205(R); 0.215(L)
Dayananda et al[14]	India	18-22	200	Engineering students	invivo	MCI of both right and left canine	Unclear	0.270(R) ; 0.276(L)
Edibamode EI et al[15]	Nigeria	18-35	184	General population	invivo	Mean of MD of right and left canine	Mean MCI	0.21
Hosmani JV et al[16]	India	15-21	100	General population	invitro	Greater canine width	MCI of greatest canine width	0.27513
Iqbal R et al[10]	China	18-25	216	Medical students	invitro	Greater canine width	MCI of greatest canine width	0.247
Kakkar T et al[17]	India	17-25	250	General population	invitro	Greater canine width	MCI of greatest canine width	0.1921
Kaushal S et al[18]	India	17-21	60	Medical students	invivo	MCI of both right and left canine	Rt and Lt MCI used seperately	0.273(R) ; 0.28(L)
Krishnan RP et al[19]	India	18-25	50	University students	invitro	Mean of MD of right and left canine	Mean MCI	0.25
Latif M et al[20]	India	17-40	150	General population	invitro	Mean of MD of right and left canine	Mean MCI	0.257
Mughal IA et al[21]	Pakistan	18-25	200	General population	invivo	Greater canine width	MCI of greatest canine width	0.2504
Muller M et al[22]	France	17-24	424	University students	invitro	Greater canine width	MCI of greatest canine width	0.268
Nagalaxmi et al[23]	India	20-30	60	General population	invivo	MCI of both right and left canine	Right MCI	0.245
Narang RS et al[24]	India	20-40	410	General population	invitro	Greater canine width	MCI of greatest canine width	0.249
Paramkusam G et al[25]	India	18-25	120	General population	invitro	Mean of MD of right and left canine	Mean MCI	0.26
Parekh D et al[26]	India	18-24	368	Medical students	invivo	MCI of both right and left canine	Right MCI	0.205
Rajarathnam BN et al (A)[27]	India	18-25	200	General population	invitro	MCI of both right and left canine	Unclear	0.255(R); 0.25(L)
Rajarathnam BN et al (B)[27]	India	18-25	200	General population	invivo	MCI of both right and left canine	Unclear	0.26(R); 0.25(L)
Reddy VM et al[28]	India	17-25	200	General population	invitro	Greater canine width	MCI of greatest canine width	0.256
Sassi C et al[29]	Brazil	21-60	112	General population	invitro	Greater canine width	MCI of greatest canine width	0.267
Silva AM et al[30]	Portugal	16-30	120	General population	invitro	Right canine	Right MCI	0.282
Singh SK et al[31]	India	20-30	100	General population	invitro	MCI of both right and left canine	Unclear	
Srivasatava PC[32]	India	17-21	400	students	invivo	Greater canine width	MCI of greatest canine width	0.257
Yadav S et al[33]	India	15-21	360	Dental students	invitro	Greater canine width	MCI of greatest canine width	0.298

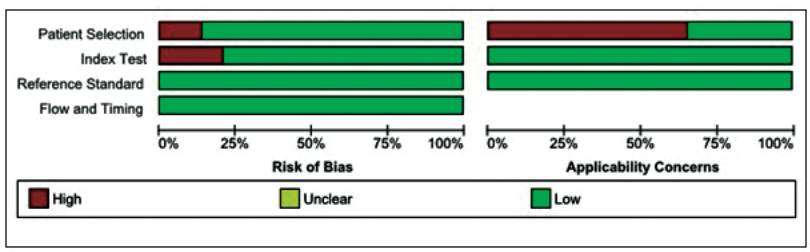

Fig. 1: Results of QUADAS-2, Risk of bias and concerns regarding applicability

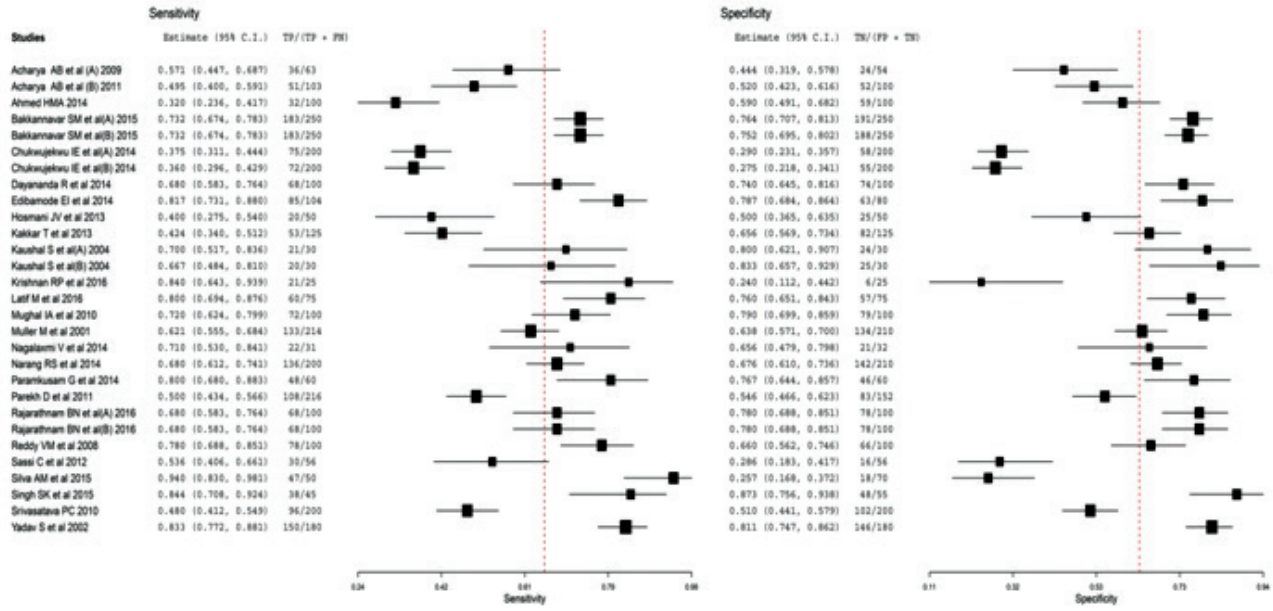

Fig. 2: Forest plot of sensitivity and specificity estimates

The forest plot is presented along with the estimates of sensitivity and specificity for each study (Fig. 2). Sensitivity refers to the percentage of males identified correctly and specificity to the percentage of females identified correctly. Overall, the summary measure of sensitivity was 0.65 (0.59,0.71) and specificity was 0.63 (0.56,0.69).

Table 3: Summary measures of accuracy for Mandibular Canine Index (MCI) for sex identification [Subgroup analysis]

	Study estimates	Summary accuracy: Sensitivity	Q value, Het p value, I^2	Summary accuracy: Specificity	Q value, Het p value, I^2
All studies	29	0.65 (0.59,0.71)	339.092, < 0.001, 91.74%	0.63 (0.56,0.69)	408.321, < 0.001, 93.14 %
Country					
India	20	0.67(0.61, 0.73)	165.726, < 0.001, 88.54 %	0.69(0.63, 0.74)	127.771, < 0.001, 85.13 %
Others	9	0.59(0.49, 0.71)	127.066, < 0.001, 93.7%	0.48 (0.33,0.63)	163.321, < 0.001, 95.1 %
Region within India					
North India	9	0.65 (0.55, .74)	155.726, < 0.001, 88.39%	0.69 (0.61,0.75)	125.726, < 0.001 89.54 %
South India	10	0.71 (0.65, .77)	148.726, < 0.001 77.08 %	0.71(0.64, 0.77)	145.726, < 0.001, 88.54 %
Study Population					
College students	12	0.57(0.47, 0.67)	145.035, <0.001, 92.42%	0.56 (0.44,0.67)	193.247, < 0.001, 94.31 %
General population	17	0.69 (0.63,0.75)	116.525, < 0.001, 86.27%	0.67(0.60, 0.74)	139.509, < 0.001, 88.53 %

Conted…

Type of study					
In vitro	16	0.67 (0.58,0.57)	162.235, < 0.001, 90.75 %	0.60 (0.52,0.68)	145.099, < 0.001, 89.66 %
In vivo	13	0.63 (0.53, .71)	171.012, < 0.001, 92.98 %	0.66 (0.54,0.77)	260.377, < 0.001, 95.39 %

I2 - measure for heterogeneity.

Table 4: Sensitivity analysis

Subgroup	No. of study estimates included	Summary accuracy: Sensitivity	Summary accuracy: Specificity
ROB criteria 1			
High risk	4	0.71 (0.59, 0.81)	0.64 (0.43, 0.80)
Low risk	25	0.64 (0.57, 0.70)	0.63 (0.55, 0.70)
ROB criteria 2			
High risk	6	0.59 (0.52, 0.66)	0.66 (0.57, 0.74)
Low risk	23	0.66 (0.58, 0.73)	0.62 (0.53, 0.70)
ROB criteria 3			
High risk	18	0.69 (0.61, 0.76)	0.65 (0.54, 0.74)
Low risk	11	0.59 (0.48, 0.68)	0.61(0.52, 0.68)
ROB criteria 4			
High risk	19	0.68(0.61,0.74)	0.70(0.64,0.76)
Low risk	10	0.59(0.48,0.70)	0.48(0.36,0.60)
ROB criteria 5			
High risk	23	0.67(0.61,0.72)	0.68(0.62,0.73)
Low risk	6	0.58(0.42,0.72)	0.42(0.27,0.58)

Note: ROB – risk of bias, criteria 1 – risk of bias in patient selection, criteria 2 – risk of bias in measurements using the index test (MCI), criteria 3 – risk of bias in using the greatest canine width, criteria 4- risk of bias using nativity of the population, criteria 5- Overall risk of bias

All the covariates (Table 3) investigated showed a significant heterogeneity. Sensitivity analysis is showed in (Table 4). Comparison of the summary measures could not be done because of high heterogeneity present between the two risk groups.

DISCUSSION

Gender determination of damaged or mutilated dead bodies or from skeletal remains constitutes a major challenge in medico-legal examination [26].Although the use of DNA gives robust results, the fact is that biological samples are not always available or suitable for DNA fingerprinting [30]. Osteometry is considered the preferred technique because it is more effective in determining

sex [34].In the case of adult, when a 90% skull and 95% pelvic bones are present, determination of sex accurately by an expert is of the order of 98%. If only long bones, such as femur and humerus are present, determination of sex accurately by an expert is of the order of only 80%. During disaster, these bones easily get fragmented, which may be major hindrance for assessment of sex using osteometry.

In such cases, teeth can be especially useful, since they are known to resist a great variety of physical, chemical and biological insults [30].Canines are the ideal teeth for identification of sex, due to its sexual dimorphism and durability in the oral cavity [29].

Hence, this review was undertaken to estimate the diagnostic accuracy of MCI in gender identification. Our review summarized the evidence from 26 studies where MCI was used as a tool for gender identification for a given population. The results of this meta-analysis

showed that MCI yielded a total sensitivity of 65% (0.59, 0.71) and total specificity of 63% (0.56, 0.69).

Overall, the identification accuracy varied from 32% to 94% for the males and 24% to 87% for females indicating a wide variation.. To explain this heterogeneity/ variation subgroup analysis and sensitivity analysis were undertaken. However, both the analysis could not explain the variation as the subgroups itself did not demonstrate homogeneity.

The varying degree of diagnostic accuracy could be probably explained on the basis of lack of sexual dimorphism with regards the mesio-distal canine width and intercanine distance. This is further explained with an example: In a study by Hosmani JV et al [16], the sensitivity reported was 0.40 (40% males identified correctly) and specificity was 0.50 (50% females identified correctly). The measurement of their study participants were: mesio-distal width of the canine in males was 7.18(6.02,8.34) and in females was 6.95 (5.37, 8.53) and the inter-canine width of males was 27.17(22.03, 32.31) and females was 26.25 (21.58 , 31.31) respectively. Observing the values closely, one can appreciate that there is an overlap indicating lack of sexual dimorphism. All those participants falling in this overlap region are misdiagnosed (False positives =50% and False negatives=60%). From this example one can interpret that only 40% males have unique bigger measurements and 50% females have unique smaller measurements and hence they have been identified correctly. While those in the overlap region, the 60% males have smaller measurements and are misdiagnosed as females and 50% females have bigger measurements of their teeth similar to males and hence are misdiagnosed as males. This accomplishes that only when there is distinct sexual dimorphism , MCI can have better accuracy in gender identification [8,30,32,33].

A varying range of Std MCI (cut off point values) from a minimum of 0.19 to a maximum of 0.3 has been observed across the different studies. Each study showed its own unique Std MCI value. This variation in the cut off points is the result of the varying mesio-distal canine width and the inter-canine distance of the population indicating that there is no one standard MCI value which is applicable to all the people from different geographical location. This can pose to be a major drawback while choosing of a cutoff point (Std MCI) value for making a decision while utilizing MCI as a tool for gender identification for a victim (from unknown geographical location) in mass disasters.

All the 26 studies considered in the review have used MCI as a tool for gender estimation in a living population with known gender. No studies could be retrieved where MCI has been used for victim identification in mass disasters or in post mortem cases. The actual application for which MCI is designed has never been tested.

Rao et al[7] proposed that MCI should be calculated in the well aligned mandibular arch. Three studies [8,9,22] have performed these calculations in the mal-aligned teeth. Such malocclusion can affect the accuracy of the MCI. More-so, this again limits the application of MCI in mass disasters, where there is a slender chance that the victim would have well aligned mandibular teeth available for estimation. Mandibular arch with missing teeth, rotated or crowed teeth limits the application of MCI.

The unique feature of this review is that, probably this is the first largest systematic review and meta-analysis with 26 studies. Because of lack of homogeneity in the data across the studies complex meta-analytic statistics could not be performed. Since only two databases were searched there is a possibility to miss on some more relevant articles.

CONCLUSION

The fact that several studies[13,16,19,30] have already refuted the application of MCI in sex estimation and synergistically the results of this systematic review and meta-analysis along with the explanation of its limitation in the above section clearly indicates that Mandibular Canine Index is not an accurate tool for gender identification.

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Histopathological Evaluation of White Lesions– An Institutional Observational Study

Roopa Madalli[1], Mamatha GS Reddy[2], Neeta Bagul[3], Supriya Kheur[4]

[1]Lecturer, [2]Reader, [3]Professor and Head, [4]Professor and Head; Department of Oral Pathology and Microbiology; Dr. D. Y. Patil Vidyapeeth's, Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune-18

ABSTRACT

The most common oral manifestation of tobacco use is in the form of white lesions.They may reflectas benign, pre−malignant or malignant condition. There are no clinical signs and symptoms which canpredict whether a pre−malignant lesion or a condition will undergo malignant change or not.An institutional based cross−sectional study was conducted including total of 344 casesreporting to the outpatient wing from 2004 - 2016. Demographic details of various white lesions of oral cavity along with histopathological findings were studied. Results showed the habit of tobacco quid placement and Gutkha chewing was followed maximum.The most common white lesion was leukoplakia andout of 344 cases 125 (36.33%) had dysplasia. 8 (2.32%) cases in our study did not have correlation between clinical and histopathological diagnosis. The aim of the study was to clinicopathologically correlate the white lesions.

Keywords: *Oral pre-malignant disorders, dysplasia, leukoplakia, lichen planus.*

INTRODUCTION

White lesion is a non-specific term used to describe any abnormal area of oral mucosa that on clinical examination appears whiter than surrounding tissue & is usually slightly raised, roughened or of different texture from adjacent normal tissue. White lesions appear white due to many reasons such as production of abnormal keratin which imbibe fluid far more readily, coagulation of surface tissue & formation of pseudo membrane, traumatic, chemical, infectious or immunologic injury and reduced vascularity of subjacent connective tissue.[1]

Chronic irritation from all forms of tobacco represents the most common cause of white mucosal lesions. Ill-fitting dentures, rough teeth, and dental restorations are also irritants.[2] White lesions in non-habit cases such as stress also reported.White lesions in the oral cavity may be benign, pre−malignant or malignant. On the other hand, suspicious looking lesions can be pursued and a definitive diagnosis made through subsequent biopsy.

Identifying and recognizing a premalignant lesion or a frank malignancy in the early stages will go a long way in averting the development of a malignancy and will provide an excellent prognosis with minimal disfiguration and functional handicaps.[4]The purpose of this study is to analyze the clinical and histopathological patterns of white lesions in the oral cavity.

MATERIALS AND METHOD

An institutional based cross−sectional study was conducted in the Department of Oral Pathology and Microbiology, Dr D Y Patil Dental College, Pimpri Pune, from 2004 to 2016. All the lesions with differential diagnosis as oral potential malignant diseases, clinically presenting as non-scrapable white lesions (leukoplakia, lichen planus, oral submucous fibrosis) were included in the study.

Corresponding Author:
Dr. Supriya Kheur, MDS,
Professor and Head,
Department of Oral Pathology and Microbiology
Dr. D. Y. Patil Vidyapeeth's,
Dr. D.Y.Patil Dental College and Hospital, Pimpri,
Pune-18
Email: supriya.kheur@dpu.edu.in

The total of 344 cases during the period of 13yrs.were retrieved from the records. A detailed demographic data and clinical history recording of age, gender, occupation, chief complaint, duration, risk factors associated personal habits,location, extent, size and type of lesions,past medical and dental history and family history were entered in Microsoft excel. The histopathological diagnosis was then correlated with the clinical data and provisional diagnosis.

RESULTS

Table 1: Distribution of cases based on habits

Type of habit	Total no. of cases N-344	Percentage
Tobacco chewing	46	13.37
Tobacco quid placement	108	31.39
Gutkha chewing	120	34.88
Combination of smoking and nonsmoking habit	28	8.13
Smoking	30	8.72
Stress	08	2.32
Trauma	02	0.58
Non habit	02	0.58

Three hundred and fortyfour cases were included in the study. 280(81.39%) were males and 64(18.6%) females in the study population. On basis of personal habit,list of non- tobacco habits and tobacco habits are summarized in table 1. Commonest found was tobacco quid and Gutkha chewing. Out of 108 (31.39%) cases of tobacco quid placement, maximum was in left buccal mucosa 60(55.5%) followed by right buccal mucosa 30(27.7%) and labial vestibule 18(16.6%). There were only 8 (2.32%) cases without habit and categorized as non-habit related white lesions.

Table 2: Clinical type of white lesions

Type of white lesion	Total no. of cases N-344.	Percentage
Leukoplakia	192	55.8
Oral Submucous fibrosis	66	19.18
Oral Lichen Planus	80	23.25
Frictional keratosis	06	1.74

Table 3: Clinical presentation of the white lesions

Clinical presentation white lesion	Total no. of cases N-344	Percentage
Homogenous	304	88.37
Non-homogenous	40	11.62

Clinically the white lesions were diagnosed as leukoplakia (55.8%), lichen planus (23.25%) and along with the white lesion in the oral cavity, pain or burning sensation, difficulty in opening mouth was present in 66 cases with fibrotic bands seen maximum on buccal mucosa following retromolar area and soft palate were diagnosed as OSMF (19.18%), and frictional keratosis (1.74%) [Table2]. According to the appearance of the lesions most of the lesions were homogenous (88.37%) and few non-homogenous (11.62%) [Table 3].The leukoplakic patches were homogenous in most cases (64) and erosive in 11 cases.

Table 4: Age-wise distribution of white lesions

Age Years	Leukoplakia		Oral Lichen Planus		Oral Submucous fibrosis	
	M	F	M	F	M	F
10-30	38	02	26	08	40	04
31-50	64	16	20	12	12	04
51 and above	68	10	10	04	02	04
Total	**170**	**22**	**56**	**24**	**54**	**12**

All male and female patients were grouped separately depending on type of white lesion i.e leukoplakia, lichen planus & oral submucous fibrosis under different age groups. Findings stated that OSF and OLP were common in 2nd decade and leukoplakia was mainly found in 5th decade both in males and females [Table 4].

Table 5: Prevalence of dysplasia among white lesions

Type of white lesion	Mild dysplasia	Moderate dysplasia	Severe dysplasia
Leukoplakia	33.7%	14.6%	6.7%
Oral Lichen Planus	-	4%	-
Oral Submucous fibrosis	-	-	-

Histopathological examination of these lesions was done by two pathologists to rule out the interobserver bias. Leukoplakia histopathologically was categorized as hyperkeratotic complex 46(75%) and hyperkeratotic simplex 29(25%) respectively. Biopsy specimens which showed parakeratosis, elongated rete pegs, and submucosal lymphocytic infiltration were diagnosed as OLP. Out of 80(23.25%) cases with diagnosis of OLP only 4 (5%) patients showed dysplasia and rest were without dysplasia which is the consistent feature with OLP (Table 5).The histopathologic picture of oral submucous fibrosis showed atropic epithelium, flat reteridges, dense fibrous connective tissue and subepithelial hyalinization.

DISCUSSION

The oral cavity is vulnerable to a limitless number of environmental insults because of its exposure to the external stimuli and can be host to a multitude of pathological lesions which may be neoplastic, premalignant, or reactive.[5] Lesions in oral cavity are generally regarded as a strong indicator of general health.[6]Chronic irritation from all forms of smoking represents the most common cause of white mucosal lesions. The direct contact of tobacco with the oral mucosa is responsible. Snuff dipping is a potent irritant and carcinogen. Ill-fitting dentures, rough teeth, and dental restorations are also irritants.[2]Suspicious looking lesions can be pursued and a definitive diagnosis made through subsequent biopsy. There are very few studies, especially from developing countries such as India, which have evaluated the clinical and pathological diagnostic factors of white lesions in the oral cavity.

Out of 344 study population 70% (274) were males and 30% (116) were females, with a male to female ratio being 2.36:1, which was in accordance to Chaturvedi et al in India.[7] We observed that half the study population was in the age group of second decade, which was in contrast to age group that of Ranganathan et al.[8] Male predominance in our study can be due to easy accessibility for males to use areca nut and its products more frequently than females in our society and changing lifestyles of the youngsters.

In the present study the major diagnosis of oral white lesions was Leukoplakia. There is male preponderance (170:22). According to study by Swati Parikh et al gave the ratio of 2.74:1.[7]In the study of Nadia Zaib et al, male to female ratio was 1.1:1.[9] In our study, the peak incidence of OSF and OLP were common in 2nd decade and leukoplakia was mainly found in 5th decade both in males and females. In study by Swati Parikh et al, the peak incidence of oral cavity lesions was between 4th to 6th decades while in the studies undertaken by Al-Khateeb TH&Pudasaini S et alit was between 2nd to 4th decades.[9, 11,12]

Commonly used non-smokeless tobacco forms were pan masala, tobacco chewing, gutka chewing, betel quid placement, non-habit such as stress, trauma was found as a significant risk factor for white lesions in the current study. In the present study 78% of patients had habit in form of chewable tobacco or gutka. Only 8% had the habit of smoking. As against the study of Laronde DM et al. in which 75% of users had habit of both tobacco and alcohol.[13] We found chewable form of tobacco is common in our study and can be justified by the group of lower socioeconomic people, orthodox group of society so, smoking was not so common in our particular study.

The most common site in the present study was buccal mucosa (52.9%) as, as chewable form of tobacco was common and general human tendency of placing it in buccal region for a long duration. Hard palate was found to be the least common site. Similar findings was found in the studies by Simi SM et al ,Axell et al and by Silverman et al.[3, 14, 15]In contrast to these studies,Al-Khateeb TH and Pudasaini S et al showed palatal and lip lesions predominance respectively.[11, 12]

However, clinically to classify lesions as premalignant is difficult because they vary in appearance and are likely to be interpreted subjectively by the clinician. A histopathologic diagnosis is generally more

definitive of premalignant change than clinically apparent alterations.[2]In the present study histopathologically leukoplakia was categorized as with dysplasia and without dysplasia. Majority of cases were of minimum dysplasia 33.7%, moderate dysplasia with 14.6% and few were showing severe dysplasia of 6.7% which is in accordance with the study by Bisht RS et al.[16]Even the superimposed candidal infections was found in few cases histopathologically which was not noted in clinical history. Only four cases with dysplasia in OLP were found. Though OLP known to undergo transformation through genetic pathways other than that of dysplasia. Which facilitates us to consider it as pre-malignant lesions.[17] Only 8 cases did not have correlation between clinical and histopathological diagnosis. Four cases were diagnosed clinically as malignant but invasion was not evident except for severe dysplastic features. Two cases had clinical provisional diagnosed as speckled leukoplakia but histopathological diagnosis was OLP. Out of 344 patients 125 (36.33%) had dysplasia which was not in accordance with Simi SM et al study in which only 8.9% were dysplastic. The clinical and histopathological diagnosis may vary and also the degree of dysplasia may not correlate with the clinical types of white lesions, so biopsy is recommended in cases of white lesions.

CONCLUSION

The white lesions affecting the oral cavity constitute a diverse group of pathologies. Of all the oral biopsies reported in the present study, 36.33% dysplastic features was reported. This makes it an emerging threat to the community and clinician. There is dire need to take effective measures to increase public awareness about the risk factors and consequences of this pathology.

Measures should be designed to encourage the population to have routine oral examination which will make an early detection of any pathological change very easy. This may contribute in reducing the oral cancer burden of our population.

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A Study on Factors Influencing Competency of Pharmacists in a Tertiary Care Hospital

Marsha Augustin[1], Samuel N J David[2], Aileen J[3], G Devakumar[4]

[1]Postgraduate Student, Department of Hospital Administration, Ramaiah University of Applied Sciences, Bangalore, [2]Senior Manager(Management Studies and H.R.) and Head of Department of Staff Training and Development, Christian Medical College (CMC), Vellore, [3]Assistant Professor, Department of Hospital Administration, Ramaiah University of Applied Sciences, Bangalore, [4]Associate Professor and Head-Innovation & Entrepreneurship Development Research Centre, Ramaiah University of Applied Sciences, Bangalore

ABSTRACT

Enhancing the performance standards of employees with competency assessment has become a cutting-edge development among the industries. It is more vital for the organization to recruit the right people for the right job so as to ensure continued stability and growth. In the recent past, health organizations have stepped forward to map competencies for their nursing department, which is considered to be back bone of health care organizations. Likewise, pharmacists are most often neglected in the healthcare delivery system, but are a key component as they are the sole providers of medications for treatment. Identifying competencies among pharmacists will help provide a better platform for them to grow in their profession with utmost diligence, dedication and patient centered care which eventually contributes towards the organizational goals.

The main aim of this study was to identify the factors influencing competency with respect to pharmacists in a tertiary care hospital and provide recommendations for future training needs.

The total population size of 153 Pharmacists were considered for this study. Initially, pilot study was conducted to identify the contemporary knowledge, attitude and skills of the pharmacists. This was done through a checklist, so as to understand their roles and responsibilities and identify major competency factors. Based on this input, a survey questionnaire was developed to capture data for further investigation. The analysis was carried out using SPSS tools such as: Descriptive statistics, Correlation and Two-way Analysis of Variance (ANOVA) followed by Hypotheses testing.

The result shows that, there is scope for improvement by providing training with respect to technical knowledge and technical skills to the pharmacists. It suggested to incorporate interpersonal relationship training module in vernacular languages, so as to attain superior customer satisfaction.

Keywords: *Competency, Competency mapping, Competency framework, Competencies among pharmacist*

INTRODUCTION

The concept of competency mapping has been vital to organizations around the world. Apart from the different fields that have adopted competencies, the healthcare sector has slowly been catching up with competency mapping and developing frameworks. Although many research studies have been conducted, only a few competency frameworks have been implemented in the healthcare sector. A few fields who have adopted the framework includes nursing, laboratories and pharmacies.

The term competency was initially used in 1972 by David Mc Clelland[1] who described that the real predictors of a job performance are a set of underlying personal characteristics or performances. According to Mulholland 1994, Wright 1998; competency is defined as the minimum standard necessary to perform a job[2,3].

With plans to improve the structure, processes, and outcomes, competencies have also become a contributory factor in the development of the employees' performances in an organization. Development of competency

frameworks have been widely used in every sphere but is still growing in the Indian healthcare industry.

Lack of standards in healthcare has led to poor performance (WHO, 2006)[4]. Thus, various performance standards came into the picture. Eventually, competency frameworks were being designed to meet the standards in various fields within the healthcare sector. Encouragement of healthcare professionals to achieve the standards with the framework will help in continuous quality improvement. The main aim of this study was to identify the factors influencing competencies required by the pharmacists to achieve their utmost level of performance. The factors which were identified were narrowed down further according to the hospital's requirements and nature of the organization.

OBJECTIVES

- To study the job roles and responsibilities of the pharmacists to understand the present level of knowledge, attitudes and skills
- To investigate the factors influencing roles and responsibilities with respect to technical competencies, behavioural competencies, leadership competencies and organization specific competencies
- To analyse the identified factors and
- their impact on effectiveness of technical, behavioural, leadership and organization specific competencies in the department
- To analyse the effectiveness of the identified competencies and suggest suitable recommendations for the organizational growth

MATERIALS AND METHOD

The study was quantitative and adopted a descriptive research design in a Tertiary Care Hospital. The research was conducted in the department of pharmacy for a period of six months.

Data Collection: Face-to-face interview, checklists and department procedure manual were used to study and understand the roles and responsibilities of the pharmacists.

Through literature survey i.e. research papers, journals, books along with expert advice, the various competency factors that have to be studied among the pharmacists were identified. With the identification of factors, a questionnaire was formulated. The data was collected with a customized questionnaire wherein the items(questions) were classified under five broad categories namely, Demographic profile, Technical Competency, Behavioral Competency, Leadership Competency and Organization Specific Competency in a 5-point likert scale. Open Ended questions were included in the questionnaire. Each employee was given the questionnaire by the researcher in person and collected to avoid bias and to address any clarifications in the questions.

Sampling: The total population who were 153 pharmacists were taken for the study.

FINDINGS

From the outcome of the study, it was noted that 61.4% were males and 38.6% were females. And out of these respondents the maximum numbers of individuals were undergraduates i.e. 79.1%. Majority of the employees (38.6%) belong to the age group of 31 to 40 years. The total percentage of the employees who are permanent is 85.6%.

All the 'R' values for technical, behavioral, leadership and organization specific competencies are not above 0.7 and there is no concern for multicollinearity. This means that all the variables are measuring its own question and there is no need for grouping them as there are no similarities or homogeneity among the items. This shows that all the items (competencies) taken for the study can be considered.

Hypotheses Testing: Hypotheses testing was done using two-way analysis of variance(ANOVA).

H_o: Null Hypothesis: There is no significant relationship among the technical, behavioral, leadership and organization specific competencies.

H_1: Alternate Hypothesis: There will be a significant relationship among the technical, behavioral, leadership and organization specific competencies.

Since the p value is lesser than 0.05, null hypothesis is rejected and alternate hypothesis is accepted which means that there is a significant relationship among the technical, behavioral, leadership and organization

specific competencies. Thus, these competencies are independent of each other.

H_o: Null Hypothesis: There is no significant relationship between occupation and technical, behavioral, leadership and organization specific competencies among pharmacists.

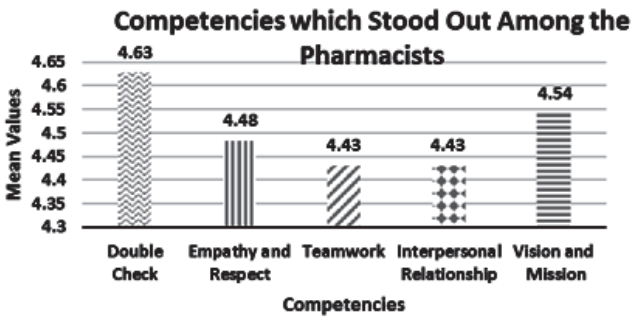
H_1: Alternate Hypothesis: There will be a significant relationship between occupation and technical, behavioral, leadership and organization specific competencies among pharmacists.

Since the 'p' value is higher than 0.05, the test is not significant. Therefore, null hypothesis is accepted and alternate hypothesis is rejected which means that there is no significant relationship between occupation and technical, behavioral, leadership and organization specific competencies among pharmacists. Therefore, there is a possibility to increase the quality of the employees through these competencies irrespective of the occupation of the pharmacists.

Thus, it can be concluded that the identified competencies after analysis can be used for the development of a customized competency framework for the pharmacy.

From the two-way analysis of variance and hypotheses testing, it was found that there is a significant relationship among the main competency domains. Whereas, null hypothesis was accepted only in case of occupation (Permanent Employee, Probation Employee, Temporary Employee, Trainee) of Pharmacists.

Table 1.1: Competencies which stood out among the Pharmacists



From the table 1.1, the mean values that were analyzed, the highest mean values were for the following competencies: The pharmacists are conscious and take precautions by double checking before dispensing the medications; their immediate boss is considerate, has empathy and respects others; the respondents agreed that the organization encourages team work to achieve organizational goals and good interpersonal relationship.

DISCUSSION

In this research study, the factors influencing competency of pharmacists in a tertiary care hospital were analyzed. The most popular languages of the patients who visit the tertiary care hospital are Hindi, English, Bengali, Malayalam, Tamil and Telugu. Implementation of a competency based system will encourage individuals to achieve performance standards and contribute towards continuous quality improvement.

Competency Practice Based Research: Competencies in the current study, have been classified into four main domains for the overall development of the individual. The domains which were identified are technical competencies, behavioral competencies, leadership competencies and organization specific competencies. According to the Organization for Economic Co-operation and Development (OECD) framework, "Sustainable development and social togetherness depend critically on the competencies of all our population–with competencies understood to cover knowledge, skills, attitudes and values." Core competencies were divided into three main groups: delivery related competencies, interpersonal competencies and strategic competencies [5]. Kumari and Sita, (2010) have examined the importance of different aspects of competency domains which are: talent acquisition, talent development and talent retention [6]. Whereas, this research study has brought about a wholistic approach in the development of the individual to achieve patient centered care.

In the process of grouping competency, factors in accordance with the organization's perspective has been included. All the items taken for the study are independent of each other and can be incorporated into the analysis of factors influencing competencies. The outcome of the analysis of variance shows that there is a possibility of improvement in the employees' quality through the identified competencies. The hypotheses testing shows that there is no significant relationship between occupation and technical, behavioral, leadership and organization specific competencies among pharmacists.

From the literature survey that has been carried out so far, this research study has analyzed various categories of employees with respect to age, gender, qualification and occupation in accordance to the various competency domains.

There exists a strong linear relationship among the various competencies that were identified. All the 'R' values for technical, behavioral, leadership and organization specific competencies were not above 0.7 which indicates a strong linear relationship which is in accordance with research acceptance limits. Research studies have shown that there exists a strong correlation between the competencies and employees' performance levels. Therefore, this confirms that competencies comprise of the knowledge, skills and attitudes of individuals to improve individualistic performance [7].

The male pharmacists are more in number than the females in the country which is also evident from the current research study. In one of India's largest pharmaceutical company, Dr. Reddy's labs, out of 17,000 employees, only 15% of females are present[8]. Therefore, from this study it is evident that there still exists a variation in the male to female ratio in the industry.

The importance of this study was that the identified and analyzed competency factors can be used for individual and organizational growth. The gaps identified among the competencies can be used to develop training modules for better performance of the employees. According to Bhojraj et al, (2016) the study states the current facts of the pharmacy situation in India wherein for optimal functioning of pharmacists the necessary knowledge, skills and abilities should be considered. As there are more number of pharmaceutical colleges arising in the country, the outcome of pharmacists with the necessary competence and motivation is less[9]. Therefore, to address this, a competency based education system will help by exposure of the right competencies that is necessary for growth and development in the field.

In addition to it, the customized competency tool which has been developed can be used across various health organizations by making changes to the technical competency domain in accordance with the job description. The rest of the domains can be retained. Thus, this tool provides a platform for the organization to develop individual competencies across the health disciplines.

RECOMMENDATIONS

There is a need for management to encourage the employees to share their views to the top management about their needs and grievances.

- Modules for training employees in languages such as Hindi, Bengali, Telugu, Malayalam is recommended for the employees to communicate better with the patients. Workshops on development of interpersonal relationships is of vital importance as the maximum number of respondents have stated lack in this area.
- Although a survey questionnaire was used for collection of data through the feedback from the respondents, including participants who represent the academic side and professional practice across the various disciplines in the health sector will add more value to the study.
- The inputs from this research for the development of the competency framework can be used in the other health disciplines also.
- Since the study was for a short period of time, survey questionnaire for self-assessment was adopted for the study. Further other qualitative techniques such as interviews, focus group discussions, Delphi techniques etc. can be used for the study.
- Based on this study, the research can delve deeper into identifying competencies at various levels within the department and across various other departments within the hospital.

FUTURE DIRECTIONS

The questionnaire which was formulated can be used to assess the employees over a period of 6 months or one year after training has been incorporated with respect to effective interpersonal communication and language training in Bengali, Telugu, Malayalam and Hindi.

CONCLUSION

The main outcome of this research was to identify factors influencing competencies for pharmacists. From the analysis through descriptive statistics i.e. through mean and inter correlation, it was found that the items present in the four variables i.e. technical competencies, behavioral competencies, leadership competencies and

organization specific competencies, were independent of each other and there was no concern for multicollinearity. All the correlations were positive and showed that there is a possibility of the employees' competence to improve through the various variables that were identified. The identified competency factors will help every individual employee to assess their own competencies and further to work towards their own development and contribute towards the organizational goals.

Conflict of Interest: Nil

Source of Funding: It was self-funded.

Ethical Clearance: Taken from MSRUAS Research Committee.

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Demographic Profile of Blood Donors: A Study of a Tertiary Care Medical College Hospital Ambala Facility Based Study

Nazuk Razdan[1], Randhir Kumar[2], Anu Bhardwaj[3]

[1]Assistant Professor Community Medicine MMMCH Solan, [2]Assistant Professor, [3]Professor, Community Medicine, MMIMSR Mullana

ABSTRACT

Introduction: An integrated strategy for blood safety is required for the provision of safe and adequate blood. Recruiting a sufficient number of safe blood donors is an emerging challenge. The shortage of blood in India is due to an increase in the demand, with fewer voluntary and limited number of replacement blood donors. A study on the Demographic profile of Blood Donors: A Study of a tertiary care medical college Hospital Ambala facility based study was done.

Material and Methods: A hospital based cross-sectional design was conducted among 800 blood donors. The statistical analyses were done by using the SPSS software. The associations between the demographic factors were analyzed by using the Chi square test.

Results: Mean age of replacement group was 28 ± 7.392%. Majority (82.4%) knew about their blood group.

Conclusion: Creating an opportunity for blood donation by conducting many blood donation camps may increase the voluntary blood donations.

Keywords: *voluntary, replacement, blood donors, age, religion*

INTRODUCTION

Blood is the only oxygen transporter in the body and is crucial in saving lives. Even years of extensive research failed to find a true substitute for blood and blood components may not be available for many years.[1] Therefore, blood donation by humans will continue to be the major source for blood and blood components. Blood donation is truly 'a gift of life' that a healthy individual can give to others in their community, who are sick or injured. In any blood bank blood and the component units available for everybody's requirements should be sufficient. With the advent of modern transfusion medicine the therapeutic use of specific portions–components of blood, e.g. factor VIII concentrates, packed red cells or platelets rather than whole blood is important. But, non-availability of sufficient basic blood units is a problem throughout the country.

The hospitals rely on the relatives of a patient to donate the necessary blood as there are not enough voluntary blood donations to help the needy patients. Maximum blood donation in our blood banks is on replacement basis. Blood banks pressurize the doctors, the nurses and the relatives of the patient and urge them to send replacement donors to maintain their stock. This is not a good practice as the relatives of the patients are compelled in to finding donors. Professional blood donors are brought to donate blood in guise of being replacement donors. This is a very risky situation as professional donors constitute a group with high-risk behavior leading to greater chances of transfusion-transmitted diseases.[2]

Like in any developing country in India too, there is a dependency on family replacement and remunerated donors. Though the World Health Organization advocates that member states should establish national

Corresponding Author:
Nazuk Razdan
Assistant professor,
Department of Community Medicine.
Maharshi Markandeshwar Medical College and Hospital, Kumarhatti, Solan
Email: nazuk_razdan@yahoo.com

blood transfusion services that will operate on the basis of voluntary, non-remunerable basis[3], family/ replacement donors still provide more than 45% of the blood collected in our blood banks.[4]

MATERIAL AND METHOD

Study Area: The study was conducted in the Blood Bank in the Department of Pathology of Maharishi Markandeshwar Institute of Medical Sciences and Research, Mullana, district Ambala, Haryana.

Study Population: The participants coming to the department of Blood Bank. These participants were both voluntary and replacement donors.

Inclusion criteria: Willing to give consent for the study and heamoglobin ≥12gm%

Exclusion criteria: Age <18years and >65years, Weight <45kgs, Suffering from any disease or on medication, Professional/Commercial/Paid donors.

Study period: For a period of 12 months i.e. from January 2015 to December 2015.

Study design: A hospital based cross-sectional design

Method of sampling: Systemic random sampling technique was used for sample collection.

Sample size: The sample size was decided taking into account the **$n=4pq/L^2$**

Where, n= Minimum sample size required, p= Expected prevalence rate, q=100-p, L=Allowable error (10 %). Literature review reveals that the overall prevalence was 35.65%, in a study by **Manikandan** et al (2013)[5] in Tamil Nadu. So keeping this study into consideration, the sample size was calculated assuming a prevalence of 35% and the sample size for the study came out to be **743** and the sample size was rounded off to **800** donors.

Sampling technique: Approximately 2000 donors attend the Blood Bank in a year. Considering sample size of 800, sampling fraction was calculated, therefore, in the current study every 3rd donor was included for the study, and till the sample size completed. However, 6.6% of the blood donors refused to participate and therefore, a total **747** donors participated in the study.

Study tools: A self designed, pre-tested, semi-structured, open and close ended questionnaire was used for collecting relevant information

Data analysis: The data were analyzed using SPSS version 21. Percentages and means were calculated for the data. Chi- square test of significance was used. A p value of <0.05 was considered to be statistically significant.

RESULTS

In the present study it was found that male were more in both the group. Mean age of replacement group was 28 ± 7.3925 and for voluntary group it was 27 ± 8.3068. Majority belongs to 21-30 year of age in both the group as seen in figure I.

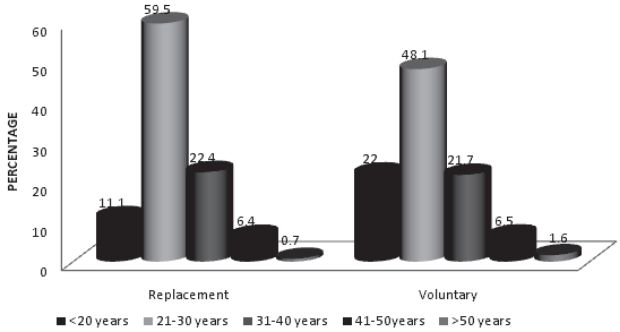

Figure I: Distribution of Donors According To Their Age

Figure II shows sex wise distribution of Replacement & Voluntary donors. Majority (89.4%) of study subjects in replacement group were males and females were 10.6%, similarly in voluntary group also the majority (92.2%) were males and females were 7.8%.

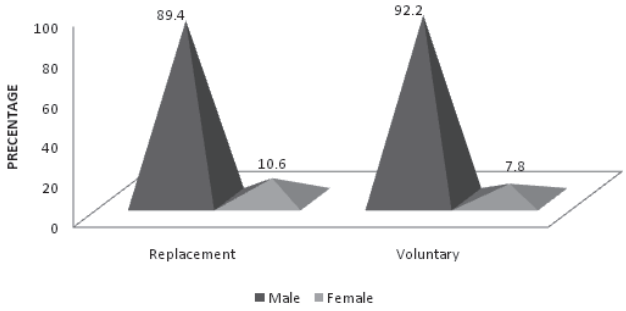

Figure II: Distribution of Donors According to Their Gender

Table 1 represents religion wise distribution of Replacement and Voluntary group donors. Majority (66.1%) of study subjects were Hindus and belonged to

replacement group, followed by Sikhs (16.5%), Muslims (10.4%), Others (7.1%) respectively, similarly in voluntary group also the majority (63.0%) were Hindus, followed by Sikhs (21.4%), Others (12.4%), Muslims (3.1%) respectively. The difference was found to be statistically highly significant.

TABLE 1: Distribution of Donors According To Their Religion

Religion	Replacement		Voluntary		Total	
	n = 425	%	n = 322	%	n = 747	%
Hindu	281	66.1	203	63.0	484	64.8
Muslim	44	10.4	10	3.1	54	7.2
Sikh	70	16.5	69	21.4	139	18.6
Others	30	7.1	40	12.4	70	9.4

χ^2=21.622, df=3, p value < 0.001

Table 2 shows distribution of donors according to their educational status among Replacement and Voluntary group donors. Majority (51.8%) of study subjects in replacement group have studied up to graduation, followed by secondary school 29.9%, similarly in voluntary group the majority (38.5%) have studied up to graduation with, followed by secondary school with 38.5%.

TABLE 2: Distribution of Donors According to Their Educational Status

Educational Status	Replacement		Voluntary		Total	
	n = 425	%	n = 322	%	n = 747	%
Illiterate	15	3.5	5	1.6	20	2.7
Primary	8	1.9	5	1.6	13	1.7
Middle School	4	0.9	3	0.9	7	0.9
High school	43	10.1	40	12.4	83	11.1
Secondary School	127	29.9	124	38.5	251	33.6
Graduate	220	51.8	140	43.5	360	48.2
PG	8	1.9	5	1.6	13	1.7

χ^2=10.446, df=6, p value 0.107

About their diet, majority (57.6%) of study subjects in replacement group and 53.7% in voluntary group were non-vegetarians. About their smoking behaviour 53.9% of study subjects in replacement group and 64.3% in voluntary group were non-smokers and 73.2% of study subjects in replacement group and 71.4% in voluntary group were non-alcoholic.

DISCUSSION

On analyzing the socio-demographic data, it was seen that the majority of the donors who participated in the present study belonged to the age group of 21-30 years (54.6%) which was similar (35.48% and 41.7%) to the studies done by Choudhury et al (2014) and Shidham et al (2015).[6,7]

In the present study, majority (90.6%) of donors were males as compared to the females 9.4%, the reasons for less percentage of female donors could be temporary deferral conditions like low haemoglobin, low weight, etc. These findings were found similar to the studies done by Uma et al (2013) and Kasraian et at (2015), where majority of donors were found to be males (93.0% and 93.74% respectively) as compared to females which were 7.0% and 6.26% respectively.[8,9]

In another studies done by Shenga et al (2008), Singh et al (2015) and Siromani et al (2016) distribution of donors belonged to Hindu community (44.7%, 66.0% and 78.3% respectively) followed by Budhist, Muslims and others which was found similar to the present study where Hindus were 64.8%, followed by Sikhs and

others. This may be because Hinduism is the dominant religion in India.[10,11]

Abderrahman et al (2014) and Nigatu et al (2014), in their studies showed that the majority of respondents were living in the rural areas (83.2% and 55.4% respectively) which was found similar to the present study which was 60.0%.[12,13]

In the present study, majority of donors were married (50.5%) which was similar to the studies conducted by Kulkarni et al (2014) and Shenga et al (2008) which was 73.6% and 89.5% respectively.[14,10]

In the studies done by Dubey et al (2014) and Uma et al (2013) majority of donors (43.58% and 60.3% respectively) were graduates which was found similar with the present study (48.2%).[15,8]

In the present study, the distribution of donors according to occupation was found to be students (33.3%) which was found similar (28.01%) to the study done by Unnikrishnan et al (2011).[16]

In the present study, the majority of donors belonged to class I (79.8%) of socio-economic status according to modified BG Prasad classification 2016 which was found similar (49.0%) to the study done by Kurian et al (2016).[17]

Most of the blood donors in the present study were non-vegetarians (56%) and 44% were vegetarians, 41.6% of the donors were smokers while 27.6% were alcoholic whereas in the studies done by Ahuja et al (2009) and Ray S et al (2005) the results were quite opposite as the majority of donors were vegetarians 92% and 65%, while 38% and 5.9% were smokers and 37.6% and 5.2% were alcoholic. Cultural factors might be responsible for these differences.[18,19]

CONCLUSION

It is important to create opportunities regarding blood donation but it is equally important to spread the awareness of voluntary blood donation. Awareness or knowledge can only change behaviour, if the facilities for adopting such practices are readily available. Availability of "Blood Donor Diary" at every blood bank containing the details of prospective blood donors could also go a long way. Non- monetary incentives for blood donation like Appreciation Certificates may lead to the achievement of goal of 100% non-remunerated voluntary blood donation.

Ethical Clearance: The study was approved by Institutional Ethics Committee. The present study did not impose any financial burden to the participants and an informed and written consent was taken

Conflict of Interest: Nil

Source of Funding: Self

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Analysis of Factors Affecting Stunting Events in Underwrapped in Cempaka Velocity Mining Area Kota Banjarbaru in Year 2017

Husaini[1], Lenie Marlinae[2], Ratna Setyaningrum[2], Dian Rosadi[2], Anggun Wulandari[2], Nida Ulfah[2], Hastaniah[3]

[1]Magister Public Health Science Program Study, Medical Faculty, Lambung Mangkurat University
[2]Public Health Program Study, Medical Faculty, Lambung Mangkurat University [3]Student of Magister Public Health Science Program Study, Medical Faculty, Lambung Mangkurat University

ABSTRACT

Poor nutrition status can result in stunting in children. Children with stunting conditions, will become a human adult with low quality. If this condition occurs in children aged 0-2 years, then most likely the child can not reach the expected potential height, the child will experience brain development is not perfect. Based on riskesdas in 2013, prevalence of baduta stunting nationally is 37.2%, while prevalence of baduta stunting in South Kalimantan is 45%. Based on the results of research Rahayu, et al., (2013) in Cempaka, Banjarbaru found that prevalence baduta stunting is 50.9%. These data indicate that the stunting problem belongs to a very poor category of public health because of the prevalence of stunting at ≥ 40%. This research is an analytic observational study with cross-sectional approach. The subjects of this study were all children under five and parents of children under five living in the mining area of Cempaka Urban Village. The results showed that there was no correlation between father education, maternal education, maternal employment status, number of family member, income, with stunting incident in Toddler in Kelurahan Cempaka Kota Banjarbaru. As for suggestions that can be given is the need for monitoring the nutritional status of children under five with follow-up as a preventive form of stunting incidents, supplementary feeding for improved nutritional status, and stunted toddlers identified should receive more intensive attention from health workers.

Keywords: *stunting, education, employment, number of family members, income*

INTRODUCTION

The development of a nation aims to improve the welfare of every citizen. The measure of the quality of human resources can be seen from the human development index (HDI), while the size of the welfare of the community can be seen, among others, from the level of poverty and nutritional status of the community (IBRA, 2007). The main problem faced by the Indonesian nation today is the low quality of human resources (HR). The problem of lacking protein energy (PEM) as one of the major nutritional problems occurring in baduta (under five years) (Husaini, et al., 2003). Nutrition status means a state of physical health of a person or group of persons determined by one or two combinations of specific nutritional measures. Suhardjo (1986: 15) says that nutritional status is a state of the body caused by consumption of food absorption and use. One of the main factors that influence the nutritional status of children under five is mother's upbringing pattern. Parenting directly affects the consumption of toddlers[1]

In Indonesia, there are still four major nutritional problems that need to be overcome with nutrition improvement program, that is protein energy problem (PEM), vitamin A deficiency problem, nutritional anemia problem, and iodine deficiency problem. Viewed from the etiology, the nutritional status of the population is influenced by various complex factors, such as: social, economic, cultural, health, natural environment, and people who are related to each other. The occurrence of economic crisis, there has been an increase in malnutrition cases, and even cases of malnutrition in Indonesia that can actually be overcome early with regular monitoring every month[2]

Poor nutrition status can result in stunting in children. Children with stunting conditions, will become a human adult with low quality. If these conditions occur

in children aged 0-2 years, it is likely that children can not reach the expected height of potential, children will experience imperfect brain development, resulting in difficulties in meeting academic value[3].

The period of the first two years of life is a time very sensitive to the environment and this period is very short and can not be repeated again, then the baduta period is called the "golden period" or the "Window of Opportunity or critical period" (critical period). The toddler period is a period of rapid growth and development, and is the foundation that determines the quality of the next generation[4].

Basic on Riset Kesehatan Dasar (Riskesdas) 2007 stated that the prevalence of baduta stunting in Indonesia is 36.8%. In 2010, the prevalence of baduta stunting was 35.6%. In 2013, prevalence of baduta stunting was 37.2%, which means an increase compared to 2010 and 2007. Prevalence of baduta stunting in 2013 based on the data can be said public health problem with bad category, because stunting prevalence of ≥ 30%[5].

Data from Riskesdas 2007, stated that prevalence of baduta stunting in South Kalimantan was 41.8% .In 2010, prevalence of baduta stunting in South Kalimantan was 35.3%. In 2013, the prevalence of baduta stunting in South Kalimantan was 45%, which means an increase compared to 2010 and 2007. The prevalence of baduta stunting in South Kalimantan in 2013 based on the data can be said to be a very bad public health problem because of the prevalence of stunting by ≥ 40%[5].

Based on the results of research Rahayu, et al., (2013) in Cempaka, Banjarbaru found that the prevalence of baduta stunting is 50.9% each (Rahayu A, et al., 2013). These data indicate that nutritional problems (stunting) are included in public health problems with very poor category because of the prevalence of stunting by ≥ 40% (Agency for Health Research and Development, 2013). The magnitude of this prevalence shows that nutritional problems, especially the problem of malnutrition is included in the category of severe problems, so it is important to do research to determine the factors that affect stunting.

METHOD

This study is an analytic observational study that aims to analyze the factors that influence the stunting status of children under five in the mining area of Kelurahan Cempaka Kota Banjarbaru. The research design used a cross-sectional approach that collects data on dependent variable and independent variable is done at one time point of the phenomenon being studied is during one period of data collection. The independent variable (independent variable) in this research consist of parent education, parent job, family member number, and family income. While the dependent variable (dependent variable) in this research is stunting status. The subjects of this study were all children under five and parents of children under five living in the mining area of Cempaka Urban Village. In this analysis the statistical test used is a chi-square test with 95% confidence level, since the variables studied are nominal and use more than two groups of unpaired samples. However, if the test is not met then use alternative test that is fisher exact test test.

RESULTS AND DISCUSSION

1. Univariate Analysis

Table 1: Frequency Distribution of Factors Affecting Stunting Occurrence in Toddlers in Cempaka Mining Areas

No.	Variable	Category	Frequency	Percentage (%)
1.	Education of Father	Low (≤ SMP), High (> SMP)	28, 2	93,3, 6,7
2.	Education of Mother	Low (≤ SMP), High (> SMP)	27, 3	90, 10
3.	Job Status of Mother	Not Work, Work	27, 3	90, 10
4.	Number of family members	Large (> 4 peoples), Small (≤ 4 peoples)	5, 25	16,7, 83,3
5.	Family income	Low (< 1.500.000), High (≥ 1.500.000)	23, 7	76,7, 23,3
6.	Stunting status	Stunting, Not Stunting	7, 23	23,3, 76,7
	Total		30	100

Based on table 1, it is known that the education history of the father who has a low education of 28 (93.3%) of respondents. Low education in question is no school, did not complete primary school, finished primary school and finished junior high school. While mothers who have low education as many as 27 (90%) of respondents. Parents' education, especially from fathers, has a role in getting more jobs and more income for the family. This will also affect the family's ability to meet every household's needs, including the need to meet nutritious consumption. The level of parental education influences parents' knowledge of nutrition and parenting patterns[6].

Based on the employment status of the mother of toddlers, mothers who do not work as many as 27 (90%) of respondents. Working moms will find it easier to get more information than just at home as housewives. Mothers who do not work and just stay home alone, they can get health information one of them through television[7]. Based on the number of family members, the family has a small number of family members of 25 people (83.3%) and there are 5 people (16,7%) who are in big family environment. The amount of family can affect the consumption of family members. The growing number of family members and not offset by rising incomes will lead to a more uneven distribution of food consumption[7]

Based on income status, it is known that families with low income are 23 (76.7%) of respondents. Family income affects the provision of family meals. In addition, family income can affect the parenting pattern of children, so it also affects the nutrition of children under five in the family. Poor child nutrition will have an impact or affect child growth. Nutritional status can be influenced by the direct factors of food intake and infection and not directly in the form of food security in the family, child care patterns and the right health environment. Food consumption also affects the nutritional state of a person[8].

2. Bivariate Analysis:

Table 2. Correlation between independent variables with stunting events

No.	Variable	Category	Stunting Status		P-value
			Stunting	Not Stunting	
1.	Education of Father	Low (≤ SMP) High (> SMP)	7 (25%) 0 (0%)	21 (75%) 2 (100%)	1,000
2.	Education of Mother	Low (≤ SMP) High (> SMP)	6 (22,2%) 1 (33,3%)	21 (77,8%) 2 (66,7%)	1,000
3.	Job Status of Mother	Not Work Work	4 (14,8%) 3 (100%)	23 (85,2%) 0 (0%)	0,009
4.	Number of family members	Large (> 4 peoples) Small (≤ 4 peoples)	1 (20%) 6 (24%)	4 (80%) 19 (76%)	1,000
5.	Family income	Low (< 1.500.000) High (≥ 1.500.000)	6 (26,1%) 1 (14,3%)	17 (73,9%) 6 (85,7%)	1,000

Based on the result of statistical test to know the correlation between father education and stunting incidence in toddler, it can be seen p-value = 1,000 (> 0,05) which means Ho accepted so there is no correlation between father education to stunting event in balita. This is in line with research conducted by Aryu Candra (2010) that there is no correlation between father education with stunting events. This condition can be influenced because the father is usually outside the home so that parenting is entirely left to the mother. Both college and college dad have never been involved in child feeding activities. In addition, the education level of the father also does not reflect his nutritional knowledge[9].

Based on the result of statistical test to find out the correlation between mother education with stunting event in balita, it can be seen that p-value = 1,000 (> 0,05) which means Ho accepted so there is no relation between mother education with stunting incident in toddler in Cempaka Mining. In line with research conducted by there

is no correlation between education level with stunting status (Ni'mah C & Muniroh L, 2015). This may be because the TB / U indicator reflects past nutritional history and is less sensitive to changes in nutritional input where the mother's role is so important. Unlike the weight that can rise, fixed or decreased while the height can only rise or stay within a certain period. Under normal circumstances, height increases with age. High level of maternal education does not guarantee children avoid malnutrition because the level of higher education does not mean that mothers have sufficient knowledge of good nutrition[10].

Parental education is not a risk factor for stunting events because of the many factors that can lead to stunting children, such as parenting and family care, as well as the history of other infections and family food intake. Research in Tangerang in 2011 found that father education is closely related to changes in stunting child height at 6-12 months of age to be non-stunting at age 3-4 years (Rahayu, 2011). Parents with better education tend to have knowledge and ability to implement knowledge better than parents with low education. But it also does not close the possibility of poorly educated parents are able to raise children better than those who have a high education and good work[11].

Based on the result of statistical test to know the relation between status of job of mother with stunting incident in toddler, it can be seen that p-value = 0,009 (<0,05) which means Ho is rejected so there is relation between status of job of mother to stunting incident in toddler in mining area Cempaka (Fikrina, 2017). These results are in line with research conducted Novita S (2013) that there is a correlation of mother work with stunting on p-value 0.04 (Siahaan, 2013). Based on the result of statistical test to know the relation between the number of family member and the occurrence of stunting in toddler, it can be seen that p-value = 1,000 (<0,05) which means Ho accepted so there is no relation between family size and stunting incident in balita. This research is in line with research of Novita S (2013) that there is no significant correlation between family size and stunting in p-value 0,059[12].

Based on the result of statistic test to know the relation between family income and stunting incidence in balita, it can be seen that p-value = 1,000 (<0,05) which means Ho accepted so there is no relation between family income with stunting incident in balita at Cempaka Mining Area . This research is in line with research of Princess A (2012) which states that there is no relation between family income with stunting event with p-value 1,000 (Anindita, 2012). This can be because the income received is not entirely spent on staple food, but for other needs. A high level of income does not necessarily guarantee good nutritional status in infants, as income levels may not necessarily be allocated sufficiently for food purposes. Although family income is low, but good childcare, the stunting will be reduced[13].

CONCLUSION

There is no correlation between father education, maternal education, maternal employment status, number of family members, income, with stunting incident in Toddler in Kelurahan Cempaka Kota Banjarbaru. As for suggestions that can be given is the need for monitoring the nutritional status of children under five with follow-up as a preventive form of stunting incidents, supplementary feeding for improved nutritional status, and stunted toddlers identified should receive more intensive attention from health workers.

Ethical Clearance: this study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for etchical clearance and informed consent. The informed consent included the research tittle, purpose, participants's right, confidentiality and signature.

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Analysis of Impact of Use of Incident Thickness in Pregnant Woman in Area of Malaria (Gunung Raja Mentawe Village Districts of Tanah Bumbu South Borneo)

Lenie Marlinae[1], Syamsul Arifin[2], Nida Ulfah[1], Sudayat Sudarmawan[3], Siti Aina Putri Warsono[3]

[1]Public Health Program Study, Medical Faculty, Lambung Mangkurat University; [2]Magister Public Health Science Program Study, Medical Faculty, Lambung Mangkurat University; [3]Student of Public Health Program Study, Medical Faculty, Lambung Mangkurat University

ABSTRACT

Malaria is an infectious disease caused by parasites. Plasmodium that lives and breeds in human red blood cells. The disease is naturally transmitted through the female Anopheles mosquito bites. Transmission of malaria is similar to infectious disease transmission in general that is determined by factors called host (human and Anopheles mosquitoes), agent (parasite plasmodium) and environment (physical, chemical, biological and social). Malaria is a world health problem, especially for tropical countries and subtropics, the World Health Organization (WHO) says 40% or more than 2,400 million people live in malaria endemic areas and estimates of prevalence between 300-500 million clinical cases each year, reported deaths of 1-1.5 million people per year. Malaria infection especially in pregnancy is very detrimental to the mother and fetus it contains, because this infection can increase the incidence of morbidity and mortality of mother and fetus. Complications of malaria in pregnant women such as anemia, hypoglycemia, cerebral malaria, pulmonary edema, placental infection, acute renal failure, puerperal sepsis and post partum bleeding, can even lead to death. The mortality rate of malaria in pregnant women with complication of hypogklikemia is 45-75%, whereas malaria of celebral have mortality 20-50%. South Kalimantan is among the top 10 provinces with the highest API. One of the districts in South Kalimantan that includes malaria endemic area is Tanah Bumbu Regency with an API of 7.4%. In Kabupaten Tanah Bumbu there are 2 sub-districts that are still malaria endemic namely Mentewe sub-district (API 12,2%). Respondents from this study were pregnant women who used insecticide-treated bed nets. The results showed that the use of insecticide treated bed nets in pregnant women was influenced by the attitude of pregnant mother (sig.0,033), while knowledge (sig 0,614), body weight (sig.0,163) and maternal anemia status (Sig 0,362) against the use of mosquito nets

Keyword: *Malaria, mosquito nets, pregnant women*

INTRODUCTION

Malaria is an infectious disease caused by Plasmodium parasites that live and multiply in human red blood cells. The disease is naturally transmitted through the bite of Anopheles female mosquitoes. Malaria is a world health problem especially for tropical and sub-tropical countries, the World Health Organization (WHO) says that 40% or more than 2,400 million people live in malaria endemic areas and estimates of prevalence between 300-500 million clinical cases each year, with the reported mortality rate reaching 1-1.5 million people per year. Malaria is one of the infectious diseases that contribute to infant and under-five mortality, and pregnant women, ie malaria in pregnancy causes 5-12% of total low birth weight infants and contributes 75,000 to 200,000 to infant mortality[1]

Malaria infection especially in pregnancy is very harmful to the mother and fetus it contains, because this infection can increase the incidence of morbidity and mortality of mother and fetus. The mortality rate of malaria in pregnant women with hypoglycemic complication is 45-75%, whereas cerebral malaria has 20-50% mortality[1]

Year 2013 The number of cases of malaria in the world as many as 198 million cases with an incidence

rate of 30% and a mortality rate of 40%. Association of SoutheastAsian Nations (ASEAN) including Indonesia stated the number of malaria cases of 28 million with the number of deaths of 584 thousand people, especially children under five (78%) each year with 42.6 million babies born from mothers at risk of malaria falciparum and / or malaria vivax. Pregnant women are exposed to the risk of malaria every year around 125 million worldwide and there are 200,000 infant deaths due to malaria infection in pregnancy. The Asia-Pacific region contains 54.4 million pregnant women at risk of malaria with deaths ranging from 75,000-200,000 infant deaths each year[2]

Malaria morality in a region is determined by Annual Parasite Incidence (API) per year. API is the number of malaria positive cases per 1,000 population in one year. National API trends in 2011 to 2015 continue to decline (from the API of 1.75% in 2011 to 0.85% by 2015). This demonstrates the success of malaria control programs undertaken by central, local, community and related partners. Looking at provinces by 2015, it appears that eastern Indonesia still has the highest API figures. The 2015 API figure in South Kalimantan is 0.68% (as much as 0.68% of the malaria positive population per 1,000 population in South Kalimantan during 2015). Malaria positive rates in Indonesia in vulnerable groups such as pregnant women and children aged 1-9 years are quite high (1.9%) compared to other age groups[3]

South Kalimantan is among the top 10 provinces with the highest API. One district in South Kalimantan that includes malaria endemic area is Tanah Bumbu Regency with an API of 7.4%. In Tanah Bumbu District there are two sub-districts which are still malaria endemic, Mentewe sub-district (API 12,2%) and Teluk Kepayang (API equal to 7,7%) including positive pregnant mother and infant. The rise of gold mining in the region became one of the factors causing the development of malaria vector. This is because the mining activity caused the holes of excavation of mine which became the breeding place of malaria vector[4]

One of the malaria preventive measures that can be carried out in accordance with the causes of malaria cases is by using insecticide treated bed nets or bed nets in bed, as recommended by the World Health Organization (WHO) since November 2004. Based on research data from R & D Center P2B2 Tanah Bumbu in 2016 the use of insecticide-treated bed nets in Mentewe Sub-District of Tanah Bumbu Regency resulted in a positive impact on malaria cases, namely the decrease in the number of malaria cases with API 10.2%. This is supported by the results of research conducted by Aisyah (2014) which states that .here is a relationship between the use of insecticide treated bed nets with the incidence of malaria. According to Soro (2014) results, 12 households (35.3%) of non-adherent respondents used insecticide treated mosquito net, while in the group of KK obedient in using inseccide treated mosquito net, as many as 30 families (100%) experienced the incidence of malaria[5]

MATERIALS AND METHOD

This study design was observational analytic with croos sectional design. The populations in this study were all pregnant women. Samples were determined using accidental system in research period.

FINDINGS

Table 1: Results of Univariate Analysis

No.	Variable	Category	Frequency	%
1.	Knowledge	not so good	4	13,3
		Good	26	86,7
2.	Attitude	Negative	10	33,3
		Positive	20	66,7
3.	Weight	Less	16	53,3
		Normal	8	20,0
		Excess	8	26,7
4.	Status of Anemia	Light	8	26,7
		Normal	22	73,3

Based on table 1 can be seen knowledge of respondents at most is good that is as much as 26 people (86,7%), respondent attitude at most is positive as much 20 people (66,7%). Status of anemia of the respondents at most is normal as many as 22 people (73.3%). The weight of respondents at most in the category less as much as 16 people (53.3%).

Table 2: Results of Logistic Regression Estimation on Variables Affecting Respondents in Behavior of Insecticide Netting Used

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Weight	.758	.544	1.946	1	.163	2.134
	Status of Anemia	.516	1.049	.242	1	.623	1.675
	Knowledge	-.809	1.603	.254	1	.614	.445
	Attitude	2.863	1.339	4.570	1	.033	17.519
	Constant	-3.152	2.124	2.202	1	.138	.043

From table 2 it can be seen that only attitude variable (sig.0,033) has real effect on behavior of inseccide treated mosquito net, while knowledge (sig 0,614), BB (sig 0,163) and maternal anemia status (sig 0,3623) did not significantly influence the use of mosquito nets.

DISCUSSION

Respondents in this study mostly did not experience anemia (73.3%). Respondents were dominated by non-primary school graduation (66.7%). Despite low educational backgrounds, the respondents' knowledge of malaria, including knowledge about malaria understanding, causes, mode of transmission, malarial signs, malaria prevention, and malaria treatment were categorized as good. Most respondents' attitudes toward malaria are categorized positive (66.7%).

Based on the bivariate analysis there is only one variable that is the attitude variable that has a real effect on the behavior of the use of insecticide treated bed nets. In terms of use of insecticide treated bed nets, most respondents did not use the mosquito net (56.7%), whereas the use of mosquito net was one of the efforts to prevent malaria transmission. The use of insecticide-treated bed nets can reduce the contact between vectors and humans, so it can be a protective tool for the community against malaria transmission[6].

Human behavior is the result of all kinds of experience as well as human interaction with the environment manifested in the form of knowledge, attitudes and actions. In other words, behavior is the response or reaction of an individual to the stimulus that comes from outside or from within himself. Behavior of the community can influence the success of using insecticide-treated bed nets, because inseccide-treated bed nets are only used at night while while not sleeping, many people interact with the causes of mosquito bites Anopheles sp so that even when sleeping at night already using mosquito net insecticide but still there is a possibility to be exposed to malaria due to the community's[6].

The results showed that pregnant women who have a positive attitude towards the use of insecticide treated bed nets. The attitude process is still in the stage of receiving, responding and appreciating, but not yet in the responsible and behavioral stages so that the current attitude condition has not implicated the behavior. Many other factors that cause the formation of such behavior, for example because of lack of family support, especially husband, or habit factors and so forth. The number or type of mosquito repellent exposure can be used and chosen so that the practicality becomes a consideration not to use insecticide treated mosquito net.

The results of the same study were conducted by Rianto (2009) which showed that there was a relationship of mother attitude with the use of insecticide treated bed nets (p = 0,000). Mothers who have a positive attitude means supporting the use of mosquito nets. The findings are in accordance with the opinion Notoatmodjo, (2007), attitude is a closed reaction of a person to the stimulus or object. Attitudes of various levels, namely receiving, responding, appreciating and responsible. As Green (2005) explains that behavioral changes can occur from predisposing factors in which one of these predisposing factors is a person's attitude.

To anticipate this and to achieve the main objectives of health education in shaping health behavior, the steps and efforts that can be taken by health institutions other than distribution of inseccide treated bed nets are ANC services regularly, continuous consultation and includes continuous health promotion and promotion program by providing knowledge about the importance of using mosquito nets for pregnant women in particular and carrying out prevention efforts of mosquitoes as a whole and integrated[7]

CONCLUSION

The use of insecticide treated bed nets in pregnant women was influenced by the attitude of pregnant mother (sig.0,033), while knowledge (sig 0,614), body weight (sig.0,163) and maternal anemia status (Sig 0,362) against the use of mosquito nets

Ethical Clearance: this study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for etchical clearance and informed consent. The informed consent included the research tittle, purpose, participants's right, confidentiality and signature.

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Organ Failure and Quality of Life: A Study among Patients Undergoing Maintenance Hemodialysis

Nishtha Mishra[1], Abdul Azeez E. P.[2]

[1]M. Phil. Research Scholar, School of Social Work, TISS, Mumbai; [2]Assistant Professor in Social Work, Amity Institute of Behavioural and Applied Sciences, Amity University, Gurgaon, Haryana

ABSTRACT

Background: Organ failure becomes a complicated health issue which creates a significant threat to a large section of the population. The burden of disease is very higher among the patients with an organ failure. The present paper looks into the quality of life and depression among the patients undergoing maintenance hemodialysis.

Methods: Patients who were above 18 years and who have a history of 6 months dialysis are selected as samples for the study. The total samples for the study were 64. The information was directly collected from the patients in the hospital setting itself through the interview.

Results: It is evident from the study that diabetes remains one of the prominent reason for kidney related problems. Different levels of depression are evident among the participants of the study. This study underlines that the Quality of life remains a challenge for the patients undergoing hemodialysis. A strong association has found between socio-demographic variables, illness related measures and sub-dimensions of the quality of life.

Keywords: *Organ Failure, Quality of life, Hemodialysis.*

INTRODUCTION

The incidents of renal diseases and other organ failure issues become very common in the recent times. Epidemiology of such issues has risen ever before in the history. The changes in the lifestyle and occurrence of co-existing diseases are viewed as the crucial reason for the same. The occurrence of a life-threatening disease not only affects the patient but will have significant implications for the family too. Azeez[1] reports that organ failure has significant implications on the familial, economic, physical, psychological and social dimensions of life. Kidney related problems are one among the major health challenges persists considerably in the category of organ failure. A large number of patients are diagnosed with kidney (renal) related problems every year and become vulnerable. Apart from being the state of physical vulnerability, kidney patients often required to avail extra medical care, especially dialysis in most cases. The physical complications of the renal failure and its consequent treatment modalities are substantial reasons for creating poor psychosocial well-being. Psychosocial issues are often identified with the patients undergoing maintenance hemodialysis[2, 3, 4]. The presence of psychosocial problems creates potential risks to the mental health as well as the physical health of the patient. Depression is one of such concern widely seen among the patients with end-stage renal diseases. Current pieces of pieces of evidence implicate the higher magnitude of depression among different groups[5, 6, 7].

It is evident from the available literature that patient on end of stage renal disease is vulnerable to mild and severe mental health problems. This could be a potential reason for poor prognosis. Organ failures, especially renal diseases are potential threat to have low quality marital, familial, cognitive functioning and sexual relations[8, 9, 10]. The consequent results of physical and co-existent mental health issues among the renal patients have a significant impact on the overall quality of life of the patients. It is evident from the everyday clinical practice and current literature that poor quality of life is a very real among the patients who are diagnosed with renal diseases and undergoing maintenance hemodialysis[11, 12]. A number of factors, directly and indirectly, influence the quality of life of the patients undergoing hemodialysis. Along with psychosocial, familial and economic factors, treatment-related factors also play a crucial role in the quality of life

of the patient. Duration of the illness, treatment modalities adopted yet, caregiving and other demographic variables are very influential on the quality of life.

MATERIALS AND METHOD

The present study was conducted among the patients who are undergoing maintenance hemodialysis at Muljibhai Patel Urological Hospital, Nadiad, Gujarat, India. The hospital is exclusively treating patients with Urological problems. Samples for the study were chosen purposively among the patients undergoing hemodialysis. Patients who were above 18 years and who have a history of 6 months dialysis only selected as samples for the study. The total samples for the study were 64. The information was directly collected from the patients in the hospital setting itself. An informed consent was taken from the patients and researcher explained them the aims of the study along with the potential benefits or threats.

TOOLS

Apart from the detailed socio-economic data sheet, two other standardized tools were administered to explore the core variables under investigation.

1. **KDQOL-SF™:** KDQOL Version: 1.3, a generic health-related questionnaire developed by the Ron D et al (1994). The KDQOL-SF™, Version 1.3 has been widely used in the studies with End Stage Renal Diseases patients. The tool contextually measures the Quality of Life of patients with renal diseases.
2. **PHQ-9:** This tool is widely used for diagnosing depression among the Kidney Patients undergoing maintenance hemodialysis. The tool is developed by Kroen et al (2001). The nine items of the PHQ-9 are based on the nine diagnostic criteria for major depressive disorder in the DSM-IV.

RESULTS

Table 1: Socio-demographic Profile

Sex	**Frequency**	**Age Group**	**Frequency**
Male	46 (71.9)	20- 40 Years	8 (12.5)
Female	18 (28.1)	41 to 60 years	30 (46.9)
		Above 60	26 (40.6)
Marital Status	**Frequency**	**Education**	**Frequency**
Married	48 (75)	Illiterate	2 (3.1)
Unmarried	6 (9.4)	Primary	5 (7.8)
Widow	5 (7.8)	Secondary	20 (31.3)
Widower	5 (7.8)	Higher Secondary and above	37 (57.8)
Education	**Frequency**	**Income**	**Frequency**
Unemployed	26 (40.6)	Below Rs. 10000	20 (31.3)
Farming	4 (6.25)	Rs.10001 to Rs.30000	26 (40.6)
Government service	9 (14)	Above Rs.30000	18 (28.1)
Private Sector	8 (12.5)		
Retired	17 (26.5)		

(N = 64)

Men constitute the majority of participants with 72 percent. This was a real reflection of the patients admitted to the hospital for dialysis as men account larger in number. Nearly Half (46.9%) of the respondents belongs to the age group of 41 to 60 years, almost same percent (40.6%) come under the age category of above 60 years. As a positive

indication, respondents in the youthhood (below 40 years) constitute a minority of respondents (12.5%).

A majority of the participants in the study were married (75%) while almost 10 percent of the respondents are still unmarried. A major portion of the respondents had a Higher secondary or above qualification while 31 percent of the respondents had secondary education.

Only three percent of the participants were illiterate. The employment status of the respondents indicates that around 41 percent of them were unemployed, a major portion of them was jobless due to illness and others were housewives. Around 27 percent of the respondents reported that they are retired from service and 14 percent are government employees. It was evident that 41 percent of the respondent are earning below Rs. 10000 per month while less than one-third (31.3%) of the respondents are earning between Rs. 10001 to Rs. 30000. Around 28 percent of the respondents are earning more than Rs. 30000 per month.

Table 2: Disease related information

Duration of illness	**Frequency**	**Frequency of Dialysis**	**Frequency**
Up to 2 years	20 (31.3)	Once in a week	1 (1.6)
3 to 7 years	27 (42.2)	Twice in a week	16 (25)
Above 8 years	17 (26.6)	Thrice in a week	47 (73.4)
Care Giver	**Frequency**	**Usage of Wheel Chair**	**Frequency**
Family Member	60 (93.8)	N o	31 (48.4)
Others	4 (6.3)	Yes	33 (51.6)
Causes of Disease	**Frequency**	**Insurance**	**Frequency**
Don't know	7 (10.9)	No insurance	28 (43.8)
Hypertension	21 (32.8)	Mediclaim	21 (32.8)
Diabetes	19 (29.7)	Reimbursement	4 (6.3)
Other	17 (26.5)	Other	11 (17.2)

(N = 64)

Patient participated in this study reported that 42.2% of them are victims of the illness between 3 to 7 years while 31 percent become within 2 years of time period. Around 27 percent of the patients have started their treatment before eight years. When asked about the dialysis frequency, 73.4 percent of the respondents reported that they are undergoing maintenance hemodialysis thrice a week whereas 25 percent reported that twice in a week. It is evident that majority of the patients are in need of availing dialysis very regularly.

Showcasing the scenario of Indian caring system, around 94 percent of the participants are reported that they are being cared by one of their family members while 6 percent reported that caregiving was provided by someone else. In most of the cases, when probed, it was a nurse. It is evident that a majority (51.6%) of the patients undergoing maintenance hemodialysis are using a wheelchair. The researcher tried to explore the probable reasons for the Kidney disease. It is reported by 32.8% of the respondent that Hypertension is the cause of their Kidney Disease whereas 29.7 percent reported Diabetes as a cause of their Kidney Disease. Around 27 percent of the respondents stated that they are not aware of the cause of the kidney failure. Diabetes and hypertension remained the crucial reason for kidney disease among the samples of this study too.

Table 3: Level of Depression

Level of Depression	**Frequency**	**Percent**
No Depression	4	6.3
Minimal Depression	32	50
Mild Depression	11	17.2
Moderate Depression	3	4.7
Severe Depression	6	9.3

(N = 64)

The impact of being a kidney patient and undergoing dialysis has evident from the results of the study. It is

reported that half of the respondents (50.0%) are having Minimal Depression while 17 percent of respondents are having Mild. Around 10 percent of the respondents are identified with Severe Depression. The state of being subjected to dialysis has made many of them feel helpless and hopeless. This further leads to depression and other mental health problems.

The same negative trend has also evident in the case of Quality of life. A majority of the respondents are identified with the poor quality of life.

Table 4: Gender, depression and different dimensions of quality of life

Gender		N	Mean	Std. Deviation	t	P
Depression	Male	46	5.33	5.420	1.974	.053*
	Female	18	8.33	5.636		
Symptom	Male	46	79.1667	12.35253	2.242	.029*
	Female	18	70.7176	16.31792		
Quality of Social Interaction	Male	46	76.5217	24.89441	.073	.942 (NS)
	Female	18	77.0370	26.98072		

(*Significant, = $p<0.05$) (NS: Not Significant)

It is evident from the present study that there are significant differences among male and female participants in some variables. Depression was seen to be more in Female when compared to Males. The t ratio for Depression is significant (t=1.974, p=0.05) which indicates that there is a significant difference in depression among Males and Females. Symptoms are another variable that shows a significant difference in the grounds of gender. Remaining sub-dimensions in the quality of life have shown no significant difference.

The present study indicates that frequency of dialysis doesn't have any influence on the different sub-dimensions of the quality of life and depression. Patients in different categories of frequency have shown an almost same level of quality of life and depression, a statistically relevant difference was not traced. In the same manner, age group also doesn't make much difference in the case quality of life among the respondents. The case of income and quality of life also remains same as lower or higher income doesn't make a significant difference in the quality of life of the patients.

Table 5: Duration of dialysis, depression and other variables in quality of life

Duration of Dialysis		N	Mean	Std. Deviation	F	P
Depression	Up to 2 Years	20	5.70	5.507	4.308	.018*
	3 to 7 Years	27	6.33	6.403		
	Above 8 Years	17	6.47	4.543		
	Total	64	6.17	5.605		
Effect of Kidney Disease	Upto 2 Years	20	66.7188	18.92123	3.190	.048*
	3 to 7 Years	27	72.6852	19.83239		
	Above 8 Years	17	68.5662	18.06937		
	Total	64	69.7266	18.97905		
Burden of Kidney Disease	Upto 2 Years	20	44.3750	37.10870	4.118	.021*
	3 to 7 Years	27	43.2870	35.56405		
	Above 8 Years	17	51.1029	36.59289		
	Total	64	45.7031	35.89272		
Cognitive Function	Upto 2 Years	20	80.3333	22.63103	5.859	.005*
	3 to 7 Years	27	72.0988	25.28721		
	Above 8 years	17	85.0980	17.40521		
	Total	64	78.1250	22.92442		

Contd…

Quality of Social Interaction	Up to 2 years	20	75.0000	22.77528	4.954	.010*
	3 to 7 Years	27	78.2716	27.46202		
	Above 8 years	17	76.0784	25.82622		
	Total	17	86.2729	23.00134		
Social Support	Up to 2 years	20	81.6648	22.23037	5.689	.005*
	3 to 7 years	27	85.8007	16.47701		
	Above 8 years	17	86.2729	23.00134		
	Total	17	84.6337	19.98893		

DISCUSSION

It is evident from the study that duration of dialysis has an impact on the other variables. The respondents' group which is on dialysis more than 8 years is having a Mean (M= 6.47), higher depression in comparison to two other groups. The same trend is visible in the case of 'effects of kidney diseases' too. The respondent receiving dialysis since 3 to 7 years are having a Mean = 72.68, which depicts that they have much bothered with the effects of kidney disease in comparison to two other groups.

Duration of dialysis made a significant impact on the patient's perception on the 'Burden of kidney diseases'. The respondent receiving dialysis since more than 8 years have a Mean= 51.10 which results that they are having the maximum burden of Kidney Disease. Further, the respondent group undergoing dialysis up to 2 years, having Mean= 44.37 which shows that they are feeling less burden of kidney disease while comparing to other groups. Cognitive functioning is another variable that shows significant variation among the respondents according to the duration of illness.

This study underlines the physiological and psychological problems are very commonly identified with the patients undergoing maintenance hemodialysis. Care and Caregiving become a complicated issue among the patients undergoing hemodialysis. Activity limitation is common among the patients and half of them are using a wheelchair. Showcasing the poor health insurance system in India, it is evident from the study that more than 40 percent of the patients do not have any insurance. This creates a significant financial burden on the patient, especially when a proportionate of them is unemployed.

Psychological variables in the study also manifest the negative implications of the organ failure. A considerable number of patients are identified with severe and mild depression. A large number of them have the feeling of helplessness and hopelessness while facing with the complexities of organ failure and frequent dialyzes. The level of depression has shown a significant relationship with other variables. As like much previous literature, the present study also indicates higher depression among females while compared to males. The duration of dialysis and depression is also established a strong connection. Patients with higher duration had a high level of depression while comparing to the patients with lower duration.

A considerable percentage of patients who are undergoing maintenance hemodialysis reported a lower level of quality of life. Variations also found in connection with the different sociodemographic and illness-related variables. The severity of symptoms is high among females than males. Other gender-related variables don't show much difference. Duration of dialysis is a variable that has a significant connection with the overall quality of life and its dimensions. Patient with higher dialysis duration reported higher effects and burden of kidney diseases. It is evident that Cognitive functions also decreases when the duration of dialysis increases. The same trend is visible in the case of quality social interactions. Patient with fresh dialysis history reported higher social interaction while comparing to a patient with long history of dialysis. Patient's felt higher social support in the initial years of dialysis while comparing to other categories.

CONCLUSION

Replicating the previous researchers, this study also reveals that end-stage renal disease patients receiving dialysis treatment have a lower quality of life than people in general population. The patients receiving longer years of dialysis are shown a much better quality of life

than patients with a new history. This is an indication which highlights the patient's ability to cope-up with the life realities rationally. Further investigations could focus on the factors contributed to the higher quality of life among patient with long history of dialysis. Like many other studies, this study also underlines the presence of depression among the patients. Psychosocial intervention programmes for the patients and their families have to be mandated for professionals and institutions. This would help in minimizing disease and treatment related psychosocial complexities.

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Legal Challenges in Blood Transfusion Process in India

Rubi Talukdar[1], Prabir Kumar Pattnaik[2]

[1]Research Scholar, [2]Professor, Siksha "O" Anusandhan (Deemed to be University) National Institute of Law, Khandagiri, Bhubaneswar, Odisha, India

ABSTRACT

In recent times, the technical and legal standards of blood transfusion in US and European nations have undergone significant change but in India, the quality and standardization of blood transfusion have not changed much and thereby the patients are exposed to risks. The present paper considers incidents of blood transfusion process errors in India, identification of causes of errors, and presents an overview of Indian laws relating blood transfusion and the judicial approach towards errors in blood transfusion process.

Keywords: *Blood Transfusion, Errors, Law, Judicial approach, Drugs and Cosmetics Act*

INTRODUCTION

Blood transfusion is a contested health care service and it is a most preferred practice under emergent situations. Since 1975, the World Health Assembly has been focusing on the global need for blood safety and has passed several resolutions [1] for that purpose. In 2016, the Global Status Report on Blood Safety and Availability [2] points out that there exist significant variations in the availability, safety and use of blood and blood components between developed and developing countries. Blood transfusion safety has been a major concerned in low and middle income countries, where the risk of transfusion-transmissible is high and in the absence of proper blood screening facilities such risk is often maximized. Therefore, the report calls for strengthening the national blood collection and screening systems so as to ensure sufficient and safe blood supplies worldwide, especially in low and middle income countries.

Reports of Error in Blood Transfusions in India: It is reported that in India 60% of blood transfusion take place due to anemia, 42 percent is due to surgery, and 26 percent for acute hemorrhage and 16percent is for pregnancy. 74 percent of adult blood transfusions are inappropriately done without following the government transfusion guidelines. The possible nearby reason for these inappropriate transfusions are due to unnecessary transfusion for volume replacement and for iron-deficiency anemia cases [3]. The BBC News reported that at least 2,234 Indians have contracted HIV while receiving blood transfusions in hospitals during 2015-16[4]. In the state of Kerala a heart patient dies allegedly after wrong blood transfusion [5].The incidence of death due to wrong blood transfusion are also not uncommon in India [6]. Further, one can find several litigations connected with transfusion errors.[7]

Causes of Error: The transfusion chain includes proper donor selection, blood collection, component separation, infection screening, issue, cold chain transport and final transfusion to patient. In India, transfusion errors take place due to (i) Error in screening the Donors (ii) Pre-analytical errors and (iii) Errors due to inadequacy in legal standardization.

Error in screening the Donors: It is estimated that in India, about 30,000 patients are annually infected due to unsafe blood transfusion. The viruses range from HIV-AIDS, Hepatitis-B or Hepatitis-C[8]. Carney [9] and Ishrath Humairah [10] enumerate how 'Blood Factories' operate and thrive in India. The Ministry of Health and Family Welfare, Government of India reports that during 2014-15 the blood supply has improved in India but it

Corresponding Author:
Rubi Talukdar
Research Scholar
Siksha 'O' Anusandhan National Institute of Law
Siksha "O" Anusandhan (Deemed to be University),
Khandagiri, Bhubaneswar-751030, Odisha, India
Phone: 9583762995
Email: rubytalukdaroo@gmail.com

still faces a deficit of 10 % [11]. India, with its population of 1.25 billion people, needs 12 million units of blood annually but collects only 9 million that amount 25% deficit [12]. The commercialization of blood is a big 'underworld' market. This market not only attracts new and professional donors but also entertains unqualified donors indiscriminately without proper screening. The Supreme Court of India attempted to ban professional blood donation and promote replacement donation system [13]. At times, over confidence on relative or replacement donors can cause errors. HIV seroprevalence is generally higher in blood sellers and even in the so called replacement or relative donors than amongst regular voluntary donors.[14] The gap between demand and supply not only precipitates corrupt practices in transfusion chain but also promote reckless collection of blood samples.

Pre-analytical Errors: In the total testing process, pre-analytical phase is the most accessible part and this phase is considered as the greatest threat to the laboratory professionals. *Satyavati* V.*Rana* [15] reports the types of pre-analytical errors that includes (a) Patient Identification and Preparation (b) Sample Collection Procedures, Handling, and Processing: proper venipuncture technique, order of draw, proper tube mixing, and correct specimen volume (c) Specimen Transport (d) Errors in Laboratory Tests and (e) Other Errors: (Missing sample and/or test request, contamination from infusion route, insufficient samples, and inappropriate containers).

Errors due to inadequacy in Legal Standardization: The pre-analytical activities, management of unsuitable specimens and reporting policies are not fully standardized, nor harmonized worldwide [16].

Blood Transfusion Services and Indian Law: Blood transfusion services in India are primarily regulated by the Drugs and Cosmetics Act, 1940 and its subsequent amendments. The Central Govt. through Drugs Controller General of India has formulated a comprehensive legislation to ensure better quality control system on collection, storage, testing and distribution of blood and its components. Human blood is covered under the definition of 'Drug' under Sec. 3 (b) of Drugs and Cosmetics Act, 1940. The Central Government of India in the year 1967 accomplished a separate provision Schedule F Part XII B of the Drugs and Cosmetics Rules. This part includes various requirements essential for the operation of blood bank such as technical staff, equipments, accommodation etc. State Drugs Controllers were empowered to issue the licenses for blood banks. The standards for 'Whole Human Blood' were dissuaded in Indian Pharmacopoeia.[17]

Due to the wide spread pervasiveness of HIV AIDS, in 1989, Government of India (the Ministry of Health and Family Welfare) issued a notification under the Drugs and Cosmetics Rules and made the test HIV 1and 2 antibodies of Whole Human Blood as mandatory requirement before transfusion . The Rules from 122F to 122P explain the various procedure of making applications by a blood bank, fees to be paid for grant/renewal of license by the applicant and conditions of license to be followed by the applicant after grant/ renewal and conditions of license to be followed by the applicant after grant/renewal of license. However, the Supreme Court order extensively revised the rules on 5.4.1999. The National Blood Policy in 2002 closely followed the inclusion of hepatitis C testing in blood; other improvements included the standardization of blood storage centers, National Plasma Policy, and recently the baseline assessment of all blood banks in India in 2016.

Judicial Approaches towards Errors in Blood Transfusion: In *Common Cause* v. Union of India and Others [18] the Supreme Court of India stated that "Blood is an essential component of the body which provides sustenance to life. There can be no greater service to the humanity than to offer one's blood to save the life of other fellow human-beings. At the same time blood, instead of saving life, cannot lead to death of the person to whom the blood is given if the blood is contaminated. Medical errors with respect to blood transfusion are dependent on several aspects which have been discussed earlier. But, most medical errors are either treated as civil or criminal negligence".

Judicial Interpretation of Error: In agreement of the A.F. Ferguson Report,1990 the Supreme Court of India took notice of levels of errors in blood transfusion process and observed that many unauthorized Blood collection centers indiscriminately collect blood through untrained and unqualified technicians and without specialized screening and store them in unhygienic conditions. [19]

Human beings ordinarily make judgment either on the basis of their sensorial data which they perceive or

on the sensorial data that are stored in memory. Incorrect processing of sensorial and stored data can lead us to commit error. For example, cognitive biases can lead to systematic deviations from a standard of rationality or good judgment.

Medical Professionals can commit error if,

(a) There is error in inductive reasoning or

(b) There is error in deductive reasoning

The term 'Error' is often interpreted as mistake, accident, or misfortune .A mistake is an omission made not by design, but by mischance [20]. Ordinarily, an accident means an unintended and unforeseen injurious occurrence; something that does not occur in the usual course of events or that could not be reasonably anticipated.[21] On the contrary, negligence means a material deviation from the normal standards due to breach of duty.

In *PoonamVerma* v. *Ashwin Patel and Others* [22] the Supreme Court of India considered several forms of negligence. It is true that 'no sensible professional would intentionally commit an act or omission which would result in loss or injury to the patient as the professional reputation of the person is at stake'[23].

As a consumer a patient reasonably expects reasonable degree of knowledge and skill from his doctor [24]. The degree of knowledge and skill of doctors might differ but must not fall below minimum standard. [25] However,' law does not require of a professional man that he be a paragon combining the qualities of polymath and prophet' [26].A doctor cannot assure cure [27].Sometimes a doctor does take risk [28] but such risk must not be reckless. At times both doctors and patient suggest for alternatives from several options [29].But, each alternative must be assessed from the minimum safety standards.

In blood transfusion process never trust either donor or the recipient. Sometimes, documents on donors and recipient can be deceptive. Unauthorized collection of unscreened blood and reckless transfusion can cause disaster. In *Ravjibhai Ramabhai Sondarwa and Others* v. *State of Gujarat and Others* [30] the Court considered the cases of 23 minor children who used to get treatment for severe Thalassemia in Government hospital were infected with HIV+ due to reckless blood transfusion collected from an unauthorized blood collection center which pretended to be an official blood bank.

Due to lack of screening facilities the recipients undertake risk. In a case it was reported that in the absence of Antizen Test conducted through Polymer Chain Reaction (PCR) method, the HIV+ virus cannot be identified during the Window Period. Therefore, the certificate given by the blood bank about the quality of blood becomes redundant.

It is internationally well-accepted that even after screening through a reliable test like the ELISA test, there is still a possibility of the Hepatitis virus not being detected in the blood if it is in the early stages of incubation which may have happened in the instant case. In this connection, we note that for screening of blood, two tests are in use: (i) ELISA test; and (ii) Radio Immunoassay test. It is also worth noting that ELISA test is not considered conclusive in detecting the HIV viruses and its results usually have to be confirmed by a subsequent test like the Western Blot Test.[31]

At times, doctors and technician are harassed by patients and police on the allegation of negligence. However, the Apex court observed that without obtaining a credible medical opinion from an expert, Investigating Officer is not justified in submitting the charge sheet against the doctor [32]. This ruling brought relief towards many doctors from police action.

It is settled law that the hospital is vicariously liable for the acts of its doctors and the State would be also vicariously liable for the damages on account of negligence of its doctors or other employees[33].

In *Dr. K. Vidhyullatha* v. *R. Bhagawathy* [34] it was viewed that there could be no doubt that administering blood of 'A' positive group to a patient having 'O' positive blood group would certainly amount to deficiency in service and the acute renal failure occurred due to intra-vascular haemolysis.

In *Post Graduate Institute of Medical Education and Research, Chandigarh* v. *Jaspal Singh and others* [35] the Supreme Court of India observed that the where internal imbalance of liver and kidney and haemoglobin levels deteriorated after wrong blood transfusion the doctors of the Hospital cannot disown absolve from their liabilities.

CONCLUSION

Precaution is better than undertaking risk. Law always expects professionals to follow minimum prescribed standards right from collection to transfusion of blood. The health technology in India has considerably improved, but the benefits of technology are yet to percolate to the rural level.

In order to minimize errors in blood transfusion both doctors and technicians must observe *inter alia* few important things in mind. (i) Doctors and technicians should ensure their professional competency and update training (ii) Doctor must record the justification of transfusion (iii) Donor and recipient should be properly identified and their informed consent be obtained and recorded.(iv) Donor and recipient's blood should be screened with minimum prescribed standard and be recorded.(v)Prescribed classification of blood products should be record (vi) The blood products under prescribed standards be stored and transported with proper records (vii) Issue and receipt of blood products be recorded (viii) Cross check status of blood of the recipient before transfusion and monitor during and after transfusion.(ix) procedural details of transfusion should be recorded.

We donate blood to give someone a second chance and let us not spoil the objectivity of philanthropy by wrong transfusion.

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32. Jacob Mathew v. State of Punjab & Another (2005) 6 SCC 1 and Martin F D.'souza v. Mohd. Isfaq (2009) 3 SCC 1

33. Savita Garg v. National Heart Institute, (2004) 8 SCC56; Achutrao Haribhau Khodwa v. State of Maharashtra, (1996) 2 SCC634

34. Dr. K. Vidhyullatha v. R. Bhagawathy I (2006) CPJ 136 NC

35. Graduate Institute of Medical Education and Research, Chandigarh v. Jaspal Singh and others (2009)7SCC330

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Substance Use among Students in a Private Medical College, Southern India-A Cross Sectional Study

S. Rajini[1], C. Kameshvell[1], Kannan[1], Alli[2], V. Tamilselvi[3]

[1]Associate Professor, Department of Community Medicine, [2]CRRI, [3]Statistician, Department of Community Medicine, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry

ABSTRACT

Introduction: Substance abuse and its associated problems are a global concern. A recent WHO estimate shows a burden of worldwide psychoactive substance use of around 2 billion alcohol uses, 1.3 billion smokers and 185 million drug users. The doctors are vulnerable to substance abuse/addiction due their ready accessibility to the substance of abuse.

Aims & Objective: To study the prevalence, duration, reasons and type of drug use among medical students.

Materials And Methods: A cross sectional study among 300 randomly selected medical students was carried out in private medical college during August to September 2016. After seeking administrative approval and verbal consent of the participants, questionnaire was prepared, distributed and data were collected from the students (of 1st year to 5th year).Questionnaire was designed to elicit information on the use cigarettes, alcohol, illegal purchase of drugs as well as reasons and age at first use.

Results: Among 300 participants 86% were males and 14% were female students. The prevalence of substance abuse among medical students was about 52% and among them 57.85% of them was staying in hostels. 40% and 36% of them started using it as for experimentation and for fun respectively and 17% of them used for stress relief. The present study also reveals that above 65% were well aware of their side effects.

Conclusion: The problem of substance abusers among medical students should gain attention and it's time to evolve on comprehensive intervention approach to promote a healthy and safe life style practices.

Keywords: *Prevalence, substance use, alcohol, cigarette, medical students.*

INTRODUCTION

Use of tobacco, alcohol, and other substances is a worldwide problem and affects many children and adolescents. [1] Early initiation of substance use is usually associated with a poor prognosis and a lifelong pattern of deceit and irresponsible behavior. [2]Substance abuse and its associated problems are a global concern. A recent WHO estimate shows a burden of worldwide psychoactive substance use of around 2 billion alcohol uses,1.3 billion smokers and 185 million drug users.[3]The doctors are vulnerable to substance abuse/addiction due their ready accessibility to the substance of abuse. There is higher percentage use of alcohol, tranquilliers and psychedelics among medical students and a dependence rate is 5%. [4] Medical students are significantly more likely to use prescription stimulant medications to boost academic performance. Medical training is a demanding endeavour; students often are pushed to limit to succeed and must find ways of copying and adapting. Three fourths of medical students reported that they believe stimulants could enhance cognitive performance and had used them typically for performance enhancement [5]. Substance use changes the way people approach and experience interactions. The adolescents' psychological and social development is compromised as in formation of a strong self identity. Half of the students who drink

Corresponding Author:
Dr. S. Rajini,
Associate professor, Department of Community Medicine,
Sri Lakshmi Narayana Institute Medical sciences,
Pondicherry.
Mobile: 9865233325
Email: rajsenspm@gmail.com

have reported binge drinking, according to the report by national institute on alcohol abuse and alcoholism. Baldwin et al (1991) investigated the problem among senior medical students at 23 medical schools in USA and reported the frequency of life time use of variety of substance as follows alcohol 98% cannabis 66% tobacco 55% cocaine 32% amphetamine 22% tranquilliers 19%. Adolescence is the critical period when the first initiation of substance use takes place. Among the youth, students are particularly involved due to increasing academic pressures. The encouragement by peer groups, the lure of popularity and easy availability of many such substances like alcohol, tobacco (cigarettes and gutkha) and other drugs make a teenager an easy prey. In India approximately 5500 children and adolescents start using tobacco products daily, some as young as 10 years old. The majority of users have first use tobacco prior to the age of 18 years [6]. Present study was undertaken to estimate prevalence of substance abuse medical students.

MATERIALS AND METHODS

A cross sectional study was done among 300 randomly selected medical students which were carried out in a private medical college during August to September 2016. After seeking administrative approval and verbal consent of the participants, a pre-tested and pre-designed questionnaire was used to collect the data. The data was collected from the randomly selected students(1st year to 5th year).Questionnaire was designed to elicit information on the use of cigarettes, alcohol, self prescription of drugs, including sedative, hypnotics ,minor and major opiates and illicit drugs such as cannabis, cocaine, heroin and others as well as reasons for use and age at first usage. The subjects were asked whether they had used the substance during their lifetime. The participants had to provide information on how often they use its quantity and type of consumption. The students were asked to choose the reason for substance use from a list including to obtain due to peer pressure, relaxation, for fun, and experimentation. The results were analyzed using suitable statistical package and chi square test was used per the requirements.

RESULTS

The present study was carried out in a private medical college of south India. 300 medical students were randomly selected and the data was collected and analyzed. Among the participants majority were male students 86% (257) and (43) 14% were female students. 64.6% of the students were following Hindu religion, 12% Christianity and 9% were Muslims. 87% of the study participants were hostlers and 13% were day scholars. Among them 57.85% of the hostlers and 25.64% of the day scholars are substance users. The variety of substances used by the students was alcohol 31.66%, cigarette 20% and drugs 2% respectively. The study showed only 48% of the students was non users of any type of substances.

Table 1: Gender wise distribution of substance use (n = 300)

Gender	Smoke		Alcohol		Drug	
	Yes	No	Yes	No	Yes	No
Female	8	35	12	31	0	43
Male	52	205	83	174	6	251
Total	60	240	95	205	6	294
	Chi Square: 0.061 df: 1 p-value: 0.805		Chi-Square: 0.328 df: 1 p-value: 0.567		Chi-Square: 1.024 df: 1 p-value: 0.311	

It was observed in the present study that consumption of alcohol is more in male students when compared to smoking. This may be because; smoking is strictly prohibited in the college and hostel campus. No statistical significance was observed when compared with gender and drug usage.

Table 2: Resident wise distribution of substance use (n = 300)

Stay	Smoke		Alcohol		Drug	
	Yes	No	Yes	No	Yes	No
Day Scholar	6	33	4	35	0	39
Hostler	54	207	91	170	6	255
Total	60	240	95	205	6	294
	Chi-Square:0.597 df: 1 p-value: 0.440		Chi-Square: 9.496 df: 1 p-value: 0.002		Chi-Square: 0.915 df: 1 p-value: 0.339	

Statistical significance was observed by the place of stay and alcohol consumption of the students.

Table 3: Year wise distribution of substance use (n = 300)

Year of Study	Smoke		Alcohol		Drugs	
	Yes	No	Yes	No	Yes	No
1st Year	10	102	40	72	1	111
2nd Year	30	87	30	87	4	113
3rd Year	9	32	15	26	1	40
4th Year	5	8	4	9	0	13
CRRI	6	11	6	11	0	17
Total	60	240	95	205	6	294

The present study shows, drug usage is common among first and second year students of the course. Regarding the usage of the substances, 27.5% and 28.9% were regular use of alcohol and smoking respectively. Two percent of the students who used were only occasional users. Majority of the substance users were using them only for the duration of past 6months to 1 year. This may be because, the students stay away from their parents during recent period only. The present study shows 40% of the substance users were doing it for experimentation and 36.4% were using it for fun as shown in table 4.

Table 4: Reason for substance use among the participants

Reason For Substance Use	Number	%
For Fun	124	36.4
Experimentation	136	40
Stress Relief	58	17
Forced By Friends Or Others	22	6.4

Questions were asked about the feeling after the use of the products. Nearly 40% of all substance users say no feeling and same percentage of individuals says that, they are relieved off stress after using them. In spite of knowing the side effects of the products, 70% of them still continue to use them.

DISCUSSION

The present study shows 31.66% use alcohol, 20% smoke and 2% use drugs respectively. Similar findings have been recorded by Arora et al in his study done at Meerut [3]. It was also observed that 57.85% of the hostlers are substance users, which was also similar to the study done by Juyal et al, [7]and Naskar et al,[8] where 66.7% of the substance users stay away from home.

Regarding the usage of the substances, it was reported 27.5% and 28.9% were regular use of alcohol and smoking respectively. These findings were supported by DN Sinha, on prevalence of regular use of smoking among male students to be 43%.[9]

Many studies done in India [10-12] and other countries show similar prevalence of substance use among the medical students of various years. [13-15] The main predisposing factor for increase of substance use upto 50% is due to the stress undergone by the medical graduates. Same observation was made by P Kumar and D Basu, were the drug usage was mainly to overcome stress. [4]

The present study shows more than 70% of the substance users know well about their side effects. The findings were similar to the study done by Gopiram et al, among adolescents and young adults. [16]

CONCLUSION

Despite of knowing the harmful use of the substance use, it has been noticed that the adolescents initiate and still continue to use. To conclude, psychological stress seems to be the major cause for substance use. Health planners and educationalists have to be informed, for the corrective action which should be taken on time to reduce the morbidity and decrease the usage of substances among the medical students.

Conflict of Interest: Nil

Source of Funding: Self

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Nutritional Status of Children Residing at an Orphanage in Puducherry

K. Kannan[1], S. Rajini[2], Kameshvell C[2], G. Jayalakshmi[3], Jenith[4], Karthikeya[4]

[1]Assistant Professor, [2]Associate Professor, Department of Community Medicine, [3]Dean, [4]CRRI, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry

ABSTRACT

Introduction: Orphanages are a vulnerable group in any socio-economic setting simply because they are deprived of one or both of their primary care givers. The level of vulnerability they face however increases significantly with the level of poverty. The practice of placing deprived children having minimum or no emotional and material resources, in orphanages has since long been prevailing in socio-economically poor Asian countries.

Aims: To assess the nutritional status of children residing at an orphanage.

Methodology: A cross section study was conducted with 75 children with pre structured questionnaire including clinical examination and biometric assessment.

Result: Mean age of children residing at orphanage was 11.2 3.1 years, while 58.7 percentage children were male. The malnutrition was graded by calculating Z score for BMI - Age. It was found that no children having severe malnutrition, but 5.3 percent children were diagnosed as moderate and 18.7 percent children were diagnosed as mild. Children were mainly seems to be deprived socially, rather than physically. Apart from, these children have scabies 12% and Hook worm infestation 5 %, anemia about 8 % and refractory error 3%.

Discussion: A study conducted by Sadik (2010) shows low intake of both micro and macro nutrients except protein by orphanage children in Ghana. Nutritional status indicated that 10% and 15% of the children were severely stunted and wasted respectively. Similar findings were reported by Bhuvanesh Shukla et al (2011), DrNaheedVaida (2013)

Conclusion: About 24 percentage of children residing at orphanage have mild or moderate malnutrition, even though none of them are severely malnourished based on BMI.

Keywords: *Nutritional status, Orphanage, BMI*

INTRODUCTION

An orphanage is an institution dedicated to the care and upbringing of children who have lost their parents. Orphans are a vulnerable group in any socio-economic setting simply because they are deprived of one or both of their primary care givers. The level of vulnerability they face however increases significantly with the level of poverty[(1)]. The evidence from the pediatric and child psychiatry literature makes clear that orphanages are neither an effective nor a humane mode of assistance to infants and families. After the independence the government of India has launched number of schemes for welfare of orphan and destitute children. Such as "Scheme for welfare of orphan and destitute children'' The sole motive of this program is to prevent destitution of children. Under this provision the destitute and

Corresponding Author:
Dr. K.Kannan, Assistant Professor,
Department of Community Medicine,
Sri. Lakshmi Narayana Institute of Medical sciences,
Puducherry.
Mobile: 9786028602
Email: drkannan83@gmail.com

orphan children are provided shelter, in order to provide good healthy atmosphere and good nutrition. Most common problems faced by orphans include loss of home, high dropout rate from school, lack of health care and problems with immunization, social downfall, child labors and drug abuse.

It has been seen worldwide that every person, every family, every institution recognizes the need for looking after its children. Particularly orphans, destitute or abandoned children who are looked after primarily through child care institution run by government and non-government organization and in some cases through fosters families. The national nutrition survey (1995-1996) report illustrates that about 62% of the children aged 6-9 years are malnutrition's, 43.4% of the children are stunted but not wasted and 9.3% of the children are wasted but not stunted. In addition, 9.1 % of the children are both stunted and wasted [(2)]. In the developing world, 43% of the children are stunted and 9% are wasted [(3)]. Directly or indirectly malnutrition contributes to more than 60% of 10 million child deaths each year[(4)].

Hence the present study is a humble effort to generate relevant information and data on health and nutritional status of destitute children living in the establishment voluntary body in Puducherry.

AIMS AND OBJECTIVES

- To assess the nutritional status of the children dwelling at an orphanage
- To identify the morbidity pattern among orphan children

METHODOLOGY

After obtaining IEC clearance, we obtained permission to conduct Cross sectionalstudy at a Private orphanage through proper channel. The Home for orphan children situated around 5 kilometer from the Institution. Prior to the examination day, the researcher arranged the logistics at the Home including Registration, Anthropometric Measurement and clinical examination and also a Pharmacy. Date was fixed on 3rd Sunday November 2016 based on the convenience of the facilitators at orphanage. On the day of examination out of 120 children, 75 children were available since remaining pupils were attending their schools, so we included all the 75 children available during examination day. Anthropometric measurements were collected based on standard methods[(9)]. Age of the subjects under study was determined by interrogation and confirmed through probing if the birth certificate or the health cards were unavailable. Measurements of weight and height were obtained from all subjects. The subjects were weighed wearing minimal cloths and bare footed. Three weight measurements were obtained using a bathroom weighing scale and the average was calculated and recorded to the nearest 0.5kg. the height was measured with a wooden measuring board without shoes and the average was calculated and recorded to the nearest 0.1cm Clinical finding were recorded on Individual Case sheet by a General Physician and a Pediatrician. Diet History was recorded by using 24hrs recall method followed by health education. Children those who need investigations and follow up were referred to the Institution, and children who need simple medication were provided on the spot. Mass Deworming was instructed though the warden, on the day of examination after Dinner. Data was then analyzed by using Microsoft Office Ex-cell 2010 and SPSS software version 20. Descriptive analysis was done by using Percentage and Frequencies.

RESULT

Figure 1: Depicts the gender distribution of study subjects that is about 59% were male and remaining 41 where female children. Table 1 describes the characteristic features of our study samples. It shows the mean age of study subject as 11.2 years with standard deviation of 3.1 years. Mean duration of stay was found about 68.8 months with Standard deviation of 34.7 (approximately 5 years of mean stay at home). Whereas the mean height and weight was recorded as 130.84cm (SD-16.51) and 31.43 Kg (SD 10.15) respectively

Fig 1: Gender-wise distribution of study subjects

The malnutrition was graded by calculating Z score for BMI – Age and it was found that no children having

Grade III malnutrition, but 5.3 percent children were diagnosed as Grade II and 18.7 percent children were diagnosed as Grade I(Fig 2). Children were mainly seems to be deprived socially, rather than physically.

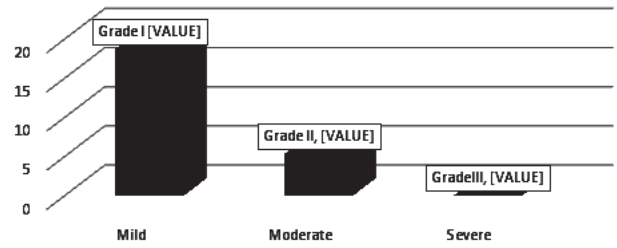

Fig 2: Prevalence of anemia among study subjects

Apart from, these children have scabies 12% and Hook warm infestation 5 %, anemia about 8 % and refractory error 3%.(Fig 3)

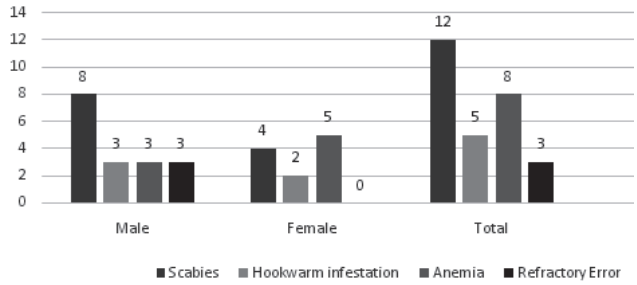

Fig 3: Health Issues among Study Subjects

Table 1: Description of study subjects

Distribution of study sample		
Variable	**Mean**	**SD**
Age in year	11.2	3.1
Height in cm	130.84	16.51
Weight in Kg	31.43	10.15
Duration of stay in month	68.8	34.7

DISCUSSION

A study conducted by Sadik (2010)[5] shows low intake of both micro and macro nutrients except protein by orphanage children in Ghana. Nutritional status indicated that 10% and 15% of the children were severely stunted and wasted respectively. Similar findings were reported by Bhuvanesh Shukla et al(2011) [6], DrNaheedVaida (2013)[7]

Another study at Bangladesh by A.K.ObidulHuqet al has stated thatNutritional statuses of the orphans are very poor. About 12.0%, 14.3% and 6.3% of the orphans were severely malnourished i.e. underweight, stunted and wasted respectively[8]

Bhuvanesh Shukla in his study on to Assess Physical Health Status of Children at Selected Orphanage in Salem, Chennai – India reported that Orphanage children skin problems shows that 3.84% of them had skin patches, 1.96% of them had skin rashes, 7.70% of then had infected wound and 3.84% of them had other skin problems. Most of the (83%) children had dandruff, 25% of them had pediculosis. children's has 4.8% blindness and only 1.96% of them had Bitot's spot. Orphanage children show that 50% of them had dental carries, 33.50 of them had gingivitis and 4% of them had glosistis. Orphanage children show that 57.70% of them were malnourished. Dandruff and pediculosis are most common in children. Mouth conditions are very poor in orphanage, mal nutrition is prevailing among orphan children.

CONCLUSION

Our study concludes that the nutritional status was not that bad when compared with different standards. Even though none of them are severely malnourished based on BMI about 24 percentage of children residing at orphanage have mild or moderate malnutrition.But still we would like to recommend for periodic medical checkup for early diagnosis and for a balanced diet distribution to reduce the complication and prevalence of malnourishments.

Ethical Clearance: Obtained before the commencement of study

Source of Funding: Self

Conflict of Interest: Nil

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Study on Prevalence of Whatsapp Addiction among Medical Students in a Private Medical College, Pondicherry

S. Rajini[1], K. Kannan[2], P. Alli[3], V. Tamilsevi[4]

[1]Associate Professor, [2]Assistant Professor, Department of Community Medicine, [3]CRRI, [4]Statistician, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry.

ABSTRACT

Background: The world is dynamically changing due to the advancement in the mobile technology. These days it is almost impossible to avoid the presence of Mobile Apps. Whatsapp is one among the major change in mobile apps communication in the recent past, it users is growing very fast. Whatsapp addiction syndrome is a part of internet addiction disorder. This study focuses on the prevalence of whatsapp addiction among medical students.

Aim and Objective: To study the prevalence, pattern, reasons, advantages and disadvantages of whatsapp addiction among medical students.

Methods: This is a cross sectional descriptive study which was done among the medical students present in the medical college. The pretested questionnaire is used for collecting the data. Questions regarding the duration of usage, reasons, to whom, its advantages and disadvantages are asked. The data was collected and analyzed by using suitable statistical methods.

Results: Of the 200 medical students who took part in the study, 108 (54%) were male and 92 (46%) were female. The prevalence of whatsapp addiction among medical students is 51%. Reason for whatsapp usage is for chatting with friends is 87% .The benefit of using whatsapp is easy way of communication is 30.5%. The drawback of whatsapp use is no face to face interaction is 24.5%. Inspite of knowing the harmful effect of whatsapp usage, 32.5% of them are using it and unable to control it.

Conclusion: The whatsapp addiction problem among medical students should gain attention and it is time to evolve a comprehensive intervention approach to promote a healthy and safe whatsapp use.

Keywords: *Whatsapp addiction, medical students.*

INTRODUCTION

The world is dynamically changing due to the advancement in the mobile technology. These days it is almost impossible to avoid the presence of mobile applications or called Mobile Apps. Most of the People can praise the various mobile applications that they use in their everyday lives. Several people are heavily dependent of the usage of such applications for their day to day activities. [1]

WhatsApp is one among the major change in mobile apps communication in the recent past, it users is growing very fast on mobile phones and also on the computers.[2]

Whatsapp was created by Jan Koum and Brian Acton in 2009 for easy communication and faster multimedia messaging. Communication through mobile phones has become easier, faster and cheaper with the help of whatsapp messenger. It is cheaper when compared to the normal phone messaging. Whatsapp messenger is a cross platform mobile messenger which is being worked

Corresponding Author:
Dr. S. Rajini, Associate professor,
Department of Community Medicine,
Sri. Lakshmi Narayana Institute of Medical sciences,
Puducherry
Mobile: 9865233325
Email: rajsenspm@gmail.com

through internet data plan. Whatsapp provides users to send and receive media's like audio, video and images.[3]

Addiction is considered by WHO as dependence, as the continuous use of something for sake of relief, comfort, or stimulation, which often causes cravings when it is absent. [4] Mobile phone addiction /abuse/ misuse is one of the forms of compulsive use of "a mobile phone" by youth across the world. A new kind of health disorder in this category among smart phone users, "WhatsApp's addiction/ abuse/ misuse" is now challenging health policy makers globally. Medical students are also affected by this high smartphone engagement.[5]

Whatsapp addiction syndrome is a part of internet addiction disorder. Internet addiction disorder may be broadly defined as "the inability of individuals to control their internet use, resulting in marked distress and/or functional impairment in daily life". One of the study conducted in South Korea on Internet addiction disorder showed that Internet addiction disorder influence suicide related behavior. Gray matter volumes of the dorsolateral prefrontal cortex (DLPFC), rostral ACC, the supplementary motor area (SMA), and white matter focal anisotropy (FA) changes of the posterior limb of the internal capsule (PLIC) were significantly correlated with the duration of internet addiction in the adolescents with internet addiction syndrome.[6]

The application is highly addictive and creates a great impact on regular users, and apart from that it becomes difficult to control and cure. They can do the positive and negative with what's app.[3] This study focus on the prevalence of whatsapp addiction among medical students.

MATERIALS & METHOD

This is a cross sectional descriptive study which was done among the final year and CRRI students of the medical college. The Pre – tested, self administered, anonymous questionnaire were provided to the individual students. Verbal consent and ethical committee clearance was obtained from the students and management respectively, before handing over the questionnaire.

They were requested to fill the Performa with full assurance about the confidentiality and anonymity that data would be used only for scientific purpose. The questionnaire was then administered to 200 students. Students not available during the study and not willing to participate were excluded from the study. Questions regarding the duration of usage of whatsapp, reasons, to whom, its advantages and disadvantages are asked The data is collected by asking the students to fill the profoma. The data is analyzed by using suitable statistical methods.

RESULTS

Of the 200 medical students who took part in the study, 108 (54%) were male and 92 (46%) were female. The prevalence of whatsapp addiction among medical students is 51%.

In the present study 8%, 15%, 21%, and 56% of students felt irritable, depressed, happy and calm respectively, when not using whatsapp.(refer figure 1) The benefits of using whatsapp was told by students were, easy way of communication, building friendship, long distance communication, improve interpersonal relationship and fast & speedy way of communication as shown in table 1.

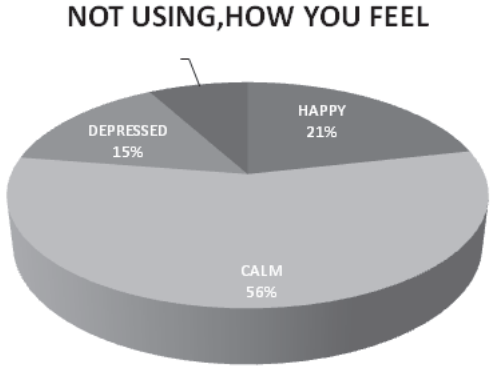

Figure 1: When Not Using, How Do You Feel?

Table 1: Benefits of Using Whatsapp

Variables	Number	Percentage
Long Distance Communication	44	22
Interpersonal Relations	28	14
Building Friendship	49	24.5
Fast & Speedy	18	9
Easy Way of Communication	61	30.5

The students responded as drawback of using whatsapp were, no face to face interaction, ignoring

people around them, less interaction with the society, unwanted relations and reduced attachment with parents. (refer table 2) The whatsapp is mainly used for chatting (66%), current updates (17%), photo & video sharing (14%) and others (3%) respectively as in figure 2. The participants reported, the usage of Whatsapp is mainly to chat with their friends (87%), relatives (8%), and with group (5%). (Refer figure 3)

Table 2: Drawbacks of Using Whatsapp

Variables	Number	Percentage
Unwanted Relations	39	19.5
Less Interaction with Society	40	20
No Face to Face Interaction	49	24.5
Ignoring People around Us	44	22
Reduced Attachment with Parents	28	14

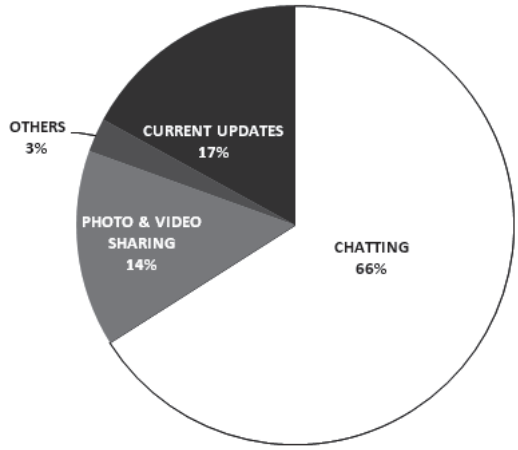

Figure 2: Whatsapp is Mainly Used for

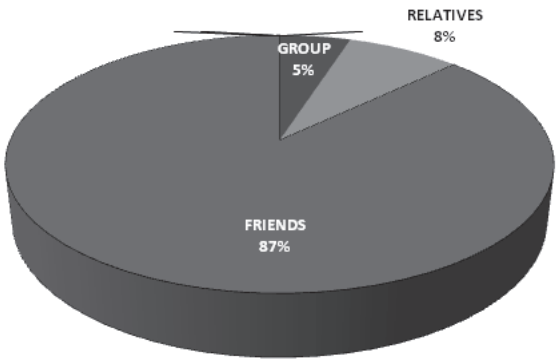

Figure 3: Whatsapp is Mainly Used to Chat with

Purpose of using whatsapp were for their personal work (73%), education (11%) and for other purposes (15.5%). Monthly data recharge done by students was approximately 0-100 Rs. (28%), 100-300 Rs. (58%) and more than 300 Rs. (14%). Whatsapp usage per day by medical students was 0-1 hour (28%), 1-2 hours (29.5%), 2-3 hours (23.5%) and more than 3 hours (17.5%).

DISCUSSION

Globally there have been a lot of advances in the field of technology and communication. Now-a-days many electronic gadgets are available with lots of facilities along with internet connectivity which has changed the way of communication and lifestyle. Use of Whatsapp can be a boon or a bane. The relationships created in this virtual world of Whatsapp builds new friendships and improve communication among people. At the same time participants in this study also opined that the use of Whatsapp also leads to lesser face to face interactions, lesser understanding, false impressions, materialistic and unwanted relations.[7] This was justified by the findings of the present study.

Students were asked the reasons why they most often use whatsapp on their mobile phones. The researchers were amazed at their responds. The results shows that majority of the students use the application for chatting with friends on different issues rather than academic work on campus, and this is represented by 72% of the total number of respondents. This also indicates the link between usage of the application and poor academic performance among the majority of the students. The more friends a student has on whatsapp, the more time he/she spends on the application" according to most students interviewed. A student who has a lot of friends on whatsapp is most likely going to be responding to more people and thus spending more time chatting. The study looked at students engaged in the use of the application for other purposes including academic work, general information, and family.[8] In our study, Purpose of using whatsapp responded by students were for their personal work (73%), education (11%) and for other purposes (15.5%).

In another study 43% of students use whatsapp for chatting, 24% of them for sharing photos and videos, and 30% of them for current updates and remaining 3% for other purposes.[3] But the present study shows, 66% of students use whatsapp for chatting, 14% of them for sharing photos and videos, and 17% of them for current updates and remaining 3% for other purposes.

In our study, students use Whatsapp mainly for 87% chatting with friends and 8% of them with their relatives,

5% of them in groups. Similar findings were reported by Karthikeyan, in his study that students use whatsapp mainly for chatting with friends 83% and 7% of them with their relatives, 5% of them in groups respectively.[3]

In a study done at Coimbatore, 54% of them use below 100 rupees for monthly data recharge 33% of them use up to 300 rupees and the remaining 13% uses more than 300 rupees monthly for data recharging. [3] But in our study monthly data recharge done by students was approximately 0-100 Rs. (28%), 100-300 Rs. (58%) and more than 300 Rs. (14%).

In a study done among college students at Coimbatore, 29% of students use 0-1 hours daily, 30% of them use 1-2 hours daily, 19% of them use 2-3 hours daily and remaining 22% use more than 3 hours in a day.[3] But our study shows whatsapp usage per day by medical students was 0-1 hour (28%), 1-2 hours (29.5%), 2-3 hours (23.5%) and more than 3 hours (17.5%).

CONCLUSION

The prevalence of whatsapp addiction is high, were in more than half of the study group show some form of whatsapp addiction pattern. The whatsapp addiction problem among medical students should gain attention and it is time to evolve a comprehensive intervention approach to promote a healthy and safe whatsapp use.

Conflict of Interest: Nil

Source of Funding: Self

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Prevalence of Stress in Young Urban Population in a City of Northern India

Samir Chattopadhyay[1], Sushil Kumar Singh[2], Arvind K. Shukla[3]

[1]Professor, [2]Junior Resident, [3]Asst Prof, Department of Community Medicine, Subharti Medical College, Meerut, Uttar Pradesh.

ABSTRACT

Stress is not a mental disorder itself but rather an early sign & symptom of under lying psychological condition. Not all stress is bad. Some amount of stress is necessary for optimal functioning; However chronic stress can lead to metabolic dysfunction. Stress has been linked to inappropriate eating, overweight, obesity for a long time. However it is not clear whether the stress causes metabolic dysfunction or itself is an effect of metabolic dysfunction.

A community based Cross-sectional study was conducted to find out the prevalence of stress among the young 18-40yrs of urban population and its association with overweight, obesity. 150 study subjects, aged 18 to 40 years of both sexes were recruited using simple random sampling. Data was collected using WHO's STEPS criteria and using modified close ended questionnaire. Pearson's Chi-square test & Fisher's exact test was applied for finding the statistical association.

Overall prevalence of psychological stress was high. As much as 28.4% of males & 24.2% of females were having "severe stress" and 60.2% males & 64.5% females were having "moderate stress", whereas the prevalence of obesity was 38.6% in males & 45.2% in females. But the association between stress & obesity was not statistically significant.

Conclusion: The prevalence of both 'psychological stress' & 'obesity' was high among the study participants. However, the association was not statistically significant

Keywords: *Psychological stress, Obesity, overweight, BMI.*

INTRODUCTION

According to American psychological association stress can be defined as "any uncomfortable emotional experience accompanied by predictable biochemical, physiological and behavioural changes". Sometimes stress can be beneficial providing boost & energy to get through situations, but extreme stress can have health consequences affecting immune, cardiovascular, neuroendocrine & central nervous system.[1]

Corresponding Author:
Dr Sushil Kumar Singh
Junior Resident
Department of Community Medicine,
Subharti Medical College, Meerut, Uttar Pradesh
Mobile: 9412823176
Email: singhkr.sushil@gmail.com

Association between stress and obesity has been suspected for many years. Scientific evidence in support of such link also has been established.[2]

Studies have established the relationship between chronic stress, HPA (Hypothalamic-pituitary-adrenal axis) and obesity. In addition of typical traits of over nutrition, sedentary life style and sleep deprivation, chronic exposure to environmental stress potentially contributes to the development of obesity.[3]

Taub-Dix, RD of New York city, a weight loss expert has noted that very often, when people are stressed they may eat inappropriately. If that causes them gain weight, that can cause even more stress.[2]

There are considerable evidence from population based and clinical studies indicating significant and positive association of high uncontrollable stressful

event and chronic stress states with adiposity, BMI and weight gain. This relationship also appears to be strongest among individuals who are overweight and those binge eat.[4]

Some studies found poor mental health (depression, anxiety) and childhood physical abuse , sexual and verbal abuse associated with overweight and obesity among university students/young adults. Numerous epidemiologists linked social stress with obesity and metabolic dysfunction. However they found it difficult to determine whether stress contributes to development of metabolic dysfunction or is a result of metabolic dysfunction itself.[5]

AIM

The study was carried out to find out the prevalence of stress among the young 18-40yrs of urban population and its association with overweight/obesity.

MATERIALS & METHOD

A community based cross-sectional study was conducted in semi-urban population of Meerut, to assess the burden of diabetes. Sample size was calculated to be 150 adults of 18-40 years of both sexes. 150 families were selected randomly from total 350 registered families of the UHTC. Home visits were made. Only one subject was selected from each family randomly by using lottery method.

Data was collected by using a pre-tested, semi structured questionnaire using WHO's STEPS criteria. Information was collected regarding socio-demographic profile, educational status, socio-economic status. Modified Kuppuswamy's classification of socio economic status was used for assessing the socio economics status of the study subjects.[6]

Anthropometric measurements (height, weight) were recorded & body mass index (BMI) was defined according to WHO's criteria for Asian adults underweight (<18.5 kg/m2), normal (18.5 -22.9 kg/m2), overweight (23-24.9 kg/m2) and obese (>25 kg/m2).[7] Perceived Stress Scale (10 item version) was used to assess subjective stress in participants under study. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable and uncontrollable respondents find their lives. The questions in the PSS ask about feelings and thoughts during the last month.[8]

Data was analysed using Statistical Package for Social Sciences (SPSS) software version 19.0. . Pearson's Chi square test was applied to find out significance of association between independent and dependent variables.

RESULTS

Socio-demographic distribution of the 150 study participants showed, 58.7% were males with mean age 30.7(± 7.03) years while 41.3% were females with mean age 29.8 (± 8.22) years. 24% of them were graduate/post-graduates, followed by 22% intermediate/post high school diploma holders, 14.7% high school certificate holders, 12.7% middle school certificate holder, 12% primary school certificate holder and 12.7% were illiterates. Only 2% were professionals/honours graduate (Table 1).

Table 1: Distribution of Study participants according to their demographic profile

Variables		n = 150	%
Age	18-19 years	22	14.7%
	20-24 years	17	11.3%
	25-29 years	20	13.3%
	30-34 years	29	19.3%
	35-40 years	62	41.3%
Sex	Male	88	58.7%
	Female	62	41.3%
Religion	Hindu	148	98.7%
	Others	2	1.4%
Education	Professional/ Honours	3	2%
	Graduate/Post-graduate	36	24%
	Intermediate/ Post High school diploma	33	22%
	High school certificate	22	14.7%
	Middle school certificate	19	12.7%
	Primary school certificate	18	12%
	Illiterate	19	12.7%

Contd…

Occupation	Professional	6	4%
	Semi-professional	9	6%
	Clerical/Shop owner	32	21.3%
	Skilled worker	17	11.3%
	Semi-skilled worker	8	5.3%
	Unskilled worker	10	6.7%
	Unemployed/ Housewife	68	45.3%
Socio-economic Status	Upper	3	2%
	Upper middle	69	46%
	Lower middle	46	30.7%
	Upper lower	32	21.3%

45.3% of the participants were Housewives/ Unemployed(mostly females), followed by 21.3% doing clerical job, 11.3% skilled workers and 10% professional and semi-professionals. Majority (46%) of the participants belonged to upper-middle class, 30.7% belonged to lower-middle class, 21.3% belonged to upper-lower middle class and only 2% were from upper class (Table 1).

The prevalence of obesity & overweight was quite high in this study, 38.6% males & 45.2% females were obese, but this relation between sex & BMI was not significant. Also, the prevalence of stress was high, with 28.4% males & 24.2% females were having "severe stress" and 60.2% males & 64.5% females were having "moderate stress". But this association was statistically not significant (Table 2).

Table 2: Prevalence of body mass index & psychological stress in males and females

Variables	Males (n = 88)	Females (n = 62)	Total (n = 150)
BMI			
Underweight	5 (5.7%)	5 (8.1%)	10 (6.7%)
Normal	26 (29.5%)	20 (32.3%)	46 (30.7%)
Overweight	23 (26.1%)	9 (14.5%)	32 (21.3%)
Obese	34 (38.6%)	28 (45.2%)	62 (41.3%)
$\chi 2 = 3.074$, df = 3, p = 0.380			
Psychological stress			
No stress	10 (11.4%)	7 (11.3%)	17 (11.3%)
Moderate stress	53 (60.2%)	40 (64.5%)	93 (62.0%)
High stress	25 (28.4%)	15 (24.2%)	40 (26.7%)
$\chi 2 = 0.350$, df = 2, p = 0.839			

Among the obese persons, 27.4% participants were having 'severe stress' & 62.9% were having 'moderate stress', while among the overweight participants, 15.6% were having 'severe stress' & 68.8% were having 'moderate stress'. Similarly, among the normal & underweight participants the prevalence of both 'severe stress' & 'moderate stress' was high respectively. But this association between BMI and "psychological stress" was not significant. (Table 3).

Table 3: Association of psychological stress and body mass index (BMI)

Variables	Psychological stress						Total	
	No stress		Moderate stress		Severe stress			
BMI	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Underweight	1	10%	4	40%	5	50%	10	100%
Normal	5	10.9%	28	60.9%	13	28.3%	46	100%
Overweight	5	15.6%	22	68.8%	5	15.6%	32	100%
Obese	6	9.7%	39	62.9%	17	27.4%	62	100%
Total	17	11.3%	93	62.0%	40	26.7%	150	100%
$\chi^2 = 5.290$, df = 6, p = 0.507								

DISCUSSION

In our study the prevalence of psychological stress was quite high, 28.4% of males and 24.2% of females were suffering from severe stress, 60.2% of males and 64.5% of females from moderate stress. Similar finding were reported by, Gomez et-al in Brazil reporting an overall high prevalence of stress among the study participants.[9] Bobyjeet reporting, 51.9% males & 48.1% females having 'severe stress' & 52% males& 48% females having 'moderate stress' respectively[10] and Darshan et al in their study among IT professional reported high prevalence of 'severe stress' 51% in males & 51.7% in females[11].

On the contrary, Sahoo et al reported lower prevalence of both 'severe stress'& 'moderate stress' in young adult males,8% & 13.1% respectively.[12] Similarly, Gupta et al[13] and T.N. et al[14]also reported lower prevalence in their respective studies.

The relation between 'psychological stress' & BMI was not statistically significant, even though high prevalence of both stress & BMI was noted among the participants. Gomez *et-al* reported a significant association between stress & BMI, but post-management the relation between stress & BMI was not significant. On the contrary, Bobyjeet reported strong association between stress & BMI which was statistically significant.

Even though the prevalence of stress is increasing all around the world but not many studies have been done to find out the actual prevalence.

CONCLUSION

High prevalence of stress was found in the study subjects. Higher prevalence of BMI, overweight and obesity was found among those having stress than those not having stress, though the association was not statistically significant.

Limitations: Other variables influencing weight gain, obesity was not included in study.

Conflict of Interest: Nil

Source of Funding: NA

Ethical Clearance: Ethical clearance taken from institutional ethical committee.

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Effects of Socio-Demographic Factors on Prelacteal Feeding Practices among the Lactating Mothers in Meerut City

Pawan Parashar[1], Kiran Garg[2], Sameer Chattopadhyay[3], Arvind K. Shukla[4], Sartaj Ahmad[5]

[1]Professor (Community Medicine), [2]Consultant CMO Office Gaziabad UP India, [3]Professor, (Community Medicine), [4]Assistant Professor (Biostatistics), [5]Associate Professor (Medical Sociology), Department of Community Medicine, Subharti Medical College, Meerut, UP. India

ABSTRACT

Background: In many countries across the world, the practice of giving new born babies other substances (pre lacteal feeding) even before lactation is a common cultural practice. Prelacteal feeding is an underestimated problem in a developing country like India, where infant mortality rate is quite high.

Aim and objective: To know the prevalence and effects of socio-demographic factors on prelecteal feeding practices among the lactating mothers in Meerut city UP.

Material and Methods: A cross-sectional study included 322 women who had a live birth during last one year. A pre-designed and pre- tested questionnaire was used for data collection.

Statistical Analysis: Data was analyzed using appropriate statistical tests by (SPSS) version 21.0 for Windows and data were analyzed using the chi-square test.

Results: Study findings showed that 232 (72.05%) of the mothers had given pre-lacteal feedings to their newborn. Ghutti (47.8%), honey (13.4%) and others (10.9) like tea, artificial milk, Gur (Jeggary) etc . had given as Prelacteal feed.

Conclusion: The problem of prelacteal feeding is still prevalent in India. In our study, (72.05%) of the mothers had given pre-lacteal feedings to their newborn.

Keywords: *Pre lacteal feeding, Socio-demographic factors , Urban Slum area*

INTRODUCTION

Pre lacteal feeds that are usually given include honey, sugar water, ghee or other herbal even before lactation has been initiated, it is called pre-lacteal feeding, and the fluids are called pre-lacteal feeds. [1]. It is common in our Indian society due to different customs and misbelieves. [2,3] According to NFHS-3 (2005-2006); the pre-lacteal feeding is most common in Bihar (90.6%), Uttar Pradesh (86.0%), Rajasthan (71.6%) and Jharkhand (66.3%). [4]. It is also observed in many countries like South Nepal (55.6%) and Pakistan (87.6%) . [5,6] Prelacteal feeds are commonly given in many developing countries including India which carries potential risk of infection and aspiration. [7]. WHO/UNICEF strongly discourages the traditional practice of pre-lacteal feeding unless medically indicated.[8]

Corresponding Author:
Dr. Pawan Parashar
Professor, Deptt. of Community Medicine,
Subharti Medical College Meerut UP

AIMS AND OBJECTIVE

To know the prevalence of prelacteal feeding practices and its effects of socio-demographic factors among the lactating mothers in Meerut city UP.

MATERIALS & METHOD

The present cross-sectional study was conducted in the catchment area of urban health and training center (UHTC), Multan Nagar which is the field practice area of the department of Community Medicine, Subharti Medical College, Meerut. 322 Lactating mothers having

child 0-12 months were included for the study. The period of study was from September 2013 to August 2014. After obtaining the ethical clearance from the institutional ethical committee of Subharti Medical College, Meerut, the required sample was taken using simple random sampling technique. A pre-designed and pre- tested questionnaire was used for data collection. For the collection of data, a personal visit was made to each selected family after verbal consent. Data was analyzed using appropriate statistical tests by (SPSS) version 21.0. For all the tests, a p-value of less than 0.05 was considered significant. Appropriate tables were used to show the results.

RESULTS

Table 1: Socio Demographic Characteristic of the Family

Characteristics of the family		Frequency	Percentage
Type of family	Nuclear Family	198	61.5
	Joint Family	124	38.5
Socio economic status of family	Upper	1	0.3
	Upper middle	25	7.8
	Lower middle	128	39.8
	Upper lower	144	44.7
	Lower	24	7.5
Religion of the Family	Hindu	280	87.0
	Muslim	40	12.4
	Others	2	.6

Table no. 1 shows that 198 (61.5%) mothers belongs to nuclear families. while 124 (38.5%) mothers were in Joint families. Majority 144 (44.7%) of women belongs to upper lower class. Majority of mothers 280 (87.0%) belongs to Hindu families and only 40 (12.4%) mothers were in Muslim families.

Table 2: Socio Demographic Characteristic of The Mothers

Characteristic of the mothers		Frequency	Percentage
Age of mother	≤20 years	25	7.8
	21-25 years	167	51.9
	26-30years	119	37.0
	31-35 years	11	3.4
Education of mother	Illiterate	74	23.0
	Primary	50	15.5
	Junior school	52	16.1
	High school	53	16.5
	Intermediate	41	12.7
	Graduate & Post Graduate	49	15.2
	Professional	3	.9
Occupation of mother	House Wife	311	96.6
	Unskilled	3	.9
	Skilled	5	1.6
	Clerk	1	.3
	Semi professional	1	.3
	Professional	1	.3
Parity of the Mother	Primipara	89	27.6
	Multi para	233	72.4

Table no. 2 shows that half of mothers167 (51.9%) belonged to age group of 21-25 years. 74 (23%) mothers were illiterate. Majority of mothers were house wife 311(96.6%). Only 1(0.3%) mother was professional in her occupation. Most of the mothers were multipara 233 (72.4%).

Table 3: Demographic Characteristic of the Child

Characteristic of the infants		Frequency	Percentage
Sex of Child	Female	142	44.1
	Male	180	55.9

Contd…

Age of the Child	0-6 months	100	31.1
	6 -12 months	222	68.9
Weight of the child at the Time of Delivery	Below average	75	23.3
	Average	212	65.8
	Above average	32	9.9
	Not known	3	0.9

Table 4: Prevalence of prelacteal feeding practices and types of prelacteal feeding

Variables	Frequency and Percentage
Types of prelacteal feeding	
Ghutti	154 (47.8%)

Contd…

Honey and water	43 (13.4%)
Other Like Tea, Artificial Milk, Gur (Jeggary) etc.	35 (10.9%)
Total	232 (72%)

Table no. 3 shows that more than half children were male 180(55.9%) and 142(44.1%) were female. Most of the children were between 6-12 months of age 222(68.9). 75 children (23.3%) were below average body weight at the time of delivery.

Table no. 4 shows that 232 (72.%) of the mothers had given prelecteal feedings to their newborn. Ghutti/ (47.8%), honey (13.4%) and others (10.9%) like tea, artificial milk, Gur (Jeggary) etc. had given as prelacteal feed.

Table 5: Association between Prelacteal Feed Given and Various Characteristic of Family, Mother and Child

Variables		Prelacteal Feed Given				Total		X^2 –Value	P-Value
		Yes (N = 232)		No (N = 90)		(N = 322)			
		Freq	%	Freq	%	Freq	%		
Sex of Child	Female	104	73.2	38	26.8	**142**	**100.0**	**0.179**	**0.673 (NS)**
	Male	128	71.1	52	28.9	**180**	**100.0**		
Socio-Economic Status of Family	Upper middle	14	56	12	44	**25**	**100.0**	**6.28**	**0.98 (NS)**
	Lower middle	96	75	32	25	**128**	**100.0**		
	Upper lower	107	74.3	37	25.7	**144**	**100.0**		
	Lower	15	62.5	9	37.5	**24**	**100.0**		
Age of Mother	=<25 YEARS	138	71.9	54	28.1	**192**	**100.0**	**0.01**	**0.92 (NS)**
	> 25 YEARS	94	72.3	36	27.7	**130**	**100.0**		
Education of Mother	Illiterate	53	71.6	21	28.4	**74**	**100.0**	**5.25**	**0.386 (NS)**
	Primary	40	80	10	20	**50**	**100.0**		
	Juniour school	39	75	13	25	**52**	**100.0**		
	High school	40	75.5	13	24.5	**53**	**100.0**		
	Intermediate	28	68.3	13	31.7	**41**	**100.0**		
	Graduate & pg	32	61.5	20	38.5	**52**	**100.0**		
Religion of Mother	Hindu	198	70.71	82	29.29	**280**	**100.0**	**1.90**	**0.168 (NS)**
	Muslim	34	81	8	19	**42**	**100.0**		
Parity of Mother	Primipara	53	59.5	36	40.4	**89**	**100.0**	**9.54**	**0.002(SIG)**
	Multi para	179	76.8	54	23.2	**233**	**100.0**		
Type of Delivery	Normal	192	73.6	69	26.4	**261**	**100.0**	**1.57**	**0.211(NS)**
	Operation	40	65.6	21	34.4	**61**	**100.0**		

Contd…

Place of Delivery	Home	102	79.7	26	20.3	**128**	**100.0**	**6.15**	**0.01(SIG)**
	Institutional	130	67	64	33	**194**	**100.0**		
Education of Mother In Law	Illiterate	113	73.4	41	26.6	**154**	**100.0**	**0.036**	**0.850 (NS)**
	Literate	15	71.4	6	28.6	**21**	**100.0**		
Child Sick Last Six Month	Once	45	73.8	16	26.2	**61**	**100.0**	**3.43**	**0.33 (NS)**
	Twice	41	69.5	18	30.5	**59**	**100.0**		
	More than 2	93	76.9	28	23.1	**121**	**100.0**		
	Nothing	53	65.4	28	34.6	**81**	**100.0**		
Reason Child Sick	Diarrhoea	39	83	8	17	**47**	**100.0**	**7.31**	**0.06 (NS)**
	Pneumonia	38	69.1	17	30.9	**55**	**100.0**		
	Fever	51	66.2	26	33.8	**77**	**100.0**		
	Two or more reason	51	82.3	11	17.7	**62**	**100.0**		

Table no. 5 shows that that prelacteal feeding practice was found (72.05%) of respondents. Mothers who had female child, 73.2% gave prelecteal feed to their babies in comparison to those mothers who had male child 71.1%. The association was found not statistically significant. (44.0%) mothers of upper middle class of families had good practice of not given prelecteal feed to their babies. The association was found not statistically significant. Mothers who were less than 25 years of age, (71.9%) of them gave prelecteal feed to their babies in comparison to mothers who were above 25 years of age (72.3%). There is no association between age of mothers an d prelacteal feeing practices . Mothers who were primary passed & illiterate (80.0% & 71.6%) of them gave prelecteal feed to their babies respectively. While mothers with high school, intermediate, graduate, & post graduation qualification, (75.5%, 68.3% & 61.5%) of them had given prelecteal feed to babies. The association was found not found statistically significant.

Prelecteal feed was given by 81.0% mothers who belonged to Muslim religion,while mothers who were hindu 70.71% given prelecteal feed. The association was found not statistically significant.

Mothers who were multipara, 76.8% of them gave prelecteal fed to their babies than primipara mothers (59.55%). With increase in parity, there is increase in prelecteal feeding practices. The association was found statistically significant. Mothers who had normal delivery, (73.6%) of them gave prelecteal feed to their babies. It means that in institutional deliveries less prelacteal feeding practices was adopted. The association was found not statistically significant. (79.7%) of mothers gave prelecteal feed who had delivery at home which was more than those who had delivery in a hospital (67.0%). The association was found statistically significant.

(73.4%) of illiterate mothers in law advised prelecteal feed to their grandchild as compared to literate mothers in law (71.4%). The association was found not statistically significant. Children who became sick for more than two times in last six months, (76.9%) of them had received prelecteal feed after birth in comparison to those children who became sick once and twice (73.8% and 69.5% respectively). The association was found not statistically significant.

Children who had two or more reason for their sickness, (82.3%) of children who had two or more reason for their sickness had received prelacteal feed in comparison to the children who had only one reason for their illness. This association also was not found statistically significant.

DISCUSSION

In our study prelecteal feeding practice was found (72.%) among mothers. A study done by Satapathy *et al*. (1984) reported that practice of prelacteal feeding was found (73%) among mothers in South Orissa.[9]

In our study, Ghutti (47.8%), honey (13.4%) and others (10.9) like tea, artificial milk, Gur (Jeggery) etc . had given as prelacteal feed. A study done by Gupta P. *et al* (2012) revealed that mugli ghutti/gripe water 55.1%,

and boiled water 49.4%, cow/buffalo's milk 4.7%, and honey 22.6% percent had given as Prelacteal feed.[10]

This study shows that among mothers who had female child, (26.8%) did not give prelacteal feed to their babies in comparison to those mothers who had male child (28.9%) which is also documented in studies by Gupta RK. et al.(2012).[11]

Lower socioeconomic group (37.5%) found to be practicing prelacteal feed to their baby as compared to the upper lower & lower middle class in our study. . A study done by Salve Dawal *et al. (2014)* revealed that lower socioeconomic group found to be practicing prelacteal feed to their baby as compared to the 11(42%) out of 26 in the upper socioeconomic class. Mothers who were less than 25 years of age, (28.1%) of them did not give prelecteal feed to their babies. The age group with highest number of respondent that practiced prelacteal feeding was 21-25 years (59.4%), while the age bracket of respondents with least practice of the prelacteal feed was 35-40 years.[12]

In our study, no statistical significant of mother & prelecteal feed practices was observed. A study conducted by Raval *et al*. (2011 found that (85.2%) illiterate mothers practiced more prelacteal feeding than literate mothers (50.9%).[13]

This study shows that the prelecteal feed was given by (81.0%) mothers who belonged to Muslim religion, which were more than 70.71% mothers of Hindu religion. A study done by Ahmad S et al.(2014) reveled that (32.00%) mothers initiated breast feeding after 24 hours.[14]

This study shows that among mothers who had normal delivery, (73.6%) of them gave prelecteal feed to their babies. A study done by Prior *et al*.(2012) in a meta-analysis concluded that cesarean delivery is associated with lower rates of early breastfeeding initiation.[15]

This study shows that (79.7%), mothers who had delivery at home, gave prelecteal feed which is more than those who had delivery in a hospital (67.0%). Giving birth at home create a favorable environment for different socio-cultural factors, like family influence and birth attendants that can influence mothers to practice prelacteal feeding. In addition, mothers who gave birth in health institution might be advised by health professionals about the risks associated with prelacteal feeding.

In our study, mother in laws who were less educated, less informed about the current practice of the breastfeeding were the main influence (73.4%) for the prelacteal feed. A study done by Khanal *et al*. (2011) revealed that the mother in laws who were less educated, were the main advocator (59.1%) for the prelacteal feed.[16].

This study shows that (76.9%) children who became sick for more than two times in last six months had received prelecteal feed after birth. Prelacteal feeding is discouraged because it limits the infant's frequency of suckling and exposes the baby to the risk of infection. [17] In Ethiopia children who received prelacteal feeding were 1.8 times more likely to be stunted than children who were not subjected to prelacteal feeding.[18]

This study shows that (82.3%) children who had two or more reason for their sickness had received prelecteal feed. It is a common misbelieve that milk comes only on the second or third day of life.[19]

CONCLUSION

This study revealed that there are very common prelacteal feeding pattern among infant in urban area of Meerut. These practices of prelacteal feeding do affect the growth parameters of a child. False beliefs and myths attached to child's feeding deeply rooted in all strata of community; need to be replaced by sound and scientific messages. It is suggested that mothers should be educated about adverse effects of prelacteal feeds. BCC should be targeted for tackling these traditional practices.

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A Cross Sectional Study to Estimate Prevalence and Maternal Risk Factors with Term Low Birth Weight Babies

Sridhar. D[1], A. Sai Ram[2], P. Narasimha Reddy[3]

[1]Assistant Professor;Community Medicine;ESIC Medical College,Sanath Nagar, Hyderabad;
[2]Assistant Professor; [3]Professor, Community Medicine;Kamineni Institute of Medical Sciences,Narketpally

ABSTRACT

Background: WHO defined Low birth weight (LBW) as birth weight less than 2500gms.Intra uterine growth retardation (IUGR), preterm birth or combinations of both are the common causes of LBW. In India two thirds of LBW cases are due to small for date. Infants with IUGR have greater morbidity and mortality than the appropriately grown infants. Also LBW is a major determinant of malnutrition in infancy, as 40% of LBW babies are malnourished at 1 year of age.

Methodology: 300 subjects were randomly selected from the department of obstetrics and paediatrics for measuring the prevalence of LBW and to correlate it with maternal risk factors.

Results: Prevalence of term LBW babies was found to be 36.30%. Mean birth weight was 2.52 kg. Lower socio economic class led LBW babies 82(52.9%), upper lower class 24(28.6%), and lower middle class 3(4.9%). Majority of the LBW babies were born to short stature(<145cms) mothers, which was statistically significant.

Keywords: *low birth weight, maternal risk factors, maternal morbidities*

INTRODUCTION

WHO defined Low birth weight as birth weight less than 2500grms.[1] In developing countries like India LBW is a serious problem. According to WHO, 20 million LBW patients are born each year, of which 95% are from developing countries, while India alone accounted around 40% i.e., 8 million infants. Of the 37 per 1000 IMR, LBW constituted 28%, while mortality rate in LBW babies being 57%.[2]

LBW is caused by Intra uterine growth retardation (IUGR) or preterm birth or combination of both, majority of them in developing countries being due to pre term birth. While in India two thirds of LBW are due to small for date.[3]

Infants with IUGR have greater morbidity and mortality than do appropriately grown, gestation matched infants. LBW is also a major determinant of malnutrition during infancy, as 40% of LBW babies are malnourished at 1 year of age. These babies have 2.3 times increased risk of mortality due to infections compared to normal birth weight babies after controlling the confounding variables. It is also a significant determinant of infant and childhood morbidity, particularly neuro developmental impairments such as mental retardation and learning disabilities.[4]

Recent evidence indicates that obesity, type 2 diabetes, and cardiovascular diseases are more common among adults who had IUGR at birth. Studies suggest that these may represent an example of "programming," in which an insult, when applied at a critical or sensitive stage in development, may result in a lifelong effect on the structure or function of the organism. There are numerous factors contributing to LBW, including both maternal and foetal factors.

MATERIAL AND METHOD

Objectives:

To measure the prevalence of LBW

To correlate LBW with maternal risk factors

Corresponding Author:
Dr. Sridhar D.
Assistant Professor, Community Medicine,
ESIC Medical College, Sanath Nagar, Hyderabad

A hospital based cross sectional study was conducted on randomly selected 300 subjects in the department of obstetrics and paediatrics. All live babies born at term and singleton pregnancy were included. Pre-term and Post-term babies, Intra-uterine deaths, Still-births, multiple pregnancies, newborns with congenital malformations were excluded from the study.

After taking Informed consent from all study subjects, pre tested questionnaire was introduced. Haemoglobin levels were recorded 15 days prior to delivery. Birth weight was measured within 1hr of birth with an electronic weighing machine. Preterm babies are excluded by assessing gestational age with the help of USG scan reports, EDD, and examination of the baby using new Ballard scoring system. Chi square tests were performed to evaluate the association of various maternal risk factors with LBW.

RESULTS

Of the 300 babies born during the study period, prevalence rate of term LBW babies was found to be 36.30% with mean birth weight of 2.52 kg.

Socio demographic factors: Table No 1

Prevalence of LBW babies was noticed more in exteme age groups (<19 yrs and >35yrs), Muslim and illiterate mothers. All these parameters were statistically significant.

Table No. 1: Socio demographic factors versus LBW

		Birth weight <2.5Kg	Birth weight >2.5Kg	P value
Maternal age	<19Yrs	33(62.30%)	20(37.70%)	<0.05
	19-35Yrs	72(30.00%)	168(70.00%)	
	>35Yrs	4(57.10%)	3(42.90%)	
Religion	Hindu	43(37.7%)	71(62.3%)	<0.05
	Muslim	51(48.6%)	54(51.4%)	
	Christian	15(20.0%)	60(80.0%)	
	Others	0(0%)	6(100.0%)	
Mother's Education	Illiterate	35(43.8%)	45(56.3%)	<0.05
	Primary School	66(41.3%)	94(58.8%)	
	High school	7(17.5%)	33(82.5%)	
	Intermediate	1(5.0%)	19(95.0%)	
Occupation	Agricultural worker	44(63.8%)	25(36.2%)	<0.05
	Daily wage labour	50(51.0%)	48(49.0%)	
	Service	8(11.1%)	64(88.9%)	
	Home maker	7(11.5%)	54(88.5%)	
Family Income	<2164	106(66.3%)	54(33.8%)	<0.05
	2165-6430	3(2.8%)	109(57.1%)	
	6431-10718	0(0%)	28(100.0%)	
Socio Economic Class	Lower Middle	3(4.9%)	58(95.1%)	<0.05
	Upper Lower	24(28.6%)	60(71.4%)	
	Lower	82(52.9%)	73(47.1%)	

Maternal factors: Table No.2

Grand multiparous women, birth spacing <18 months, pre-pregnancy weight <40 kg, weight gain during pregnancy <7 kg, Short stature (<145 cm), mothers with Hb <7 mg/dl, strenuous physical activity during pregnancy, tobacco/alcohol/toddy consumption during pregnancy had increased incidence of LBW with significant association. Equal distribution of LBW was noted in mothers who received protein and calorie supplementation and who didn't.

Table No. 2: Maternal Factors versus LBW

		Birth weight <2.5Kg	Birth weight >2.5Kg	Pvalue
Parity	Primi	34(33.7%)	67(66.3%)	<0.05
	Multi para(2-3)	17(18.7%)	74(81.3%)	
	Grandmulti para (4 or above)	58(53.7%)	5(46.3%)	
Birth spacing	<18 MONTHS	63(46.7%)	72(53.3%)	<0.05
	18-24 MONTHS	30(30.6%)	68(69.4%)	
	>24 MONTHS	16(23.9%)	51(76.1%)	
Prepregnancy birth weight	<40Kgs	79(94.0%)	5(6%)	<0.05
	>40Kgs	30(13.9%)	186(86.1%)	
Weight gain	<7Kgs	97(82.2%)	21(17.8%)	<0.05
	>7Kgs	12(6.6%)	170(93.4%)	
Height of mother	<145cm	106(83.5%)	21(16.5%)	<0.05
	>145cm	3(1.7%)	170(98.3%)	
No of antenatal visits	<4	105(59.7%)	71(40.3%)	<0.05
	>4	4(3.2%)	120(96.8%)	
Haemoglobin status of mother	<7mg/dl	54(100.0%)	0(0%)	<0.05
	7-9.9mg/dl	33(22.6%)	113(77.4%)	
	>9.9mg/dl	22(22.0%)	78(78.0%)	
ICDS beneficiary	Yes	6(136.5%)	106(63.5%)	>0.05
H/O strenuous physical activity	Yes	95(48.5%)	101(51.5%)	<0.05
Smoking/tobacco chewing	Yes	64(91.4%)	6(8.6%)	<0.05
Alcohol/toddy consumption	Yes	64(66.7%)	32(33.3%)	<0.05
Iron&folicacid	Yes	62(64.6%)	34(35.4%)	<0.05
Bad obstetric history	Abortions	10(35.7%)	18(64.3%)	>0.05
	Still Births	17(51.5%)	16(48.5%)	
	Neonatal deaths	9(33.3%)	18(66.7%)	
	H/O LBW baby	7(30.4%)	16(69.6%)	

Maternal Morbidities: Table No.3

Prevalence of LBW is more in mothers who had Tubercolosis followed by other infectious disorders. Highest percentage of LBW babies were born in mothers with chronic hypertension, pre-eclampsia and eclampsia(47.6%), followed by other systemic diseases.

Table No 3: Maternal morbidities versus LBW

		Birth weight <2.5Kg	Birth weight >2.5Kg	P value
Maternal infections	Fever	7(24.1%)	22(75.9%)	>0.05
	Malaria	9(31.0%)	20(69.0%)	
	TB	3(75.0%)	1(25.0%)	
	UTI	29(34.9%)	54(65.1%)	
	Bacterial vaginosis	13(35.1%)	24(64.9%)	
Systemic diseases	Chronichypertension, Preeclampsia, Eclampsia	10(47.6%)	11(52.4%)	>0.05
	Heart disease	8(30.8%)	18(69.2%)	
	Diabetes,GDM	10(38.5%)	16(61.5%)	
	Bronchial Asthma	8(33.3%)	16(66.7%)	
	Sickle Cell Anaemia	8(32.0%)	17(68.0%)	

DISCUSSION

In the present study, the prevalence of term LBW was high i.e., 36.3% compared to Telangana state(8.6%). According to NFHS 3 data prevalence of LBW in India was 21.5%, Andhra Pradesh accounting for 19.4%.[2] This is comparable to results of Noor N et al[5] and Juneja et al[6]. This can be attributed to locality and referral hospitals receiving high risk pregnancy cases from local and area hospitals.

Association between extreme age group (<19yrs and >35 yrs) and LBW was similar with findings of Kaur S et al[7], Aggarwal A et al[8] and Dubey M et al[9] but was not consistent with the study of Prudhivi S et al[10]. Soujanya M et al[11] showed significant association. Early age at marriage and illiteracy in women will make them physically and physiologically immature for reproduction and hence resulting LBW babies. Women >35 years were mostly grand multi paras with increased incidence of complications like hypertension, diabetes etc, this may augment the risk of birth of LBW baby in them.

Muslim religion was significantly associated with LBW babies, similar to the findings of with Dubey M et al[9], Raghunath D et al.[12] Prudhivi S et al [10] , while Kaur S et al[7] found no significance. This may be due to Muslim population belonging to lower socioeconomic status.

Grand multi and primi paras association was similar with findings of Kaur S et al[7], Prudhivi S et al[10] and Dubey M et al[9] and not similar with Sumana M et al.[13]Primi paras will have utero placental insufficiency, structural factors which limit uterine capacity in the first pregnancy, so first born infants may be exposed to a different maternal immune environment, contributing to relative growth restriction, compared to subsequent pregnancies. Grand multi para had higher incidence of pregnancy related complications leading to LBW.

Less birth spacing (<18 months) association with LBW is consistent with findings of Kaur S et al[7], Sumana M et al[13] and Giri A et al[14] but not with findings of Raghunath D et al.[12] This can be explained by the deterioration of nutritional status in the present pregnancy, because of the previous delivery and breast feeding.

Pre-pregnancy weight <40kgs led to LBW and it was similar to results of Prudhivi S et al[10] and Thombre PS et al[15] but not with the findings of Raghunath D et al.[12]It can be due to malnourishment and less body stores of proteins and fats leading to LBW.

Less weight gain during pregnancy(<7 kg)and its association to LBW was similar to the findings of Rajashree K et al[16], Raghunath D et al.[12]It can be due to factors like inadequate intake of nutritious food, hard manual labour during pregnancy etc.

Short stature (145 cm) association to LBW is similar to findings of Sumana M et al[13], Prudhivi S et al[10] and Agarwal A et al[8] but not with Soujanya M et al.[11]Maternal height though influenced by heritable factors or other environmental factors, under nutrition appears to play an important role leading to short maternal height and LBW.

Literacy status of mothers was comparable with the findings of Kaur S et al[7], Raghunath D et al[12] Sumana M et al[13] and Prudhivi S et al .[10] But Reddy RS et al [18] didn't find any significance. Educated mothers may have an increased awareness about the health care services and pregnancy care.

Mother's occupation was comparable with the findings of Rajashree et al[16] and Shahnawaz k et al[17] but not with study findings of Reddy RS et al.[18] It can be attributed to an increased physical activity and less rest when compared with homemakers.

Less family income findings are similar with Reddy RS et al[18] and Sunilbala K et al[19] but not with the findings of Dandekar RH et al.[20] Low income can cause stress on pregnant women forcing them to work and also can be the reason for reduced intake of nutritious food during pregnancy.

Socioeconomic class association with LBW was comparable with findings of Sahu KK[20], Agarwal A et al[8], Raghunath D et al[12], Thomre PS et al[15] and Bendhari ML et al[21] and not consistent with Shahnawaz k et al[17] .They have not found significance between socio economic status and LBW. Low socioeconomic status indirectly linked to infections, low birth spacing etc.

Antenatal visits less than 4 led to significant association and it is similar to results of Dubey M et al[9], Thombre PS et al[15], Kaur S et al[7] but not with Dandekar RH et al.[19] Proper anti natal care can decreases modifiable risk factors like infections, anemia, hypertension etc leading to decrease in LBW.

LBW significantly associated with maternal severe anemia. This is consistent with the findings of Raghunath D et al[12], Sahu KK[20] and Kaur S et al[7].Severe maternal anaemia limits maternal oxygen uptake leading to decrease in oxygen delivery to foetus and consequently leading to foetal growth restriction.

ICDS beneficiaries association was not similar with Dubey M et al.[9] They found reduced percentage of LBW in mothers who had consumed an extra meal during pregnancy. Supplementary meal provided to the mother may not be eaten by the mother alone in the family due to poor socioeconomic conditions.

Physical activity of mothers and its association with LBW was similar with results of the Kaur S et al[7], Thomre PS et al[15] and Sahu KK et al[20]. Dandekar RH et al[19] couldn't find any significance. Strenuous physical activity can alter the balance in mothers with marginal nutritional deficiency and can lead to LBW babies.

LBW and smoking/chewing tobacco during pregnancy showed significant association. This is consistent with Giri A et al[14], Agarwal K et al[8], Dubey M et al[9], Bendhari ML et al[21], and Johnson CD et al[22] but not with the Raghunath D et al[12] and Sahu KK[20]. Nicotine on placental vasculature leads to hypoxia and foetal growth retardation.

Alcohol/toddy consumption during pregnancy significantly leads to LBW. Nykjaer C et al[23] found similar finding. Most of them consumed because alcohol can give fairer babies and also increases amniotic fluid.

LBW babies were born to those who didn't taken iron and folic acid supplementation. Raghunath D et al[12] and Giri A et al1[4] and Sahu KK[20] found similar readings. Thomre PS et al [15], Dandekar RH et al found opposite readings. This is because mothers were not aware of the benefits and also reduced compliance.

Bad obstetric history association was similar with the findings of Raghunath D et al[12]and Bendhari ML et al[21] who did not find any statistical significant association. But Sumana M et al[13] and Thomre PS et al[15] found significant association between bad obstetric history and LBW. History of still births is comparable with Negi KS et al[24] findings.

Maternal infections and LBW association is similar with the Soujanya M et al[11] findings. Tuberculosis during pregnancy lead to high incidence of LBW babies compared to other maternal infections during pregnancy. Bates M et al[25] documented similar findings.

Chronic hypertension, pre-eclampsia and eclampsia were major variables that led to LBW compared to other systemic diseases like diabetes, bronchial asthma, sickle cell anemia and heart diseases during pregnancy. It is comparable to the findings of Kumari PR[26] who did not find significant association between hypertension and LBW. Findings of Prudhivi S et al[10], Raghunath D et al[12], Bendhari ML et al[21], found significant association between hypertension and LBW.

Conclusion: Health education, socioeconomic development, maternal nutrition, and increasing use of health services during pregnancy are important in reducing LBW.

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Role of Videofluroscopy in Rehabilitation of Dysphagia– A Case Study

Kevin Gautham M[1], Vijay Kumar K V[2], Shankar V[3]

[1]Intern, [2]Senior Lecturer, Department of Speech Language and Hearing Sciences, [3]Professor, Department of Neurology, Sri Ramachandra University

ABSTRACT

Dysphagia, described as difficulty in swallowing is a commonly seen post stroke. Individuals with stroke experience difficulty in cognition, language and swallowing. Not many centres in India offer a comprehensive dysphagia management due to lack of infrastructures and professionals working in the domain of swallowing disorders. Visualisation techniques are used to detect aspiration and swallowing disorders. This helps Speech Language Pathologists (SLPs) to facilitate modification of therapeutic manoeuvres to the need of the patient. These techniques not only help in planning treatment, but also provide information on treatment efficacy and decision making on initiating oral feeds. This study focuses on demonstrating the use of Videofluroscopic swallow study (VFS) in a 57 Year old patient, medically diagnosed with left lateral medullary infarct with dysphagia. This study throws light on usage of VFS in modifying therapeutic manoeuvres to improve the patient's quality of life.

Keywords: *Dysphagia ,Videofluroscopy , Therapeutic manoeuvres, Speech Language Pathologist, Quality of life.*

INTRODUCTION

A 57 Year old male patient was medically diagnosed with left lateral medullary infarct, along with systemic hypertension and aspiration pneumonia. The patient's nutritional needs were met through nasogastric tube since February 22, 2017. The patient was consulted and clinically examined by the Speech-Language Pathologist on March 09, 2017. He was observed to have frequent throat clearing, reduced hyolaryngeal elevation during dry/saliva swallow, presence of a gurgly voice and multiple swallow attempts. His voice was breathy which suggested the presence of vocal cord palsy. Fiberoptic Endoscopic Evaluation of Swallowing (FEES) was advised before initiating therapy but was neglected due to the patient's personal reasons and he was reluctant to attend regular speech and swallow therapy to promote safe swallow. A home plan was structured and was given to the patient after a re-assurance from him for regular follow up. The patient followed up on the last week of March 2017 and showed no signs of improvement in swallowing. He consented to attend speech and swallowing therapy twice a week but refused to undergo any formal instrumental evaluation.

Therapeutics focused on strengthening the base of tongue, by pushing the tongue against the palate and Masako manoeuvre (gently biting the tongue and attempting to swallow dry air). It was initially difficult for the patient to achieve hyolaryngeal elevation using Masako manoeuvre and complained of inability to do the exercise. The base of tongue exercises along with breath holding and breath holding with gentle cough to facilitate vocal adduction were practised for ten sessions. It was observed that the patient had hyolaryngeal elevation (but clinically reduced in functioning and not adequate on three finger test).

After the above mentioned ten sessions of therapy the patient was persuaded to undergo a visualisation technique (either FEES or VFS) to understand his

Corresponding Author:
Vijay Kumar K V
Senior Lecturer,
Department of Speech Language and Hearing Sciences
Sri Ramachandra University
Email: vijaykumarkv@yahoo.in

swallow physiology. The advantages of visualisation were discussed in detail with the patient. The patient then opted to undergo VFS considering that, FEES is an intrusive procedure. VFS is a radiological examination for assessing swallowing functions. The examination was done on June 02, 2017 by using soft solids and liquids (banana and water respectively mixed with Barium Sulphate). The examination was carried out in lateral and anteroposterior view.

On examination; lip closure, tongue elevation, chewing and anteroposterior movement of tongue were present (for soft solids and liquids). There was a delay in the oral transit time. Oral residue (pocketing), multiple swallow, coughing (during and after swallowing), and reduced hyolaryngeal elevation were observed.

It was also noted that the patient also had premature spillage. In the pharyngeal phase, pooling was observed in the valleculae and pyriform sinus. Relaxation of cricopharyngeus muscle was not observed. Efforts were made by the patient to regurgitate. Aspiration for liquids was also an important finding in this individual.

The results of VFS study were discussed with the patient and the treatment was planned based on the same. The therapeutic manoeuvres were modified to benefit the patient's recovery. The following exercises and manoeuvres were taught to the patient, each of them having rationale behind it.

1. Shaker's manoeuver was carried out to facilitate relaxation of the criocopharyngeus muscle. It also helps in increasing its flexibility and improving in strength.
2. Masako manoeuver was prescribed to strengthen the pharyngeal muscles.
3. Mendelsohn's manoeuvre was prescribed to facilitate hyolaryngeal elevation.
4. Pitch glide to facilitate pharyngeal movement.
5. Effortful Swallow helps in increasing the posterior movement of the tongue. This manoeuvre is to overcome the pooling in the valleculae.
6. Supraglottic swallow was done due to aspiration during swallowing. Voluntary holding of breath adducts the vocal cords, hence gaining control over aspiration before and during swallowing.
7. Breath holding exercises were also done for vocal adduction to facilitate voicing and preventing food to enter the airway.

These exercises were practiced for twelve sessions of therapy. Apart from therapy sessions, the patient was advised to maintain a record of practise sessions at home. The patient practised these exercises and manoeuvres 4 – 6 times a day. After twelve sessions, when hyolaryngeal elevation was clinically observed, oral trails of soft solids and puree (pongal and thick curd) were tried using supraglottic swallow modified to the left side was recorded on June 29,2017. It was observed that he was tolerating oral trials. It was also brought to the notice of SLPs few oral trial of liquid was attempted successfully at patient's home. The patient was assessed with VFS again on July 18, 2017 to document the prognosis attained by him over the modification of the therapeutic manoeuvres. On examination, the patient was given liquids and semi-solids (water and pongal; south Indian dish, respectively). First, the water was mixed with Barium Sulphate and was attempted. The patient did not find it difficult to swallow and no signs of aspiration or any oral/ pharyngeal residue/ pooling were observed. Secondly, pongal was given and it was observed that the patient was able to have a safe swallow without multiple swallow trials and residue/ pooling.

Based on the evaluation, the patient was asked to continue the swallowing manoeuvres and also accommodate semi-solid and puree (rice/pongal and curd) to the diet by oral intake in smaller proportions for breakfast. He was advised to slowly increase the portion of the food for intake every week. From only breakfast, the patient began oral feeds for lunch. Liquids were also advised to be included in the diet by oral intake. In the following weeks, the patient could take semi solid, puree, and liquids. Until then he was advised to use NG tube for medicines. He was then asked to start taking medication orally after discussing with the primary physician. The patient showed improvements in therapy and started to intake his food orally everyday (which include his breakfast, lunch, dinner, hydration and medication). The Nasogastric tube was removed on July 31, 2017after careful assessment of SLP and Neurologist.

DISCUSSION

Dysphagia is seen in both acute ischemic and haemorrhagic strokes. The occurrence of dysphagia

varies depending on time of evaluation, and the measures used. It is estimated that 37 to 78% of stroke patients encounter dysphagia [1,2].Aspiration pneumonia is a common threat to medical, allied health professionals and patients post stroke. This can cause greater morbidity, mortality, and increased hospital stay [3,4]. Dysphagia screening protocols are clinically used to detect dysphagia and aspiration at bedside [5,6]. Although this conveys the information of a patient at risk of aspiration, these bedside evaluations fails to provide information on silent aspiration, swallow transit time, pooling in valleculae and pyriform sinus etc. These information are important for a Speech Language Pathologist (SLP) to modify the treatment manoeuvers to facilitate safe swallow.

A good visualisation technique provides this information to SLPs who work in the field of swallowing disorders. VFS is a commonly used instrumental evaluation of swallow among oropharyngeal dysphagia patients. This provide details on the nature and severity of swallowing difficulty and deliver baseline of dysphagia therapy[7] .Several manoeuvers, exercises and stimulation are provided to patients to modify physiology of swallowing in individuals with dysphagia. Manoeuvers like Mendelsohn's, Shaker's, Masako and facilitatory approaches like head tilt/ head turn during swallow, suraglottic swallow are carefully selected based on the swallowing physiology. Hence the study aims to document the role of VFS in the management of dysphagia by tailoring the manoeuvres and exercises to the need of the patient to facilitate safe swallow.

Management of Dysphagia is a 'Team Event' including many professionals contributing in the treatment of the given patient [8] .Speech Language Pathologists play a central role in assessment and management of dysphagia with the help of visualisation techniques like VFS. Modification of therapeutic manoeuvres demonstrate good prognosis and safe swallow among individuals with dysphagia. For over three decades VFS is considered gold – standard in the assessment of dysphagia. Considering the limitation like portability and vitals of patient, one may use this instrument for dysphagia assessment on individuals who are medically stable and mobile [9] .

Teaching point: Videofluroscopic swallow study has showed to be efficient and could be incorporated in rehabilitation of dysphagia. Modification of therapy is possible only after assessing swallowing physiology using visualisation technique. Speech-Language Pathologists play an important role in rehabilitation of dysphagia. Videofluroscopic swallow study also helps in decision making on nasogastric tube removal and initiating safe oral feeds after rehabilitation.

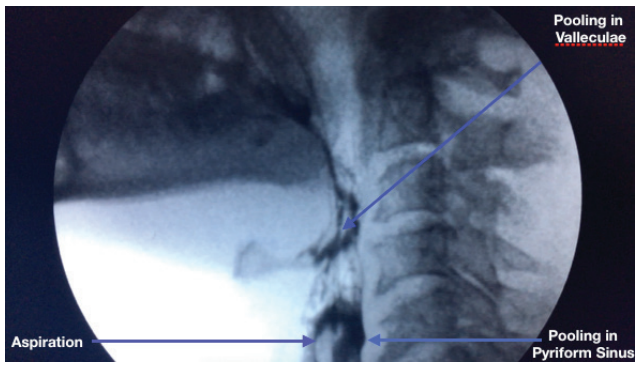

Figure 1: Lateral view demonstrating signs of dysphagia

Figure 1 demonstrates the presence of aspiration, pooling in valleculae and pyriform sinus.

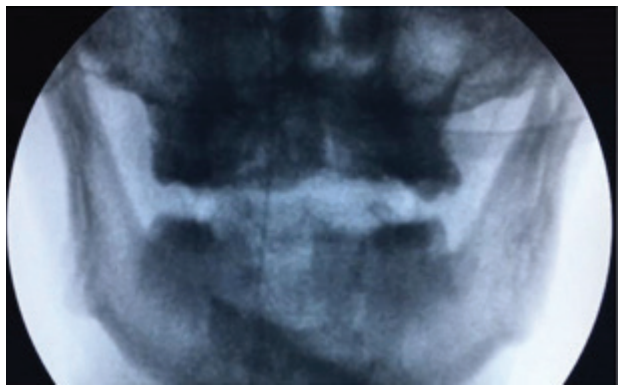

Figure 2(a) Anteroposterior view

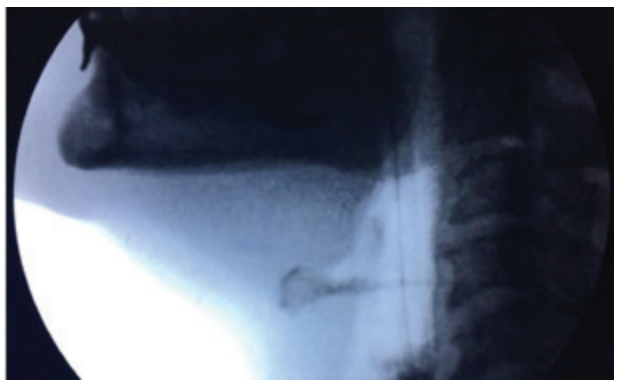

Figure 2(b) Lateral view

Figure 2 a and b confirms the findings of no aspiration, no pooling in valleculae and pyriform sinus, no oral or pharyngeal residue.

Table 1: Result of VFS evaluation of swallow (Pre-therapy)
Parameters of Swallowing

Lip Closure		Present
Oral propulsion of bolus		Present
Velum closure (Posterior Pharyngeal Walls)		Inadequate
Hyolaryngeal Elevation	Lid action of epiglottis	Absent
	Movement of hyoid (Anterior)	Inadequate
	Movement of hyoid (Posterior)	Inadequate
	Pharyngeal Transit Time	Delayed
Relaxation of Cricophrayngeus muscle		Present
Multiple Swallow		Present
Pooling in Valleculae		Present
Pooling in Pyriform Sinus		Present
Aspiration		Present

Table 2 Result of VFS evaluation of swallow(Post-therapy)
Parameters of Swallowing

Lip Closure		Present
Oral propulsion of bolus		Present
Velum closure (osterior Pharyngeal Walls)		Adequate
Hyolaryngeal Elevation	Lid action of epiglottis	Present
	Movement of hyoid (Anterior)	Adequate
	Movement of hyoid (Posterior)	Adequate
	Pharyngeal Transit Time	Immediate (Less than 1 Sec)
Relaxation of Cricophrayngeus muscle		Present
Multiple Swallow		Absent
Pooling in Valleculae		Absent
Pooling in Pyriform Sinus		Absent
Aspiration		Absent

Consent: Did the author obtain written informed consent from the patient for submission of this manuscript for publication? YES

Conflict of Interest: The authors have no conflict of interest in this publication.

Declaration: This article has not been published in any journal. This was carried out as a part of student clinical case presentation. This study did not receive funding from any agencies.

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System Modeling for Forecasting of Diabetes Prevalence

Vinaytosh Mishra[1], Cherian Samuel[2], S K Sharma[3]

[1]Research Scholar, [2]Assistant Professor, [3]Professor, Industrial Management Department of Mechanical Engineering Indian Institute of Technology (BHU), Varanasi, INDIA

ABSTRACT

The computer simulation models can help understanding the progression of a chronic disease like diabetes. These models allow researchers and decision makers to forecast disease progression and resource required for managing it. The simulation tools presently used for planning and evaluating the health policy are inadequate for capturing the dynamic complexity of chronic disease involving the large delays between causes and health consequences. The paper develops and uses system dynamics for diabetes system modeling. The system dynamics approach is able to address the complexity of the chronic disease like diabetes. The study further forecasts the prevalence of diabetes by the year 2030, using the case of an ancient city of Varanasi.

Keywords: *Chronic Disease Modeling, System Dynamics, Healthcare, Diabetes Prevalence*

INTRODUCTION

Diabetes is rising as an epidemic in many parts of the world. The rate of growth of diabetes has earned a tag of world's diabetes capital of India. In the year 2014, there were 387 million individuals with diabetes, and this number is estimated to become 592 million by 2035[1]. The major reasons for this increasing prevalence of diabetes are a sedentary lifestyle, increased urbanization and increased life expectancy. The South Asian population is genetically at high risk of developing diabetes[2-3]. Multiple complications like retinopathy, nephropathy, neuropathy, cardiac risk and diabetes foot occur with the progression of the disease. The cost of diabetes management increases many folds with multiple complications[4]. The close monitoring and awareness are critical in diabetes management. For planning a prevention program, we need to forecast the resource requirement. The tools like system dynamic can help in predication and capacity planning for diabetes management.

Diabetes Mellitus: Diabetes mellitus (DM), commonly known to as diabetes, is a group of metabolic disorders in which there is a persistent increased level of glucose in the blood. It is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. The prevalence of diabetes in India ranges from 5–17%, with a higher percentage, is reported in the southern part of the country and in urban areas[5-12] .As per INDIAB study done by Indian Council of Medical Research diabetes, the northern regions report a higher prevalence of diabetes than southern regions. The table below summarizes the result of INDIAB study Phase-I completed in the year 2011[13].

Table 1: Prevalence of Diabetes in Year 2011

Region	Prevalence	Confidence Interval
Tamil Nadu	10.4%	(95% CI: 9.0-11.0%)
Jharkhand	5.3%	(95% CI: 4.5-6.1%)
Chandigarh	13.6%	(95% CI: 12.8- 15.2%)
Maharashtra	8.4%	(95% CI: 7.5-9.3%)

Source: ICMR–INDIAB study (2011)

The second phase of the INDIAB study completed in July 2013 is more comprehensive and includes fifteen states of the country. The overall prevalence of diabetes in all 15 states of India was estimated as 7·3% (95% CI 7·0–7·5). The Figure 1 below suggests that state with higher GDP has a higher prevalence of diabetes. The data below made us believe that the prevalence of diabetes is dependent on the economic growth of the region[14].

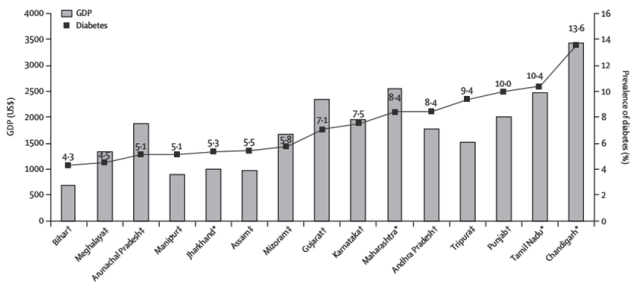

Figure 1: Prevalence of diabetes and GDP per capita by state

The National Urban Survey conducted across the metropolitan cities of India reported similar trend: 11.7 per cent in Kolkata (Eastern India), 6.1 per cent in Kashmir Valley (Northern India), 11.6 per cent in New Delhi (Northern India), and 9.3 per cent in West India (Mumbai) compared with (13.5 per cent in Chennai (South India), 16.6 per cent in Hyderabad (south India), and 12.4 per cent Bangalore (South India)[15].

There have been researchs to predict the prevalence of diabetes in a different part of the country, but there is lack of any comprehensive study to measure the prevalence of diabetes in Varanasi and surrounding areas. The government and healthcare providers still use conventional methods of evaluating and managing each aspect of the disease separately. The tools presently used are diagrammatic logic models and epidemiological forecasting models. These tools are not capable of addressing the dynamic complexity of diabetes. The silo approach to management is not appropriate for managing the disease involving a long delay between causes and the health events. It is time to adopt an integrated system-wide approach in prevention and management of diabetes. This paper attempts to address this gap.

METHOD

The method used in this research is computer simulation method known as System Dynamics. The simulation is a method that allows experiment on the system through a computer based model of the system[16]. System dynamics model has unique ability to mimic the real world scenario. It can address the complexity, nonlinearity, and feedback loop structure attached to the healthcare system[17]. The system dynamics (SD) model is used for the study because it is simple, powerful, useful and natural for addressing the dynamic complexity of health care system.

The researchers have used System Dynamics model for developing tools for chronic disease prevention and control. The research adopts the diabetes and Prediabetes stock and flow model developed by Homer et al for development of model for predicting the state of diabetes in Varanasi by year 2030. A focus group of eight experts (clinicians and researcher) was constituted for the estimation of parameters and system components. The size of eight participants is appropriate for the study as a group with higher than eight members, is hard to handle[18].

Model Structure: The suggested in studies group strived to achieve a diabetes system models having[19] :

1. Generic enough to be adaptable for another chronic disease.
2. Realistic enough to reproduce the historical data derived from other epidemiological studies.
3. Comprehensible enough to test various policy scenarios.
4. Broad enough to include various policy measures considered during the third meeting.
5. Doesn't require guess work beyond what focus group agrees upon.

The study adopts a model (Homer et al, 2004) as described in Figure 2 as preliminary stock and flow model after various iteration of the focus group we were able to finalize the customized stock and flow model for the population being studied[19]. (Undx: undiagnosed; Dx: diagnosed; PreD: prediabetes; D: diabetes)

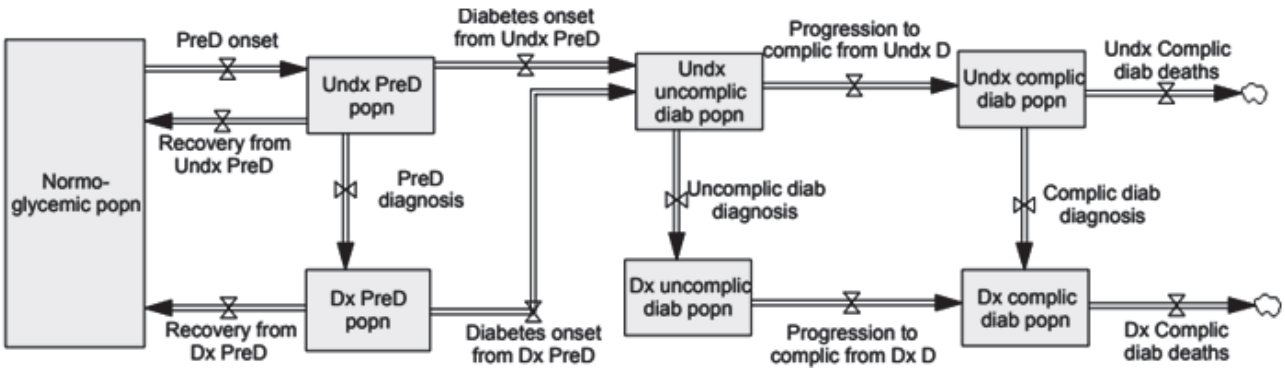

Figure 2: Preliminary Diabetes and Prediabetes Population Stock and Flow Structure

The system can be divided into two parts namely upstream (prevention related variables) and downstream (treatment related variables).Using the secondary research and input of the Focus Group the parameter values and initialization values very estimated. The proposed system dynamics model uses availability & affordability of preventive care, testing of diabetes and prediabetes, availability of qualified doctors and support staffs, availability of hospitals, health insurance and government subsidies as the policy variables. The model uses following steps in the process:

Initialization Phase:

1. Create a list of all equations in required order of evaluation.
2. Calculate initial values for all stocks, flows and auxiliaries (in order of evaluation).

Iteration Phase:

1. Estimate the change in stocks over the interval DT (Step size).
2. Calculate new values for stocks based on this estimate.
3. Use new values of stocks to calculate new values for flows and auxiliaries.
4. Add DT to simulation time.
5. Stop iterating when Time >= StopTime

The year 2017 is taken as year Zero and the step size used is a year. The numerical integration method used for the model is Euler Method. The reason for selecting the method is its simplicity and availability as inbuilt option in the Vensim tool. The Euler Method uses following steps in processes of calculating the value of stock:

$$\Delta \text{ Stock} = DT \times \text{Flow at begining at DT}$$

$$\text{Stock}_t = \text{Stock}_{(t - DT)} + \Delta\text{Stock}$$

$$\text{Stock}_t = \text{Stock}_{(t - DT)} + DT \times \text{Flow}_{(t - DT)}$$

Please refer exhibit 1 for the final system dynamics model for prediction of prevalence of diabetes.

RESULTS

The parameters for the model developed were estimated and the system was tested whether it mimics the other reliable studies. The validation was done using the information collected through secondary research. The results of the study are summarized in Table-2 below.

Table 2: Results of the Simulation Run

Year	Undx Uncomplic diab popn	Dx Uncomplic diab popn	Undx Complic diab popn	Dx Complic diab popn	Total
2017	50000	50000	25000	25000	152017
2022	85014	166727	20594.4	109643	384000.4
2027	63585.4	219735	16302	204169	505818.4
2030	**52985.7**	**215808**	**13565.6**	**235190**	**519579.3**
2032	46904.2	206247	12015	244921	512119.2
2037	34335.3	172042	8816.56	240683	457913.9
2042	24953.1	135325	6415.86	212248	380984
2047	18073.6	102965	4649.84	175220	302955.4
2050	14881.1	86515.6	3829.26	152854	260130

The prevalence of complicated and uncomplicated diabetes by year 2030 with be 0.52 million in Varanasi. At present growth rate (1.19%) the population of Varanasi will be 1.46 million by years 2030. This data gives us the prevalence of diabetes by years 2030 at 35.64 %., which is very alarming. To achieve the doctor patient ratio of 1:1000 and bed patient ratio of 1:1000, we will need 520 doctors as well as beds for diabetic population alone. Moreover, this infrastructure is needs to be specialized in diabetes care to provide health care effectively. As depicted in Figure 3, the prevalence of diabetes in Varanasi will increase and peak by year 2030 and will decrease thereafter.

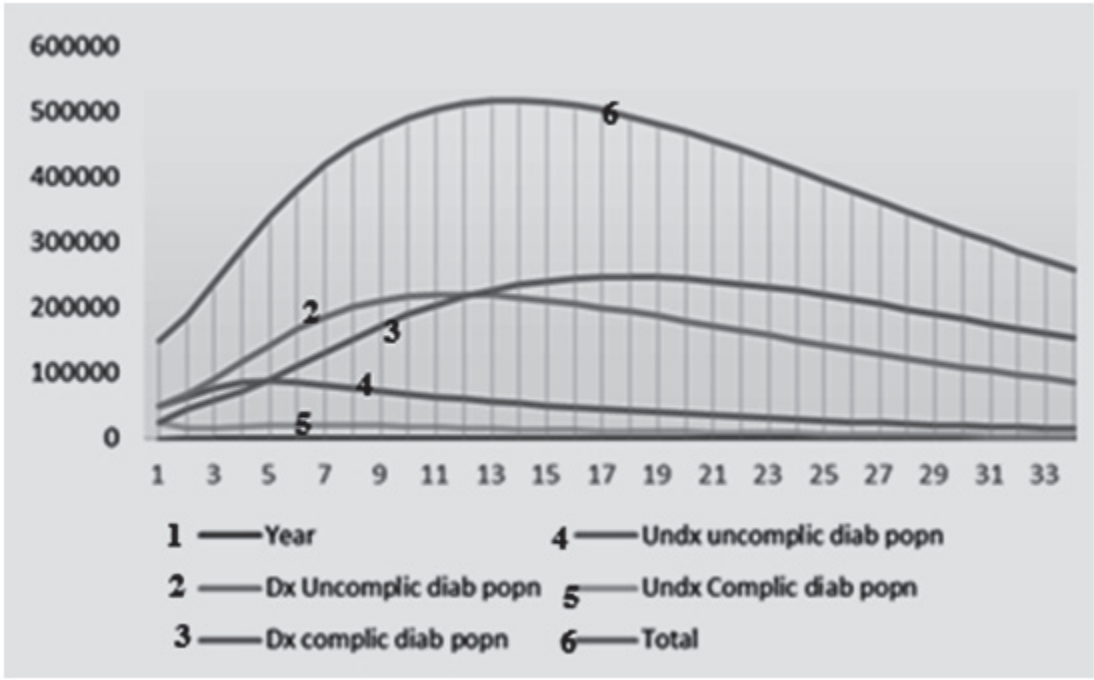

Figure 3: Prevalence of Diabetes in Varanasi

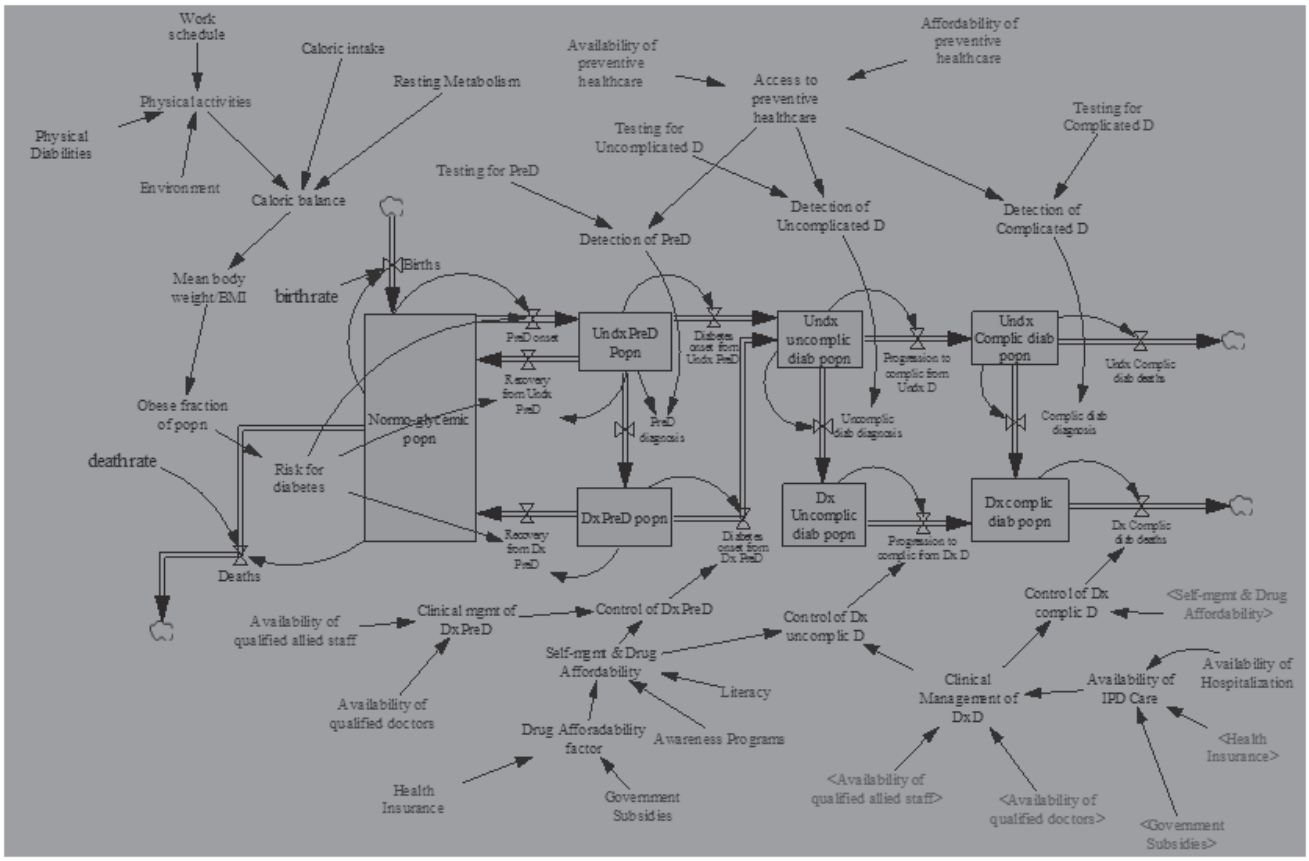

Exhibit 1: System Dynamics Model for Prediction of Diabetes Prevalence

CONCLUSION

The model described in this paper can help policy makers design strategies for addressing the burden of diabetes at national and regional level. Though the simulation is done for the city under study, the model can be easily tuned to get a picture at national level. The simulation model gives prevalence of diabetes in years

2030 as 0.52 million and 35.64 %. The study suggests involving 520 specialized doctors in management of diabetes. Assuming fifty beds per hospital, the city will need opening additional nine district level hospitals (presently two) to support this surge of diabetes cases. The same infrastructure can be utilized for proving the healthcare for other disease as well.

Ethical Clearance: The study use secondary research and focus group discussion for data collection. Since, the study uses the data freely available in public domain it don't need ethical clearance.

Source of Funding: Self, there is not any source of funding to be declared.

Conflict of Interest: Nil, there is not any conflict of interest to be declared.

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Knowledge, ARV Access and Compliance of PLHIV before and after Providing Health Education Based on Community ARV and Adherence Support Group (Caasg) in Bulukumba Regency

Andi Suswani[1], AA Arsunan[2], Ridwan Amiruddin[2], Andi Zulkifli[2], S. Ariyanti[3]

[1]Student Doctoral Program Faculty of Public Health UNHAS Makassar, [1]Lecturer at High School of Health Sciences Panrita Husada Bulukumba; [2]Professor of Epidemiology Faculty of Public Health UNHAS Makassar; [3]Senior lecturer at Faculty of Nursing UNHAS Makassar

ABSTRACT

HIV and AIDS is a global and very complex disease which in handling the need for active health education involving People living with HIV (PLHIV). Knowledge, access to ARVs and adherence are very important factor in maintaining the quality of PLHIV. This study aimed to analyze differences in knowledge, access to ARVs and adherence before and after the provision of health education interventions based on ARV and adherence Support Group (CAASG) in existing PLHIV in Bulukumba.

The study design was Quasi Experiment using pre-test and post-test with Control Group Design. The study group was divided into 2 (two) groups consisting of group I and group II. The group I was given a health education through lectures and modules, while the group II was given a health education with a leaflet. The number of samples were 42 respondents consisting of group I with the sample counted 24 people and the group II with the number of samples were 18 people.

Based on Cochrane test results showed that there are differences of knowledge in treatment groups 1&2 (p1= 0.004, p2= 0.026), difference of ARV access (p = 0.004) and difference of adherence in group 1 and 2 (p1= 0.001, p2= 0.015) and no significant difference in group II for ARV access

It is suggested to maintain the group that has been formed in order to increase knowledge, experience no barriers to accessing ARVs and have and maintain compliance with the treatment to obtain a better quality of life for PLHIV in Bulukumba.

Keywords: *Health education, HIV and AIDS, knowledge, ARV access, adherence*

INTRODUCTION

HIV and AIDS are major health problems and become one of the world's most serious health challenges, to date there are currently about 36.9 million people living with HIV (PLHIV) in the world, 17.1 million are unaware of the presence of HIV virus in the body they needed HIV testing services, 22 million did not get access to antiretroviral treatment including 1.8 million children[1-3]. In 2030, deaths due to HIV and AIDS continue to increase[4].

Sub-Saharan Africa is the largest contributor to HIV (71%), Asia Pacific (14%). In the Southeast Asian region, Indonesian adults aged 15-49 years who contracted the HIV virus reached 0.5 / 1000 uninfected populations, the highest compared to Myanmar, Malaysia and Vietnam which only reached 0.3/1000 population[3,5].

The second largest province of HIV, after Papua in eastern part Indonesia, is South Sulawesi[6] and Bulukumba is one of the districts in South Sulawesi, which ranks third in HIV and AIDS after Makassar and Pare -Pare which have number of HIV and AIDS sufferer as many as 188 people with the highest percentage in man that is equal to 110 people (60,6%), in woman counted 68 (37%) and transvestite counted 4 people (2,42%) with factor the highest risk of transmission in heterosexuals (58.7%), IDU's (37.1%) and pregnancy/

breast milk (4.19%) with the highest number of cases in Ujung Bulu sub-district as many as 93 cases (51%) and the lowest in Herlang sub-district (2%). One form of prevention in a national strategy undertaken in key populations is behavioral change interventions[7]. The process of changing one's behavior can be achieved through health education[8,9].

Health education is a process of change in oneself where the process of change that influences one's behavior includes the components of knowledge, attitudes, or practices related to the purpose of healthy life both individually, group and society[8,9]. The purpose of this research is to know the effect of health education based on Community ARV and Adherence Support Group to knowledge, access of ARV and medication compliance to PLHIV in Bulukumba in 2016.

MATERIAL AND METHOD

The study design was Quasi Experiment using pre-test and post-test with Control Group Design. The study group was divided into two groups consisting of treatment group I and treatment group II. Treatment group I was given health education through lectures and modules, while the treatment group I l given health education leaflets. This research was conducted in Ujung Bulu Subdistrict. The population of the study were all PLHIV in Bulukumba Regency were 189 people. The sample chosen using purposive sampling technique and collected as many as 42 PLHIV. Univariate data processing analyzed and presented in the form of a frequency distribution table, using a bivariate test Cochran test and Mc-Nemar.

RESULTS

Characteristic of PLHIV Respondents: Based on Table 1, it can be seen that most respondents are in the adult age group with the number of 17 people (70.8%) in the group I and 16 people (88.9%) in group II, with the highest percentage of male sex with the number of 17 people (70.8 %) in the treatment group I and 11people (61.1%) in the second treatment group), with the most senior secondary education being 1 to 3 people (54.2 %) in the treatment group I and 7 (38.9%) with nursing diploma in the treatment group II. Respondents mostly worked with percentages with 20 persons (83.3 %) in the treatment group I and 16 (88.9%) in the 2nd treatment group, with the highest married status with unmarried category as big as 11 people (45.8%) in the treatment group I and 13 people (72.2%) in the treatment group II. The largest mode of transmission through heterosexuals by percentage 45.8 % in group I and 61.1% in group II, and most had public insurance with 87.5% percentage in group I and 88.9% in group II.

Table 1: The characteristic of participant in Bulukumba Regency

Characteristic	Group I	%	Group II	%
Sex				
Male	17	70.8	11	61.1
Female	7	29.2	7	38.9
Age Group				
Adolescent	4	16.7	2	11.1
Adult	17	70.8	16	88.9
Elderly	3	12.5	0	0
Education				
High	2	20	8	80
Low	22	68.8	10	31.3
Occupation				
Occupied	20	83.3	16	88.9
Non-occupied	4	16.7	2	11.1
Marriage status				
Single	11	45.8	13	54.2
Married	8	72.7	3	27.3
Divorced	5	71.4	2	28.6
Mode of transmission				
Heterosexual	11	45.8	11	61.1
IDU	7	29.2	5	27.8
LSL	6	25	2	11.1
Assurance				
Yes	21	87.5	16	88,9
No	3	12.5	2	11.1
Total	24	100	18	100

Distribution of knowledge changes, ARV access, and PLHIV compliance before and after the provision of community-based ARV & Adherence Support Group health education in each group.

Table 2: The changes of knowledge between intervention groups

Groups	KNOWLEDGE																p
	Pre-Test				Post-Test I				Post-Test II				Post-Test III				
	High	%	Low	%	High	%	Low	%	High	%	Low	%	High	%	Low	%	
Group I	12	50	12	50	14	58.3	10	41.7	15	62.5	9	37.5	20	83.3	4	16.7	0.004
Group II	8	44.4	10	55.6	10	55.6	8	44.4	12	66.7	6	33.3	14	77.8	4	22.2	0.026
Total	20	47.6	22	52.4	24	57.1	18	42.9	27	64.3	15	35.7	34	81	8	19	

p = Cochran test

Table 3: The changes of ARC access of PLHIV between intervention groups

Group	ARV ACCESS																p
	Pre-Test				Post-Test I				Post-Test II				Post-Test III				
	High	%	Low	%	High	%	Low	%	High	%	Low	%	High	%	Low	%	
Group I	11	45.8	13	54.2	13	54.2	11	45.8	16	66.7	8	33.3	20	83.3	4	16.7	0.004
Group II	11	61.1	7	38.9	12	66.7	6	33.3	11	61.1	7	38.9	14	77.8	4	22.2	0.261
Total	20	47.6	22	52.4	24	57.1	18	42.9	27	64.3	15	35.7	34	81	8	19	

p = Cochran test

Table 4: The changes of compliance of PLHIV between intervention groups

Group	COMPLIANCE																p
	Pre-Test				Post-Test I				Post-Test II				Post-Test III				
	High	%	Low	%	High	%	Low	%	High	%	Low	%	High	%	Low	%	
Group I	7	29.2	17	70.8	14	58.3	10	41.7	13	54.2	11	45.8	18	75	6	25	0.001
Group II	7	38.9	11	61.1	12	66.7	6	33.3	12	66.7	6	33.3	15	83.3	3	16.7	0.015
Total	20	47.6	22	52.4	24	57.1	18	42.9	27	64.3	15	35.7	34	81	8	19	

p = Cochran test

Tables 2, 3 and 4 show the test results of Cochran the treatment groups 1 and 2 show the significance of the knowledge variables (p1 = 0.001, p2= 0.026), the ARV access variables in the treatment group 1 (p = 0.004), the adherence variable in the treatment group 1 and 2 (p1= 0.001, p2= 0.015) which means there is at least a difference in the level of knowledge, access to antiretroviral drugs and adherence before and after a CAASG-based health education and group support. In the second treatment group showed the significance of the variable of ARV access (p = 0.261), which means there was no difference in ARV access before and after health education.

The post hoc analysis test is conducted to find out which measurement differs regarding the knowledge. Post hoc analysis is done by using Mc-Nemar test. The following table will illustrate the measurement of the difference in knowledge.

Table 5: The result of Mc-Nemar test from the first to the 3rd measurement

Assessment	n	p
Knowledge (baseline) & Knowledge (post 1)	24	0.625
Knowledge (baseline) & Knowledge (post 2)	24	0.25
Knowledge (baseline) & Knowledge (post 3)	24	0.008
Knowledge (post 1) & Knowledge (post 2)	24	1.000
Knowledge (post 1) & Knowledge (post 3)	24	0.07
Knowledge (post 2) & Knowledge post 3)	24	0.125
Access (baseline) & Access (post 1)	24	0.5

Conted…

Access (baseline) & Access (post 2)	24	0.63
Access (baseline) & Access (post 3)	24	0.022
Access (post 1) & Access (post 2)	24	0.25
Access (post 1) & Access (post 3)	24	0.065
Access (post 2) & Access (post 3)	24	0.289
Compliance (baseline) & Compliance (post 1)	24	0.016
Compliance (baseline) & Compliance (post 2)	24	0.31
Compliance (baseline) & Compliance (post 3)	24	0.001
Compliance (post 1) & Compliance (post 2)	24	1.000
Compliance (post 1) & Compliance (post 3)	24	0.219
Compliance (post 2) & Compliance (post 3)	24	0.125

p = Mc-Nemar test

Based on table 5 it can be seen that differences in knowledge, access to ARV and adherence are found in the measurement between initial measurements and post t measurements 3, where the number of significance shown in the knowledge variables (p = 0.008), ARV access variables (p = 0.022), (p= 0.001).

DISCUSSION

The provision of health education by using a module for 3 months in the treatment group can increase the knowledge of PLHIV continuously. The results of research supported by the theory suggested that the longer the information is retained in short-term memory with the help of repetition, the more likely it is to enter long-term memory, thus becoming more permanent relative. Knowledge will be stored long in memory. So, it needs an effective repetitive learning method to suppress the decrease of one's knowledge, which is aided by user of media[10].

The use of media / learning aids such as leaflets and modules in the implementation of health education is expected to increase the attention of PLHIV. This is supported by Bullet theory which states that the effectiveness of messages using the media can directly affect the intended target[11], which is in line with the theory which says that the use of learning media in health education using modules can facilitate the reception of public health messages[8].

A research showed that after being given a health education using learning aids booklets and posters, the knowledge and attitude of the intervention group increased significantly compared to the control group[12].

Learning aids are used on the principle that the knowledge that is present in every human being is accepted or captured through the five senses. The more senses used to receive something the more and more clearly the understanding or increase of knowledge obtained, thus the use of learning aids is intended to exert the senses as much as possible on an object so as to facilitate understanding[8].

Access in this study include physical access (distance from home to the health service, the travel time from home to health care, the cost to get access to antiretroviral services) access to psychological (shame be shunned from society and have problems in communicating with health care providers). Based on information from health personnel who served in the VCT clinic, Sultan Daeng Radja Hospital in Bulukumba stated that the number of PLHIVs in the hospital were only 13 people, when compared with the number of PLHIV based on data from the District Health Office Bulukumba are 188 people. It means only about 6.91% who perform treatment at Bulukumba Hospital which is the only health facility that provides ARV drugs.

Some studies suggest that the distance to be a predictor of LTFU incidence that affects ARV access is more than 5 km distance from home to health service and travel time ≥ 1 hour to place of ARV services. It is likely that people living far from health facilities have less access to health care. Patients with close proximity to health facilities have a smaller LTFU risk[13].

The results in Table 4 showed that the proportion of adherence of ODHA in treatment in the group I experienced an increase of 45.8%, while in the group II increased by 33.3% since the initial measurement until the final measurement, this indicates that the compliance of the treatment group I is greater than the group II.

The results of this study are supported by research conducted in Mozambique where participant who did not become a community CASG (ARV Community Support

Group) has LTFU higher levels *(p=0.04)* compared with participants who are members of CASG. The CASG is an effective strategy for reducing LTFU and improving adherence in supporting ART programs[14]. In line with research conducted in Ethiopia in tuberculosis patients, which showed improved adherence to TB patients who were members of *TB* than those who did not join as *TB Club* members with p <0.001[15].

The small opportunity for PLHIV in CASG to experience LTFU is because the goal of CASG is to facilitate group members in terms of drug procurement every month so that the possibility of not accessing ARVs and non-compliance is very small. In addition, because group members support each other and remind each other in terms of ARV therapy, medication schedule and the effects of disobedience in antiretroviral therapy. The failure of the therapy is often caused by non-compliance with antiretroviral drugs consumption, few factors related to health care delivery system, the drug and the person taking ARV drugs can influence the adherence to antiretroviral therapy[16]. Sub-Saharan-African compliance studies in 2012 show that clinics with adherence support, counseling services and compliance monitoring tools have lower LTFU rates[15].

Studies conducted in Africa show that Adherence and a good response to antiretroviral therapy (HAART) can be achieved in home-based AIDS care programs in rural areas. Where the health care system should be continuously applied, evaluated, and modified interventions to overcome barriers to comprehensive AIDS care programs, particularly obstacles to adherence to antiretroviral therapy[17].

CONCLUSION

Necessary follow-up and moral support, funding, infrastructure and environment of the relevant parties to the sustainability of the group CAASG that have been formed to support treatment access and adherence of PLHIV in treatment, so it will be easier access to treatment no fear of stigma and discrimination of the social environment.

Ethical Clerance: This research has received recommendation from Hasanuddin University ethics committee with number: 547/H4.8.4.5.31/PP36-KOMETIK/2017

Sources of Funding: Nil

Conflict of Interest: No conflict of interest in this study

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Obesity and Pulmonary Functions in Young Non Smoker Male of Shah Alam, Malaysia

Aniruddha Bhattacharjee[1], Ariitharan A/L Thygoo[1], S. Rammohan[2]

[1]Department of Physiology, [2]Department of Pharmacology, International Medical School, Management & Science University (MSU), Malaysia

ABSTRACT

Background: The prevalence of overweight and obesity among Malaysian adults has increased due to their sedentary lifestyle and unhealthy food habits. Other than cardiovascular and metabolic diseases, obesity is also associated with respiratory impairments. Studies on pulmonary function in relation to obesity are very few in Malaysia

Aim: To evaluate the effect of obesity on dynamic lung function parameters and to identify the association of both relative and abdominal obesity indicators with dynamic pulmonary function measurements among young male non smoker healthy university students of shah alam, Malaysia.

Materials and Method: A Cross-sectional comparative study was conducted in a total of 100 (50 obese and 50 non obese control) adult non-smoker healthy male students aged 18-25 years. Forced vital capacity (FVC), forced expiratory volume in 1 sec (FEV_1), FEV_1 as a percentage of FVC (FEV_1/FVC%), maximum mid expiratory flow rate ($FEF_{25-75\%}$) and peak expiratory flow rate (PEFR) were measured using a computerized spirometer. Body weight, height, waist circumference (WC) and hip circumference (HC) were measured.

Results: All dynamic pulmonary function measurements were significantly lower in obese subjects than non obese except FVC. Body weight, waist circumference (WC) and waist hip ratio (WHR) exhibited highly significant ($P<0.001$) inverse correlation with all pulmonary function measurements except $FEF_{25-75\%}$. However, BMI, body height had no significant correlation with any spirometric variables .

Conclusion: Obesity has adverse effect on dynamic lung function parameters and central obesity has more impact on impairment of pulmonary functions than overall relative obesity.

Keywords: *Obesity, Pulmonary function test, Body Mass Index (BMI), Waist circumference, Waist hip ratio.*

INTRODUCTION

Over weight and obesity is one of the major global healthcare problem[1] including Malaysia. In both developed and developing countries, incidence of obesity is increasing in adults[2]. The sedentary lifestyle and unhealthy diet of Malaysian university students have become important contributing factors to the rise of obesity. Based on the report of National Health and Morbidity Surveys (NHMSs) in 2015, the prevalence of overweight and obesity among Malaysian adults aged 18 years and above has increased from 29.4% and 15.1% in 2011[3] to 30.0% and 17.7% in 2015[4]. Major respiratory complications due to obesity are lowering of respiratory muscle endurance, chest wall compliance and elevated work of breathing. Pulmonary function parameters are influenced by both relative obesity and body fat distribution. Body mass index (BMI) is a measure of relative adipocity, whereas waist circumference (WC) and waist hip ratio (WHR) is considered as a measure of central obesity. Central adiposity may be associated with a modest impairment of lung volumes such as FVC, FEV1 and TLC in normal and mildly obese men [5]. Studies have shown that both obesity itself and pattern of body fat distribution has an independent effect on ventilatory functions[6]. Most of the previous studies on pulmonary function impairment in relation to obesity have used BMI as obesity indicator[7,8].However, the

Corresponding Author:
Dr Aniruddha Bhattacharjee
Department of Physiology, International Medical School, Management & Science University (MSU), Malaysia
Email: aniruddha60@gmail.com

abdominal obesity markers are better predictor of pulmonary function than BMI[9]. Studies on pulmonary function in relation to obesity are very few in Malaysia and it is important to evaluate the effect of obesity on ventilatory impairment in Malaysian young adult university student due to their unhealthy food habit and sedentary lifestyle. Therefore, the present study was aimed to evaluate the effect of obesity on dynamic lung function parameters as well as to identify the association of both relative and abdominal obesity indicators with dynamic pulmonary function parameters among young male university students of shah alam, Malaysia. We hypothesized that upper body fat is a better predictor of reduced pulmonary function than total body adiposity.

MATERIALS AND METHOD

Study design: This cross-sectional study was conducted in the Human Physiology Laboratory of international medical school, Management and Science University, Shah alam, Malaysia.

Selection of subjects: A total of 100 (50 obese and 50 non obese) non-smoking healthy young male subjects were randomly selected from the a student population of the management and Science University, Shah alam Campus, Malaysia. The study population belonged to the age group of 18-25 years and with similar socio-economic background.

Body mass index (BMI) was greater than 30 kg/m^2 was defined as obese[10]. A total of 50 such obese male were identified. An identical number of age-matched non-obese with BMI between 18.50 - 24.99 kg/m^2 were taken as control group.

Each subject filled up one questionnaire[11] to record their personal demographic data, health status and consent to participate in the study. Subjects with symptoms or history of pulmonary diseases , anxious, apprehensive, doing regular exercise were excluded from the study. The experimental protocol was explained to all the participants. Each subject signed the written informed consent form.

Anthropometric measurement: The body weight was measured by using a balanced beam scale with an accuracy of ±0.1 kg with the subject wearing minimum clothing whereas body height was measured with the measuring rod attached to the balanced beam with an accuracy of ± 0.50 cm. Waist circumference was measured as the smallest circumference between the ribs and the iliac crest to the nearest 0.1 cm, while the participant was standing with the abdomen relaxed, at the end of normal expiration. Hip circumference was recorded as the maximum circumference between the iliac crest and the pubic symphysis. Waist hip ratio (WHR) was calculated by dividing waist circumference by hip circumference.

Dynamic pulmonary function measurements: The dynamic pulmonary functions were recorded using a computerized spirometer. The spirometer was calibrated daily using calibration syringe of 2 liters. The parameters measured were FVC, FEV1, FEV1/FVC%, FEF25-75% and PEFR. All the measurements were conducted in standing posture with nose clipped [12]. These tests were recorded at noon before lunch, as expiratory flow rates are highest at noon [13]. Three satisfactory efforts were recorded for each volunteer with at least 5 min rest between the consecutive trials as per the standard norm[14]. All the anthropometric measurements and recording of pulmonary function measurements were recorded in one sitting on the same day for each subject.

Statistical analysis: Student's t test and Pearson's product moment correlation (r) was adopted. The level of significance was set at $P<0.01$.

RESULTS

Table1 compares the demographic and anthropometric variables of the obese and control groups. The mean BMI ,body weight, waist circumference of the obese students were significantly ($p<0.001$) higher compared to control group with same age . The comparison of dynamic

Table 1: Physical and anthropometric characteristics of obese and non-obese.

	Obese (n = 50)	Non-obese (n = 5 0)	
	Mean ± SD	Mean ± SD	p values
Age(Years)	21.2±0.05	21.16 ± 2.17	0.946
Height(cm)	172.16 ± 5.57	173.76 ± 7.83	0.447
Weight (kg)	92.16 ± 7.18	67.92 ± 5.09	0.000***

Conted…

Body mass index (kg/m^2)	31.10 ± 3.74	22.32 ± 2.35	0.000***
Waist circumference (cm)	99.56 ± 6.89	82.08 ± 6.70	0.000***
Waist hip ratio(WHR)	0.80 ± 0.05	0.78 ± 0.15	0.918

***Highly significant P<0.001

pulmonary function parameters of the obese and non obese healthy young male has been depicted in Table 2, .The mean FEV1/FVC ratio of obese subjects was significantly($p<0.01$) lower than non obese control group (Fig2). The mean FEV1(L), $FEF_{25-75\%}$(L/s) and PEFR(L/s) of obese subjects were much lower than non-obese control group and the difference was highly significant ($p<0.001$)(Fig1). However, there was no significant difference in FVC (L) of obese and non obese subjects.

Table 2: Comparison of dynamic lung function parameters between obese and non-obese.

	obese (n = 50)	**Control (n = 50)**	
	Mean ± SD	**Mean ± SD**	**P values**
FVC(L)	3.25 ± 1.31	3.81 ± 0.78	0.1246
FEV1(L)	2.41 ± 0.73	3.55 ± 0.79	0.0004***
FEV1/FVC (%)	78.62 ± 18.83	91.58 ± 8.36	0.009**
$FEF_{25-75\%}$ (L/s)	2.75 ± 1.27	4.29 ± 0.85	0.0002***
PEFR (L/s)	3.52 ± 1.82	6.38 ± 1.59	0.0001***

** Moderately significant P<0.01, ***Highly significant P<0.001

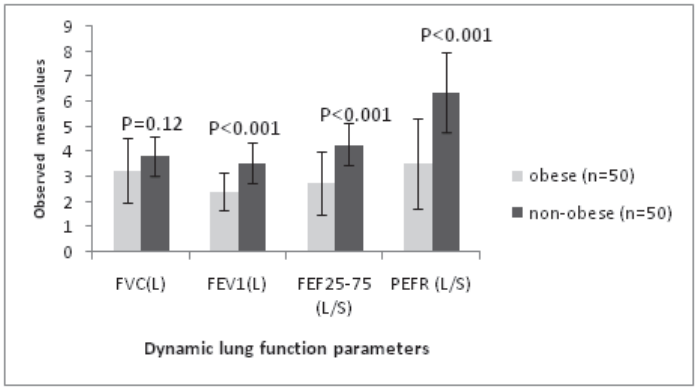

Figure 1: Comparison of dynamic lung function parameters between obese and non-obese (control group) healthy male of shah alam, Malaysia

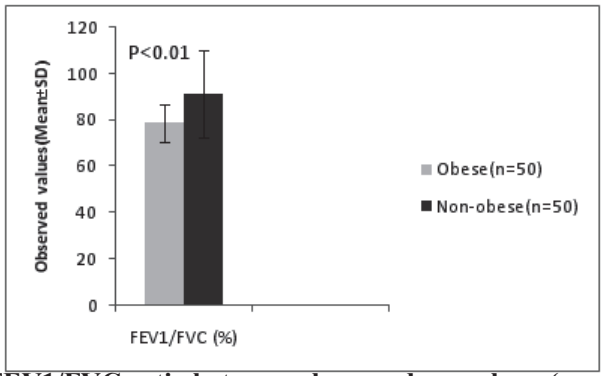

Figure 2: Comparison of FEV1/FVC ratio between obese and non-obese (control group) healthy male of shah alam, Malaysia.

The values of correlation coefficient between different obesity markers and dynamic lung function measurements have been depicted in Table 3. Based on correlation coefficient values and p values ,body weight ,waist circumference (WC) and waist hip ratio (WHR) exhibited a highly significant inverse correlation with all pulmonary function measurements except $FEF_{25-75\%}$. However, BMI and body height had no significant correlation with any spirometric variables.

Table 3: Correlation of anthropometric obesity indices with pulmonary function measurements in young healthy male (n = 100) of shah alam, Malaysia (values are correlation coefficient r).

	FVC (L)	FEV1 (L)	FEV1/FVC (%)	FEF25-75% (L/s)	PEFR (L/s)
Age(yrs)	0.03	0.09	0.04	0.02	-0.03
Weight(kg)	-0.37#	-0.28*	-0.27*	-0.09	-0.39
Height(cm)	0.15	0.24	0.09	0.11	0.19
BMI (kg/m²)	-0.14	0.17	0.23	0.09	0.15
WC (cm)	-0.53#	-0.29*	-0.37#	0.01	-0.54#
WHR	-0.47#	-0.41#	-0.36#	0.02	-0.52#

Strongly significant P<0.000, * moderately significant P<0.01

DISCUSSION

Many physiological factors affect lung function. The effect of age, gender, ethnicity and smoking status on lung function has been confirmed [15,16]. The effects of obesity on spirometric values are not consistent. Some studies showing no effects[17,18] and some other studies showing significant effects [19-21]. By this study we tried to evaluate the effect of obesity on different dynamic pulmonary functions among Malaysian non smoker healthy adult university students by comparing lung function of the obese to their age matching normal weight control group. Our study showed FEV1(L), FEV1/FVC %, $FEF_{25-75\%}$ and PEFR of obese subjects were significantly($P< 0.01$) lower than non obese control group of same age. However, there was no significant (P=0.12) difference in FVC of obese and non obese subjects. This may suggest that obesity has an adverse effect on dynamic lung function parameters. Similarly carey et al. [22] showed a reduction in FEV1 but not FVC in obese individual, whereas similar other studies [23,24] showed a decline in both FEV1 and FVC in obese individuals. This discrepancy between studies regarding the effect of obesity on pulmonary function may be explained by the wide variations in ethnicity of different population in pulmonary function test values or this may be a result of methodological differences in these studies.

Most of the previous studies reported an inverse relation between respiratory function and various indices of obesity [22,25-27]. Central obesity is likely to have direct effects on the pulmonary function, whereas peripheral obesity would be less likely to have any direct mechanical effect on the lungs. In our study, we investigated the association between adiposity markers with pulmonary function measurements in non-smoker healthy young university students. Body weight, waist circumference (WC) and waist hip ratio(WHR) exhibited strong significant inverse correlation with all pulmonary function measurements except $FEF_{25-75\%,}$ whereas BMI and body height were not significantly correlated with any pulmonary function parameters , suggesting that central obesity has more impact on the impairment of dynamic lung function than overall relative obesity. Our findings support the hypothesis that abdominal adiposity markers have better explanatory power than total body adiposity measured as BMI according to the p value significance and the correlation coefficient values. Similar findings was observed by Banerjee et al.[28] where there was no significant association between BMI and lung function parameters (FVC, FEV1, FEV1/FVC, FEF25-75%) in obese male non-asthmatic subjects in India. Our results were consistent with finding by Chen et al.[29] where WC was inversely associated with FVC and FEV1 in both men and women. In our study, we found that central obesity markers are better predictor of lung function than BMI, which is supported by a study [30]in western New York where they found that WC was a better predictor of pulmonary function than BMI. The impairment of pulmonary function by abdominal obesity

may be due to mechanical restrictions of the descent of the diaphragm and increase thoracic pressure by thoracic and abdominal fat[31]. Our findings have similarity with the findings of Saxena et al.[9] where they showed abdominal adiposity markers such as WHR and WC had a strong negative correlation with FEV1. Pouliot et al, also showed that abdominal adiposity markers have much better explanatory power than total body adiposity measured as BMI [32].

LIMITATIONS

There are few limitations in our study. A bigger sample size would have given more concrete evidence. In our study we have only investigated the dynamic lung volumes ,we did not examine static lung volumes. Fat mass (FM), and body fat percentage (BF%) , conicity index (CI) were not determined as measure of obesity.

CONCLUSION

In conclusions, our study showed that all dynamic pulmonary function measurements except FVC, were significantly lower in obese than non obese studied male of the same age and ethnic group. This may suggest that obesity has adverse effect on dynamic lung function parameters parameters. Body weight, waist circumference (WC) and WHR exhibited highly significant inverse correlation with all pulmonary function measurements except $FEF_{25-75\%.}$ However, BMI, body height had no significant correlation with any spirometric variables, suggesting that central obesity has more impact on the impairment of dynamic lung function than overall relative obesity. It is necessary to implement healthcare programs for this population, with the purpose of improving lung function and therefore improving quality of life of obese individuals.

Ethical Clearance: Taken from Management and Science University (msu) ethical committee.

Source of Funding: Self

Conflict of Interest: Nil

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Prevalence of Self Medication with Antibiotics among Medical Students of Barabanki

Ankur Shrivastava[1], Nidhi Shrivastava[2], Sandhya Mishra[3], Pankaj Mishra[4], Vijay Kumar Singh[5]

[1]Associate Professor, Department of Community Medicine; [2]Assistant Professor, Department of Dentistry; [3]Associate Professor, [4]Professor, [5]Assistant Professor, Department of Community Medicine, Mayo Institute of Medical Sciences, Barabanki.

ABSTRACT

Background: Self-medication with antibiotics is becoming a common type of self-care behavior among the population of many countries. Many international studies have investigated the prevalence and nature of self medication practices at the population level. In India, some workers have also looked at the population prevalence of self-medication with antibiotics in general; however the prevalence of self-medication with antibiotic among medical undergraduates has been studied very less. The interest in studying this practice among this select group is due to the fact that they are the future prescribers and health educators of the nation.

Aims and Objectives: (1) To estimate the prevalence of self-medication with antibiotics among undergraduate medical students. (2) To know the factors associated with the practice of self-medication with antibiotics.

Material and Method: The study was a cross-sectional pre-tested questionnaire-based study carried out among medical students of Mayo Institute of Medical Sciences, Barabanki, Uttar Pradesh, in January 2018. The information from the returned questionnaire, was entered and analyzed using SPSS Version 16 statistical software and MS Exel.

Result: A total of 147 medical students participated in the study, 17 questionnaire were found to be incomplete, hence 130 medical students were the study subjects. Among them majority were males (50.8%), the prevalence of self – medication with antibiotics came out to be 89.2%.Majority (61%) of the respondents found self medication was "convenient". Azithromycin was the most popular (27%) antibiotic for self-medication, besides amoxicillin (23.4%) and fluoroquinolones (4.6%).

Conclusion: Self-medication with antibiotics is prevalent among medical undergraduates. There is a need for an intervention to address this practice.

Keywords: *Self medication, Antibiotics, Medical Students, questionnaire*

INTRODUCTION

Self-medication products are those not requiring a medical prescription and which are produced, distributed and sold to consumers for use on their own initiative. Responsible self-medication can be used to prevent and treat symptoms and ailments that do not need medical consultation or oversight. This reduces pressure on medical services, especially when these are limited. For those populations living in rural or remote areas where access to medical services may be difficult, patients are able to control their own conditions to a greater extent. Only if the condition fails to respond, persists, or becomes more severe will the patient need to seek professional medical care[1].

Antibiotics are one of the most prescribed drugs worldwide[2]. Self-medication with antibiotics is a common practice in many countries in the world although the trend seems to be more in developing or resource-poor nations[3].

Corresponding Author:
Dr Ankur Shrivastava
Associate Professor, Department of Community Medicine, Mayo Institute of Medical Sciences, Barabanki

Other factors have also contributed to prescription drugs being deregulated to over-the-counter (OTC) sale and new drugs with specific pharmacological action have been successfully reclassified from prescription to non-prescription status in many countries. For example, in the United States of America, products containing over 80 active ingredients of different therapeutic groups were switched from prescription-only to OTC status between 1976 and 2000. In many cases, restrictions imposed on reimbursement of prescription drugs have provided the impetus for authorities to evaluate and deregulate self-medication products to OTC status[1].

According to a consumer interview study carried out in six Latin American countries, only 34% of dispensed medicines were classified as OTC. It was concluded that a relatively high percentage of drugs were being dispensed without medical prescription or follow-up and this was attributed to lack of access to medical care. Of equal concern is the fact that, in many countries, although OTC medicines are provided with a patient information leaflet the self-prescriber does not receive any information whatsoever on how to use a prescription medicine[4].

A study conducted at All India Institute of Medical Sciences, New Delhi observed that self-medication was proportionately high among undergraduate medical and paramedical students in India, and it increased with medical knowledge of the student[5]. There are many reasons for the increased likelihood of self-medication among medical students. These students have easy access to information from drug indices, literature, and other medical students to self – diagnose and self – medicate. Furthermore, they have easy access to the medication itself through physician samples provided by pharmaceutical representatives, and "The White Coat" guarantees trouble-free access to drugs available in pharmacies[6].

The current study will provide suitable data to frame a new curriculum program to acquire and equip our students to fight against Antibiotic Resistance. A strong foundation is of utmost importance for a durable construction hence we need to strengthen the base of the health care system by nipping the problem of resistance in the bud itself. Therefore, the present study was undertaken to assess the existing knowledge, attitude and practices of first year MBBS students on antibiotics.

AIMS AND OBJECTIVES

1. To estimate the prevalence of self-medication with antibiotics among undergraduate medical students.
2. To know the factors associated with the practice of self-medication with antibiotics.

MATERIAL AND METHOD

The study was a cross-sectional study. A pre–designed pre–tested questionnaire based study was carried out among 147 medical students of Mayo Institute of Medical Sciences, Barabanki, Uttar Pradesh, in January 2018. The approval of Institutional Ethics Committee was sought before commencement of the study.

A questionnaire was used to assess knowledge, attitude and practice of antibiotic usage among 1st year medical students. The students who were present on the day of data collection, willing to participate were included in the study and those who were absent, not willing to participate or returned incomplete questionnaire within the stipulated time were excluded. After briefing about the study, the questionnaire was distributed to 1st year medical students during one of their Community Medicine classes and was asked to complete the questionnaire anonymously. Verbal consent was obtained from the participants, to utilize their data for research purposes. Quality control was maintained as per the standard protocol and Confidentiality was maintained.

The results were analyzed by using percentage, proportion, and chi-square test, when applicable, with the help of Microsoft Excel 2007 and Statistical Package for Social Sciences version 16.0 Statistical Software (IBM, Chicago, USA). A $P < 0.05$ was considered as statistically significant for the purpose of this study.

RESULTS

Out of 147 first year undergraduate medical students of Mayo Institute of Medical Sciences, a total of 130 students participated in the study giving a response rate of 88.4%. Among them, 50.8% were males (n = 66) and 49.2% were females (n = 64). The mean age of the respondents was 19.89 ± 1.41 years. 50.8% (n = 66) were in 17-19 years age group, 49.2% (n = 64) were in 20-22 years age group.

The prevalence of Self–Medication with antibiotics usage among medical students were found to be 89.2% (n = 116) in their lifetime, whereas in last one year 70% (n = 91) medical students had indulged in self medication. Among the study subjects 58 (50%) males and 50 (50%) females were found indulging in self medication. (Table 1).

Table 1: Distribution of participants according to Age, Sex and History of Self medication with antibiotics.

	Self Medicated	Non–self medicated	Total
Age			
17–19 years	60 (91%)	06 (09%)	66 (50.8%)
20–22 years	56 (87.5%)	08 (12.5%)	64 (49.2%)
Total	116 (89.2%)	14 (10.8%)	130
Gender			
Male	58 (88%)	08 (12%)	66 (50.8%)
Female	58 (90%)	06 (10%)	64 (49.2%)
Total	116 (89.2%)	14 (10.8%)	130

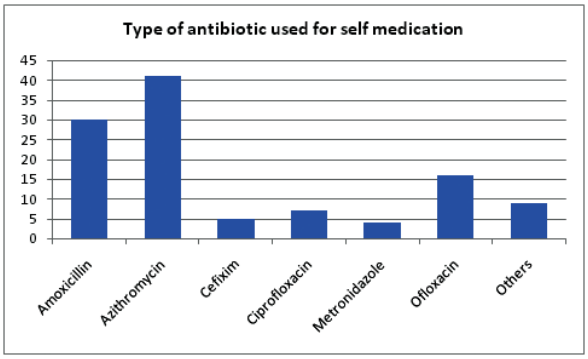

Figure 1 shows the type of antibiotic that was most frequently used for self-medication. Azithromycin was the most popular (37%) antibiotic for self-medication besides amoxicillin (27%) and Ofloxacin (14%).

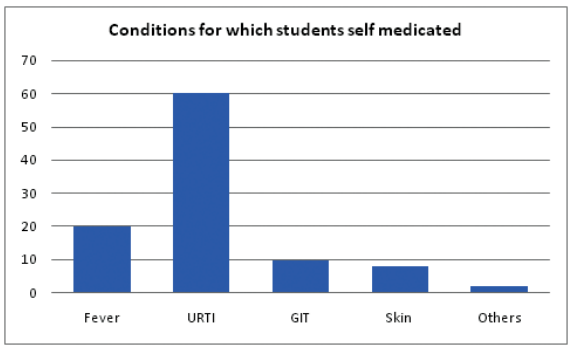

Figure 2. Depicts the conditions prompting self-medication were common cold, cough, and sore throat (60%), fever (20%), and gastrointestinal tract infections (10%) followed by skin ailments (08%) and others (02%)

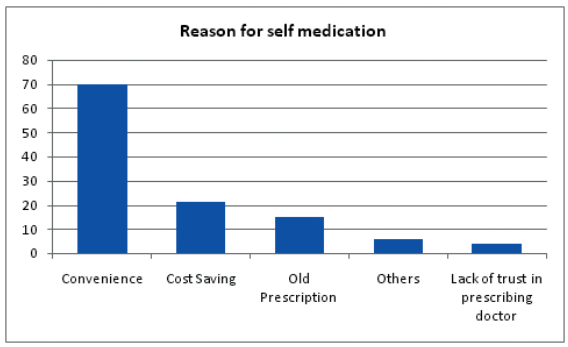

Figure 3 shows the reasons for self-medication with antibiotics. Majority of the students self-medicated because they found it convenient (60%), followed by cost saving (18%), Some used old prescriptions for the same illness as a source for information about the drug (13%) and 4% students did not had trust in the doctor

Majority of respondents purchased the drugs from Medical store (86.2%). Other sources of the drugs included left-over drugs from previous prescriptions (10.4%) followed by community pharmacies (1.7%).

Table 1 shows the distribution of certain characteristics of undergraduate medical students according to the practice of self-medication. The prevalence of self-medication was found to be high among those aged between 17 and 19 years, but this association was not statistically significant (P > 0.05). Self-medication practice was equal among males and females, a statistically non-significant association (P > 0.05).

DISCUSSION

Self-medication with antibiotics is becoming an increasingly important area of healthcare, and this study has shown that it is even more prevalent among medical students. A major problem with self-medication with antibiotics is the emergence of drug resistance. It is widely believed that human malpractices, such as inadequate dosing, incomplete courses, and indiscriminate drug use, have contributed to the emergence and spread of antimicrobial resistance[7]. An understanding of the level of antibiotics selfmedication practice, the reasons for such practices and the awareness about antibiotic resistance is necessary to take steps for a more rational use of antibiotics.

The total of 130 students participated in the study out of a total 147 undergraduate medical students giving a response rate of 88.4%. The mean age of the respondents was 19.89 ± 1.41 years. Similarly, the mean age of the

respondents was 20.3 ± 1.5 years in a study conducted by Kumar et al among medical students in coastal South India[8]. In a study on antibiotic self-medication among university medical undergraduates in Northern Nigeria by Fadare and Tamuno[9], a response rate of 83.2% was found and the mean age of all respondents was 23.2 ± 2.5 years.

In the present study the prevalence rate of self-medication with antibiotics among medical students was 89.2%. The results were similar to those reported by other Indian authors from Karnataka (88.18%)[10], Uttar Pradesh (87%)[11], and Mangalore (92.7%)[8]. The result was also similar to those reported by Azad et al.[12] in Islamabad (88%). And in Zaria by Olayemi et al[13]. (80.36%). While only 38.8% of undergraduate medical students admitted to self-medication practice with antibiotics in the study by Fadare and Tamuno[9] conducted in Northern Nigeria.

In our study, equal number of male and females students were involved in self-medication with antibiotics, hence it was not statistically significant (P > 0.05). Where as in a study done by Kumar et al[8], females (81.2%) outnumbered males (75.3%) in antibiotics self-medication.

In our study, the prevalence of self-medication was more among those aged between 17 and 19 years(52%), when compared to age group between 20 – 22 years (48%), but this association was not statistically significant (P > 0.05). Where as in the study by Azad et al[12].,13 self-medication was highest in the age group of 20-25 years as compared to those aged <20 years and >25 years, but this association was also not statistically significant (P > 0.05).

Concerning to type of antibiotics commonly used, Azithromycin (a macrolide) was the most popular (37%) antibiotic for self-medication besides amoxicillin (a penicillin) (27%) and fluoroquinolones/ofloxacin (14%). Similarly, Indu et al[14],in their study on self-medication of antibiotics among undergraduate medical students of South India, found out that the most commonly used antibiotic for self-medication was macrolides (38%) followed by beta-lactams (25%), fluoroquinolones (23%), and tinidazole (14%). Whereas in other studies, by Kumar et al[8]. (59.6%), Fadare and Tamuno[9] (44.10%), Olayemi et al[13]. (43.11%), and Bala et al[15]. Penicillin group were the most common class of antibiotics frequently self-medicated.

In our study, the conditions prompting self-medication were common cold, cough, and sore throat (60%), fever (20%), and gastrointestinal tract infections (10%) and skin ailments (8%) A similar observation was found in studies by Kumar et al.[8] (58.7%) and Fadare and Tamuno[9] (34.8%). In contrast, gastrointestinal tract infections (42.08%) was the most common condition prompting antibiotic self-medication in the study by Olayemi et al.[13]

Majority (60%) of students in our study self-medicated with antibiotic because they found it to be Convenient, followed by cost saving (18%), Some students self-medicated because they found it easier to apply previous prescription (13%).

In other studies, the reasons cited for self-medication were somewhat different. Badiger et al.[6], Kumar et al[8]., and Fadare and Tamuno[9] in their studies found out the illness being too trivial to be the most common reason for self-medication.

Pharmacies were the major source of antibiotics (51.6%) for self-medication in our study which was supported by other studies also.[9, 13]

The study was based on self-reported data about self-medication with antibiotic hence recall bias cannot be ruled out. All the students were encouraged to fill the questionnaire independently, but mutual influence cannot be ruled out. Other limitations of this study included the absence of a comparative group, such as students from another field; the small sample size; and the absence of interventions, like providing information regarding hazards of self – medication.

CONCLUSION

This study has shown that self-medication with antibiotics is common among medical undergraduates. There is a need for a review of educational programs especially the teaching of clinical pharmacology to include modules on self- medication and rational use of medicines. The students should be educated and made aware of the dangers and implications of self-medication with antibiotics. Self-medication can facilitate access to medicines and reduce health care costs. High ethical standards should be applied to the provision of information, promotional practices and advertising. At the policymaking level, there is an urgent need to

legislate and enforce laws restricting access to antibiotic. Most importantly, there is a need for a robust public enlightenment campaign to educate the populace of the disadvantages and possible complications of antibiotic self-medication.

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Utility of Dundee Ready Educational Environment Measure for Evaluation of Nursing Educational Environment in Iraq

Mohammed Jabarah AL-ZOBAIDY

School of Nursing, University of Al-Qadysiah, Al- Diwaniyah city, Iraq

ABSTRACT

To appraise reliability of Dundee Ready Educational Environment Measure as a measure for nursing educational environment and to evaluate students' perception of educational environment at Al-Qadysia Nursing School in Iraq. A descriptive cross-sectioinal questionnaire-based study conducted at Al-Qadysia Nursing School in the 2015/2016 academic year. The Dundee Ready Educational Environment Measure inventory was administered to 336 undergraduate nursing students. Data were collected from 283 completed questionnaires and analysed using SPSS version 19.0. Participation rate was 95.3%. The study reporeted good to high overall internal consistency of Dundee Ready Educational Environment Measure with an overall mean score of 102.6 out of 200 (51.3%) which indicates unsupportive educational environment. Also, mean Dundee Ready Educational Environment Measure subscales scores were 23.3 out of 48 (48.54%) for Students' Perception of Learning, 22.5 out of 44 (51.14%) for Students' Perception of Teaching, 17.8 out of 32 (55.63%) for Students' Academic Sefl-Perception, 23.3 out of 48 (48.54%) for Students' Perception of Atmosphere and 15.8 out of 28 (56.43%) for Students' Social Self-Perception. Dundee Ready Educational Environment Measure has adequate reliability as an instrument for measurement of nursing educational environmnet. Also, students perceived educational environment at Al-Qadysia Nursing School seriously negative and in need of extensive modifications. However, they were somewhat assured about their academic ability and they have satisfactory social life.

Keywords: *Dundee Ready Educational Environment Measure, nursing school, traditional curriculum, undergraduate students.*

INTRODUCTION

Although it is considered as an "intangible" concept that is beyond description, educational environment is as important for the educational process as the heart is for the living body[1] and it expresses itself all the time students meet whether formally or informally[2]. In addition, it was proposed that it includes everything happens during the course of study[2]. It covers the institute's infrastructure, student-teacher relationship and availabilty of students support system[3]. Also, it is concerned with psychosocial and emotional well-being of students[4]. The provision of supportive, and the regular evaluation of, learning environment should be a high priority for any health profession institute[5], as it is a critical requirement for attaining quality assurance in medical education. For this purpose, both quantitative and qualitative research methods were used[6], yet the latter must be valid, reliable and applicable. The most frequently used instrument for this purpose is Dundee Ready Educational Environment Measure (DREEM)[7]. It has been developed and validated at University of Dundee using Delphi technique[15]. In addition, it has been translated to more than ten languages and utilised for assessment and comparison of educational environments at traditional and innovative health profession institutes worldwide[7,8,9]. However, few published studies had employed DREEM for measurement of nursing educational environment[10-14]. Al-Qadysia Nursing School (QNS) in Iraq was established in 2012. I have joined the school as pharmacology lecturer since 2014. The curriculum, teaching methods

Corresponding Author:
Mohammed Jabarah AL-ZOBAIDY
School of Nursing, University of Al-Qadysiah,
Al- Diwaniyah city, Iraq
Mobile: 009647705982654
Email: mjabarah.17@gmail.com

and assessment strategies are still conventional. To the best of my knowledge there is no previous study in the literature that has investigated the qualities of learning environmnet in the context of Iraqi nursing education. Therefore, current study was aimed at appraising psychometric properties of DREEM inventory and its utility for evaluation of educational environmnet at an Iraqi nursing school.

MATERIALS AND METHOD

A descriptive cross-sectional questionnaire-based study conducted at Al-Qadysia Nursing School (QNS) in the 2015/2016 academic year. Agreement of the Institutional Ethical Review Committee was obtained prior to beginning the study. All male and female nursing students (336) across years 2, 3 and 4 of the undergraduate programme were targeted in this study. Therefore, no particular sampling method was needed for subjects selection. Dundee Ready Educational Environment Measure (DREEM) was used for collection of information regarding educational environmnet. The 50 items within the DREEM are sub-grouped into five subscales related to the concept of educational environment [7]. Each individual item is scored on a 5-point Likert scale with a score of 0, 1, 2, 3, or 4 for strongly disagree, disagree, uncertain, agree and strongly agree, respectively [15]. However, nine negative items in the DREEM are scored in the opposite direction. The paper-based Arabic version [15] of DREEM was administered by face-to-face contact with participants near the end of the first semester of the 2015/2016 academic year on different occasions after a lecture class. Students were informed that their participation is voluntary, anonymous and will not affect their academic progress. Also, they were told that data they provide are confidential and will only be used for research purposes. In the event of return of filled questionnaire, consent was implicit. After the negative items were reverse scored, data from DREEM inventory were entered into Microsoft Excel spreadsheets and processed using computer-based software, the Statistical Package for Social Sciences (SPSS) version 19.0. Descriptive statistics were applied to present percentages and socio demographic data. Data from entire inventory, scores for categorized domains and each item were expressed as Mean ± Standard Deviation (SD). Comparisons were accomplished using independent t-tests while one-way analyses of variance (ANOVA) was used for comparisons across the three years of study. Cronbach's alpha coefficient [28] was used to evaluate internal consistency of DREEM inventory. Chi-squared test was used to explore any possible association between students' gender and their response to DREEM assuming that there is no such association. Probability values less than 0.05 were considered statistically significant. Interpretation of DREEM was performed using the guide proposed by McAleer and co-workers[29].

Table 1: Total numbers of students, respondents to DREEM and their gender distribution, in each year of study at QNS for the 2015/2016 academic year

Year of study	No. of students	No. of females (%)	No. of males (%)	No. of questionnaires administered	No. of male respondents (%)	No. of female respondents (%)	Total No. of respondents (%)
2nd	119	82 (69)	37 (31)	105	26 (24.76)	74 (70.47)	100 (95.2)
3rd	87	52 (60)	35 (40)	77	28 (36.36)	46 (59.74)	74 (96.1)
4th	130	87 (67)	43 (33)	115	32 (27.84)	77 (66.96)	109 (94.8)
Total	336	221	115	297	86 (28.96)	197 (66.33)	283 (95.29)

Table 2: Cronbach's alpha for overall DREEM and its five subscales at QNS for the 2015/2016 academic year

Domain	Year 2	Year 3	Year 4	All years of study
SPL	0.66	0.53	0.65	0.63
SPT	0.73	0.74	0.73	0.74
SASP	0.65	0.70	0.60	0.64
SPA	0.77	0.75	0.60	0.72
SSSP	0.40	0.37	0.20	0.30
Overall DREEM	0.89	0.89	0.86	0.88

Table 3: Overall and subscales mean DREEM scores at QNSfor the 2015/2016 academic year

DREEM inventory	2nd year Mean (%) n = 100	3rd year Mean (%) n =74	4th year Mean(%) n = 109	Overall Mean (%) n = 283	Maximum score	P** value
Students' perception of learning (SPL)	23.05 (48.02)	23.9 (49.79)	23.1 (48.13)	23.3 (48.54)	48	>0.05
Students' perception of teachers (SPT)	22.8 (51.82)	24.2 (55.0)	20.9 (47.5)	22.5 (51.14)	44	< 0.05#
Students' academic self perception (SASP)	16.9 (52.81)	17.2 (53.75)	18.9 (59.06)	17.8 (55.63)	32	< 0.05##
Students' perception of atmosphere (SPA)	22.4 (46.67)	22.9 (47.71)	24.4 (50.83)	23.3 (48.54)	48	>0.05
Students' social self perception (SSSP)	15.7 (56.07)	15.0 (53.57)	16.3 (58.21)	15.8 (56.43)	28	>0.05
Total DREEM	100.9 (50.45)	103.2 (51.60)	103.6 (51.8)	102.6 (51.30)	200	>0.05

Table 4: Overall and subscale mean DREEM scores for male and female students at QNS for the 2015/2016 academic year

DREEM inventory	Male students Mean (%) n = 86	Female students Mean (%) n = 197	Overall Mean (%) n = 283	Maximum score	P* value
Students' perception of learning (SPL)	23.2 (48.33)	23.4 (48.75)	23.3 (48.54)	48	>0.05
Students' perception of teachers (SPT)	21.4 (48.64)	22.9 (52.05)	22.5 (51.14)	44	>0.05
Students' academic self perception (SASP)	17.2 (53.75)	17.9 (55.94)	17.8 (55.63)	32	>0.05
Students' perception of atmosphere (SPA)	23.2 (48.33)	23.3 (48.54)	23.3 (48.54)	48	>0.05
Students' social self perception (SSSP)	14.9 (53.21)	16.1 (57.50)	15.8 (56.43)	28	<0.05
Total DREEM	99.9 (49.95)	103.7 (51.85)	102.6 (51.3)	200	>0.05

Table 5: Comparison of DREEM overall and subscales scores at QNS and Nursing institutes running traditional curricula

Country	Overall DREEM/ 200 (%)	SPL/48 (%)	SPT/44 (%)	SASP/48 (%)	SPA/32 (%)	SSSP/28 (%)	Reference
Iran	114.3 (57.15)	27.30 (56.88)	24.33 (55.30)	20.31 (63.47)	26.78 (55.79)	15.56 (55.57)	[22]
Iraq	102.6 (51.3)	23.30 (48.54)	22.50 (51.14)	17.8 (55.63)	23.3 (48.54)	15.8 (56.43)	Current study
Malaysia	120.12 (60.06)	28.54 (59.46)	28.13 (63.93)	19.42 (60.69)	27.78 (57.88)	16.23 (57.96)	[11]
Pakistan	131.77 (65.89)	32.61 (67.94)	28.14 (63.95)	23.86 (74.56)	29.61 (61.69)	17.55 (62.68)	[20]
Philippine	123.41 (61.71)	28.80 (60.0)	27.56 (62.64)	20.88 (65.25)	29.15 (60.73)	17.03 (60.82)	[21]

RESULTS AND DISCUSSION

Total numbers of students, respondents to DREEM and their gender distribution in each year of study at QNS for the 2015/2016 academic year are shown in table 1. The high participation rate (95.29%) reported in current strudy could be attributed to anonymous study and voluntary participation (see Methods section). The results revealed good to high internal consistency for overall DREEM and acceptable for its subscales (Table 2). These results are similar to those reported by previous studies conducted in different countries[12, 18,19]. The lenghth of a questionnaire, misconception of some items, translation factors and the negative items a questionnaire contains are among the factors that might influence its reliabilty[20,21]. In terms of quality of educational environmnet, participants at QNS had rated it as unhelpful. This perception was similar across three years of the nursing programme (Table 3). In addition, participants viewed teaching in the school as being seriously negative and teachers are in need of further training (Tables 3 & 4). Also, This study reported an average academic ability for students at QNS (Table 3), yet 4th-year students gave the impression of more ability to deal with coursework and to pass exams. Moreover, the school's social climate was perceived as being uncomfortable (Tables 3 & 4). Although participants were somewhat satisfied about their social experience in the school (Table 3), females showed more satisfaction than the males (Table 4). In contrast to data from QNS, those from schools running similar traditional curricula showed positive students' perception of learning environmnet (Table 5). On the other hand, studies conducted in innovative medical institutes[8,22,23] reported students' perceptions of affirmative educational environmnet. Maybe, the implementation of innovative educational strategies[24] had accounted for such perceptions. Nursing students' perceptions of positive educational environment at traditional nursing schools worldwide (Table 5) maybe attributed to the modern infrastructure of these schools. This conclusion is drawn from my experience as a teacher at QNS, as the latter is based in a building shared with medical and pharmacy schools. Therefore, physical setting at QNS does not promote students' communication, adversely affects their thinking and does not help them achieve their educational objectives. In contrast to the pessimistic views of teaching at QNS reported in current study, data from studies conducted in traditional nursing schools (Table 5) reported positive students' views about teaching and they rated their teachers as being well-trained. In addition, those students were more confident regarding their abilities to deal with coursework and felt more prepared for the practice of nursing (Table 5). Also, studies conducted in innovative medical institutes revealed comparable positive views[23]. In terms of the school's social climate, the latter was likewise perceived by male and female students as being non-motivating and stressful. Nursing students from international traditional nursing schools (Table 5) were more pleasant with social atmospheres of their institutes so as those studying at modern medical schools[22, 23] except those from United Arab Emirates[8] and Sri Lanka[26] who expressed comparable views to those reported in current study. One reason behind the unhelpful educational environment at QNS maybe the traditional nursing curriculum where conventional teaching methods do not pave the way for building students' capacity as self-directed life-long learners. Also, it (curriculum) does not promote development of learners' clinical, professional and generic skills that are necessary for the nursing profession[24-26]. Another reason could be lack of staff development programmes in medical education. When the number of females exceeds that of males in an educational setting, the latter turns more suitable for women [3]. However, current study showed that both male and female students expressed comparable perceptions of a problematic educational environment at QNS (Table 4). Barcelo[11] reported higher mean scores of female students for overall DREEM, perception of learning, perception of atmosphere and social perception. In addition, Iranian female nursing students were more satisfied about teaching and they were socially more pleasant than their male colleagues[12]. However, the latter had more positive perception of overall learning environment and they were more confident about their academic ability. Moreover, a study conducted at an "all female medical school" in Saudi Arabia[27] reported lower mean scores for overall and subscales of DREEM inventory than those reported in current study.

CONCLUSION

Current study showed that DREEM is suitable and applicable instrument for assessment of educational environment in Iraqi nursing education. In addition, nursing students at QNS expressed the perception of unsupportive learning environment, rated their teachers in need of more training.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the School of Nursing, University of Al-Qadysiah, Al- Diwaniyah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Drivers' Perception Towards Road Safety in Al Hilla City

Amean Ajeel Yasir

College of Nursing, University of Babylon, Hillah city, Iraq

ABSTRACT

Across sectional study design was adopted to assess the drivers perception toward road safety and to state ways that will help to ensure road safety and reduction of road traffic accidents. The population under study was (240) drivers who drive either their own car or rented or were driving the car as an occupation. The study was conducted at two primary health care centers in Al Hilla city which covered Al Gameyah primary health center and Al Kawthar primary health center. Structured questionnaire was developed for collecting the data. It was divided into 3 parts, the first part included demographic data, second part consisted questions pertaining to their perceptions by using Likert scale 3-point scale, and the third part included suggestions given by drivers to ensure road safety. Community health nursing students interviewed the drivers and collected the data during their clinical training in the above two mentioned primary health centers. Simple statistical methods were used to assess the results of the study. Results showed that majority of drivers (81.7%) always felt safe driving with seat belt on all the time, (43%) of them reported that loss of concentration & inability to control the car was the major causes of accidents, followed by speeding (24,5%).

Keywords: *Road safety, Drivers, Accidents, Community health*

INTRODUCTION

In recent years there is worldwide alarm due to the rising incidence of motor traffic accidents, which could probably contribute to the maximum percentage of the mortality and morbidity rate. It is evident from the WHO's initiative in dedicating the year 2004 as the year of "Road Safety". Since then citizens in more than 100 countries are hosting hundreds of World Health Day events. Responsible countries have identified it as a major preventable cause of death and are developing newer strategies to combat road traffic accidents[1, 2]. Use of mobile phone could not be less credited for the cause of road traffic accidents, as it has become part of human body, ready to respond to calls wherever they may be. It is agreed by most people that cell phones have revolutionized our way of life by adding convenience, swift responses and an ability to continue working uninterrupted by travel time. Cell phones when used by drivers have also revolutionized one of our ways of death too[3, 4]. The magnitude of the consequences of road traffic accidents far more believing as it leaves many homes fatherless, parentless, childless and the country's future economy would be affected with the higher percentage of persons belong to those who contribute to the economic growth and development of a nation. The survived are again left deficits looking forward to help from the social welfare for their means and lose all hope in life, as they cannot be effective citizens. The emotional turmoil of the kith and kin, friends and the neighborhood are unbearable and cannot be estimated in figures[5]. The researcher had conducted the study aimed at assessing the drivers perception toward road safety and to state ways that will help to ensure road safety. General objectives of the study: To assess drivers' perception toward road safety. To identify the causes of road traffic accidents as opined by the drivers. To obtain suggestions by drivers to ensure road safety. To state ways that will help to ensure road safety in Al Hillah city.

Corresponding Author:
Amean Ajeel Yasir
College of Nursing, University of Babylon,
Hillah city, Iraq
Phone number: 009647812267818
Email: amean1966@yahoo.com

MATERIALS AND METHOD

Across sectional study design was adopted. The population under study was (240) drivers who drive either their own car or rented or were driving the car as

an occupation. The study was conducted at two primary health care centers in Alhilla city which covered Al Gameyah primary health care center and Al Kawthar primary health care center. Structured questionnaire was developed for collecting the data. It was divided into 3 parts, the first part included demographic data, second part consisted questions pertaining to their perceptions by using Likert scale 3-point scale, and the third part included suggestions given by drivers to ensure road safety. Community health nursing students interviewed the drivers and collected the data during their clinical training in the above two mentioned primary health centers. Simple statistical methods were used to assess the results of the study.

Table 1: Drivers' responses that reflect their personal experiences toward Road accidents

	Statements	Always		Sometimes		Never	
		F	%	F	%	F	%
1.	I feel safer when driving with the seat belt on all the time.	197	81.7	39	16.6	4	1.7
2.	Talking over the mobile phone (GSM) while Driving leads to loss of control.	180	75	53	22	7	3
3.	Driving under the influence of alcohol leads to loss of control.	212	88.3	24	10	4	1.7
4.	I listen to loud music while driving most of the time, which reduces my concentration.	186	77.5	38	16	16	6.5
5.	I drive my car when I am tired or exhausted.	144	60	67	28	29	12
6.	I strictly follow road safety policies and regulations.	195	81.3	40	16.7	5	2
7.	I take rest from time to time while driving long distance.	24	10	163	68	53	22

Table 2:Drivers' perceptions toward the time they fasten their seat belt.

	Drivers' perceptions	F	%
1.	Before switching the car on.	45	19
2.	After switching the car on.	34	14
3.	Immediately after moving the car.	24	10
4.	Never wear a seat belt.	137	57
	Total	240	100

Table 3: Main causes identified by drivers for the occurring of incidents

	Causes of accidents	F	%
1.	Loss of concentration	78	29.0
2.	Inability to control the car	73	27.0
3.	Speeding and careless driving	63	24
4.	Lack of sleeps and fatigue	27	10.0
5.	Rains and weather disturbances	6	2.0
6.	Not enough street space	18	7.0
7.	Lack of car services and trespass	3	1.0
	Total	268 *	100

Table 4: Suggestions given by drivers to ensure road safety and reduce traffic accidents

	Suggestion given by drivers	F	%
1.	Following the traffic rules strictly	67	23
2.	Avoid speeding	41	14
3.	Concentrate while driving	16	5.5
4.	Have mental relaxation	16	5.5
5.	Check the car before starting to drive	5	2
6.	Avoid drinking before driving	7	2.5
7.	Install extra road traffic instructions	10	3.5
8.	Do not give license for young people	9	3
9.	Increase instructions board on the roads	9	3
10.	Penalizing the careless drivers	29	10
11.	Increase awareness through mass media	23	8
12.	Building safe roads and widening the roads	9	3
13.	Fasten seat belt and do not talk over the mobile phone (GSM) while driving	44	15
14.	During long distance travel, driver should take period of rest in between	5	2
	Total	290 *	100

RESULTS AND DISCUSSION

The study has brought results significant for affecting interventions to bring down the rate of traffic accidents in Al Hillah city. The demographic data shows that the majority of drivers are male (93.3%) in the age group of (21-29) years old also in comparing the drivers between the sexes, the males outstand the females (6.7%). This is evident as reported by khaleej Time Online 2016, (80%) of fatalities are male between (20-50) years of age (12). The results relative to identify the perceptions of the drivers towards road traffic accidents show that maximum percentage of (81.7%) drivers always felt safe driving with seat belt on all the time, while (16.6%) of them felt important to use only sometimes. However it is interesting to note that only (1.7%) of them are never felt safe when driving with seat belt on. This small percentage could be equated to the (59%) of people killed in reported traffic accidents in 2002 were not wearing seat Belt [6]. The second important cause associated with traffic accidents in this study was the use of mobile while driving. The use of mobile phones while driving has sometimes leaded to loss their control was admitted by a majority of drivers (75%). It has been aptly pointed in a research conducted by Hassan 2013 as talking on a mobile phone while driving is more dangerous than being over the legal alcohol limit according to research as listening to someone on the phone uses a lot more brainpower and uses the same areas to cope with sensory input and thus talking on the phone could result in a lapse of visual concentration [7]. Driving under influence of alcohol has not been accepted and clearly depicts the cultural practices of muslim people that alcohol is not accepted norm, as the majority of drivers (88.3%) agreed that it leads to loss of control. Music is of course mentally relaxing and does take away the stresses of day-to-day chores of life. Yet it has been associated with traffic accidents as in our study about (77.5%) felt their concentration is reduced while listening to music during their drive. The next cause frequently associated to traffic accidents was identified in my study that nearly (60%) reported that they drove their cars when they were tired or exhausted. Al Khalid 2006 has mentioned when you are behind the wheel of a car, being sleepy is dangerous. most people may not fully realize that drowsy driving can be just as fatal as driving drunk. Like drugs or alcohol, sleepiness slows reaction time, decreases awareness, impairs judgment and increases your risk of a crash [8-10]. One of the objectives of our study was to determine the extent to which the drivers followed the road safety policies and regulations, and it has been shown that there were nearly (16.7%) who only sometimes followed and nearly (2%) never followed at all the road safety policies. Therefore the study has great concerns to create awareness of road safety to this small percentage of driver who could bring down the accident rates massively as the results was supported by Nofal,199, Ouimet and others 2014 [8, 11]. Most of the drivers (68%) said that sometimes they take rest from time to time while driving for long distance. The National Transportation Safety Board (NTSB) estimates (31%) of commercial driver deaths and (58%) of single-truck crashes are fatigue related [12]. This is probably of high number of miles driven, truckers often drive at night when the body is tired, working all day before driving, driving long distances without stopping for breaks, taking medications, and driving alone on long rural roadways. We had other data related to safety measures were collected and analyzed in fulfill the objectives of this study. The safety timing of fastening seat belt showed that (57%) of the drivers were never wear a seat belt, followed by (19%) of the drivers only are wearing the seat belt before switching the car on, while (14%) of them are wearing it after switching the car on and a small percentage of them (10%) are wearing it immediately after moving the car. Though no study supports this view, however it has been shown in report of WHO, 2004 that fastening of the seat belt can reduce risk of fatality by (45%) and can reduce moderate to critical injury by (50%) for passengers riding in the front seat [10, 11]. The objectives of our study also included obtaining suggestions to ensure road safety in Al Hillah city. There were many suggestions, however for easy inference the results have been grouped as administrative suggestions and public health education and suggestions to drivers. It was found that the suggestions to drivers were with regard to following the traffic rules strictly, avoid speeding, concentrate while driving, have mental relaxation, fasten seat belt and not use mobile phones while driving and check the car before starting to drive and avoid drinking before driving. Next various suggestions to administrative agencies such as install extra road traffic instructions, do not give license for young people, increase instructions board on the roads, penalizing the careless drivers, increase awareness through mass media and specialized awareness programs.

CONCLUSION

Accordingly, the researcher recommended that the drivers should follow traffic rules strictly, avoid speeding, concentrate while driving, fasten seat belt and not use mobile phones while driving. Finally community health nurses, health educators, nursing students, teachers and other skilled health personnel should continue taking a vital role in reduction of road traffic accidents.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under College of Nursing, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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MF-GF Horizontal Distance as a Predictor of Sagittal Jaw Dysplasia (A Cephalometric Cross Sectional Study)

Kasem Ahmed Abeas[1]; Issam Merza Abdullah[1]; Lamees Khudir Mohamed[1]; Arkan Muslim Abd Al-kareem[1]

[1]Faculty of Dentistry, University of Babylon, Hillah city, Iraq

ABSTRACT

To overcome the deficiencies, at least geometric shortcoming, associated with the most commonly available sagittal indicators (ANB, Wits), efforts were employed to develope another an accurate and valuable mean for sagittal skeletal prediction. The study aimed to establish the mean values of a new sagittal approach [MF-GF"] for the assessment of skeletal relationship in its different patterns and whether or not there is a correlation with the other cephalometric indexes used in the study. The total study sample consist of ninety-seven pretreatment lateral cephalometric radiograph of Iraqi subjects with a mean age (13.5± 2). Again it has been subdivided into three skeletal relations (I, II, III) according to the combined criteria of (ANB angle, W angle, Wits appraisal) for each relevant class. MF-GF" is a linear distance measured between two lines perpendicular on the Frankfurt line from point M and G of the maxilla and mandible, respectively. Their mean values were (6.83 ± 0.69; 10.29 ± 1.63; 1.52 ± 1.60) for class I; II; III, respectively. A statistical significant mean difference was determined among all the classes. No significant gender differences were detected. A high degree of association was found to be with ANB angle (r= 0.82, P value<0.001) followed by the wits appraisal. It was concluded that the new MF-GF" distance can accurately be utilized in clinical assessment of sagittal jaw relationship in conjunction with other well known methods of sagittal jaw indicators for orthodontic diagnosis and treatment planning. Further studies are required to assess the reliability and reproducibility of MF-GF" linear for different skeletal patterns using larger sample and different age groups.

Keywords: *Sagittal jaw relation, MF-GF.*

INTRODUCTION

Since 1947[1], Regardless the different well known modern methods; and more recently the cephalometrics has a vital role in the interpretation of sagittal jaw relation for orthodontic patient. Various linear and angular parameters have been incorporated by cephalometric analyses to aid in diagnosing discrepancies within the apical jaw bases in the anterio-posterior direction[2]. The reliability of the landmarks with jaw rotation, head posture, orthodontic treatment as well as growth is the common problem that was faced using these parameters whatever its type [3]. "Cephalometrics for you and me", is the classical article of Steiner [4] who popularized the ANB angle in clinical practice after it was introduced by Riedel [5], as an anterio-posterior measure of jaw disharmony. However, with age progression the reproducibility of ANB angle is questionable as the nasion point is unstable in different directions as well as jaw rotation subsequent to growth and/or orthodontic treatment. The forementioned factors negatively would be affect the actual ANB angle reading [5-9]. To overcome the previous shortcomings, Jacoobson in 1975 [10] was developed the Wits horizontal distance depending on the functional occlusal rather than the reference lines of the cranial base whereby the severity of the skeletal pattern can be measured. Unfortunately, an additional problem had been arised as part from the difficulty in identification of the occlusal plane especially in patients with open bite, skeletal asymmetries, canted occlusion, and mixed dentition stage [11-13]. Thereafter, recently different parameters Beta angle [14], Yen angle [15], W angle [16] were developed to estimate the sagittal jaw

Corresponding Author:
Kasem Ahmed Abeas
Faculty of Dentistry, University of Babylon,
Hillah city, Iraq
Mobile: 009647832435858
Email: kasemaa2@gmail.com

discrepancy. Although those angles have advantages of being neither dependent on cranial reference plane nor occlusal plane and so it gave a reliable picture of the sagittal jaw relation. Difficulties associated with landmark identification, growth rotation, and unstability of the centre of the hypophysial fossa again are adversely affect their actual values [17-20].

The purpose of the present study was to test the ability of a new anatomical cephalometric parameter [MF-GF" distance] in the interpretation of anteroposterior skeletal relationship of the jaws for different skeletal classes for both genders independent on the rotation of the jaws as well as cranial and extracranial reference lines.

MATERIALS AND METHOD

Before sample assignment into the main skeletal groups and to be included in the present study, all the lateral cephalograms which comprise our study sample after their initial selection were traced by an Auto Cad 2010. According to certain predetermined criteria, ninety-seven standardized pretreatment lateral cephalometric radiograph with high quality for Iraqi sample aged between 11 and 16 years (57 females and 40 males) were selected for a study. By using two angular (ANB and W angles) and one linear (Wits appraisal) parameters; the traced cephalographs again were subdivided into three sagittal skeletal relations (29) class I;)33) class II; (35) class III. **(Table 1; Figure 1)**

Table 1: Showes sample classification using three skeletal anteroposterior measures into three skeletal types (I,II,III).

Skeletal Class	Antero-posterior Measures			No.
	ANB angle	W angle	Wits	
class I	2°- 4°	51°- 57°	BO coincide or ahead of AO by 1mm	29
class II	morethan 4°	lessthan 51°	AO ahead of BO	33
class III	less than 2°	morethan 57°	BO ahead of AO	35

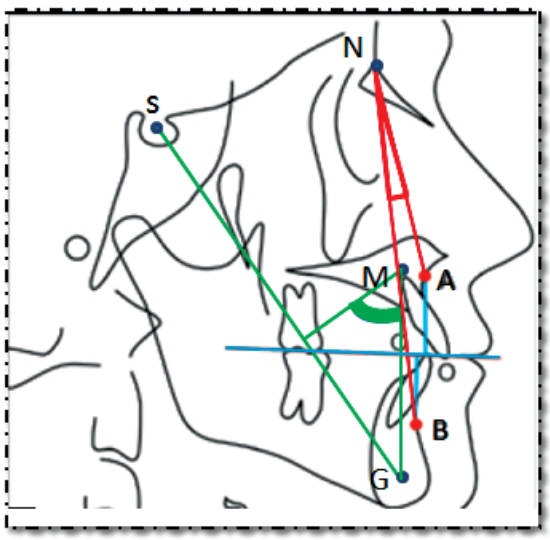

Figure 1: Represent measurement of ANB angle (red line); W angle (green line); Wits appraisal (syan line) for sample classification.

Cephalometric points and lines that are used for MF-GF" distance construction:

- Point M: Midpoint of the premaxilla.
- Point G: Center of the largest circle that is tangent to the internal inferior, anterior, and posterior surfaces of the mandibular symphysis [21].
- Porion (P) point: the most superior point on the external auditary canal[22].
- Orbitale (O) point: The lowest point on the infra-orbital margin[22].

By connecting these points three reference lines would be formed**: (Figure 2)**

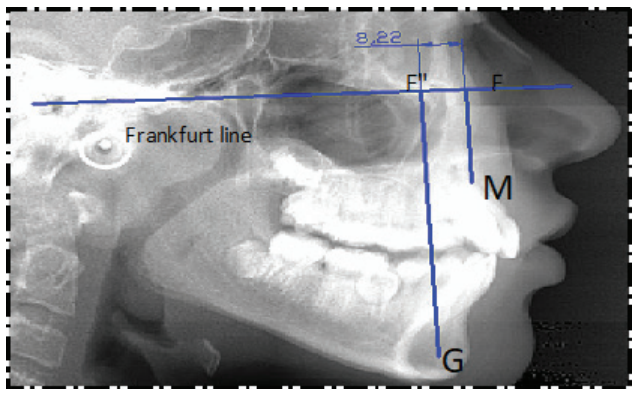

Figure 2: one of a study sample that represents Cephalometric tracing of MF-GF" distance.

- Line connecting P-O points forming Frankfurt plane.
- Line connecting M point perpendicular to Frankfurt line at F point [M-F line].
- Line connecting G point perpendicular to Frankfurt line at F" point [G-F" line].

Anatomical cephalometric angles and lines used for sample assignment:

1. ANB angle: formed by the connection of "A-N-B" points[4, 5].
2. Wits [AO-BO]: Horizontal linear distance between the perpendicular projection of A and B on the functional occlusal plane[10].
3. W angle: is measured between the M-G line and the perpendicular line on the S-G line from M point[16].

DATA ANALYSIS

Statistical analysis was carried out using SPSS version 17. Student t-test was used to compare means between genders. One way ANOVA test also was used for multicomparison of MF-GF" horizontal distance among the skeletal classes. In addition its correlations with ANB and W angles and Wits appraisal index were determined using Pearson correlation coefficient (r). A p-value of ≤ 0.05 was considered as significant.

RESULTS AND DISCUSSION

The balance and harmony of dentofacial complex and its growth and development have been studied by many investigators in four dimensions: namely height, depth, breath, and time, using lateral cephalometric radiographs [23]. Most orthodontic problems occur in the anteroposterior and vertical plane, so the lateral cephalographs provide the most useful information. The anteroposterior disharmony has received maximum attention in orthodontics as it is usually of utmost concern to patient and parents. Over the years, a number of analyses have been proposed with varying degrees of success and reliability in assessing the apical sagittal relation [24]. The ANB angle has been remained the most popular and useful principal method of establishing sagittal jaw relation. However, there is some difference between the cephalometric estimation of this angle and the absolute malrelationship between the apical jaw bases [7,25]. The Wits appraisal; similarly, uses a dental parameter, the functional occlusal plane, which is also subjected to variation with growth or orthodontic tooth movement [26, 27]. Several different studies have been reported on ANB angle and wits appraisal [26-28] by different authors and some on Beta angle; Yen angle; W angle [14-16] while not on MF-GF" distance. The horizontal linear measurement between the mandibular G point and the maxillary M point on the frankfurt reference line has been proposed to be more reliable and simple cephalometric method in estimating the sagittal skeletal disharmony of the jaws in their different relations as the latter two points are easily to be located and considered to be less susceptible, if any, by remodeling process during orthodontic treatment which is an advantage over the A and B cephalometric points. Moreover, Projections on the true horizontal line of the head can successfully be excluding the drawbacks enhanced during implementing the occlusal as well as anterior cranial base as reference lines.

Regarding our study results, the mean values of MF-GF" for skeletal class I; II; III were (6.83 ± 0.69; 10.29 ± 1.63; 1.52 ± 1.60), respectively. According to these values, each individual group had specific mean value differs significantly from the other. A statistical significant mean difference was determined among all the classes. The cephalometric M point is projected more forward on the Frankfurt plane than G point in the apical base relation is class II. In the same maner, the reverse is true for class III. No significant gender differences were found among all the skeletal classes **(Tables 2, 3)**. According to Pearson correlation coefficient (r); a varying degree of variability was found between the MF-GF" and the three anteroposterior skeletal measures of the jaws used in the study. Nevertheless; there is a direct significant linear correlation between the MF-GF" distance and ANB angle ($r= 0.82$; $P<0.001$) and Wits index ($r= 0.70$; $P<0.001$) while the former distance is indirectly proportional to W angle ($r= -67$; $P< 0.001$). A high degree of association was found to be with ANB angle followed by the wits appraisal. So, as the ANB angle and Wits index increases, the MF-GF" value can be increased and indicating a class II tendency. When there is a class III tendency, the reverse is true. Similarly, the MF-GF" distance shows gradual reduction as the W angle is increased. Anatomical as well as geometric variations among these sagittal jaw indices already was found.

Table 2: Reveals mean values for male and female, standard deviation, and gender defference of MF-GF" Distance for different skeletal classes. There were no significant gender differences between means of MF-GF" Distance for all classes

Skeletal class	Gender	N	Mean ± SD	t-test	P value
Class 1	Male	12	6.62 ± 0.76	-0.712	0.483
	Female	17	6.87 ± 0.69		
Class 2	Male	17	10.16 ± 1.52	-0.447	0.658
	Female	16	10.42 ± 1.78		
Class 3	Male	11	2.12 ± 1.85	1.518	0.139
	Female	24	1.25 ± 1.43		

Table 3: Multiple comparison for MF-GF" Distance among the three skeletal classes. A significant difference was found among the classes

Study Variable	Study group	Mean ± SD	Mean differences	P value	95% CI	
					Lower	Upper
MF-GF" Distance	Class 1	6.83 ± 0.69	- 3.461	<0.001*	-4.17	-2.74
	Class 2	10.29 ± 1.63				
	Class 1	6.83 ± 0.69	5.302	<0.001*	4.59	6.005
	Class 3	1.52 ± 1.60				
	Class 2	10.29 ± 1.63	8.764	<0.001*	8.08	9.44
	Class 3	1.52 ± 1.60				

*P value ≤ 0.05 was significant

CONCLUSION

The MF-GF" horizontal distance is a new anteroposterior measure of apical jaw bases disharmony and simply can be used clinically in conjunction with other well-known methods of sagittal jaw indicators for orthodontic diagnosis and treatment planning. Due to the large variability in human population, an accurate anteroposterior diagnosis cannot be achieved by merely using a single cephalometric analysis. Hence, and as the need arises, it is imperative that a clinician be aware of a range of cephalometric analyses to be used appropriately. Further studies are requested to assess the reliability and reproducibility of MF-GF" distance for different skeletal patterns using larger sample and different age groups.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of Dentistry, University of Babylon, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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The Anti-Fertility and Cytotoxicity Effects of Cyproterone Acetate and Phenolic Extract of *Hibiscusrosa Sinensis* Linn Flowers in Male Albino Rats

Al-Saily H. M.[1], Al-Hady F. N.[1], Al-Halbosiy M. M.[2]

[1]Department of Biology, College of Science, University of Babylon, Hillah city;
[2]Biotechnology Research Center, University of Al-Nahrin, Baghdad city, Iraq

ABSTRACT

The current study was designed to investigate the anti- fertility activity of Cyproterone acetate CPA and phenolic extract of *Hibiscus rosa sinensis L.* flowers and their cytotoxicity on the splenic lymphocytes (*In vivo*) and *(In vitro*) of male albino rats. The animals were divided into two groups, the first group was treated with CPA at dose 5mg/kg/day for 50 days and the second group treated with phenolic extract of *H..rosa sinensis* flowers in dose 300 mg/ kg/day for 60 days. The control group was also divided into two groups, the first group treated with corn oil for 50 days and the second treated with tap water for 60 days. The results showed a significant decrease (p<0.05) in the sperm parameters, and a significant increase (p<0.05) in percent of sperms abnormalities and the decrease in the sexual efficiency of males treated with CPA, whereas the sexual efficiency not affected in the group of rats treated with the phenolic extract. The pregnancy didn't occur in females mated with males treated with CPA until two weeks after the end of the treatment period. While the pregnancy didn't occur in females mated with phenolic extract of *H. rosa sinensis* flowers until five weeks after the end of the treatment period, also the results showed a significant increase in proliferation index (PIX) of splenic lymphocytes of albino rats (*In vivo)*.

Keywords: *anti- fertility, cytotoxicity, Cyproterone acetate, Hibiscus rosa sinensis L, male Rats*

INTRODUCTION

Cyproterone acetate used as a medicine for prostate cancer , it is steroidal antiandrogen inhibits the testosterone and DHT action by competitive association with cellular receptors. Al-Hady (2000) [1] revealed that cyproterone acetate has an effect in reducing the fertility of albino mice by decrease the sperm parameter in treated rats , especially the dosage 5mg/kg /day for 50 days (Abd-Al-Ameer, 2008) [2] which prompted to try to use it as a contraceptive for men [3]. Al-Zubaide *et al*., (2015) [4] also showed that the treatment of rats with phenolic extract of flower of *H. rosa* by dose 300 mg/ kg and duration of 60 days resulted in a significant decrease in the sperm grade activity and concentration of sperms in the testes and epididymis of treated animals. Significant decrease in the percentage of live and motile sperm and significant increase in the sperm abnormality in caudal of the epididymis of treated male rats , the treatment also caused a significant reduction in the level of hormones as FSH , LH and testosterone [5]. Cytotoxicity tests mainly aimed to detection the biological activity of tested substances, many cell types (e.g fibroblast, HeLa, splenocytes, lymphocytes and hepatoma cell) can be used to carry out these tests [6]. The aim of present study is to compare the cytotoxicity effect of CPA and crude phenolic extract of *H. rosa sinensis* flowers on the lymphocytes from splenocytes and the possibility to use the *H. rosa* extract as a male antifertility and compared with CPA.

Corresponding Author:
Al- Saily, H. M.
Department of Biology, College of Science,
University of Babylon, Hillah city, Iraq
Email: halamohy77@gmail.com

MATERIALS AND METHOD

The flowers of *Hibiscus rosa sinensis* L. were collected from nursery and agricultural areas in Babil province in April and May 2017. The flowers were used

in the flowering stage after well cleaned and washed with water and left to dry in the air at room temperature for two weeks. After that, the dried flowers were grinded with the grinder, until use.

Preparation of crud phenolic extract of *Hibiscus rosa sinensis* L. flowers: Ten gm of plant powder is taken and put in the flask (500 ml) and add 400 ml of acetic acid 2%. The phenolic compounds of the plant were extracted by using reflex condenser in water path (70°c) for 8 hours. After extraction was completed leaving the solution to cool down. Filtrated and the filtrate placed in a separator funnel and added to it an equal volume of n- propanol and amount of sodium chloride until saturation. Two layers formed, the upper layer containing the phenolic compounds and neglected the lower layer, the upper has been concentrated in a rotary evaporator then deride in the oven (40°c), this product kept in the refrigerator until use[7].

General phenolic Reagent: This reagent was prepared by mixing two equal quantities of aqueous solutions of 1% ferric chloride and 1% of potassium ferric cyanide. The extract was derided after it was obtained by dry calcium chloride ($CaCl_2$) to get rid of any effect of the moisture which could affect the identification. Compounds of *H. rosa sinensis* extract was identified by infrared spectrum by using Ft. Infrared device[8].

Animals: This study include 40 adult albino male rats and 16 female albion rats. The groups of males were randomly divided into four groups each group contains 10 animals:

First control group: (n = 10) treated with one ml of tap water.

Second control group: (n = 10) treated with one ml of corn oil.

Third group: (n = 10) treated with phenolic extract of *Hibiscus rosa sinensi*s flowers (300mg/kg) for 60 day [5].

Fourth group: (n = 10) treated with CPA (5mg/kg) for 50 days [2].

Sexual efficiency tests and Fertility: The remaining 2 animals from each group, each one placed with two of the females who had previously consive and delivered in a special breeding cage (40×30×15) where the existence of a vaginal plug was examined after the coupling for the purpose of sexual efficiency and fertility tests and monitored weekly for eight weeks to determine the time of conception.

Lymphocytes analysis (*In vivo*): The spleen was removed from euthanized rats and weighed it was teased between two frosted slides, and the tissue dispersion was separated by centrifugation at 260 g for 10 minutes at 4°C. The supernatant was discarded, and the pellet was suspended in 3ml red blood cell lysis buffer containing 0.83% NH_4Cl in 100 mM Tris buffer, PH=7.4 and maintained at room temperature for 3 minutes. The cells washed three times with media and suspended into 1ml of medium containing 10% FBS.

The proliferation index (PIX) was calculated as follows:

PIX =Absorbance of stimulated cells/ Absorbance of unstimulated cells.

Cell Culture Study

Lymphocytes analysis (*In vitro*): Splenic cell suspensions were prepared from eight untreated rats. Cells were counted and assessed for viability on a Haemocytometer through trypan blue exclusion test. Viable cells (>95%) were adjusted to 2×10^6 cells ml^{-1} in complete culture media. The treatment with CPA and phenolic extract of *H. rosa- sinensis* flowers (in different concentration) *in vitro* was performed in quadruplicates at the different concentrations. CPA in concentrations 0.156, 0.312, 0.625 and 1.25 mg/ml and phenolic extract in concentrations 18.75,37.5, 75 and 150 mg/ml were added to the cultures (2×10^5cells/well, or 2×10^6 cells/ml).

Statistical Analysis: Statistical Package for Social Science (SPSS) system/version 23 was used to perform the analysis of data. Results expressed as mean ± S.D. The Analysis of Variance (ANOVA), the Least Significant Difference (LSD) test and Duncan was used to compare between means.

RESULTS AND DISCUSSION

Identification of phenolic extract of Hibiscus *rosa sinensis* flowers by ft- Infrared: The infrared spectrum for extract shows appearance absorption band at (3358) cm^{-1} of (-OH) group and appearance absorption band at (1632)cm^{-1} of(C = C) aromatic bond which prove that our phenolic extract of *H. rosa- sinensis* was produced

and that the –oH group that appeared back to the phenols found in the extract and if they were return to the water or moisture, the beam was appeared broad [8].

Sperm Parameters Assays: Table (1) showed a significant decrease (p<0.05) in the sperm motility percent and epididymal sperm concentration, sperm viability percent, while a significant increase (p<0.05) in the abnormal morphology percent in the tail of epididymis in the male of rats treated with CPA and phenolic extract of *H. rosa* as compared with tap water and corn oil control groups. Also the treatment of adult male rats with phenolic extract of *H. rosa* flowers showed a significant decrease (p<0.05) in the concentration of sperms in the epididymis, grade activity of sperms and percentage of sperm viability and a significant increase (p<0.05) in the sperms abnormality percentage in the tail of epididymis as compared with tap water and corn oil controls. The results of the current study agreement with many studies showed that some plant products have the effectiveness of altering the sperm morphology or reduce its motility, such as the aqueous extract of the stem of *Leptadenia hastate* plant[12].

Table 1: Changes in sperm parameters in Experimental RatsTreated with CPA and Phenolic Extract of *H. rosa sinensis* Flowers (Mean ± SD).

Sperm parameters / Groups	Epididymis sperm Concentration Million/ml	Sperms with progressive Motility %	Sperms with non-progressive motility %	Immotile sperm %	Viability %	Abnormality %
Control (DW)	75 ± 6.12 a	53 ± 4.18 a	16 ± 4.18 a	25 ± 7.90 a	87 ± 4.47 a	19 ± 4.18 a
Control (corn oil)	73 ± 7.58 a	59 ± 4.47 a	17 ± 5.70 a	30 ± 7.90 a	81 ± 7.92 a	15 ± 6.08 a
CPA 5mg/kg	24 ± 4.18 b	6 ± 2.23 b	13 ± 4.47 a	83 ± 2.73 c	33 ± 7.58 b	67 ± 7.58 c
Phenolic extract of *H. rosa Sinensis* flowers 300mg/kg	28 ± 4.83 b	9 ± 2.73 b	18 ± 2.73 a	74 ± 4.18 b	38 ± 5.70 b	52 ± 5.70 b

Changes in Sexual Efficiency: The males treated with CPA for 50 days could not mating with the females up to the second week after the end of the duration of dosage where the sexual intercourse rats were 25% in the second day and 25% in the fifth day and 50% in the first day of the third week compared to the control group treated with corn oil, they were able to mate in percent 25% in the second day and 25% in the fourth day and 50% in the fifth day of the first week, while ,The males which treated with the phenolic extract of *H. rosa sinensis* flowers for 60 days were able to mate with the females in the first week after the end of the dosage period. The sexual intercourse ratio was 25%on the second day and 50% in the fourth day and 25% in the sixth day, where the ratio was close to the control group treated with tap water which they can mate with females in percent 25% in the third day and 25% in the fourth day and 50% in the sixth day of the first week Table (2).

Table 2: Changes In Percentages of Sexual Intercourse in Adult Males Treated with CPA and Phenolic Extract of *H. rosa–Sinensis* flowers

	Control (Corn oil)						Control (Tap water)						CPA group						Phenolic extract of *H. rosa sinensis* flowers group					
D / W	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1		25%		25%	50%			25%		25%		50%								25%		50%		25%
2														25%			25%							
3													50%											

Changes in Fertility Ratio: In Table (3).The pregnancy didn't occur in females mated with males treated with CPA in dose 5mg/kg of body weight for 50 days, until two weeks after the end of the treatment period, the pregnancy

percentage reached 25% in the third week and 25% in the fourth week and 25% in fifth week after the end of treatment period compared to the controls males who were the pregnancy percentage was 50% in the first week and 50% in the second week. While the pregnancy didn't occur in females mated with phenolic extract of *H. rosa- sinensis* flowers in dose 300mg/kg of body weight for 60 days, until five weeks after the end of the treatment period, the pregnancy percentage 25% in the sixth week and 25% in the seventh week and 25% in the eighth week after the end of the treatment period compared to the controls males who were the pregnancy percentage was 50% in the first week and 50% in the second week. The results of current study showed that the phenolic extract of *H. rosa sinensis* flowers had a good effect for a longer period on fertility percentage compared with the effect of CPA if it was suggested as anti-fertility for the male.

Table 3: Fertility Rates of Healthy Females Mated with CPA and Phenolic Extract of *H. rosa sinensis* Flowers

Groups / Weeks	Control (Corn oil)	Control (Tap water)	CPA 5mg/kg	Phenolic extract of H. rosa sinensis flowers 300 mg/kg
1st	50%	50%		
2 nd	50%	50%		
3 rd			25%	
4 th			25%	
5 th			50%	
6 th				25%
7 th				25%
8 th				25%

Lymphocytes Analysis: Proliferation Index (PIX): The results presented in Table (4) showed that CPA group and phenolic extract of *H. rosa sinensis* flowers have a significant increase (P<0.05) in PIX compared to both corn oil and Tap water controls, and non- significant differences (P<0.05) in PIX between groups treated with CPA and phenolic extract. Adenosine deaminase ADA, an enzyme present in high concentration in lymphocytes, it is responsible for purine metabolism, therefore it regulates the lymphocytes metabolism and play important role in differentiation and growth of lymphocytes.

Table 4: Changes in the Proliferation Index (PIX) of splenic lymphocytes in Experimental Rats Treated with CPA and Phenolic Extract of *H. rosa sinensis* Flowers (*In vivo*) (Mean ± SD)

Groups	PIX
Control (corn oil)	0.95 ± 0.04 a
Control (Tab water)	0.92 ± 0.07 a
CPA 5mg/kg	1.26 ± 0.05 b
H. rosa sinensis extrsct phenolic extract 300 mg /kg	1.36 ± 0.12 b

Proliferation index (PIX) of lymphocytes Treated with CPA: The results presented in Table(5) indicated that the incubation of splenic lymphocytes with CPA in concentrations (0.156,0.312. 0.625 and 1.25) mg/ml for 24 hours showed a significant reduction in PIX of lymphocytes as compared to control in dose dependent pattern by which the PIX decrease by increasing the concentration of CPA. Our results consistent with other studies reported cytotoxic effect of CPA in human peripheral blood cell culture *in vitro*.

Table 5: Effect of CPA in different concentrations on the proliferation index PIX of lymphocytes (*In vitro*)

Treatment mg/ml	PIX (mean ± SE)
Control	1.258 ± 0.069 a
0.156	1.167 ± 0.029 a
0.312	1.148 ± 0.085 a
0.625	1.029 ± 0.054 b
1.25	0.856 ± 0.042 c

Proliferation index (PIX) of lymphocytes treated with phenolic extract of *H. rosa sinensis* flowers: In the Table (6) the results revealed that the incubation of splenic lymphocytes with phenolic extract of *H.*

rosa sinensis flowers in concentrations(18.75, 37.5,75 and150) mg/ml for 24 hours showed a significant increase in lymphocytes PIX in dose-dependent pattern by which the PIX increase by increasing the concentrations of phenolic extract of *H.rosa sinensis* flowers.

Table 6: Effect of phenolic extract of *H. rosa sinensis* flowers in different concentrations on the proliferation index PIX of lymphocytes (*In vitro*)

Treatment mg/ml	PIX (mean ± SE)
Control	0.884 ± 0.08 a
18.75	1.069 ± 0.03 a
37.5	1.085 ± 0.02 a
75	1.155 ± 0.01 b
150	1.210 ± 0.06 b

CONCLUSION

The results showed that the incubation of splenic lymphocytes with CPA for 24 hr. caused a significant decrease ($p<0.05$) in PIX which decrease with increasing concentration, whereas the incubation of splenic lymphocytes with phenolic extract of *H. rosa* caused a significant increase ($p<0.05$) in PIX which increase with increasing concentrations as compared with control.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Self-concept in Relation to Inheritance Blood Diseases among Adolescents in Babylon Governorate–Iraq

Sahar Hasan Issa[1], Saja Hashim Mohammed[1], Abdulmadhdi A. Hasan[1]

[1]Department of Pediatric & Mental Health Nursing, College of Nursing, University of Babylon, Hillah city, Iraq

ABSTRACT

Adolescence is considered a critical stage of life, thalassemic adolescents undergo changes in perception due to frequent blood transfusions, severe complications, absenteeism from school and their psychosocial problems. This study aimed to identify the level of self-concept and to find out the association between level of Self-concept and related factors in adolescents with thalassemia major aged 10-18 in Babylon Governorate Iraq. This is a descriptive cross sectional study which was conducted on non-probability purposive sample of 100 adolescents with thalassemia referring to therapeutic and blood transfusion center. The instrument used to assess self-concept was Piers-Harris self –concept questionnaire ,the demographic data, clinical data and school history were obtained after gaining their verbal consents . The analysis was performed by using SPSS software version 21, Chi square test applied to assess the levels of associations between different variables. The mean of self-concept was low (M.S=1.43±SD=0.36) and also a significant association between self-concept domains except freedom from anxiety domain and absenteeism rate , and frequency of transfusion ($p<0.05$). The results revealed that there was low self concept level among thalassemic adolescents. Urgent psycho social intervention program is strongly requested to deal with this high priority public health problem.

Keywords: *Self-concept, children, adolescent, thalassemia*

INTRODUCTION

Thalassemia is a hereditary issue that show up at any age with most evident and major issues showing in adolescence stage. It was calculated that 53/1,000 child and youthful are liable to have illnesses with substantial genetic components [1]. Thalassemia is one of the inherited hemoglobinopathies responsible for a large number of chronic illness throughout the world [2]. Thalassemia is considered as one of the serious health problems situated in the Mediterranean regions, about 300 million carrier of this disorder of hemoglobin around the world [3]. The world health organizations have showed Thalassemia as one of the most popular chronic genetic disorders in 60 countries [4]. It's have challenges on the individual at the physical, emotional, cognitive levels and be more vulnerable to psychological disorders [4-8]. Where self-concept is a fundamental part of psychological functioning [9]. Self-concept is a complex mental design that depicts subjective image of their social credit, muscular, scholastic abilities , conduct and body image , its framework from which a person distinguish and interrelates with the self and others [10, 11]. Most psychosocial burden in adolescence period when adolescents developed self-concept, it is vital part for child mental health and progress. The Psychosocial burden for thalassemia perceived even more in adolescence stage [12, 13]. So, this study was done to measure the levels of self-concept among adolescents with thalassemia referred to special diseases center in Babylon, and to assess possible factors associated with low self-concept of Participants.

Corresponding Author:
Abdul Mahdi. A. Hasan
Department of Pediatric & Mental Health Nursing,
College of Nursing, University of Babylon,
Hillah city, Iraq
Phone: 009647716150716
Email: imad_dna@yahoo.com

MATERIALS AND METHOD

The target population for this study was Adolescents school patient who diagnosed with Inheritance blood

diseases and live in Babylon provenance Iraq and who have attended the hereditary blood disease center in Babylon teaching hospital for maternity & pediatric. The parent and guardians who bring their child for blood transfusions were close from the study.

Sample and Sampling technique: Purposive sample (non-probability) was used to recruit the Adolescents with thalassemia for this study . According to the following criteria:

- Adolescents Ages between 10 and 18 years according (WHO). Established diagnosis with B-thalassemia major or sickle thalassemia child was registered with thalassemia center attending Blood diseases center for regular blood transfusion at Babylon teaching hospitals in Babylon province.
- Both gender.
- The participation agreement in this study is achieved by having an informed consent from the legal guardians and the children's consent.
- Adolescents school patient able to read and write Arabic language.
- Adolescents school patients free from current psychiatric disorders.
- Babylon Governorate resident.

Exclusion Criteria for this study:

- Orphan adolescents.
- Patient with parents separated previously.
- Patient or Family refused to participant.

Other approvals were taken from the ministry of health , and official permission was obtained from director of blood disease center at Babylon teaching Hospital for maternity and pediatric. To ensure their agreement and facilitate to ensure the researcher's task to enter the center.

Instrument: For the present study, a questionnaire was developed based on study objectives, The Piers- Harris Child self-concepts scales sub-titled how do I feel about Myself is a short means of self-assessments that were made to evaluate the meanings of (I) in a child and an adolescent. The data on the scales are marked in true, somewhat true and very true in order to reveal the dimensions of these self-evaluations.

Data Collection Procedure: Data was collected on a self-administered questionnaire compromising 60 questions. that was self-developed to assess the self-concept. The subjects personal data were collected and their self-concept measured the collection of information was undertaken by only one researcher. in the present study the scale was given to 100 school thalassemia adolescents attending blood diseases center at Babylon teaching hospital for Maternity & Pediatric.

Data analysis procedure: Data analysis is based on a sample of 100 valid questionnaires. For the data analysis SPSS version 21 statistical package was used. Non-parametric test using the Chi $\chi 2$ test for differences and associations were applied. A P-value ≤ 0.05, ≤ 0.01 were considered as statistically significant at 5% (*) and highly significant at 1% (**) respectively, whereas P value more than 0.05 considered as non-significant.

Table 1: Shows the Sociodemographic characteristics of the parents

Demographic Variables	Rating	Number	Percentage
Mother Occupation	house wife	94	94.0
	Employed	6	6.0
Father Occupation	Employed	40	40.0
	free working	46	46.0
	Unemployed	8	8.0
	Retired	6	6.0
Mother Education	does not read and write	7	7.0
	Primary	20	20.8
	Intermediate	31	31.0
	Secondary	26	26.0
	college or diploma	16	16.0

Conted…

Father Education	does not read and write	5	5.0
	Primary	12	12.0
	Intermediate	24	24.0
	Secondary	26	26.0
	college or diploma	33	33.0

Table 2: Self-concept for Study Participants

	Items	Levels	F	%	M.S	±SD
1.	Happiness and Satisfaction	Low	73	73.00	1.48	0.20
		Moderate	23	23.00	1.97	0.13
		High	4	4.00	2.43	0.11
	Total		100	100	1.63	0.32
2.	Popularity	Low	74	74.00	1.51	0.21
		Moderate	18	18.00	2.04	0.09
		High	8	8.00	2.54	0.26
	Total		100	100	1.69	0.38
3.	Freedom form anxiety	Low	32	32.00	1.45	0.27
		Moderate	31	31.00	1.98	0.11
		High	37	37.00	2.50	0.18
	Total		100	100	2.00	0.48
4.	Physical appearance and attributes	Low	75	75.00	1.41	0.24
		Moderate	22	22.00	1.99	0.11
		High	3	3.00	2.38	0.22
	Total		100	100	1.56	0.35
5.	Intellectual and school status	Low	68	68.00	1.50	0.23
		Moderate	23	23.00	1.95	0.09
		High	9	9.00	2.36	0.18
	Total		100	100	1.68	0.35
6.	Behavioral adjustment	Low	83	83.00	1.31	0.21
		Moderate	13	13.00	1.98	0.13
		High	4	4.00	2.35	0.15
	Total		100	100	1.43	0.36

Table 3: Association between self-concept of child and frequency of transfusion/month

Variables	Freq. transf.	low		Moderate		high		χ2	P value
		No.	%	No.	%	No.	%		
Happiness and Satisfaction	Once	54	76.1	16	22.5	1	1.4	39.092	** <0.001
	Twice	17	70.8	5	20.8	2	8.3		
	Three	2	40	2	40	1	20		
Variables	Freq. transf.	73		23		4	100	χ2	P value
		low		Moderate		high			
		No	%	No	%	No	%		

Conted…

Popularity	Once	52	73.2	14	19.7	5	7.	78.178	** <0.001
	Twice	18	75	4	16.7	2	8.3		
	Three	4	80	0	0	1	20		
Variables	Freq. transf.	74		18		8	100	χ2	P value
		low		Moderate		high			
		No	%	No	%	No	%		
Freedom form anxiety	Once	23	32.4	23	32.4	25	35.2	5.446	NS 0.243
	Twice	7	29.2	7	29.2	10	41.6		
	Three	2	40	1	20	2	40		
Variables	Freq. transf.	32		31		37	100	χ2	P value
		low		Moderate		high			
		No	%	No	%	No	%		
Physical appearance and attributes	Once	57	80.3	12	16.9	2	2.8	44.940	** <0.001
	Twice	16	66.7	7	29.2	1	4.2		
	Three	2	40	3	60	0	0		
Variables	Freq. transf.	75		22		3	100	χ2	P value
		low		Moderate		high			
		No 68	%	No 23	%	No 9	%		
Intellectual and school status	Once	52	73.2	14	19.7	5	7	22.693	** <0.001
	Twice	14	58.3	7	29.2	3	12.5		
	Three	2	40	2	40	1	20		

Table 4: Association between self-concept items and child's absenteeism rate in school

Variables	**Absenteeism rate**	**low**		**Moderate**		**high**		**χ2**	**P value**
		No	**%**	**No**	**%**	**No**	**%**		
Happiness and Satisfaction	Rarely	54	76.1	16	22.5	1	4.1	33.023	** <0.001
	Some time	17	70.8	5	20.8	2	8.3		
	Frequently	2	40	2	40	1	20		
Variables	**Absenteeism rate**	73		23		4	100	χ2	P value
		low		Moderate		high			
		No	%	No	%	No	%		
Popularity	Rarely	52	73.2	14	19.7	5	7	78.178	**<0.001
	Some time	18	75	4	16.7	2	8.3		
	Frequently	4	80	0	0	1	20		
Variables	**Absenteeism rate**	74		18		8	100	χ2	P value
		low		Moderate		high			
		No	%	No	%	No	%		

Conted…

Freedom form anxiety	Rarely	23	32.4	23	32.4	25	35.2	5.466	NS 0.243
	Some time	7	29.2	7	29.2	10	41.7		
	Frequently	2	40	1	20	2	40		
Variables	**Absenteeism rate**	32		31		37	100	$\chi 2$	P value
		low		Moderate		high			
		No	%	No	%	No	%		
Physical appearance and attributes	Rarely	57	80.3	12	16.9	2	2.8	44.940	** <0.001
	Some time	16	66.7	7	29.2	1	4.2		
	Frequently	2	40	3	60	0	0		

RESULTS AND DISCUSSION

The Demographic characteristics of the participants show the children with thalassemia aged between (10-14) years highest percentage where present 69% of the study participants . Whereas, regarding Gender distribution the higher percentage from study participants was male (58%), Only77% of children were in the primary school. ,While 52% reported that they had accounted not quite enough income . The majority Children were living with extended families constitute 62%. Table l clearly shows the Sociodemographic data of children parents ,It shows that the majority of the study subjects their father's (46%) had free work; whereas, the majority of mothers were housewives (94%). Table 2 shows the overall score and each subarea obtained in the Piers-Harris Self –Concept Scale Based on the statistical cut off point, this table shows that each subarea score obtained by participants was low in the Piers –Harries self-concept scales of Children. ,about 75% of participants had an low or poor appearance and attitude and 37% of participants had low or poor anxiety . levels of happiness and satisfaction in 73% of the sample were low**.** According to the findings in Table 3 ,This table represents of the child clinical data , the present study reported that regarding the frequency of transfusion were highly significant association between all aspect of self-concept domain except freedom from anxiety and frequency of transfusion at *P* value less than 0.001. As shown in Table 4 This table represents of the child school history , the present study reported that regarding the absenteeism rate were highly significant association between self-concept domains except freedom from anxiety and absenteeism rate at P value less than 0.001. In general , our study results indicated approximately 67.50% of thalassemic adolescents who participated in this study had lower perceptions of self-concept in the overall subareas and scores. Children with thalassemia major had the mean of score of self-concept for all dimension was 1.43 in the low range , according the finding in table 2 .The results of this study compatible with other studies that examined self-concept in different region of the world , agree with study done by [14, 15],Also study done by [16, 17] was partially compatible with our study result where 58% of the thalassemic children had average level from self-concept. The results for the "Popularity" subareas show that children with thalassemia are unpopular where 74% of them had low level from popularity and mean of score 1.69 these results compatible with previous studies where indicated negative impact of beta thalassemia major on social relationship, involving common stigmas and discriminations in South Asian community [18]. Results regarding Table 4 revealed a highly important associations between self-concept domains and school absenteeism ($\chi 2$=9.488; d.f.= 4; P=value=,<0.001) except freedom from anxiety, [19] congruent with our study results there were highly important associations between the effects on psychosocial burden and recent schoolings 50% of the patients who report severe levels of psychosocial burdens because of thalassemia on their educations.

CONCLUSION

According to the findings of this study, it was indicated that self-concept of children with thalassemia is low. This indicates the importance of psychological consultations in educational fields. Considering the psycho-social aspects of thalassemia, in their management protocol and training, the adaptive strategies along with providing new clinical and therapeutic services to the patients and their families who directly engaged with these patients can increase self-concept of these patients in emotional, behavioral, social and school dimensions.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In this research, all experimental protocols were approved under the Emergency Department of Hillah Teaching Hospital of Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Cytotoxic and Apoptotic Effects of Phenolic Extract of *Hibiscus Rosa Sinensis Linn* Flowers Against Cancer Cells And Normal Cells

Al-Saily H. M.[1], Al-Halbosiy M. M.[2], Al-Hady F. N.[3]

[1]Department of Biology, College of Science, University of Babylon, Hillah city; [2]Biotechnology Research Center, University of Al-Nahrin, Baghdad city; [3]Department of Biology, College of Science, University of Babylon, Hillah city, Iraq

ABSTRACT

Phenolic extract of *Hibiscus rosa sinensis* Linn flowers was evaluated for their cytotoxicity and apoptosis induction in human testicular cancer cell line Tera-1 and macrophage cancer cells from an adult BALB/c strain mouse male RAW 264.7 as compared to normal human hepatic cells WRL-68. The results showed that the phenolic extract of *H. rosa sinensis* flowers were effective on all cancer cell lines used in this study and Tera-1 cells with IC50 value of 23.496 mg/ml were more sensitive toward phenolic extract of *H. rosa sinensis* flowers than RAW264.7 cells with IC50 value 31.841 mg/ml, whereas the WRL-68 cells with IC50 value 498.884 were not affected by phenolic extract. The Multi- Parameters Cytotoxicity Activity of extract on Tera-1 cell line showed a significant decrease ($P<0.05$) in valid cell count, nuclear intensity and mitochondrial membrane potential (MMP) and a significant increase in membrane permeability and cytochrome C releasing, therefor the phenolic extract of *H. Rose* sinensis have anti-tumor activity, especially on testicular cancer cells.

Keywords: *cytotoxic, apoptotic, Hibiscus rosa sinensis cancer cells, normal cells*

INTRODUCTION

The *H. rosa* is native to tropical Asia, especially southeastern Asia (China), 8 or more different species originating from the islands in the Indian and African East Coast and Pacific ocean[1]. The *Hibiscus rosa sinensis* plant is a perennial shrub with tap root and the flowers take bright colors such as red, white, pink and yellow. Red–colored flowers are used in medical applications[2], the flowers of *H. rosa* contain flavonoids, phenolic compounds, glucosides, phytosterols, terpenoids, tannins, saponins, flavones, alkaloids, carbohydrates amino acids and proteins contributed to the medicinal utility of the plant[3-5]. By using HPLC technique the phenolic extract of *H.rosa Sinensis* flower showed contain: Acetylsalisalic acid, Chlorogenic acid, Coumarin, Lutein, Cynidin, and Quercetin[6]. *Hibiscus Rosa sinensis* plant is used to treat many diseases and its leaves and flowers are used to stimulate hair growth[7], and anti- diabetic effect, and wounds healing, and cardiac protective effect. and reduce blood pressure[8] have been found to be useful for treatment of hypercholesterolemia[9]. Alsoit is found that the root extract act to reduce the lipids in blood and cause hypolipidaemic activity[10]. The Quercetin and Lutein are a flavonoids content as glycosides, flavonoids have anti-oxidation and anti-cancer activity[11]. other studies which suggested the anti-cancer activity of *H.rosa sinensis* plant[12, 13].

Corresponding Author:
Al-Saily, H. M.
Department of Biology, College of Science,
University of Babylon, Hillah city, Iraq
Email: halamohy77@gmail.com

MATERIALS AND METHOD

Preparation of *Hibiscus rosa* extract: Crud phenolic compounds were extracted according to Ribereau-Gayon, (1972) [14] method, 10 gm. of plant powder is taken and put in flask (500 ml) and add 400 ml of acetic acid 2%. The phenolic compounds of the plant were extracted by using reflex condenser in water path(70°c) for 8 hours. After extraction was completed, leaving the solution to cool down. Filtrated and the filtrate placed in a separatory funnel, and added to it an equal volume of n- propanol and amount of sodium chloride until

saturation. Two layers formed, the upper layer containing the phenolic compounds and neglected the lower layer, the upper has been concentrated in a rotary evaporator then deride in oven (40°c), this mater kept in refrigerator until use.

Determined of Cytotoxicity: The cytotoxic effect of phenolic extract of *H. rosa sinensis* flowers was investigated according to selected parameters including: MTT assay as assay of cell function to determined cell viability, high content screening (HCS) technique for the apoptosis of cell. Only the most cytotoxic concentration of the phenolic extract and the most sensitive cells as assayed by MTT was selected to complete the other test:(HCS).

MTT assay: The cell viability was determined by colorimetric assay using 3-[4,5-dimethylthiazoyl]-2,5-diphenyltetrazolium bromide (MTT dye), three kinds of cells were employed in this work: (Tera-1 cell line), (RAW 264.7) and the normal human hepatic cells (WRL-68). Briefly, 100 µl of cell suspension was added onto the 96 flat bottomed micro-titer plate wells, each line in a separated plate, for the three cell lines and two fold serial dilutions of *H. rosa sinensis* phenolic extract (1.17, 2.34, 4.68, 9,37, 18.75, 37,5 and 75 mg/ml) were added to wells, in a final volume of 200 µl complete culture medium per each well. Triplicates were used per each concentration as well as the controls (cells treated with serum free medium), then the plates were incubated in 5% CO_2 incubator for 24 hours at 37°C. Ten µl of the MTT solution was added to each well. Plates were further incubated in 5% CO_2 at 37°C for 4 hours ,the solution became yellow, then 200 µl of solubilization solution of DMSO was added into each well and shaked for 5 min.(the DMSO solution became purpule). After complete solubilization of the dye, the absorbance of the colored solution obtained from living cells were read at 570nm with an ELISA reader. The mean absorbance for each group of replicates was calculated. The percentage of cell viability that exposed to various treatments is obtained as follows:

cell viability percent =[(absorbance of treated cells/ Absorbance of non- treated cells)×100] [15].

The data of optical density was subjected to statistical analysis in order to calculate the concentration of compounds required to cause a 50 % reduction in cell viability for each cell line [16].

The High Content Screening (HCS) Assay (Diana et al., 2012): The multi- parameters cytotoxicity assay was performed by using the HCS kit to measurement of five independent parameters that monitor cell death, including viability cell count, nuclear size and morphological changes (nuclear intensity), changes in cell membrane integrity and cell permeability, mitochondrial membrane potential and cytochrome C localization, release from mitochondria. Different concentrations of the phenolic extract of *H. rosa- sinensis*, 200, 400 and 800 µg/ml were used for treatment one cell line: the human testes cancer cell lines (Tera-1) for interval time 24 hours.

Tera-1 cell preparation: The protocol of Tera-1 cells was optimized according to instruction of ATCC (American Type Culture Collection). EMEM medium containing 10% fetal bovine serum and 100 units/ml pencillium and 100 µlg/ml streptomycin were used for routine culture.

Statistical Analysis: Statistical Package for Social Science (SPSS) system/ version 23 was used to perform the analysis of data. Results expressed as mean ± S.D. The Analysis of Variance (ANOVA), the Least Significant Difference (LSD) test and Duncan was used to compare between means.

Table 1: Cytotoxicity effect of phenolic extract of *H.rosa sinensis* flowers on RAW264.7 cells, Tera-1 cells and WRL-68 cells after 24 hours incubation at 37C°

Phenolic extract of *H.rosa sinensis* flowers	**Cell viability % (mean ± SD)**		
Conc. mg/ml	**RAW 264.7**	**Tera-1**	WRL-68
1.17	92.15 ± 1.62	96.60 ± 1.51	96.56 ± 1.29
2.34	84.64 ± 2.83	95.40 ± 1.29	95.94 ± 1.22
4.68	75.05 ± 0.50	78.89 ± 3.32	96.25 ± 0.37
9.37	62.71 ± 0.57	62.07 ± 4.16	94.86 ± 1.54

Conted…

18.75	51.58 ± 0.49	56.32 ± 4.11	90.54 ± 2.08
37.5	47.96 ± 1.23	39.85 ± 4.04	74.61 ± 2.29
75	46.70 ± 1.53	32.40 ± 4.64	66.15 ± 2.79

Table 2: Cytotoxicity effect of phenolic extract of H. rosa sinensis flowers on multi cellular parameters of Tera-1 cell line after 24 h. incubation at 37c° and evaluated on the Array Scan HCS Reader

HCS parameters (mean ± SD)					
Concentrations µg/ml	**Valid cell count**	**Nuclear intensity**	**Membrane Permeability**	**(MMP)***	**Cytochrome C releasing**
Control (untreated)	2010 ± 31.82 a	297.2 ± 6.71 a	77.50 ± 5.79 a	310± 13.08 a	152 ± 9.89 a
Doxorubicin 20µM	1205 ± 9.19 c	172.4 ± 4.52 d	172.6 ± 9.05 c	178.7 ± 10.82 d	258.6 ± 6.50 d
200	1942 ± 31.11 a	289.5 ± 1.48 a	88.70± 3.96 a	290.5 ±6.36 a	159.9.3± 4.10 a
400	1783 ± 14.85 b	274 ± 7.49 b	98.40± 3.96 a	271.3 ±3.88 b	181.6± 6.50 b
800	1575± 19.80 c	226.7± 7.21 c	133.4± 8.55 b	237.1± 11.46 c	197.4± 4.10 c

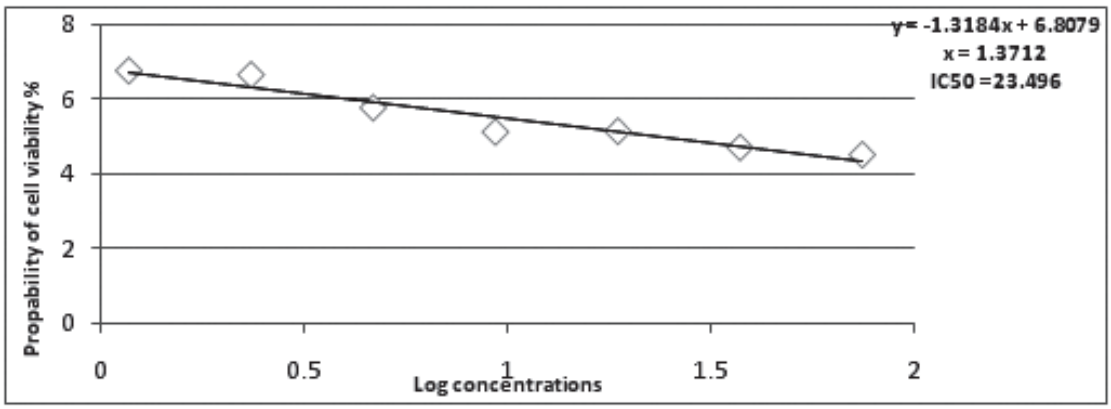

Figure 1: IC50 of phenolic extract of H. rosa sinensis flowers–treated RAW264.7 cells after 24 hr of incubation

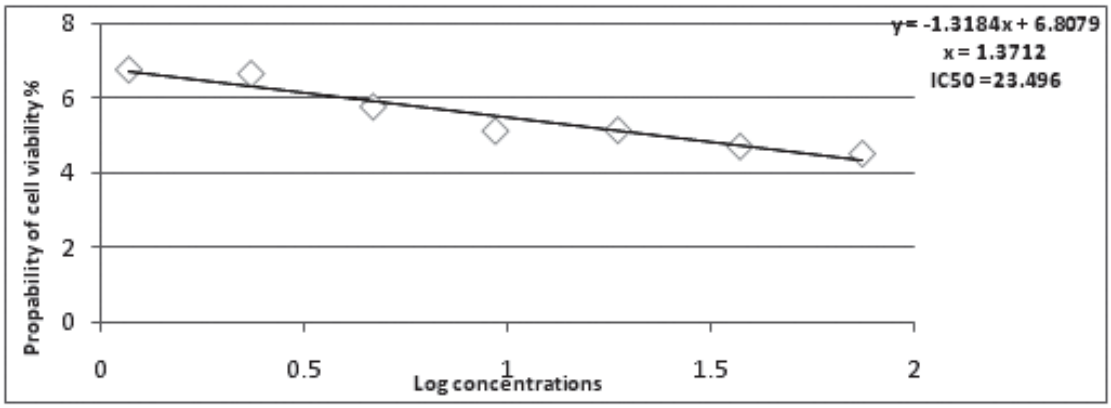

Figure 2: IC50 of phenolic extract of H. rosa sinensis flowers – treated Tera-1 cells after 24 hr of incubation.

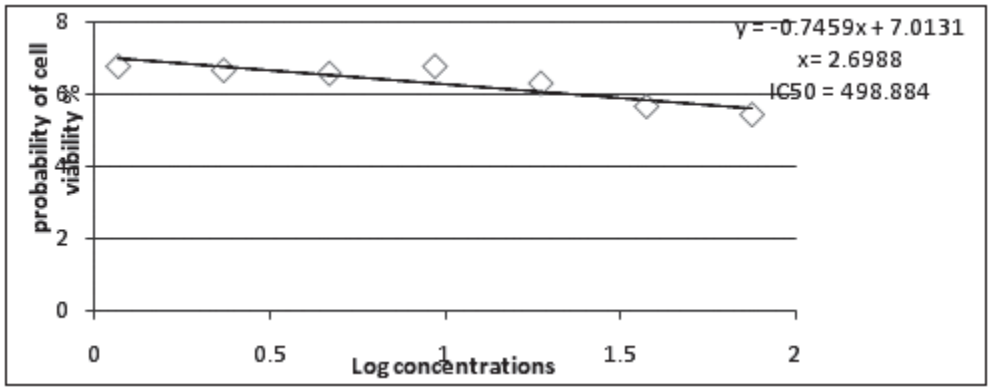

Figure 3: IC50 of phenolic extract of H. rosa sinensis flowers–treated WRL-68 cells after 24 hr of incubation

RESULTS AND DISCUSSION

Cytotoxic effect of phenolic extract of H. rosa sinensis flowers on cancer cell lines and normal cells *in vitro* by using MTT assay: The cytotoxic effect of phenolic extract of *H.rosa sinensis* flowers was determined by 3-(dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromid (MTT) assay on two different types of tumor cell lines: tastis cancer cell lines Tera-1, macrophage cancer cell lines RAW264.7 and normal hepatic cells WRL-68. This assay was performed to measure the cell viability by applying different concentrations of phenolic extract on the tumor and normal cell lines Table(1). MTT colorimetric assay was achieved to determine cell viability at each time- point, best values were chosen for the most significant IC50 values Figure(1), Figure(2) and Figure(3). The results indicated that the incubation of RAW264.7 cells and Tera-1 cells with phenolic extract in concentrations 1.17, 2.34, 4.68, 9.37, 18.75,37.5 and 75 mg/ml for 24 hours showed a reduction in cells viability in a dose dependent pattern by which cell viability decreased by increasing the concentrations of phenolic extract of *H.rosa sinensis* flowers. The lowest cell viability % was recorded in Tera-1 cells 32.40 % in concentration 75mg/ml; however it was 46.70 % and 66.15 % for RAW264.7 and WRL-68 respectively at 75mg/ml. The results showed that the WRL-68 cells viability was not significantly affected by the application of different phenolic extract of *H. rosa sinensis* flowers concentrations as compared with the viability of Tera-1 and RAW246.7 cells. It was observed significant differences in the cell viability % between the different cell lines by calculating the IC50. The tera-1 significantly affected by cytotoxic activity of phenolic extract of *H. rosa sinensis* flowers with IC50 23.496 mg/ml, whereas IC50 values of RAW246.7 and WRL-68 were 31.841 and 498.884 mg/ml respectively. The results of this study showed that the IC50 of Tera-1 cells was 23.496 mg/ml, whereas IC50 of RAW 264.7 cells was 31.841 mg/ml that's mean the testicular cells more sensitive to phenolic extract than macrophage cells, this may be due to that phenolic compounds possess a reactive oxygen species ROS production property especially hydrogen peroxide (H_2O_2) radical [17], and because testicular cells are more sensitive to H_2O_2 which induce apoptosis in these cells [18]. The hepatic normal cells WRL-68 were not affected by the phenolic extract compared to cancer cells Tra-1 and RAW 264.7 cells.

The Multi- parameters Cytotoxic Activity Phenolic Extract of *H. rosa sinensis* flowers on Tera-1 cell line: The multi- parameters cytotoxic activity of *H.rosa sinensis* phenolic extract was estimated by using Tera-1cells. Five of cell-health parameters were simultaneous measurement by thermo scientific cellomics multi-parameter cytotoxicity 3 kit. Three concentrations (200,400,800 µg/ml) of phenolic extract were tested on Tera-1 cell line to detect the changes in five cellular parameters (valid cell count, nuclear intensity, membrane permeability, mitochondrial membrane potential MMP and cytochrome C) after 24hours of exposure. Table (2) showed that 800 µg/ml has the highest significant effect on all the five parameters when compared with Doxorubicin 20 µM (substance used as anti-cancer) which consider the positive control. The concentration 200 µg/ml showed a close results to those of the untreated cells which represent the negative control. The incubation of Tera-1 cells with *H.rosa sinensis* phenolic extract in concentrations (200,400 and 800 µg/ml) for 24hours showed a significant decrease ($p<0.05$) in valid cell count, nuclear intensity and mitochondrial membrane potential MMP, and a significant increase

($p<0.05$) in membrane permeability and cytochrome C releasing as compared to untreated cells (negative control) in dose dependent pattern by which the decrease of valid cell count, nuclear intensity and mitochondrial membrane potential MMP and increase membrane permeability and cytochrome C releasing by increasing of concentrations of *H.rosa sinensis* phenolic extract.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Biology, College of Science, Hillah city, Iraq and all experiments were carried out in accordance with approved guidelines.

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Prevalence, Control and Associated Factors of Hypertension in Rural Middle Aged Women of Kerala

Sandhya GI[1], Anitha Abraham[2], Ramla Beegam[3]

[1]Associate Professor, [2]Assistant Professor, [3]Professor &HOD, Community Medicine, Dr SMCSI Medical College, Karakonam, Thiruvananthapuram

ABSTRACT

Title: Prevalence, Control and associated factors with hypertension among rural women aged 30-60yrs in Kerala

Objective: To estimate the prevalence, control and factors associated with hypertension among middle aged women of rural Kerala.

Background: Hypertension is a major public health problem in India. It is a leading cause for mortality and morbidity in India

Result: The overall prevalence of hypertension was 32.1% and prehypertension was 8.4%. Among the hypertensive 32.2% (10.2% of the total study population) were newly diagnosed. 55% the known hypertensive were not taking treatment regularly and 57% of the known hypertensive have uncontrolled hypertension. 32.3% of the study population was overweight where as 12.8% was obese. Multi logistic regression revealed that BMI>25kg/m^2, perceived stress, family history of hypertension and diabetes were factors associated with hypertension

Conclusion: This study has shown that hypertension is highly prevalent among rural women and the disease is uncontrolled among the rural women.The fact that one tenth of the population has hypertension which is undetected is alarming. Primary and secondary levels prevention of hypertension should be considered.

Keywords: *Hypertension, Prevalence, prehypertension, control,rural women*

INTRODUCTION

Hypertension is an important disease and a risk factor which directly and indirectly contribute to the mortality and morbidity of the Indian population. This disease can affect the population without causing symptoms and for this reason it can be undetected for a long period. Cardiovascular diseases account for a large proportion of all deaths and disability worldwide. Global Burden of Disease Study reported that in 1990, there were 5.2 million deaths from cardiovascular diseases in economically developed countries and 9.1 million deaths from the same causes in developing countries.[1]The situation in India is more alarming. It was reported that of a total of 9.4 million deaths in India in 1990, cardiovascular diseases caused 2.3 million deaths (25%). A total of 1.2 million deaths were due to coronary heart disease and 0.5 million due to stroke.[1] It has been predicted that by 2020, there would be a 111% increase in cardiovascular deaths in India. Hypertension is a risk factor for major cardiovascular diseases and there by a public health burden in India[2,3,4] Moreover, most or all BP-related risk appears to be reversible within a few years with inexpensive interventions. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India.[2] This fact is important because hypertension is a controllable disease and a 2 mmHg population-wide decrease in BP can prevent 151,000 stroke and 153,000 coronary heart disease deaths in India.[2,]

A number of Prevalence studies about hypertension has been conducted in urban areas of India[5,6,7,8] but a few studies of hypertension in rural areas were published in

Corresponding Author:
Dr Sandhya GI
Associate Professor, Community Medicine
Dr SMCSI Medical College
Karakonam, Thiruvananthapuram, Kerala

India[9-13] . As per best of our knowledge women centered studies regarding hypertension are limited[14] . Although there is generally a lower prevalence of hypertension in the rural Indian population, there has been a steady increase over time in this rural population as well[15]. It has also increased over the years—0.52% in Bombay (1959), 1.99% in Delhi (1959), 3.57% in Haryana (1978), 5.41% in Delhi (1983), 5.59% in Rajasthan (1984), 2.63% in Punjab (1985), 4.02% in Maharashtra (1993), 3.41% in Maharashtra (1993), 7.08% in Rajasthan (1994) and 3.58% in Haryana[15].In South Indian rural subjects, that are almost urbanised, the prevalence has been reported to be as high as 17.8% (1993) and 12.46% (1994) in recent years[15]. A study conducted in Achudamenon centre for kerala has shown that incidence of hypertension is 23.6%[9] and another study conducted in central Kerala reported prevalence of hypertension as 36%.

Most of the prevalence studies have reported that women have lesser prevalence compared to men[11-14]. One of the study conducted in central India[10] reported a high prevalence of hypertension among women compared to men in India.

Diagnosis of hypertension is important. Chenni urban study [8] reported that 32.8% of the people were aware of their disease and among them 45.8% were under control. A tribal study from Kerala state[16] reported only 10% diagnosed and 8% control of hypertension. Early diagnosis and treatment of hyper tension is important as hypertension can be asymptomatic for a long period and may lead to a number of complications.

We performed population based cross sectional study in a rural panchayath of Kerala to study prevalence, treatment control of hypertension in women aged 30-60 years.

MATERIALS AND METHOD

The study has started after getting ethical clearance from the institution.The study purpose explained to all the participants and informed consent has taken from all the participants

Study design and period: It is a community based cross-sectional study conducted in rural areas of Kerala State, India. The study period was 2014 august to December.

Sample size and sampling strategy: Sample size is calculated based the prevalence study conducted in one of the rural areas of India [9-13]Based on this prevalence with 95% confidence interval (CI) and 20% relative precision the sample size required is 324. Predicting a 5% non response rate the final sample size is 345. Considering a design effect of 2 final sample size was 690.Sample size collected for this study was694.

Selection of area: Area selected for the study is two rural panchayath of Thiruvananthapuram district namely Ottasekharamangalam and Amboori with a total population of 44000.

A multi stage random sampling technique was used for the present study. In first stage five villages were selected randomly from a total of 24 villages. In second stage 694 eligible women were selected randomly from these villages. We excluded migrant population and women with chronic debilitating diseases. The selected participants were interviewed with a questionnaire in local language which include parameters like physical activity, SES, existing morbidity, perceived stress and their sleep pattern. Height, weight, abdominal obesity were examined .Height was measured through a stadiometer, weight through weighing machine and abdominal girth using a measuring tape at the level of umbilicus. Blood pressure was measured using a mercury column sphygmomanometer[17] by a standared technique. Study participants were instructed to refrain from drinking coffee/ tea during the half-hour preceding the interview. Three blood pressure measurements were taken at 5 minutes interval and mean were taken.. The criteria for hypertension is based on WHO–International Society of Hypertension (WHO–ISH) and the US Sixth Joint National Committee on Detection, Evaluation and Treatment of Hypertension (JNC–VI)[18] .Hypertension is defined as as either an SBP≥140 mm Hg, and/or a DBP≤ 90mmHg, and/or treatment with antihypertensive medication . Socioeconomic assessment was based on modified Kuppuswamy scale[19] Current use of prescription medication for lowering elevated blood pressure among hypertensive subjects were considered as treatment.

STATISTICAL ANALYSIS

The statistical package for social sciences (SPSS) software version 16 was used for data entry and analysis**.** Both mean and percentages were used for analysis. The Chi-square test were used to demonstrate relationships between categorical variables. Multivariate logistic

regression analysis were done using hypertension as the dependent variable and risk factors identified to be significant in the univariate analysis as independent variables. The level of significance was set at *P* values ≤ 0.05 for analysis of categorical variables.

RESULT

Total population studied was 694. Mean age of the study population was 45.44yrs with a standard deviation of 9.4yrs.The baseline characteristic of the study population was given in table1. 32.3% of the rural women were having overweight where as 12.8% were obese.61% belonged to lower socioeconomic status.

Table 1: Baseline characteristic of study population

Age group	Number (%)
30-40	213 (30.7)
41-50	230 (33.1)
51-60	251 (36.2)
Education status	
Primary	211 (30.4)
High school	378 (54.5)
Higher secondary & above	105 (15.1)
Occupation	
Household work	476 (68.6)
Cooli	165 (23.8)
Others	53 (7.6)
Physical activity	
Mild	397 (57.2)
Moderate	243 (35)
severe	54 (7.8)
BMI (kg/m^2)	
18.5-23	246 (35.4)
23.1-2	135 (19.5)
25.1-29.99	224 (32.3)
30 or above	89 (12.8)
Socioeconomic scale	
Low	423 (61)
Medium	246 (35.4)
High	25 (3.6)

Age specific prevalence of hypertension was given intable2. It showed that as age increases prevalence of hypertension is increasing which is statistically significant. The pre hypertension prevalence detected was 8.4% among the study group

Table 2: Age specific Prevalence of hypertension

Age group	Prevalence in%	P value
30-40	12.2	<0.05
41-50	27.8	
51-60	53.4	

The associated factors of hypertension was identified using multilogistic regression model. The factors which were significant in univariate analysis were used in multivariate analysis. Inunivariate analysis factors like high BMI, family history of hypertension, diabetes ,decreased sleep, stress and agegroup were found to be significant Factors like SES, physical activity,educational status were found to be non significant in univariate analysis. In multilogistic regression age group, family history of hypertension , perceived stress, diabetes and BMI>25kg/m^2 were found significant. Results of multi logistic regression were shown in table3

Table 3 : Result of multi logistic regression

Factor	Odds ratio (95% CI)	P value
Age group	2.18 (1.66-2.85)	P < 0.05
Known diabetic	4.21 (2.52-7.01)	P < 0.05
Family history of hypertension	2.16 (1.41-3.32)	P < 0.05
Perceived stress	5.28 (3.41-8.17)	P < 0.05
BMI>25kg/m^2	2.46 (1.64-3.69)	P < 0.05

Among the total study population 151 were known hypertensives (21.8%).only 45% was taking regular treatment and 57% of known hypertensives were having uncontrolled hypertension

Table 4: Showed the treatment and control status of hypertension

Hypertension status	Number (%)
Known hypertensives	151(21.8)
Regular treatment	68(45%)
Un Controlled hypertension	86(57%)

DISCUSSION

This study has shown that rural women in south Kerala are having high prevalence of hypertension. This result is comparable with the result of previous prevalence studies in rural area[9-13]. A meta analysis

conducted in rural area of India[20] to determine prevalence of hypertension showed prevalence of 27.6 with 95% confidence interval of 23.2 to 32.00 which is similar to our result. As hypertension is a for runner of a number of serious diseases like cardio vascular, renal and other vascular diseases its control and early diagnosis is important. This study revealed kerala population has high prevalence and their awareness and control were extremely poor.

The age specific prevalence has shown that hypertension is also highly prevalent among young adults. This is very important as hypertension is a risk factor for a number of cardiovascular diseases and stroke.

The study results has shown that 10.2 % of the population have undetected hypertension. This is alarming. Eventhough hypertension is a disease which can be detected by simple measures this high un detection rate pointed out the need of strengthening the primary health systems.

Uncontrolled hypertension is a real threat to the community. Prevalence of many life threatening diseases can be controlled if we can control hypertension. Previous studies from various part of India [8,13,6] also showed high undetection rate and low control.

This study has revealed that factors like high BMI, diabetes status, perceived stress, age and family history of hypertension are associated with hypertension. But factors like physical activity ,socioeconomic status ,education status were not associated with hypertension. High association of stress with hypertension demands the need of further studies as this study being a cross sectional study couldn't find out the temporal relationship. More over in this study we couldn't use any tool to measure stress and we used perceived stress.Most of the factors are modifiable we need to do more studies regarding risk reduction stratergies.

The methodology used to diagnose hypertension in this study was like any other epidemiological study. Single time measurement of blood pressure which might have chances for over diagnosis. In order to reduce the biases we measured blood pressure three times and mean were taken.

In conclusion this study results have pointed to the need of effective public health planning for early detection and proper control of hypertension. Obesity reduction and stress reduction should be started in school levels.

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A Survey to Assess the Facility Access of People with Mobility Disabilities in King Abdulaziz Medical City, Riyadh, Saudi Arabia

Fayz Al shahry[1], Jobby George[2], Winnie Philip[3], Amirah Ageil Al Shammari[4], Hend Faisal Al Qudaimi[4], Sarah Saad Ghemlas[4]

[1]Assistant Professor & Consultant of Rehabilitation, King Abdulaziz Medical City, National Guard Health Affairs, Riyadh; [2]Assistant Professor, [3]Lecturer, [4]Internship Student, Occupational Therapy, College of Applied Medical Sciences King Saud bin Abdulaziz University of Health Sciences, Riyadh, Saudi Arabia

ABSTRACT

According to the World Health Organization, people living with disability accounted for 15% of world's population, and their numbers are expected to grow[1]. The Saudi national census estimated that 0.8% of people have disability, yet no study in Saudi Arabia has examined the architectural barriers of healthcare facilities and the difficulty it poses for person with disability (PwD). This study aimed at investigating accessibility of the architectural facilities in King Abdulaziz Medical City (KAMC) for People with Mobility Disabilities (PWMD). A quantitative cross-sectional study was conducted in KAMC in two phases, in phase I, respondents (n=100) were surveyed on the accessibility of architectural facilities and in phases II, an inspection was performed on the accessibility of architectural facilities using the Americans with disability act (ADA) standardized checklist for building design. Phase I, survey results showed that people ambulating by means of assistive devices needed additional help to access KAMC ($p<0.05$). In phase II, the mean accessibility rates of the measured facilities of KAMC were found to be: parking (36%), exterior access (32.5%), interior access (11.75%) toilets (34.75%), waiting area and registration counters (46.5%), patient sleeping rooms (29.5%), and signage (45%). This study indicates that there is limited awareness among (PWMD's) and inadequate accessibility within the healthcare facilities in KAMC. Further education to raise the awareness is needed so as to help the advocacy of the modifications needed to facilitate the access of health care services for PWMD.

Keywords: *Facility Access, People with Mobility Disabilities, Person with disability*

INTRODUCTION

Accessibility is the compatibility of an environment to people's functional capacities that allows them to benefit from facilities and services. Among the People with Disability (PwD), the inadequacy of accessibility limits their physical engagement with the outdoor world. The participation of (PwD) in society is considered mandatory to promote equalization[2]. According to a national census, it was estimated that 0.8% of people have disabilities in Saudi Arabia, which corresponds to 135,000 people[3]. Another Saudi survey on 60,630 children below age 16 with disabilities showed that physical disabilities were the most common[4]. WHO confirmed that road traffic accidents is the leading cause of disability in Saudi Arabia[2], WHO findings were confirmed by yet another study in which traumatic accidents were identified as the major factor leading to disability comparing to non-traumatic incidents[5].

A number of research evaluated accessibility barriers to (PwD) revealed that they encounter difficulties seeking health services, which substantiated that reasonable physical accessibility is a minimum requirement to guarantee fair access[6]. Physical accessibility studied in

Corresponding Author:
Fayz Al shahry
Assistant Professor & Consultant of Rehabilitation,
King Abdulaziz Medical City,
National Guard Health Affairs, Riyadh, Saudi Arabia
Email: shahryf@hotmail.com

primary health care settings in California identified that physical barriers have a negative impact on (PwD) when they are looking for health care services[7]. Researchers explored primary care and specialty care clinics in United States, and observed lack of accessibility in facilities for wheelchair users[8]. A survey on (PwD) accessibility of dental health facilities in Brazil concluded that 37.3% of (PwD) reported physical barriers, and 43.8% of the dentists claimed that facilities are considered inaccessible; the reason being the high level of education and awareness about (PwD's) rights among the dentists in contrast to the (PwD's) low education level[9].

A rehabilitation center accessibility study in Iran found that (PwD) encountered accessibility difficulties which made their health status wo rse[10]. Furthermore, other studies also confirmed the existence of poor accessibility for (PwD) in rehabilitation centers [6, 11,12,13,14]. Evidence also was fou that there was inadequate accessibility for (PwD's) in majority of the health clubs and fitness facilities across United States[15]. It was also reported that (PwD) are struggling due to insufficient accessibility; importance of modifying the physical facilities for it is essential to make it barrier free.[17] In Saudi Arabia researches have not examined the architectural barriers, leaving a wide gap in estimating accessibility, hence the current study was conducted with the specific objective to investigate the experience of people with mobility disabilities regarding their facility access in KAMC.

MATERIALS AND METHOD

This study was conducted in two phases, phases I, respondents were surveyed on the quality of accessibility of architectural facilities whereas in phases II, investigation was performed on the accessibility of architectural facilities, the settings included King Fahad Hospital, King Abdulaziz Cardiac Center, King Abdullah Specialized Children's Hospital (KASCH), and Health Care Specialty Center (HCSC) in King Abdulaziz medical city (KAMC), Riyadh, Saudi Arabia. A quantitative cross-sectional study design was adopted.

Phase I: Patient Survey: Applying the Saudi national senses values[4] to obtain the sample size a sample of 100 was calculated using a margin of error of 2% and 95% confidence interval. The respondents were selected using convenient sampling technique. The inclusion criteria were People with Mobility Disabilities (PWMD) of both genders in the age category 18 years and above. A structured questionnaire was developed and circulated among respondents in (KAMC); a pilot study was conducted to determine the reliability and validity of the questionnaire. Data was collected by asking the respondents to mark their opinion. The questionnaire is depicted in table no.1

Phase II: Investigation on the Accessibility of Architectural Facilities: The 2010 ADA standardized building design checklist[18] was used to assess architectural facilities such as parking, exterior routes, interior routes, toilet rooms, waiting room, registration counters, examination rooms, medical equipment, patient sleeping rooms, and signage. Among the facilities that have similar dimensions in the same category, only one was assessed, for different facilities, assessment was taken individually.

Table 1: Queries and Responses with respect to facility access for people with mobility disabilities

S. No.	Questions	Yes (%)	No (%)
1.	No hesitation to visit KAMC because of facilities.	84	16
2.	Caregiver not reducing the frequency of the visits because of the facilities.	88	12
3.	Not needing help from others to access the facilities.	9	91
4.	Not finding enough support from health care staff inside facilities.	12	88
5.	**Access to parking**		
	Can you find an accessible parking?	48	52
	Distance between the parking is problem	54	46
6.	**Access to entrance**		
	Entrance door	80	20
	Ramps	72	28

Conted…

7.	**Access to waiting area**			
		Is the space in the waiting area enough to move for you?	82	18
8.	**Access to toilets**			
		Do you easily find an accessible toilet?	76	24
		Is the space in the toilet rooms enough for you move to you?	79	21
		Can you reach the lavatory easily?	91	9
9.	**Access to doctor's office/examination room**			
		Can you enter the examination room/doctor's office easily?	82	18
		Is the space in the examination room/doctor's office enough for you move to you?	80	20
10.		**Access to goods and services**		
		Garden/Cafeteria	62	38
		Mosque	37	63
11.		Any other difficulties in other facilities	8	92

Table 2: Mean Score & Percentage of accessibility at KAMC

KAMC	HCSC (Khashem Alaan)	KASCH	King Abdulaziz Cardiac Center	King Fahad Hospital		
	7	10	10	9	**Parking**	Mean Score & Percentage
36	28	40	40	36	**%**	
	7	8	13	12	**Exterior Access**	
32.5	23	26	42	39	**%**	
	5	7	8	6	**Interior Access**	
11.75	9	13	14	11	**%**	
	10	20	8	12	**Toilet**	
34.75	28	56	22	33	**%**	
	4	4	4	3	**Waiting rooms & Registration counter**	
53.5	57	57	57	43	**%**	
	7	7	6	6	**Examination rooms & Medical Equipment**	
46.5	50	50	43	43	**%**	
	0	32	24	21	**Patient room**	
29.5	0	49	37	32	**%**	
	4	5	4	5	**Signage**	
45	40	50	40	50	**%**	
	44	93	77	74	**Total mean score**	

FINDINGS

The age of the respondents ranged from 19-106 years with a mean age of 56.98 (SD ±19.71). The response rate was100%, majority 62% of the respondents was female. Most 69% of the respondents were married; and 69% of the respondents were living within Riyadh. The wheelchair 68% was the most used assistive device, 50% of the respondents did not receive formal education, and 64% of the respondents had income less than 5,000 SAR. The purpose of their present visit to the facility 72% had come for regular appointment 18% came for admission

3% emergency and 7% were periodically visiting the KAMC for yearly check-ups.

Responses regarding facility access for (PWMD): The survey results suggest that 84% of the respondents were willing to visit KAMC facility. 88% informed that caregivers were not trying to reduce the regularity of the visits because of the services. However 91% stated that they needed help from others to access the facilities. With regards to the queries related to parking, 48% found reachable parking. 80% reported that exteriors were accessible so was entrance doors and ramps 72%. 82% reported that they had enough space and were free to move around. Toilets were accessible and easily found by 76%. The toilet seat and lavatory height were handy for 91%. 80% reported that examination rooms and doctor's office were accessible. For access to goods and services, (62%) respondents mentioned that access to garden/cafeteria/coffee shop were easy. Mosques were inaccessible by 63%. Chi square test indicated that people with assistive devices need help to access KAMC ($\chi 2 = 7.37$; $p<0.05$). Also, it was statistically significant that married people do not find their caregivers trying to reduce their frequency of visits due to the facilities ($\chi 2 = 4.76$: $p<0.05$)

Phase II: Investigation on the Accessibility of Architectural Facilities: Based on the 2010 ADA standards for building design checklist, the measurement of the parking facility demonstrated a mean rate of accessibility of 36% within KAMC. For exterior access 32.5%, for interior access 11.75%, toilets 34.75%. Waiting area showed a mean rate accessibility of 53.5%. For the examination and medical equipment 46.5% was scored. The patient sleeping rooms found to meet 29.5% of ADA standards. For the signage 45% was scored. The mean rates of accessibility of the measured facilities for each individual building within KAMC are shown in table no.2.

CONCLUSION

This is the first study that examined the quality of accessibility of architectural healthcare facilities in Saudi Arabia. The patient questioner survey unearthed the fact that people ambulating with assistive devices need help to access KAMC facilities. Although, the majority of respondents view of accessibility inside the KAMC facilities showed positive tendency in rating the accessibility the results of the site assessment of KAMC using the 2010 ADA standardized building design checklist was found to be low. This inferred that receiving help might have prevented people from experiencing the difficulties of accessibility which led them to report that the majority of facilities are accessible. It could be concluded that awareness of accessibility is not fully acknowledged within the (PwD) population, education is needed to support this population in recognizing their rights and advocacy for them. Even though the accessibility barriers were recognized, implementation of accessibility must be monitored to grantee the rights and access of (PwD) to obtain their needs and freedom of movement. Future studies are recommended to investigate the knowledge of accessibility among healthcare providers and explore the accessibility barriers for visual and hearing disabilities.

Conflict of Interest: The authors have no conflict of interest to declare.

Source of Funding: "The author(s) received no specific funding for this work."

Ethical Clearance: The Institutional review board of the King Abdullah International Medical Research Center (IRB-KAIMRC) approved the study with the protocol number SP16/125. Phases I, an informed consent was obtained from the respondents, and for part II, an informed written consent was collected prior to site assessment.

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Evaluation of Prevalence of Exercise Induce ECG Changes in 200 Patient with Diabetes Mellitus

Arul Murugan S[1], Aravind C[2], Vishnupriya. G[3], E. Prabhakar Reddy[4]

[1]Associate Professor of General Medicine, [2]Professor of General Medicine, [3]Junior Resident of General Medicine, [4]Professor of Biochemistry and Central Lab Head, Sri Lakshmi Naryana Institute of Medical Sciences, Puducherry, Bharath University

ABSTRACT

Introduction: Diabetes mellitus is a chronic metabolic disorder is one of the most common risk factor for cardiovascular disease. Diabetic individuals exhibit 2 to 5 fold increased risk of developing MI and even silent myocardial ischemic. Detection of CAD before its associated morbidity is reasonable and life saving. One of the well known non – invasive relatively inexpensive rest in detected IHD is treadmill test.

Aim: To find out the asymptomatic exertional coronary ischemia in patient with diabetes mellitus of 10 yrs duration.

Methodology: For those patients of 10 yrs duration of diabetes who are attending our diabetic and medicine OPD conducted cross sectional observational study. After getting the consent, patients were made to run on TMT.

Conclusion: 76.5% of the patients demonstrated positive TMT.

Keywords: *Diabetes mellitus, cardiovascular disease,Tread Mill Test,*

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder which can cause various micro and macro vascular complication. Diabetes mellitus is defined as presence of FBS >126 mg/dl, PPBS >200mg/dl and HbA1C> 6.5[1]. Patient may have myocardial ischemia without symptoms.

Incidence of coronary artery disease (CAD) in diabetics is four times higher compared to the age-adjusted general population. Early onset and rapid progression of atherosclerosis combined with early commencement of ischemic heart disease (IHD) in association with diffuse involvement of the coronary arteries are common findings in diabetics. CAD, including myocardial infarction (MI), is the leading cause of death in young diabetics. Cardiovascular diseases (CVD) are irrefutably responsible for 65% of deaths in diabetics, the majority of whom suffering from type 2 DM. In Framingham study it was demonstrated that diabetic individuals exhibited a two to five fold increased risk of developing angina, MI, and congestive heart failure. In individuals younger than 45 years, the risk of CVD surges to more than 11 fold compared to general population. Mortality statistics after myocardial infarction or even after revascularization procedures are regrettably increased in the setting of preexisting diabetes. In most diabetic patients, diagnosis is delayed due to chiefly obscured and atypical symptoms meaning that they don't meet the usual clinical diagnostic criteria for myocardial ischemia. Silent ischemia is defined as transient ischemia without typical recognized associated symptoms, especially chest discomfort. Patients with DM experience silent myocardial ischemia more commonly than general population.

Diabetics are at high risk of developing extensive CAD at younger age and silent ischemia which further

Corresponding Author:
Dr. C. Aravind
Professor of General Medicine,
Sri Lakshmi Narayana Institute of Medical Sciences,
Puducherry
Mobile No. +919159186879
Email: drsarulmurugan@yahoo.com

increases the chance of adverse outcome. Consequently, detection of CAD before its associated morbidity and mortality is reasonable and may be lifesaving. Screening and detection of high risk coronary lesion with a non-invasive test is an attractive goal. One of the well-known non-invasive tests in detection of IHD is Treadmill test or exercise tolerance test (ETT).It is a non-invasive, relatively inexpensive test, and commonly performed in clinical practices. It provides substantial diagnostic and prognostic information. Exercise capacity is one of many important prognostic factors revealed during the test.

Tread Mill Test: ECG base test in which patient made run on treadmill till he become fatigue and till he developed chest pain[5]. Treadmill stress testing is indicated for diagnosis and prognosis of cardiovascular disease, specifically CAD. This is the initial procedure of choice in patients with a normal or near-normal resting electrocardiogram who are capable of adequate exercise. [7, 8] Contraindications have been outlined in guidelines from the American College of Cardiology (ACC) and the American Heart Association (AHA).

Absolute contraindications include the following:

- Acute myocardial infarction (MI; within 2 days)
- Unstable angina not previously stabilized by medical therapy–Appropriate timing of tests depends on the level of risk of unstable angina as defined by the Agency for Health Care Policy and Research Unstable Angina Guidelines
- Uncontrolled cardiac arrhythmias causing symptoms or hemodynamic compromise
- Symptomatic severe aortic stenosis
- Uncontrolled symptomatic heart failure
- Acute pulmonary embolus or pulmonary infarction
- Acute myocarditis or pericarditis
- Acute aortic dissection

Relative contraindications can be superseded if the benefits of exercise outweigh the risks. They include the following:

- Left main coronary stenosis
- Moderate stenotic valvular heart disease
- Electrolyte abnormalities
- Severe arterial hypertension–In the absence of definite evidence, the committee suggests an SBP higher than 200 mm Hg, a DBP higher than 110 mm Hg, or both
- Tachyarrhythmias or bradyarrhythmias
- HOCM & other types of outflow tract obstruction
- Mental or physical impairment leading to an inability to exercise adequately
- High-degree atrioventricular (AV) block

In this article, the broader term "physical activity" (defined as "bodily movement produced by the contraction of skeletal muscle that substantially increases energy expenditure") is used interchangeably with "exercise," which is defined as "a subset of PA done with the intention of developing physical fitness (i.e., cardiovascular [CV], strength, and flexibility training)." The intent is to recognize that many types of physical movement may have a positive effect on physical fitness, morbidity, and mortality in individuals with type 2 diabetes [6].

AIM AND OBJECTIVES:

The study is to find out the asymptomatic exertional coronary ischemia in patient with diabetes mellitus of >10 years duration.

METHODOLOGY

This is a cross sectional observational study conducted in the diabetic patients who attended the diabetic opd and medicine opd. Patient with >10 years duration of diabetes who doesn't have co-morbid condition like systemic hypertension/coronary heart diseses/cerebro vascular accident/perpheral vascular diseses were included in the study. Patient with known case of CAD, who are on antiplatelet drugs and smokers were excluded from the study.

After getting the consent, patient were made to run on treadmill either Bruce or modified Bruce criteria. Patient who developed ST inversion >1 mm in >2 leads was taken as positive case[7].

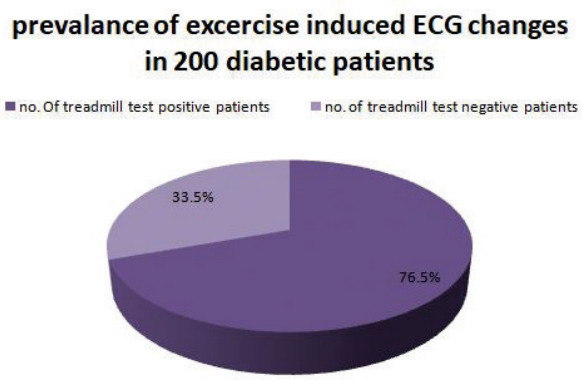
Bruce Protocol (Maximal Table)

Stage	Minutes	% grade	MPH	km/h	METS
1	3	10	1.7	2.7	4
2	3	12	2.5	4.0	7
3	3	14	3.4	5.5	10
4	3	16	4.2	6.8	11
5	3	18	5.0	8.0	13
6	3	20	5.5	8.9	15
7	3	22	6.0	9.7	15

Total Durations = 21 minutes

RESULTS

Among total number of 200 diabetic patients who were entered the study, 153 cases (76.5%) demonstrated positive treadmill test that is developed ST depression >1 mm in >2 leads of 12 leads.



CONCLUSION

In the above conducted study the prevalence of exercise induced ECG changes among 200 diabetic patients is found to be 76.5%.

Conflict of Interest: The author's declares no competing interest

Source of Funding: Self/Diagnostic kits are provided by institution as on complimentary basis for research.

Ethical Clearance: No. No.IEC/C-P/049/2016

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Parasitic Tea *Scurrula atropurpurea* (Blume) Danser Active Compound Potencies Towards Inhibition of DNA Methylation in Cancer: An *In Silico* Study

Ni Luh Putu Eka Sudiwati[1], Tatit Nurseta[2], Mulyohadi Ali[3], Aulani'am Aulani'am[4], Heru Santoso Wahito Nugroho[5]

[1] Department of Nursing, State Health Polytechnic of Malang; Indonesia, [2] Department of Obstetri and Gynecology, Saiful Anwar Hospital, Malang, Indonesia / Faculty of Medicine, Brawijaya University, Malang, Indonesia, [3]Department of Pharmacology, Faculty of Medicine, Brawijaya University, Malang, Indonesia, [4] Laboratory of Organic Chemistry, Mathematic and Natural Sciences, Brawijaya University, Malang, Indonesia, [5] Health Polytechnic of Ministry of Health at Surabaya, Indonesia

ABSTRACT

DNA methylation is metil group (CH_3) adding towards DNA. This mechanism will affected cells function and arise difference gene expression. Tumor suppresor gene hipermethylation, was silencing gene expression, induced cancer progressivity, and interfere the therapy. Recent studies have been reported that some compound from plants could act as an inhibitor on DNA methylation. Since methylation is inhibiting, the silenced tumor suppressor gene caused by hipermethylation, will be re-active. Previous study was succesfully identify flavonoid from *Scurrula atropurpurea* (Blume) Danser (SAD) that collected from Lawang city, Jawa Timur. Fractionation of a compound have been carried out with a solvent n-heksan, chloroform, and ethanol. Identification of a compound through investigating liquid chromatography mass specthrometry mass (LCMS). The outcome showed that flavonoid compound in SAD were included flavanon, dihidroflavonol, flavon, flavonol, katekin, and Epigallocathecin-3-O-gallate (EGCG). The study was an advanced study, has an objectives to identify the SAD potency towards methylation inhibition, and it was insilico using Autodock Vina on software PyRx 0.8. The result shown that an active compound isolated from SAD have potency to inhibit DNA methylation, in which EGCG as the strongest candidate with binding affinity was -10.4 Kcal./mol. Result of this study can be used to tested a potential active compound of SAD as anticancer both in vitro and in vivo.

Keywords: *DNA methylation, Scurrula atropurpurea (Blume) Danser*

INTRODUCTION

Epigenetic modification have an important role on cancer progresivity and therapy. DNA methylation is one of epigenetic modification which have an effect towards cells funnction, via gen expression changing [(1), (2), (3)]. In cancer, some epigenetic modification such as methylation towards some important tumor supressor genes is due on cancer proression, and caused gene silencing [(4)]. Some recent studies showed that EGCG could act as an *DNA methyltransferase* (DNMT) inhibitor via direct interaction, and induce demethylation and reactivation of silenced tumor supressor genes caused by methylation [(5), (6)]. The research objective was to identify the SAD potency as a DNA methylation inhibitor in silico experiment.

Corresponding author :
Heru Santoso Wahito Nugroho
Health Polytechnic of Ministry of Health at Surabaya, Address: Midwifery Campus of Magetan, S. Parman Street No. 1, Magetan District, Jawa Timur Province, Indonesia, Email: heruswn@gmail.com

MATERIAL AND METHOD

On the previous study, we already able to identify *Scurrula atropurpurea* (Blume) Danser (SAD)

flavonoids from Lawang Jawa Timur. Those flavonoids were : flavanon, dihidroflavonol, flavon, flavonol, cathecin, dan EGCG [7]. The potency of those compound was test using PASS method. The method was using *Structure Actvity Relation (SAR)* approach, that be able to predict the compound activity based on the functional group similarity with drugs active group that been known before [8].

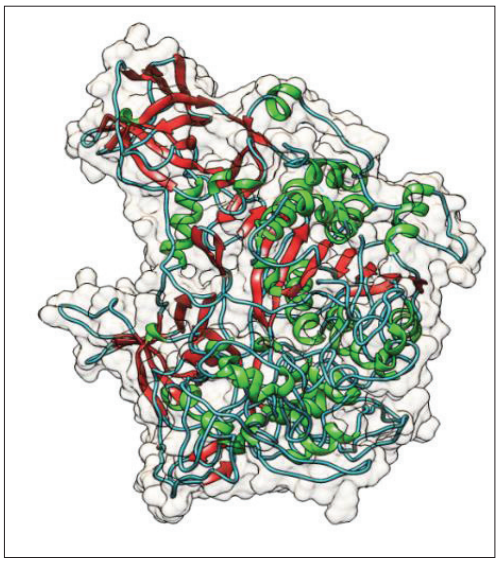

Figure 1. The 3D Structure of Human DNMT 1

DNMT sample were collected from Protein Data Bank (rcsb.org) with ID 3SWR (Figure 1) [9]. The model was DNMT protein from Human that linked to inhibitor. DNMT activity was depend on it active functional site. DNMT active site was on amino acid 1226. The co-factor for this enzyme was zink (Zn) and *zink finger* position (*DNA binding domain*) was the amino acid 646-692. Natural flavonoid data (EGCG, catechin, dihidroflavonol, flavone, flavonol, flavanon), were collected from PUBCHEM NCBI. The potency of each compound as DNMT inhibitor were analyze to find the afinity of the coumpound with active site oof DNMT. The Molecular Docking analysis was using Autodock Vina from PyRx 0.8 program. The *docking* was done at active site of DNMT.

We were inhibition mechanism to examine the molecular interaction, and we can find which active group function from the compound that will linked to amno acid site. The molecular interaction analyze and its visualization were use Ligand Scout V.2.0 [10], [11].

FINDINGS

The SAD flavonoids potency towards DNA inhibiting methylation were presented on Table 1.

Table 1. Docking flavonoid on SAD with DNMT

Active Compound	Protein Target	*Binding Affinity* (Kcal / mol)	Link Site
EGCG	DNMT	-10.4	Glu1266A, Asn1578A dan Gly1223A
Catechin	DNMT	-8.4	Asn1267A dan Glu1168A
Dihidroflavonol	DNMT	-8.2	Met1169A, Ile1167A, Phe1145A, Leu1247A dan Glu1168A
Flavon	DNMT	-8.0	Met 696A, Val1268A dan Asn1267A
Flavanon	DNMT	-7.8	Trp1170A, Asn1578A, Ala699A dan Val1268A
Flavonol	DNMT	-7.7	Met1169A, Ile1167A, Leu1247 dan Phe1145A

Table 1 stated that on every SAD compound will link on DNMT active site, with different afinity. EGCG Afinity towards DNMT was the highest, with smallest bindiing affinity value. When a compound and another were linking, and have a small *binding affinity*, and this meanss the link will be strong. This mechanisme will give strong link and higher inhibitor effect towards methylation. Contrary, highest *binding affinity* value gives weak inhbitor towards DNA methylation. The docking of ECCG on SAD towards DNMT is shown on Figure 2.

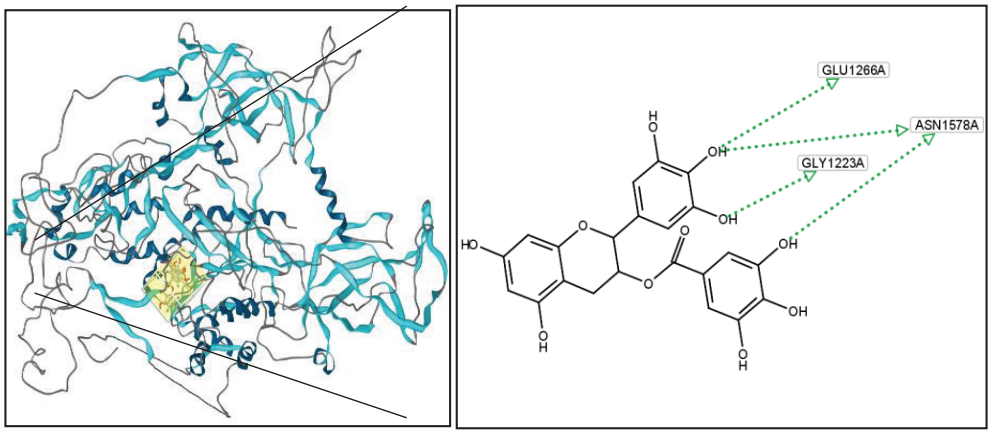

Figure 2. Binding of EGCG on DNMT active site, with afinity -10.4 Kcal / mol via hidrogen bond with Glu1266A, Asn1578A and Gly1223A residu on DNMT

Based on table 1 and figure 2 we known that ECCG have potency as a demethylation agent and flavonol ave the lowest demethylation potency among other SAD flavonoid. EGCG predicted have strongest inhibitor DNMT potency, becaus its capable to bond the actove site of DNMT using 3 hidrogent bonds.

DISCUSSION

SAD Favonoid compound that isolated from Lawang Jawa Timur can bond with active site of DNMT, and have a potency as an inhibotor DNA methylation. Insilico study was shown that every SAD flavonoid compound, could form a bond with DNMT active site via certain and diferent amino acids. EGCG was a compound that shown the highest afinity towards DNMT active site, followed by : katekin, dihidroflavonol and flavon, with *binding affinity* value respectively were : -10.4 Kcal / mol, -8.4 Kcal / mol, -8.2 Kcal / mol, dan -8.0 Kcal / mol. The smallest binding affinity value means that he compound have stronger inhibition effect potency towards DNMT action.

Previous studies have beeen shown that flavanol compound, cathechin and EGCG were potencial demethylation agent. EGCG will inhibit DNMT via blocking the cytosin to link in the DNMT active site. EGCG eill form a hidrogen bond with DNMT active site, and methylation will be inhibit. This will reactivate the genes that silenced by methylation. The othet study also reported that cathechin and EGCG on green tea and apple give an demethylation effect 5-aza-2dC like. 5-aza-2dC is an synthetic DNMT 1 inhibitor, already clinially tested, but still give a toxic effect [4].

Previous study have shown that etanol fraction of SAD Lawang content of EGCG, flavon and flavonol. Chloroform fraction, were content : cathecin, dihidroflavonol and flavanon. From recent study, we found that those comppound have potencies as an *p53 expression enhancer* and strong proliferation inhibitor agent compare to n-hexan fraction [7] . The anti-cancer effect assumed from interaction from chloroform fraction compound in the chlorodorm and n-hexan towards DNMT inhibition activity, and inhibition apoptosis and proliferation indirct and directly. The epigenetic modification like methylation and demethylation will be able to influenc the tumor progresion, metastasis, and resistency towards chemotherapy [1], [2], [12], [13], [14], [15] . Some studies have reported tha some genes were silenced becaus og the methylation on its promotor [16], [17] . The active compound of SAD Lawang *in silico* have been proved inhibit DNA methyltion, and have opportunity as a natural demethylation agent, that potencial as a drug for cancer in the future.

CONCLUSION

This in silico study have been prove that flavonoid compound in the SAD Lawang owing a potency towards inhibition DNA methylation, with EGCG as the strongest candidate. Result of this study can be used to explore potencies active compound from SAD as anticancer agent in future both in vitro and in vitro.

ADDITIONAL INFORMATIONS

Conflict of Interest Statement

All members of the team of research and article writing stated that there is no conflict of interest related to all research activities or publications of this research article.

Source of Funding : All funds used to finance all research activities and publications of research articles come from the research team and the authors of the article.

Ethical Clearance : To ensure that there is no ethical violation as a result of the implementation of this research, before the research has been conducted ethical feasibility testing. Ethical approval recommendation for this study taken from Ethics Committee of State Health Polytecnic of Malang, Indonesia with number " Reg. No. : 009 / KEPK – Polkesma / 2015 ".

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Revitalization of Posyandu as an Effort to Improve the Function and Performance of Posyandu

Antarini[1], Heru Santoso Wahito Nugroho[2]

[1]Health Polytechnic of Ministry of Health at Pangkalpinang, Indonesia,
[2]Health Polytechnic of Ministry of Health at Surabaya, Indonesia

ABSTRACT

This research was conducted in 2017 at posyandu in the working area of Girimaya Health Center with case study approach. The sample was chosen by purposive sampling technique. Data were collected by checklist as a tool, referring to guidelines for the Nutrition Manager of the Ministry of Health. In addition, triangulation was also done through in-depth interviews to key informants, namely the cadre leader and the triangulation informant, the health center officer and the under-five mother. Although the quantity of health cadres has been sufficient, but their quality has not been maximized. The limited facilities, infrastructure and funds make the government need to pay special attention to improving it.

Keywords: *Posyandu revitalization, Cadres*

INTRODUCTION

Integrated Service Post (Posyandu) is managed and organized from, by, for, and with the community, to empower and facilitate the community in accessing basic health services, especially for mothers, infants and toddlers. Posyandu has 5 priority programs: maternal and child health, family planning, immunization, nutrition, and prevention and control of diarrhe[(1)].

Since its inception in 1986, Posyandu has achieved many results. Maternal mortality (MMR) and infant mortality (IMR) have been successfully lowered, while life expectancy of Indonesian population has increased significantly. The 2007 SDKI data shows that there has been a decrease in MMR to 228 / 100,000 live births and IMR to 34 / 1,000 live births. However, data from the SDKI 2012 shows an increase in MMR of 359 / 100,000 live births and IMR of 4000 / 100,000 live births. By 2015 the MMR declines to 305 / 100,000 live births of the Intercensal Population Survey Data.[(2)]. MMR in Indonesia is higher compared to Myanmar (200 per 100,000 live births), Philippines (100 per 100,000 live births), while in Thailand, Vietnam and Malaysia MMR is below 100 per 100,000 live births.[(3)]

In quantity, the development of posyandu is very encouraging because there are 3 to 4 posyandu in each village. When the posyandu was proclaimed, there were 25,000 posyandu, and in 2011 there were 268,439 posyandu. But in terms of quality, there are still many problems such as lack of facilities and cadre skills, in this case posyandu cadres are elected, willing, able and have time to manage Posyandu[(4)].

The ratio of posyandu to the number of villages is 3.42. Community empowerment in the health sector requires the participation of cadres, community leaders and religious leaders, namely 569,477 trained cadres / community leaders / religious leaders[(5)].

The implementation of revitalization of Posyandu in Pangkalpinang City began in 2006, with activities such as fulfillment of Posyandu facilities such as scales, Card to Healthy, Posyandu Information System, incentives for cadres, Supplementary Feeding, cadre training, cadre fulfillment for each posyandu and coaching posyandu; but to date these activities have not been evaluated.

Evaluation of activities can be done at the following stages: 1) input (to find out whether the resources used are in accordance with the standards and needs), 2) the process (to know the effectiveness of methods, staff motivation and communication among staff), 3) output (to determine whether output can reach target)[(6)].

MATERIAL AND METHOD

This research was conducted in 2017 at posyandu in Girimaya Health Center, Pangkalpinang, with case study approach. The sample was chosen by purposive sampling. Data from posyandu cadres were collected by checklist as a tool, referring to guidelines for the Nutrition Manager of the Ministry of Health. In addition, triangulation was also done through in-depth interviews to key informants, namely the cadre leader and the triangulation informant, the health center officer and the under-five mother.

FINDINGS

Table 1. The Results of Evaluation

No.	Activity	Posyandu	
		Ceria	Kelapa
	Registration		
1.	Record toddler in register book, ask for card to healthy / MCH book.	Yes	Yes
2.	Record the pregnant mother in register book, measure weight and upper arm circumference.	Yes	Yes
3.	Record Couples Age of Fertile in register book, go to the counseling and health services.	Yes	Yes
	Measurement of weight and upper arm circumference		
1.	Weighing a toddler a. Insert a toddler into a weigh case, barefoot and diapers, then slide the pendulum up the needle perpendicularly.	Yes	Yes
	b. Read the weight by looking at the numbers at the end of the shear pendulum.	Yes	Yes
	c. Record the weighing result on a MCH book	Yes	Yes
	d. Return the pendulum to zero, then issue a toddler.	Yes	Yes
2.	Measuring the upper arm circumference of pregnant women and women of childbearing age to determine the nutritional status.	Yes	Yes
	Recording		
1.	Toddler a. Recording and plotting the weights, creating child growth line.	Yes	Yes
	b. Record every incident in the child.	Yes	Yes
	c. Filling data on breast milk, immunization and vitamin A	Yes	Yes
	d. Copying the weight to a posyandu information system.	No	No
2.	Weight and upper arm circumference are recorded in MCH books and pregnant women register books in posyandu information systems.	Yes	Yes
3.	The upper arm circumference is recorded on the register register of fertile-age couples / women of child-bearing age in the posyandu information system.	No	No
	Counseling		
1.	Explain the growth of toddlers based on the results of weight measurement.	Yes	Yes
2.	Delivering information about food for toddlers.	Yes	Yes
3.	Conveying information and counseling to pregnant women and postpartum about examination results including high risk	Yes	Yes
4.	Convey information to couples of childbearing age about family planning	Yes	Yes
5.	Provide other necessary health counseling.	Yes	Yes
6.	Referring to toddlers or pregnant women at risk.	Yes	Yes

Cont... **Table 1. The Results of Evaluation**

No.	Activity	Posyandu	
		Ceria	Kelapa
	Provision of Health Services		
1.	Giving Immunization.	No	No
2.	Provision of vitamin A capsules to infants, toddlers, and postpartum mothers.	Yes	Yes
3.	Provision of blood booster tablets	Yes	Yes
4.	Family planning services	No	No
5.	Supplementary feeding	Yes	Yes
6.	Antenatal care	No	No
7.	Provision of mild treatment.	No	No

DISCUSSION

Knowledge and Skills of Cadres

The number of active cadres in both posyandu are 5 people with high school education (80%) and all are housewives. The number of active cadres is sufficient and varies from 4-5 people, but at the time of posyandu implementation, sometimes not all active cadres can attend. The lack of cadres and the number of workloads leads to a shortage of jobs. Kader is active if participated in posyandu activities at least 8 times a year. The smoothness of posyandu services is supported by the activeness of the cadres. Kader is said to be active if in posyandu there are at least 5 cadres[7].

All cadres have not been exact in determining the age of children. Determining the age of toddlers should be written in years and months, but the cadres write the age in years. This is not appropriate because it is associated with complementary feeding (age 6-24 months) which requires the cadres to calculate the age in months. In addition, the program of Early Stimulation, Detection, and Intervention for Growth and Development implemented with age in month.

All cadres are able to measure weight and meticulously in reading and recording the weight. Not all cadres are able to fill MCH book/ card to healthy, because there are new and uninformed cadres on how to fill them.

Cadre skills are lacking as some of them are new cadres. Older cadres who have been in posyandu training have dropped out. Therefore, the training that has been implemented so far less effective. In addition it is not easy to get a new cadre who is willing to spend time providing services at posyandu because many housewives who still help the head of the family to earn a living.

Posyandu cadres operate posyandu activities with preferred criteria from local community members, can read and write Latin letters, have pioneer and reformer souls, community mobilizers, volunteer willingness to work, have the ability and free time.[8]

Training of cadres aims to improve the capability and quality of cadres. This activity greatly supports the improvement of posyandu. Since 2007, cadres training has been carried out by Health Office or other organizations in turn. Performance-related training provides space for the development and upgrading of skills and competencies that can have a direct impact on individual or team performance.[9]

Incentives for Cadres

Incentives for cadres are provided directly by the health center every three months regularly. The active and attendance of the cadres can be monitored through the attendance list, so that it can be easily seen the suitability between incentives and attendance.

Ridwan et al reported that one of the impacts of posyandu revitalization is an increase in the number of active cadres due to the transportation costs provided by the government[10]. One indicator of posyandu revitalization progress from the input aspect is the number of cadres who have access to improve their economic condition[11].

Other rewards are free service for cadres and their

families at health centers. The result of Syafei's research shows that free service is given to the cadres and their families. However, not all free service policies for cadres are made by health center. There are health center that provide free service policy only to the cadres only, there are even health center that do not make free service policy for cadres[12].

Facilities and Infrastructure

The results showed that posyandu had good scales, weighing pants, upper arm circle ribbons, MCH book / card to healthy, extension aids, Vitamin A and Fe capsules, cadre manual and recording and reporting books. However the SKDN diagram data board is only owned by the Posyandu Ceria. The making of SKDN diagram can be done outside of Posyandu activity. Posyandu Kelapa has a very complete counseling tool that poster 5 posyandu program, diarrhea prevention, environmental health, maternal health, balanced nutrition, ARI prevention, and immunization.

Facilities and infrastructure such as buildings, tables, chairs etc. most still use community property. Scales, stationery, and register books are available at all posyandu. Extension poster can only be installed in posyandu which already have their own building, meanwhile for posyandu that do not have building, poster still kept at home of cadre chairman. Stock card to healthy is already available at both posyandu.

Cards to healthy and MCH books are an important tool for monitoring infant growth, so malnutrition cases can be detected and addressed as early as possible.

Achieving a policy objective must be supported by the availability of facilities and infrastructure. Without facilities and infrastructure, tasks can not be executed so that the objectives can not be achieved properly. The availability of facilities and infrastructure is a determinant of the performance of a policy[13].

Operational Fund

Besides the 5 posyandu activities, there are other activities in Posyandu Ceria namely the Toddler Family Development and Healthy Fund. Community contributions are mainly used for the cost of supplementary feeding. Fund management is done by Posyandu management. Each income and expenditure are managed responsibly. Funds obtained by posyandu are used to finance posyandu activities[1].

Posyandu Activities

1. Registration

Registration has been carried out according to the standard that is: fill the register register book and ask card to healthy / MCH Book. For pregnant women, fill the register register of pregnant women and invite to the place of measurement of weight and measurement of upper arm circumference.

2. Weighing and measuring the upper arm circumference

There are 4 cadre posyandu Ceria able to measure the weight, while 1 cadre can not do it because he is a new cadre. There are 2 posyandu Kelapa cadres who have not been able to measure the upper arm circumference because they have not been trained on the subject[14].

Weight measurement aims to monitor the growth of toddlers every month. On the basis of this month's data can be determined follow-up[8].

3. Recording

Not all cadres are able to perform recording of toddlers and pregnant women because each cadre performs tasks in accordance with their respective tables, so that inexperienced perform tasks at other tables. They also do not copy the contents of the card to health into the book of information system posyandu. In this case, the cadres need to be trained on filling in the format of the posyandu information system first. The benefits of posyandu information system are: 1) as a reference for posyandu cadres to understand the problems, so as to develop appropriate activities and in accordance with the needs of the target, 2) to provide information on the management of posyandu, to build posyandu for the benefit of the community[15].

4. Counseling

Counseling is not carried out by cadres, but is still widely assisted by health workers. Counseling is rarely done by the cadres due to the lack of tools and extension materials, and the low ability of cadres in doing counseling.

Activities related to maternal and child health, family planning, nutrition, immunization and diarrhea

prevention have been implemented. Posyandu activities that are always implemented are weight measurement of children under five, supplementary feeding and immunization. At Posyandu Ceria, family planning programs, maternal and child health, and diarrhea prevention are not done, as health workers recommend that they be served in village maternity huts, considering that the facilities at posyandu are incomplete.

Individual counseling is conducted on table IV. The given material is aligned with the condition of the toddler. The first step of the cadre before carrying out the counseling is to pay attention to the card to be healthy, then tell the mother about the state of the child based on changes in the child's weight listed on the card to healthy and cadre carry out counseling based on the results of weight measurement of children under five[8].

5. Health Services

At Posyandu Ceria, immunizations, family planning services and pregnancy checkups were not performed because the posyandu activities were conducted in the homes of residents and there were no midwives in the posyandu. However, the Posyandu Ceria has healthy funds used for supplementary feeding.

Posyandu Kelapa activities are carried out at village health posts so that health services such as immunization, family planning and pregnancy tests can be carried out, because there are midwives in charge at the venue. There is no additional feeding at Posyandu Kelapa Karenan no funds available.

The two posyandu have implemented the service with a five table system but most of the posyandu in the implementation of registration and weighing are incompatible with the 5 table system. This is done by the cadres to maintain the effectiveness of work and time efficiency.

To see the commitment of health workers, it can be seen from the presence of health workers in posyandu activities. health personnel present at the two posyandu are village midwife, midwife, nurse and doctor of community health center. The attendance of health worker of community health center in Posyandu is obligated once a month[1].

Guidance and Supervision

In order for the implementation of posyandu activities to run properly, it takes coaching from health workers and related institutions. The purpose of coaching is to provide guidance, to guide the coverage of posyandu increases, to help solve problems and to motivate the cadres to be more energized and achievers.

Basically the cadre's guidance function is to increase the cadre's insight, so their skills and confidence are higher. This will be seen in his stance and accompanied by a sense of responsibility[1].

Monitoring activities are carried out by the health office through monthly reports from community health centers. Supervision is not done specifically, but is done in conjunction with coaching. Supervision is a very important activity in order to achieve organizational goals. The purpose of supervision is to improve management functions and have a forward-looking orientation[6].

CONCLUSION

Although the quantity of health cadres has been sufficient, but their quality has not been maximized. The limited facilities, infrastructure and funds make the government need to pay special attention to improving it.

INFORMATION

There is no conflict of interest related to this study. All funds of this study taken from researchers. this study already has ethical clearance.

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Global Comparison of Ambulance Services in Select Countries and Feasibility to Have Standardized Ambulance Services for India

Parag Rishipathak[1], Rajiv Yeravdekar[2], Prasad Rajhans[3]

[1]Deputy Director, [2]Director, [3]Consultant - EMS, Symbiosis Institute of Health Sciences, Symbiosis International (Deemed University), Pune, India

ABSTRACT

Introduction: Emergency Medical Service (EMS) is provided by a variety of individuals, using a variety of methods. The levels of service available will fall into one of three categories: Basic Life Support (BLS), Advanced Life Support (ALS) and Intermediate Life Support (ILS)

Objective: The objective of the study was to compare the ambulance services in various parts of the world and to study the feasibility of having standardized ambulance services for India.

Methodology: The present study focuses on Ambulance services in select countries of the world based on questionnaire circulated and responses obtained. This study is based on the responses obtained from EMS stakeholders working in EMS field in India and various parts of the World. Their responses were corroborated for authenticity through additional sources e.g. website, official publications of their Institutions and in some cases through personal interaction with the authorities.

Results: There is no standardization of ambulance design across various procurements in the country and the industry is forced to re-integrate their vehicles every now and then. Most of the ambulance specifications are written by medical specialists who are unable to translate the user requirements in automobile terminology there by resulting in a huge gap between the user expectations and industry deliverability. Developed and developing countries have both Basic Life Support (BLS) & Advanced Life Support (ALS) type of Ambulances.

Conclusion: The real concept of an ambulance is missing in India. EMS is responsible for delivery of Emergency care in pre-hospital or out of hospital environment and to develop relatively good EMS model. India should have both BLS as well as ALS type of ambulance services which should include Ambulance Vehicles, Ambulance drivers and Emergency Medical Technicians (EMT's). There is also need to issue necessary instructions to the buyer of the incompletely built vehicle about the constructional and functional aspects of the ambulance.

Keywords: *Advanced Life Support (ALS), Ambulance, Basic Life Support (BLS), Emergency Medical Service, Intermediate Life Support (ILS).*

INTRODUCTION

In India, every 4 minutes, one person dies on the road[1]. While 7 to 10 percent are critically injured, 20 to 30 per cent are seriously hurt, of these about 30 per cent are disabled for life, either partially or totally[2]. Considering the rate of road accidents and following critical injuries, there is a need for Emergency services to provide immediate aid to the victims in order to save their lives. The World Health Organization (WHO) in its landmark 2005 treatise on EMS and pre hospital trauma care systems also, has established the importance of EMS and pre hospital trauma care systems in reducing morbidity and mortality from injury and violence and therefore the need and priority for development of EMS

system worldwide[3].

As per a WHO draft outlining the key concepts for developing pre hospital trauma care systems minimally, an effective pre hospital care system should contain the following elements: "Prompt communication and activation of the system, the prompt response of the system and the assessment, treatment and transport of injured patients, regardless of country or terrain in which their injuries occur and regardless of the economic status of the country or municipality rendering care and treatment"[4].

The first one hour after the road accident is critical for saving lives. In this "golden hour", as coined by Dr. R Adams Cowley[5], prompt medical aid can be critical to the patient's survival[6,7]. Death rate can be reduced by 30% if better medical aid is provided in the first hour after accident. Proper wound care, immobilization of fractures, availability of Oxygen, intravenous fluids, prompt recognition of life - threatening conditions and transport to definitive care can all reduce morbidity and mortality. This should be the chief function of a well-equipped ambulance. Unfortunately, in much of the developing world such services are unavailable and care and transport of the sick and injured patient are carried out by lay people. EMS essentially aims at either providing treatment to those in need of urgent medical care, with the goal of satisfactory treatment, or arranging for timely removal of the patient to the next point of definitive care. This role must be played by an efficient ambulance service and subsequently the Casualty department at a hospital or another place where physicians are available."[8]

EMS is provided by a variety of individuals, using a variety of methods[9]. To some extent, these are determined by country and locale, with each individual country having its own 'approach' to how EMS should be provided, and by whom. Generally speaking, the levels of service available will fall into one of three categories: **Basic Life Support (BLS)** Ambulance is used to transport relatively stable patients; **Advanced Life Support (ALS)** Ambulance that contains all emergency equipment and drugs necessary to manage any kind of patient emergency; and, **Intermediate Life Support (ILS)**, which is essentially a BLS provider with a moderately expanded skill set, may be present, but this level rarely functions independently, and where it is present, may replace BLS in the emergency part of the service. The objective of this paper were to study ambulance services in the selected developed and developing countries and study the feasibility of having standardized ambulance services for India.

METHODOLOGY

The present study focuses on Ambulance services in select developed & developing countries of the world based on questionnaire circulated and responses obtained. This study is based on the responses obtained from EMS stakeholders working in EMS field in these countries (developed & developing countries). The primary data was obtained from an interview and an analysis of the responses obtained from various EMS stakeholders to the questionnaire administered personally. Their responses were corroborated for authenticity through additional sources e.g. website, official publications of their Institutions and in some cases through personal interaction with the authorities. Similar questionnaire was also administered to EMS authorities in various parts of India via e mail. In order to obtain a global perspective and understanding of EMS system prevalent in various parts of the World, similar questionnaire was administered to EMS authorities in various parts of the world via e mail. Unfortunately, despite repeated reminders researchers managed to obtain limited responses, both nationally & internationally. To supplement the interview responses, information of countries included in the study from secondary data were collected.

As regards secondary data, published literature relevant to Ambulance services in various parts of the world to include select countries and India was identified. This was to identify various Ambulance services existing in various parts of the World and study various Ambulance services existing. Literature was identified through electronic literature searches & data bases. Websites of various EMS organizations were also accessed. This was to identify various Ambulance services existing in India and various parts of the World. The Basis of selection of Countries and the Inclusion criteria and Exclusion criteria are detailed further.

RESULTS AND DISCUSSION

For purpose of this study, three strata with countries having Emergency Medical Services were considered for study.

Countries that do not have existing EMS were omitted from the study. Countries were grouped in three categories, High, Medium and Low Human Development Index. The Human Development Index (HDI) is a comparative measure of life expectancy, literacy, education, standards of living and quality of life for countries worldwide[4].

It was noticed that the group / population is not homogenous, hence stratified sampling techniques were applied. Each strata was formed on basis of common characteristics thus,

Strata I included.

79 Countries with High Human Development Index.

Countries having existing Emergency Medical Services.

Strata II included

23 Countries with Medium Human Development Index.

Countries having existing Emergency Medical Services

Strata III included.

45 Countries with Low Human Development Index.

Countries having existing Emergency Medical Services.

It was ensured that all elements are most homogenous within each stratum and heterogeneous between different strata. For selection of countries to constitute sample from each stratum, simple random sampling technique was used. Name of each element was written on a slip of paper and all slips were put in a box, mixed thoroughly and blindly drawn the required number of slips and put back for all participants to have equal chance of being in the sample. Repeat slip was not included on second time. (i.e. once an item is drawn selected for sample, it cannot appear again in the sample.) It was ensured that in successive drawing each of remaining elements of population has same chance of being selected. That is if P_i represents proportion of population (High Human Development Index) included in stratum i and n represents total sample size, the number of elements selected from stratum i is n.P_i. For e.g., when we want a sample size of n=15 to be drawn from a population (all countries having existing EMS) of size n= 147 which is divided into three strata as under.

For strata n_1=79 we have P_i=79/147 and hence,

$n_1 = n.P_i = 15 \times 79/147 = 8.0612$ rounded off to 8

$n_2 = n.P_2 = 15 \times 23/147 = 2.234$ rounded off to 2

$n_3 = n.P_3 = 15 \times 45/147 = 5.591$ rounded off to 6

Thus using proportional allocation the sample sizes for different strata are eight, two and six respectively which is in proportion to the size of the strata seventy nine: twenty three:" forty five (79:23:45) (i.e. stratified sample was obtained). Thus after performing stratified Random Sampling following countries were selected from each strata for the study.

Eight Countries with High human Development Index with existing EMS:

United States of America, New Zealand, Canada, Germany, Hong Kong, Singapore, United Kingdom, France

Two Countries with Medium human Development Index with existing EMS

Sri Lanka & South Africa

Six Countries with Low human Development Index with existing EMS

Kenya, Pakistan, Bangladesh, Sudan, Afghanistan, Nepal

India is in Medium human development index category with existing Emergency Medical Services.

The sample size consisted of all EMS stakeholders working with various EMS setups across the world. A total of Seven hundred and fifty filled forms were collected. Incompletely filled ambiguous responses, ineligible forms etc. were discarded. Finally, six hundred and seventy two forms were analyzed. The forms filled were collected, collated and analyzed by using statistical package for social sciences (SPSS) Software version16.0 for the purpose of the study. It can be seen (fig. 1) that 60.5% of respondents say that India has only Basic Life Support (BLS) type of Ambulances and 26.3% replied India has Advanced Life Support (ALS) type of Ambulances, whereas 13.2% of respondents replied that India has both or other type of Ambulance Services.

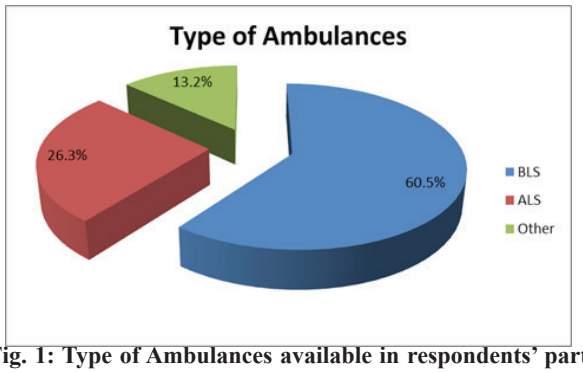

Fig. 1: Type of Ambulances available in respondents' part of India

This analysis shows that developed and developing countries have both Basic Life Support (BLS) & Advanced Life Support (ALS) type of Ambulances.

The Ministry of Road Transport and Highways, Govt. of India has set up five Working Groups on 4Es of Road Safety i.e. Education, Engineering (Vehicles), Enforcement and Emergency Care on the recommendation of the National Road Safety Council (NRSC).[9] The Working Group on Emergency Care in its report observed that the real concept of an ambulance is missing in India. Existing ambulances are more like transport vehicles and any vehicle suitable to lay a patient is called an ambulance without consideration to the overall ambulance design. Unrestrained occupants, particularly those riding in the patient-care compartment, are particularly vulnerable. It is, therefore, all the more necessary in an ambulance to take care of occupant safety, patient care ergonomics, medical equipment selection and placement, vehicle engineering and integration, etc.

The working group recommended that there is a need to formulate the

"National Ambulance Code" [10] with necessary amendments in Central Motor Vehicle Rules (CMVR) that defines the Constructional and Functional Requirements for Road Ambulances. In view of this, an Expert Committee was constituted with approval of the Hon'ble Union Minster for Road Transport and Highways to formulate the **"National Ambulance Code"**. The Committee took stock of the existing trends vis-a-vis ambulance construction, design and integration to understand the current scenario, limitations of the existing framework, available technology, manufacturer maturity, local conditions, past trends, etc. The committee members shared their experiences as regards the Indian reality and deliberated on the reasons behind the condition of ambulances. The following important points were highlighted during these discussion[10]:

There is no standardization of ambulance design across various procurements in the country and the industry is forced to re-integrate their vehicles every now and then.

Most of the ambulance specifications are written by medical specialists who are unable to translate the user requirements in automobile terminology there by resulting in a huge gap between the user expectations and industry deliverability.

There are certain inherent limitations in the existing laws which allow goods vehicles to be converted as ambulances for passenger application without incorporating essential safety features in patient compartment like side door, forward backward seating, occupant restraints, certified electrical systems, etc.

Thus Ambulance was broadly categorized as:

Basic Life Support Ambulance – A vehicle ergonomically designed, suitably equipped and appropriately staffed for the transport and treatment of patients requiring non - invasive airway management/ basic monitoring.

Advanced Life Support Ambulance - A vehicle ergonomically designed, suitably equipped and appropriately staffed for the transport and treatment of patients requiring invasive airway management/ intensive monitoring

Information analyzed from Secondary Data of various countries from study shows that in selected countries ambulance vehicles attempt to meet either European standard for ambulances CEN 1789, published by European Committee for standards or United States federal KKK-1822 standards. They are either Basic Life Support (BLS), or Advanced Life Support (ALS) or both.

They are used for transportation depending upon severity of illness.

Emergency Calls.

Doctor's urgent admission request.

High dependency and urgent inter – hospital transfer.

Major incidents.

CONCLUSION

The real concept of an ambulance is missing in India. Existing ambulances are more like transport vehicles and any vehicle suitable to lay a patient is called an ambulance without considering the overall ambulance design. As EMS is responsible for delivery of Emergency care in pre-hospital or out of hospital environment and to develop relatively good EMS model, India should have both BLS as well as ALS type of ambulance services which should include Ambulance Vehicles, Ambulance drivers and Emergency Medical Technicians (EMT's). There is also need to issue necessary instructions to the buyer of the incompletely built vehicle about the constructional and functional aspects of the ambulance. Any body builder who is engaged in the activity of building ambulances needs to follow the prescriptions of National Ambulance code for necessary compliance, verification & certification.

Ethical Clearance- IEC, SIU

Source of Funding- Nil

Conflict of Interest - Nil

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A Low Cost Wireless Patient-health Tracking System

Mandeep Singh[1] , Deepak Jain[2]

[1] Assistant Professor, [2]Research Scholar, EIED, Thapar University, Patiala, INDIA,

ABSTRACT

Remote health monitoring systems have started to become one of the main building blocks of modern healthcare systems. It offers innovative and better ways to monitor chronic diseases or detect early deterioration, especially in case of patients, old people and infants. It acquires physiological signals using sensors and wirelessly transmits them to a remote healthcare station where they are monitored. This paper presents the design and development of a health monitoring system using a 16 bit microcontroller that monitors vital parameters namely heart rate, respiration rate, body temperature and body orientation. MSP430 based microcontroller acts as the data acquisition unit interfaced with orientation sensor and the Bluetooth chip, tied around the upper arm of the patient. An elastic chest belt houses the sensors for body temperature and respiration rate. The pulse sensor is worn either on the index finger or the ear. The data is then transferred from the board to a nearby laptop or mobile phone via Bluetooth where the data is stored and displayed graphically.

Keywords: *Wireless monitoring, orientation, physiology parameters, healthcare system, wearable embedded system.*

INTRODUCTION

Affordability of healthcare has started to become a bigger issue. Generally automation is the key to reduce costs. This automation is provided by the wireless medical embedded systems through ubiquitous patient monitoring and automated data analysis[1]. The population of people aged 65 and above was around 500 million in 2006. The number will be doubled by 2030 to around 1 billion. The conventional healthcare systems, used in hospitals which focus on diagnosis and treatment, are shifting their focus towards an individual-oriented healthcare system with the main purpose of early detection of risk factors, early diagnosis, and early treatment[2-4].

A basic block diagram of the wearable vital signs monitoring system is depicted in Figure 1. It shows the location of pulse sensor on the index finger which is used to monitor heart rate, a force sensitive resistor on the chest belt for calculating the respiration rate, a LM35 sensor to measure the body temperature and the MPU9150 body orientation sensor worn on the upper arm by the patient. All the sensors are connected to MSP430 based microcontroller board where these signals are processed and then sent wirelessly through Bluetooth module to a laptop/smart phone, from where the data can stored and displayed and send to the physician for consultation.

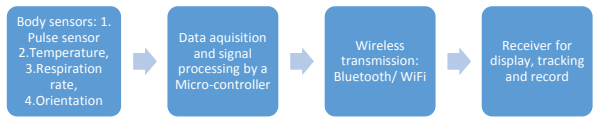

Figure 1. Block diagram of the proposed system

MATERIALS ANAD METHOD

Heart rate

Continuous monitoring of vital signs can help identify a patient's risk for stroke, heart attack, heart failure etc.[5] . In this system heart rate is measured using photo-plethysmograph (PPG) technique. It is a low cost, non-invasive technique to measure heart rate at skin surface[6]. It uses a an LED which illuminates the skin surface and a photo detector which detects the intensity of light reflected back which changes periodically with

Corresponding author:
Mandeep Singh
Assistant Professor, EIED, Thapar University, Patiala, INDIA, E-mail: mdsingh@thapar.edu

the heart rate. With each heartbeat, a surge of blood is forced through the vascular system, expanding the capillaries in the finger, and changing the amount of light returning to the photo detector[7].

PPG signal has been used to detect heart rate at different positions of the human body to select the best location having highest accuracy and minimum artefacts. Three different locations were chosen which were the ear, index finger and the palm. Figure 2a) represents the output waveform of PPG taken from the index finger, 2b) is from the palm and 2c) is from the ear. The peak values for the 3 output waveforms were 3V, 2.5V and 2V respectively. As evident from the figure 2a also, the most prominent peak came from the output of the index finger, where a significant pulse wave is visible. Therefore the index finger has been selected to acquire the pulse rate.

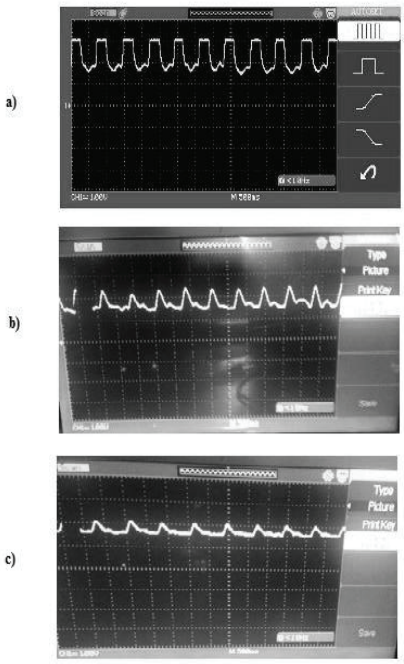

Figure 2. PPG output waveforms from a) index finger, b) palm and c) ear.

Later on, the pulse sensor has been calibrated using with a standard Medical grade pulse oximeter. The output from the pulse sensor and oximeter was taken simultaneously. The index finger was considered the best position due to its best output. Positioning of the sensor at the palm was found to be quite uncomfortable and the output at ear was quite low, though it could be used as a probable position.

Respiration Rate

The monitoring of the respiration rate is one of the key aspects to detect early changes in the health status of critically ill patients[8]. In this design it is monitored using a force sensitive resistor (FSR). It is a square resistor with sensing area of 1.75”x1.5”. It is placed on the chest belt. It is one of the cheapest methods to monitor respiration rate. When a person inhales the chest expands and the resistor experiences force and consequently its resistance increases. When the person exhales the chest contracts and the pressure/force on the resistor reduces and the resistance decreases. A voltage divider is made with this resistor and a 22kΩ resistor with a voltage supply of 3.3V. The output voltage across the resistor changes periodically with the respiration rate. The peak voltage is about 1.7V.. Figure 3 depicts the waveform corresponding to the output voltage of the FSR. It is very easy to calculate the respiration rate from this waveform using a voltage level detector algorithm in microcontroller. The sensor was calibrated with the help of a spirometer which also helps in finding the respiration rate. In spirometer with one hand you have to hold the sensor close towards a nostril and with the other hand you have to close the other nostril and breathe into the sensor.

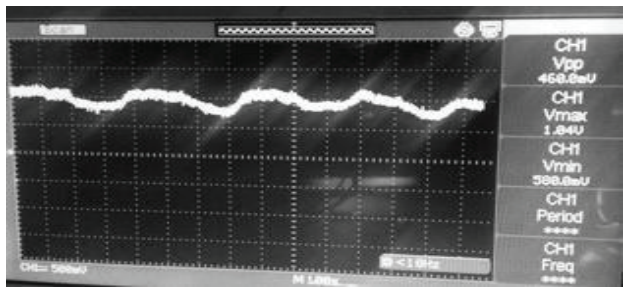

Figure 3. Output waveform of voltage across resistor connected in a voltage divider circuit

Body Temperature

Body Temperature is a vital sign as it can be used to detect infection, viral or an inflammation etc. So it is very important to monitor it. As the system has to made wearable, temperature was monitored at 4 different locations namely wrist, chest, anterior calf and auxiliary. The normal temperature is approximately within the range of 95.9-98.6° F (35.5-37.0 °C) [9]. The sensor used for these locations was LM35 by Texas Instruments. It is highly accurate at room temperature with an accuracy of ±0.25°C. It has a wide range from -55°C to 150 °C. The output voltage is directly proportional to temperature in °C with a scale factor of 10mV/° C. For example if the output voltage is 320mV then the temperature is 32 °C.

Body Orientation

In some cases, it is important to note down the sleeping pattern of the patient. Body orientation in this system tells whether the person is lying down or standing, sitting or rolled-over. Orientation is monitored using MPU9150 sensor. This sensor keeps the track of body movements that may be useful in clinical correlation. It is one of the finest 9-axis motion tracking device which has an inbuilt 3axis accelerometer, 3-axis gyroscope and a 3-axis magnetometer. It has an inbuilt digital motion processor; 16-bit ADC's (Analog to Digital Converter) and can measure up to ±16g of force, ±2000 degrees/ sec rotation and ±1200μT magnetic field. It uses I2C (inter-IC communication) communication with the microcontroller.

Microcontroller

The microcontroller used is Texas Instruments MSP430G2553. Its launch pad kit with the circuit on board can be seen in Figure 7 with the whole circuit. The microcontroller has 8 analog channels, supports UART (Universal Asynchronous Receiver/Transmitter), I2C communication and has an inbuilt 10-bit ADC. It also acts as the data acquisition unit of the system.

Wireless Communication

There are a number of wireless technologies available in the market. Mainly two of them are frequently used namely Bluetooth[10] and Zigbee[11]. Bluetooth is used in this system as it is more popular, low cost and easy to use. When Bluetooth is connected with the laptop it assigns a COM port to the Bluetooth and it can be used as UART. Basically it acts as a cabled serial port.

Software Used

Code composer studio 5.5.0 [12]

Code composer studio is an integrated development environment which is used to program Texas Instruments Microcontroller.

NI LabVIEW

National instruments Laboratory Virtual Instrument Engineering Workbench (LabVIEW) software is used for making a Graphical User Interface (GUI). VISA resource is used for connecting with the Bluetooth via COM port. It tells about the Heart Rate, Body

Temperature, Respiration Rate and Orientation. It also has a visual alarm which turns bright green if any parameter is abnormal.

RESULTS

The heart rate is taken from the index finger as the output of the pulse sensor is most significant from there. Table 1 shows the comparison of heart rate calculated using the pulse sensor on index finger and a standard medical grade pulse oximeter.

Table 1 Heart rate using pulse sensor and comparision with pulse oximeter

Subject Number	Pulse Oximeter (Heart Rate bpm)	Pulse Sensor (Heart Rate bpm)	Error
1	85	82	3.5%
2	86	89	3.4%
3	97	99	2%
4	78	75	3.8%
5	66	64	3%
6	68	70	2.9%
7	95	95	0%
8	69	70	1.4%
9	83	82	1.2%
10	88	90	2.2%
		Average Error	**2.3%**

It has been observed from table 1 that the maximum error was found to be ±3.8% and the average error is ±2.3 % of true value, which is acceptable.

Table 2 shows the respiration rate calculated using the sensor and a spirometer. It was observed from table 2 that the maximum error was found to be ±1 unit and average error is also ±1 unit which is acceptable.

Table 2 Respiration rate using FSR and spirometer

Subject Number	Spiro meter	Force Sensitive Resistor	Error (units)
1	14	14	0
2	23	22	-1
3	28	29	1
4	16	15	-1
5	15	15	0
6	17	18	1
7	25	26	1
8	13	12	-1
9	17	18	1
10	21	20	-1
		Average Error	±1

Table 3 shows the readings of the temperature of the participants at different locations with LM35 sensor and a standard clinical digital thermometer.

Table 3 Temperature measurement at different locations with LM35 sensor and a digital thermometer

	Digital Thermometer (calibrated)	LM35	Error
	Subject 1		
Wrist	30	30.3	1%
Chest	33	33.2	0.6%
Axillary	32	32.4	1.2%
Anterior Calf	32.6	32.8	0.6%
	Subject 2		
Wrist	31.2	31.5	1%
Chest	33.2	33.4	0.6%
Axillary	31.6	31.4	0.6%
Anterior Calf	32	32.1	0.3%
	Subject 3		
Wrist	31.4	31.5	0.3%
Chest	32.9	33	0.3%
Axillary	31.7	31.1	1.8%
Anterior Calf	31	30.3	2.2%

The temperature was monitored throughout the day at the 4 locations. One such reading is shown in table 3 and the mean and standard deviation was found out which is shown in table 4. Temperature was taken from the chest as the deviation was the least, it was least effected by external environment and won't affect the person during daily work. Hence the LM35 sensor was pasted on the chest belt itself. The error in the reading was found to be quite small and hence temperature was successfully monitored. Moreover, this at this location, error due to artifacts is also minimum. 10 participants were chosen irrespective of their age, sex, weight etc. MPU9150 sensor was able to identify with an accuracy of 100% whether the person was lying down or not

Table 4 Mean and standard deviation at different locations

Location	Mean	Standard Deviation	Avg. Error
Wrist	30.077	0.496	0.77%
Chest	**33.011**	**0.116**	**0.5%**
Axillary	32.133	0.35	1.2%
Interior thigh	32.644	0.415	1.03%

CONCLUSION

In this paper, design of a low cost Bluetooth based wireless patient monitoring system is presented, which can monitor 4 vital parameters like heart rate, respiration rate, body temperature and orientation. All the sensors are connected to the analog channels of the microcontroller. Using UART the microcontroller is connected to Bluetooth which sends the data wirelessly to LabVIEW on the laptop where the status of the person can be monitored. As the data is being stored in real time on the laptop or smart phone, further, the data can be shared through internet with a medical specialist in case of emergency. An alarm button is also given which goes high if any parameter goes out of its normal range, which can trigger an SMS or email to the ward of the patient. The proposed system is of very low cost (around Rs. 600 or USD 10) and the novelty is that it can remove so much junk of wires around the patient on hospital bed. It can be used to monitor the health of elderly people, patients at home, working personnel etc. It is also useful in rural areas where health centres are not in abundance or lack of facilities.

Ethical Clearance - The study is related to an electronic circuit which operates on 3.7 V and does not involve any intervention method or intrusive device to the patient. Hence, ethical issue does not arise.

Source of Funding - The present study is self sponsored.

Conflict of Interest – There is no conflict of interest.

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The Association of Risk Factors with Dental Caries in Primary School Children in Banjar Disrtict

Rasuna Ulfah[1], Erida Wydiamala[2], Lenie Marlinae[3]

[1]Student of Public Health Magister Program Medical Faculty LambungMangkurat University, [2]Department of Parasitology Medical Faculty LambungMangkurat University, [3]Enviroment Health Department Public Health Program Medical Faculty LambungMangkurat University

ABSTRACT

Dental caries experienced by almost 70-95% in school children throughout Southeast Asia.[1] The dental and oral disease is the highest disease in primary school age children in Indonesia with a prevalence of 74.4%.[2] This study aims to determine the relationship of risk factors with the incidence of dental caries in primary school children. This research is quantitative with cross-sectional design conducted on elementary school children in Banjar District. Sampling is based on multistage cluster sampling that has been established based on inclusion and exclusion criteria with a sample size of 136 primary school children. Data were analyzed using logistic regression test. The results showed that 82.4% of primary school children had high dental caries. The logistic regression test showed that three variables had significant relationship and were the risk factor of dental caries incidence was sweet food consumption (p = 0,000; OR = 16,980), oral and mouth hygiene (p = 0,000; OR = 62,126), knowledge of the mother = 0,009; OR = 9,927) and the most influential factor on dental caries incidence is the habit of maintaining oral hygiene (OR = 62,126). The conclusions of this study are factors related to the risk of dental caries in primary school children is the consumption of sweet foods, the habit of maintaining oral hygiene and knowledge of the mother, with the most influential factor is the habit of maintaining oral hygiene.

Keywords*: Dental caries, risk factor, elementary school age children.*

INTRODUCTION

Dental caries is a disease of the hard tissue of the tooth begins with continuous enamel and cementum, which is caused by the activity of a microbial organ in a fermentable carbohydrate. The sign is the demineralization of hard tooth tissue followed by damage to organic matter. As a result, bacterial invasion and pulp death and the spread of infection periapical can cause pain.[3]

The prevalence of dental caries and mouth in Indonesia reaches 72.6% far above the target to be achieved in 2020 of 54.6% .[4] Basic Health Research Data (2013) shows South Kalimantan is the second highest province with people with dental and oral problems by 36.1% compared to the national average of 25.9%. The caries experience rate (DMF-T) depicting caries severity in South Kalimantan is 7.2 and is second highest in Indonesia. Far above the national average DMF-T figure of 4.6.[5]

The high incidence of dental caries and mouth can be caused by many factors, such as diet, oral hygiene, socioeconomic, educational, knowledge and environmental practices.[6,7] Primary school-aged children are susceptible to dental and oral diseases. Because at that age children are very fond of sweet foods and oral hygiene is less awake.[8] Teeth damage left in children can cause infection in the mouth and cause pain. These conditions affect the appetite and nutritional intake of children, so it can lead to growth disorders and affect the nutritional status of children who ultimately have a

Correspondence:
Rasuna Ulfah
E-mail: rasunaulfah82@gmail.com
uulnida74@gmail.com

negative impact on the quality of life of children. [1]

Mulu et al. (2014) stated that consumption of sweet foods and low oral hygiene habits was significantly associated with dental caries in children.[9] Improved oral hygiene resulted in plaque accumulation on tooth surfaces that would increase the risk of dental caries.[10] According to Tyath et al., (2015), the high caries rate is also influenced by socioeconomic level.[11]

Materials and Methods

The design of this study was analytic observational with the cross-sectional design. The population in this study is all elementary school children in the region of Banjar Regency. The sample size using the two-way hypothesis formula according to the Lemeshow formula was 136 schoolchildren.[12] The sampling technique used multistage random sampling. The sample used was elementary school children in the district of Banjar by randomly taking 3 primary schools representing urban and 3 primary schools representing rural areas. The data obtained were analyzed by Logistic Regression test at 95% significance level. The instrument used to measure the consumption of sugary foods is the Food Frequency Questionary (FFQ), to measure the habits of maintaining oral hygiene, maternal knowledge and location of residence is a questionnaire. Drinking water is checked by pH and flour content in the laboratory. Dental examination is performed by health workers for dental caries data in school children.

RESULTS AND DISCUSSIONS

Findings

Table 1 Results of univariate analysis

Variable	Category	Frequency	%
Sweet Food Consumption	High	99	72,8%
	Low	27	27,2%
Habits Maintain Oral Hygiene	High	28	20,6%
	Low	108	79,4%
Mother's Knowledge	Height	84	61,8%
	Less	52	38,2%
Social Economics	High	48	35,3%
	Low	88	64,7%
Drinking water	Eligible (pH≥6,5 dan Flour ≥1ppm)	0	0%
	Not Fulfilling the Requirements (pH <6,5 dan Fluor <1ppm)	136	100%
Location of Residence	Urban	68	50%
	Villages	68	50%
Dental caries	Height	112	82,4%
	Low	24	17,6%

Based on table 1 above can be seen that the consumption of sweet foods high in elementary school children in the region of Banjar Regency is 99 respondents (72,8%) and low consumption of sweet foods is 27 respondents (27,2%).

According to table 1, it was found that 108 respondents (79,4%) had a habit of maintaining poor oral hygiene and only 28 respondents (20,6%) had a habit of maintaining high oral hygiene.

Table 1 shows that 52 respondents (38,2%) have inadequate mother's knowledge about dental health, and 84 respondents (61,8%) have high maternal knowledge about dental health.

Table 1 shows the respondents with low socioeconomic level as many as 88 respondents (64,7%) and 48 respondents (35,3%) at high socioeconomic level.

Respondents with drinking water sources fulfilling the chemical requirements (pH ≥6,5 and Flour ≥1ppm) were 0 respondents (0%), while respondents with drinking water sources did not meet the requirements of 136 respondents (100%). In table 1 can be seen respondents who live in urban areas as much as 50 respondents (50%) and residing in rural areas as many as 50 respondents (50%).

Based on the findings in the field, elementary school children in Banjar Regency experienced high dental caries 112 children (82,4%) and low dental caries only 24 children (17,6%).

Table 2: Analysis Multivariat

Variable	P Value	Odds Rasio (OR)	95% Confidence Interval (CI)
Sweet Food Consumption	0.000	16.980	3.602-80.049
The Habit of Maintain Oral Hygiene	0.000	62.126	12.810-301.294
Mother Knowledge	0.009	9.927	1.784-55.246
Socio-Economic	0.947	1.052	0.235-4.737
Residence Locations	0.745	0.787	0.187-3.321

Table 2 shows the results of logistic regression test with 95% confidence level to see the relationship of consumption of sweet foods with dental caries obtained p-value = 0,000 (p <0.05) which means there is a relationship between the consumption of sweet foods with the risk of dental caries in school children basic.

The result of logistic regression test with 95% confidence level to see the relationship of habit to maintain oral hygiene with a risk of dental caries in elementary school children obtained p-value = 0.000, which means there is a relationship between the habit of maintaining oral hygiene with the risk of dental caries.

According to table 2, it is known that the result of logistic regression test with 95% confidence level to see the correlation between mother's knowledge with a risk of dental caries is obtained p-value = 0,009 which means there is the correlation between mother knowledge with dental caries incident in elementary school children.

The result of logistic regression test with 95% confidence level to see a correlation between socioeconomic level with risk of dental caries was obtained p-value = 0,947 (p> 0,05). This means there is no relationship between the socioeconomic level with risk of dental caries.

Table 2 shows the results of logistic regression test with 95% confidence level to see a correlation between and location of residence with dental caries incidence in elementary school children obtained p-value = 0,745 (p> 0,05), so there is no relation between and location place to live with dental caries events.

Table 2 shows the most influential variables on dental caries in primary school children in the habit of maintaining oral hygiene with a value of odds ratio of 62.126, meaning that children who have a habit of maintaining low oral hygiene are at risk 62,126 times have high dental caries.

DISCUSSION

High consumption of sweet foods in the form of snacks is very liked by children, besides tastes good, the price is relatively cheap, easy to get with various shapes and colors of food vary.[13] Sweet foods, especially containing sucrose, will be metabolized by bacteria in plaque as a source of energy for bacteria. This metabolism will produce an acid which results in a decrease in plaque pH to the extent that it may cause tooth surface demineralization. The more frequent the consumption of sweet foods will cause the pH below normal and a certain time will cause the demineralization of the tooth surface so that the process of dental caries begins.[3] The results of this study supported by Chen et al. (2017) with p-value = 0.002, where the child children who consume sweet foods and drinks have a higher risk of dental caries than children who rarely eat sweet foods.[14]

Caries is a disease caused by the interaction of germ plaque with diet and teeth. There is no doubt that without the plaque there will be no caries. One way that plaque formation on the tooth surface can be limited, either by preventing its formation or by clearing plaque over a period of time by cleaning the teeth correctly

and regularly.[15] This study is in line with the research of Cheng et al. (2014) obtained p-value = 0.001, where the children who have a habit of maintaining high oral hygiene have a low caries level.[16]

The role of mother plays an important role in educating and nurturing children in maintaining healthy teeth. The role of the mother in the family is as a health leader and caregiver. Based on this role a mother must know various things about oral health. in dental care. Increased maternal knowledge of health behaviors will improve their ability to monitor the health behaviors of their children.[17] Similar results were also found in Sari (2016) p-value = 0,029 where the higher the mother's knowledge the lower the child's caries index. [18]

The high socioeconomic level in society, on the one hand, societies with high socioeconomic levels have a greater interest in healthy living thus allowing financing and higher dental care.[19] On the other hand, it gives greater opportunities to choose different types of food based on health needs and considerations, but leads to consideration of the desire to buy good food thus increasing the risk of dental caries.[20] This study is in line with the research of Ngantung et al., (2015) where there is no socioeconomic effect with dental caries in children with p-value = 0.164.[20]

Logistic regression test cannot be done at drinking water source in this research, because data obtained from 136 respondents (100%) have drinking water source that does not meet the requirements chemically so that drinking water variable is issued in the test.

The result showed no correlation between residence location with dental caries incidence where p-value = 0,745, this is indicated from high dental caries data experienced by elementary school children in urban area as much as 59 children (87%) and primary school children who live in rural areas as many as 53 children (78%). This is due to high consumption of sweet foods and low oral hygiene practices in primary school children in urban and rural areas. The results of this study were supported by Fadilah's (2017) study where rural and urban dwellings were not associated with dental caries with p-value <0.05.[21]

Based on the results of logistic regression analysis of variables maintaining oral hygiene is the most influential variable on the occurrence of dental caries in school children with the value of Odds Ratio of 62.196 where respondents with habits maintain low oral hygiene has a risk 62 times the occurrence of caries compared to respondents with the habit of maintaining oral hygiene high. The results of this study are supported by the research of Aurora et al. (2015) in his study of dental caries risk factors in Ferozepur India, suggesting that low oral hygiene measures in children are a risk factor for the high rate of dental caries in children.[22]

CONCLUSION

Based on the result of the research, it can be concluded that risk factors related to dental caries in school children are sweet food consumption (p-value = 0,000), the habit of maintaining oral hygiene (p-value = 0,000) and maternal knowledge (p-value = 0,009). The most influential variable on the occurrence of dental caries in elementary school children in the habit of maintaining oral hygiene (OR = 62,126).

Ethical Clearance: This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for etchical clearance and informed consent. The informed consent included the research title, purpose, participant's right, confidentiality and signature.

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Indonesian Rural Medical Internship: The Impact on Health Service and the Future Workforce

Hardisman Dasman[1], Lillian Mwanri[2], Angelita Martini[2]

[1]Department of Public Health and Community Medicine, Andalas University, [2]Department of Public Health, College of Medicine and Public Health, Flinders University of Australia

ABSTRACT

Background: Studies have shown a shortage of medical practitioners in rural areas, and that graduate doctors are reluctant to practice in the rural areas. To address this shortage and reluctance, the Government of Indonesia implemented a rural medical internship program with the aims of preparing medical graduates for primary medical practice, and attracting them to rural areas. The purpose of this study was to understand the experience of medical interns in the rural medical internship program, and to identify the barriers and enablers to achieving the program aims.

Method: A purposive sample of 38 medical interns (70.4%) from five districts of West Sumatera Province, participated in focus group interviews. The interviews were recorded and transcribed verbatim. Data was coded and categorized before thematic analysis for experiences in rural setting specifically to identify factors important for retention of the doctors.

Results: The medical interns indicated that their exposure to rural practice did not influence their decision to practice in rural area in the future, with most interns reporting that they did not intend to undertake clinical practice as rural doctors. The main reasons expressed were due to interpersonal issues with senior clinicians, nurses and hospital staff, which resulted in their autonomy and decision making processes being undermined; and a perceived lack of professional and financial reward for practicing as rural doctors. Overall, the study found that the program improved access to medical services in the five districts, but may not improve the shortage of medical practitioners in rural areas on a long term basis

Conclusion: A rural medical internship program improves rural medical services. However, the program alone will not address the long term goal of improving rural workforce shortage. Providing incentives for rural doctors and structural change are needed in order to make rural practice more attractive.

Keywords**:** *medical internship, rural, primary care, Indonesia*

INTRODUCTION

A lack of medical practitioners in rural areas is a significant issue affecting health care systems in low and middle income countries. To address this workforce shortage in 2010 the Indonesian government enacted new government regulations and implemented a rural medical internship program. The government cited evidence that the introduction of new medical graduates to rural practice results in serving rural and remote communities after their internship,[1] and this has been supported in studies showing that placement in rural medical training promotes rural career retention.[2-7]

The program aimed to increase the number of doctors in rural areas, and to improve the quality of new medical graduates by preparing them for practice in primary medical services. The new model of internship mandated new graduates undertake their internship in Community Health Centers and District Hospitalsfor a period of one year. This rural medical internship training aimed to a) improve competencies for the new medical graduates; b) expand the rural medical workforce; and c) improve the health care access of the communities.[1,8] This study examined medical interns' experience during internship program whether the program improve the

health care workforce shortage and rural health service delivery.

METHOD

To understand medical interns' experience in the Indonesian Rural medical internship program, we conducted focus group interviews. Focus groups are used in qualitative research to enable discussion that produces rich data quickly, is undertaken within a social context.[9] Additionally, direct observation for the internship work was also conducted.

The study was conducted in from 2011 to 2013 in five districts of West Sumatera Province, Indonesia. All medical interns in the five districts were invited via email to participate in the focus groups. Thirty eight of the 54 medical interns (70.4%) agreed to participate in focus group interviews (table 1).

Table 1. Location and Number of Focus Group Interview Participants

Focus Group	District	Geographical Area	Number of Participants
1	Agam	North	5
2	Pesisir Selatan	South	8
3	Solok	Middle	10
4	Tanah Datar	East and Hilly	5
5	Pariaman	West and Coastal	10
Total			**38**

RESULTS

This study found that issues around workforce, interpersonal relationships, and career choices (table 2).

Table 2. Main themes and related sub-themes found during interviews

Theme	Sub-theme
Improved medical services	Rural medical shortage Filling workforce gap Public health programs
Interpersonal relationships	Hierarchical relationship Power exertion Lack of role understanding and respect by nursing staff Support by nursing staff Dissatisfaction with work culture
Incentives	Inadequate salary
Career intentions	Better understanding of rural practice

Improved medical services

The medical interns perceived that the rural internship provided improvement to health services. They expressed the view that many districts suffered from a shortage of doctors and that the interns filled this workforce gap. In district hospitals, the interns were involved in provided treatment or further advanced examination. In the Community Health Centers, the interns were involved in a variety of programs such as epidemic infectious diseases surveillance, household sanitation surveys and public health promotion and education.

Interpersonal Relationship

A hierarchal relationship between interns and senior clinicians was found. The clinical practices of medical interns were mandated to be under the control of the clinicians who were on duty at that time. The strict hierarchical approach to procedures in medical services led to disharmonious professional relationships between interns and senior clinicians. Within the work environment, medical interns showed disrespect to senior clinicians, they felt that the senior clinicians exerted their power over interns.

"...maybe in other hospitals, the medical interns are respected similar to other doctors, but our condition in this hospital is totally different. So what is our position? We are doing medical practice, take care patients. Maybe some of them also do not have much clinical experience either. They just show off their seniority" (IA4).

Some participants perceived that many nursing staff undervalued and did not respect the medical interns' work. It was considered that nursing staff did not understand the role of the medical interns and thought that they were similar to medical students who are doing clerkships.

"Here, the nursing staff ……. do not respect and underestimate what the interns do…" (ITD1).

"…If there is any fatal condition of a patient after obtaining treatment, they (nurses) always blame it as our fault" (ITD3).

Unpleasant relationships with the senior clinicians and lack of respect from nursing staff made medical interns feel uncomfortable and caused dissatisfaction with the work culture of the hospitals. The interns expressed their dissatisfaction with this situation as physical and mental burdens.

Incentives

Generally, the interns only received a monthly stipend from the Ministry of Health, which was lower than local average professional monthly salary. Even though the medical interns in the District Hospitals became an important part of the medical workforce, there was no additional reward for them by hospital management. This was considered a major disincentive to the rural medical internship program.

"*We do almost every task in emergency department and even minor surgical procedures. We do not get any financial incentive from the hospital, and you know… all the incentive for the procedure that we have done goes to senior clinician*" (IA3).

Career Intentions

The rural medical internship program did not change the career intentions of interns to become rural medical practitioners. This study revealed that the internship placement in rural areas provided real clinical experience for the interns and made them aware of the different career choices. However, no one had a clear view that doing the internship encouraged him/ her to become a rural medical practitioner.

"Maybe, the influence of this internship on our career choice is we know what it looks like to be a doctor. We get the pictures: what a hospital medical officer looks like, what a rural doctor in a heathcentre is and what a medical specialist looks like. So, we can make decisions based on those pictures. Before, we only imagined how to be a doctor but now we see it, and we can make our future career based on that" (IA1).

The medical interns expressed several reasons that influenced their decision. One was the uncomfortable relationship between doctors and nurses and other health professionals that they encountered during internship. Additionally, some interns indicated that living as rural doctors was far from the ideal standard of living as a doctor in Indonesia.

"Personally I do not want choose my career as a rural practitioner as long as there is a chance to pursue medical specialist qualifications. We know and we see that living as a rural or general practitioner just like that... there is not sufficient support from the government. Of course, also we cannot obtain more income by doing private practice because of the social and economic condition of people in rural regions" (IS3).

DISCUSSION

Overwhelmingly, the medical interns considered that the program met its strategy to improve access to and enhance health services in rural settings, and they felt an important part of health service delivery. The general perception among medical interns was that rural medical practitioners are not well remunerated.

The most significant result of this study was that the medical interns' exposure to rural practice did not influence their decisions to include practicing as rural doctors in their future careers. These findings are in contrast to many studies that found that training in rural settings can influence future career choice of the trainee.[2,3,5,7,11,12] The differences in findings in this study were due to factors including negative perceptions and unpleasant experiences that medical interns encountered and the different work culture of rural practitioners in Indonesia. Therefore the rural medical internship program may not help to improve the medical workforce for rural areas over the long term.

The medical interns perceived that there was improvement in access to health services resulting from the additional medical workforce provided through the program, addressing the lack of availability of medical practitioners.[13] While the implementation of the internship program improved access to medical services in rural areas, the quality of service was also maintained or improved. The interns reported that their supervision by senior clinicians, and their high level of competency that enabled them to practice with minimal supervision, helped to improve services to the rural areas. This is consistent with a recent study in South Africa, where

medical interns were found to improve health services in the community while prepare them to be able practice independently[14].

Despite becoming an important part of the medical workforce in the rural District Hospitals, the medical interns faced financial hardship and did not see financial reward in the long term. Financial incentives including increasing salaries, supplements, allowances, pensions, benefits and loans, introduced in various countries, have demonstrated success in increasing workforce retention.[3,4,15-17] There is also evidence that non-financial incentives can be applied to increase retention of rural doctors, such as more opportunity to obtain additional training and further medical qualifications.[4] As recent literature suggests, without addressing these problems and challenges will undervalue both medical internship program and community medical service.[18]

It was also observed in earlier studies that unpleasant experiences for medical interns are not uncommon. For example, medical interns may face significant challenges that cause distress or psychological problems during the internship due to mistreatment and work overload.[18-20] Our study also shows that some both medical and nursing staff treated medical interns as medical students who were always under his/ her control and instruction without independence, findings that are consistent with the literature.[21,22]

In some hospitals, the hierarchy between the interns and senior clinicians was strictly applied, with senior clinicians imposing strict control over what medical interns could or could not do. These strict hierarchical procedures can lead to disharmony in the professional relationship. Mutual respect and collaborative efforts between interns and nursing staff need to be promoted,[21,22] with the appropriate professional behavior to their staff and colleagues.

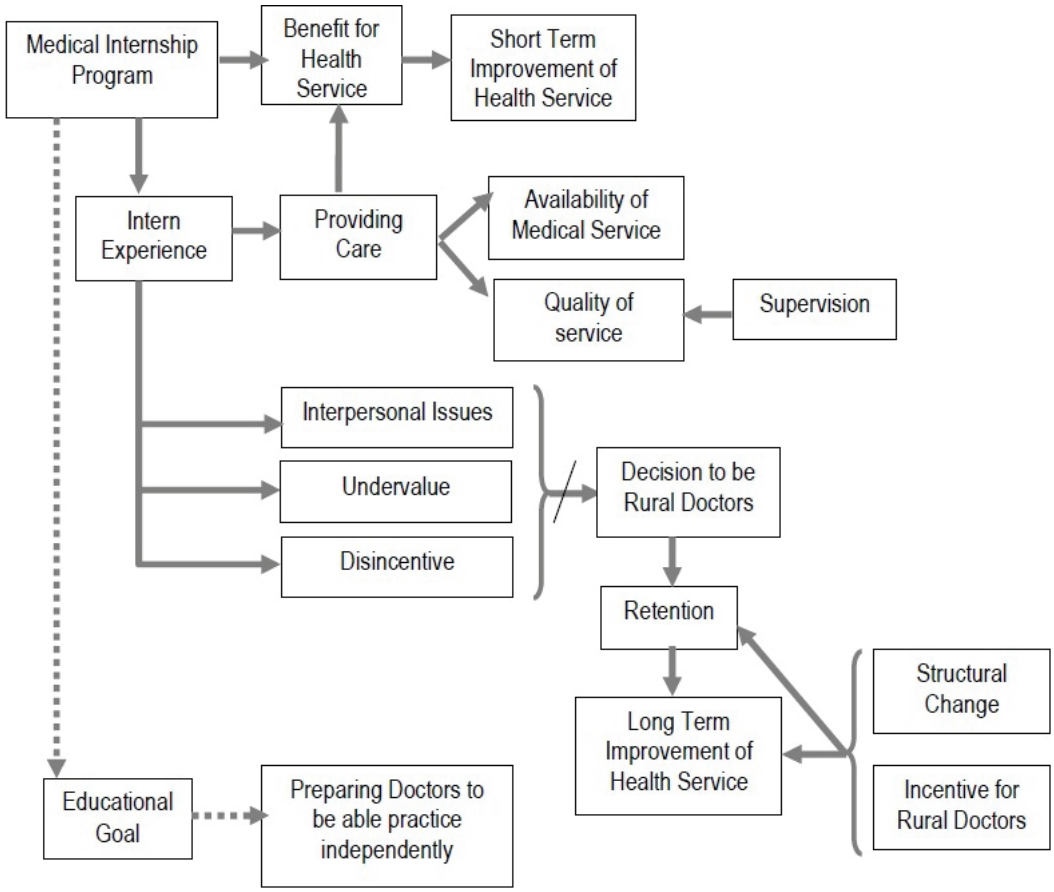

Figure 1. Current Practice of Medical Internship in Indonesia

Importantly, rural doctors in Indonesia do not receive adequate rewards from the National or District Governments.[23] Rural doctors receive only the basic salary with minimal additional support, which is considerably insufficient compares to other government employees who work in the same geographic area. This condition engendered negative attitudes in the medical interns which led them to decide not to practice as rural doctors for their long term career. The current study demonstrated that the medical interns' perceptions about rural practice were negative and this was influenced by a number factor as seen in Figure 1.

CONCLUSION

The rural medical internship program provided valuable, wide-ranging experience to medical interns practicing in rural district hospitals and community health practices. The findings revealed that there was an improvement in health service delivery as a result of the internship program. However, the internship program may not improve the medical workforce for rural areas in the long term because the exposure to rural practice did not influence their decisions about their future careers to consider practicing as rural doctors. The interns face interpersonal issues, which resulted in their autonomy and decision making processes being undermined. There was also a lack of professional and financial rewards which is a general disincentive for rural doctors in Indonesia. These challenges should be addressed to improve long term benefit of health care services and medical workforce development in Indonesian districts regions through structural changes in rural health services.

Ethical Clearance: Formal permission was obtained from the Department of Health and the Nation and Public Protection Board of West Sumatera Province of Indonesia No.B070/WAS-BKPL/2011. Participation of the medical interns were voluntary and they were advised that their participation would remain anonymous as they would not be personally identifiable**.**

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Competing Interests: The authors declare that there is no competing interests.

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Effectiveness of an Educational Program Concerning Nurse- Midwives Knowledge Concerning SBAR (Situation, Background, Assessment, Recommendation) Tool Communication on Maternal Health Documentation

Sunduss B Dawod[1], Rabea M Ali[2], Ezedeen F Bahaaldeen[3]

[1]Assistant Teacher, Fundamental Nursing, College of Nursing, University of BASRA, Iraq, [2]Professors, [3]Assistant Professor, Maternal & Neonate Nursing, College of Nursing, University of Baghdad

ABSTRACT

Background: Poor communication is responsible for up to two-thirds of sentinel events, and of those events, over half were related specifically to poor transition of patient care between providers(1).

Objective: To assess the effect of SBAR (Situation, Background, Assessment, Recommendation) educational program on nurse –midwives knowledge in maternal health report documentation accuracy.

Method: A quasi- experimental design was carried with the application of pre- post test for nurses-midwives' knowledge regarding SBAR communication tool**.** The study was held in Al-Elwia maternity teaching hospital, Al –Karckh maternity hospital and Al-Yarmouk teaching Hospital. Non-probability sample consisted of (84) nurse- midwives. The questionnaire comprised of demographic data**,** nurses- midwives knowledge of SBAR using (3) level Likert scale for assessment, with Cut –off point (2). Content validity was determined through (21) expert. Pilot study was conducted on (10) nurses-midwives during 15th to 22nd, may, 2017. Reliability of the questionnaire (pre (0.89), post (0.89), evaluation (0.936)). Descriptive ,and Inferential statistical data analysis were used.

Results: The result shows low, moderate, and high mean scores and relative sufficiency in pre test SBAR periods. While in posttest period there is moderate and high mean scores and relative sufficiency in all items except items (12,13,17,18,19,& 20), presented low mean scores and relative sufficiency in both periods (pre and posttest period). No significant differences between pre , and posttest periods with the socio-demographic characteristics, except for work place shows significant differences in pre, and posttest periods at (P-value : 0.001-.040) respectively. The results also presents that participants were extremely confident in applying scenario for Placenta praevia, and Abortion.

Conclusion: The study concluded that there is improvement in nurses – midwives knowledge concerning SBAR communication tool application after implementation of the program.

Keywords: *SBAR, communication, tool, nurse-midwives, knowledge, maternal health, documentation.*

INTRODUCTION

Communication errors in the health care setting often have severe consequences(2). Communication errors also lead to other negative outcomes, such as increased length of stay and decreased patient satisfaction (3). Accordingly, to implement practices that aid in the reduction of communication errors. One practice that has recently been adopted in some health care settings is the Situation, Background, Assessment, Recommendation (SBAR) protocol (4). The SBAR protocol was positioned as a solution to these problems. When SBAR is used, the sender communicates the patient's condition in a concise manner by delivering each of the components of the protocol In this way, SBAR ''allows for an easy and focused way.

to set expectations for what will be communicated and how between members of the team safety." [5].

METHODOLOGY

A quasi- experimental design was carried throughout the present study with the application of pre-test and post-test for nurses-midwives' knowledge regarding SBAR communication tool**.** The study was held in (3) maternity hospitals. Non-probability sample consisted of (84) nurse- midwives who are working in the morning shift, different educational levels, who are working in critical care wards and who agree to participate in the study.

Implementation of the Program:

At the SBAR- introduction, primarily the researcher provided staff with information about the study, asked them to participate, and obtain informed consent. The SBAR- intervention, based on the evidence for best practice, included teambuilding and collaboration strategies, positive communication techniques, communication styles, empathy, and problem-solving strategies. Intervention classes offered in 90 minutes sessions at various times throughout a 2-week timeframe.

A questionnaire was constructed through the review of literatures and previous study, and use of information which had emerged prior to need assessment. The questionnaire comprised of demographic data and nurses- midwives knowledge of SBAR using (3) level Likert scale for assessment, with Cut off point (2), they were given a scenario that required an urgent response and contact of a provider, the SBAR Observed for seven scenarios. (Post-partum hemorrhage, Premature-early rupture membranes, Placenta praevia, Teenage pregnancy, Preeclampsia, Abortion, & Postdate pregnancy). Content validity determined through (21) expert. A pilot study was conducted on (10) nurses-midwives during 15th to 22nd ,may, 2017. Reliability of the questionnaire showed very high level of stability and internal consistency of study domains (pre (0.89), post (0.89), evaluation (0.936)). Descriptive ,and Inferential statistical data analysis were used.

RESULTS

Table (1): Nurse –Midwives Knowledge in Pre-Posttest for SBAR Tool.

NO	Statistic / Items	Pretest no. (84)				Posttest no. (84)			
		MS	**SD**	**RS%**	**Ass.**	**MS**	**SD**	**RS**	**Ass**
1	**The nursing documentation is important to improve nursing practice.**	2.8452	.45241	94.84	High	2.9762	.21822	99.21	High
2	SBAR is easy to use	2.0357	.36227	67.86	Mod.	2.7976	.57623	93.25	High
3	SBAR summarize the time and effort	2.0595	.39120	68.65	Mod.	2.8214	.54132	94.05	High
4	SBAR communication reduces maternal mortality	2.0595	.35909	68.65	Mod.	2.8214	.51859	94.05	High
5	The patient situation information preferable to be comprehensive and more detailed regarding social status	2.0476	.40790	68.25	Mod.	2.8095	.52587	93.65	High
6	SPAR contains all the necessary information	2.0238	.41000	67.46	Mod	2.8571	.46937	95.24	High
7	The information transferred to doctor or duty team without mentioning the name of nurse.	1.9881	.52627	66.27	low	2.8690	.40419	95.63	High
8	SBAR recognize malpractice easily.	2.1548	.52627	71.83	Mod	2.8810	.45003	96.03	High
9	Serious conversation is faster to describe the case health.	2.4405	.81183	81.35	High	2.8929	.41122	96.43	High
10	The SBAR less time consumer	2.7500	.59869	91.66	High	2.9167	.35426	97.23	High
11	The patient is more comfortable in the conversation	2.309	.57899	76.98	Mod.	2.464	.81184	82.14	high
12	The SBAR guarantees rights of nurse	1.52	.7589	50.79	low	1.46	.6899	48.209	low

Cont... **Table (1): Nurse –Midwives Knowledge in Pre-Posttest for SBAR Tool.**

13	The verbal conversation ensures patient privacy	1.654	.7001	55.158	low	1.523	.7073	50.79	low
14	Shortness of evening shift lead to a difficulty record	2.64	.8966	88.9	High	2.13	.50622	71.03	Mod
15	When in waiting room I observe only the cases and will wait doctor's instructions	2.702	.90728	90.07	High	2.464	.81184	82.14	High
16	case sheet field of nursing notes space is Enough	2.452	.9766	81.73	High	2.166	.95480	72.2	Mod
17	The document ensure my presence	1.821	.5467	60.2	Low	1.547	.70766	51.569	Low
18	We receive the case ready without need for observations	1.988	.60677	66.26	Low	1.345	.63622	44.83	Low
19	Regular documentation ensures continuity of patient care.	2.047	.96823	68.23	Mod	1.654	.82481	55.13	Low
20	Equipment document have priority more than Nursing documentation	1.5	.81403	50	Low	0.940	.71407	31.33	Low

MS.: Mean Scores; SD: Standard Deviation, RS.: Relative Sufficiency, Ass.: Low: (0-66.66) ,Mod.= Moderate : (66.67 -77.77), High (77.78– 100)

Table indicates low mean scores and relative sufficiency in items (7, 12,13,17,18,20) , moderate mean scores and relative sufficiency in items (2,3,4,5,6,8,11,16,19) , and high mean scores and relative sufficiency in items (1,9,10,14,15) in pretest periods. While there is high mean scores and relative sufficiency in items (1,2,3,4,5,6,7,8,9,10,11,15), moderate mean scores and relative sufficiency in items (14,15), and low mean scores and relative sufficiency in items (12, 13, 17, 18, 19, 20) in posttest period. for work place shows significant differences in pre, and posttest periods at (P-value : 0.001-.040) respectively.

Table (2): Comparison between Pre-Posttest Periods (SBAR program) on Overall Domains.

Paired Samples Statistics							
		NO	Mean	SD	Std. Error Mean	Correlation	Sig
Pair 1	pretest	84	41.7619	4.47650	.416	.416	.000
	posttest	84	50.5595	5.39824	.58900		

Paired Samples Test								
Domain	Paired Differences					t	Df.	Sig. (2-tailed)
	Mean	SD	S. Error Mean	**95% Confidence Interval**				
				Lower	Upper			
pretest posttest	-8.79762-	**5.39250**	.58837	-9.96786-	-7.62738-	-14.953-	83	.000

There are significant different correlations between pretest and posttest because the value of the correlation is equal to 0.416 therefore

There is significant different means between pre-post SBAR program.

Table (3): SBAR Training Feedback.

Statistic Cases	SBAR Training Feedback				Mean for all	SD for all
	No.	Not Confident	Somewhat Confident	Extremely Confident		
Premature-early rupture membranes	14	3 (21.4%)	8 (57.2%)	3 (21.4%)	5.814	0.415
Placenta praevia	14	1 (7.1%)	5 (35.8%)	8 (57.1%)	6.564	0.468
Teenage pregnancy	14	2 (14.2%)	5(35.8%)	7 (50%)	6.533	0.466
Preeclampsia	14	1 (7.1%)	8 (57.1%)	5 (35.8%)	6.15	0.439
Abortion	14	1 (7.1%)	5 (35.8%)	8 (57.1%)	6.564	0.468
Postdate pregnancy	14	2 (14.2%)	6 (42.9%)	6(42.9%)	6.128	0.437

Table(3) shows that participants were extremely confident in applying scenario no. (2 & 5) for Placenta praevia, and Abortion (Mean± SD= 6.564± 0.468) respectively, then followed by scenario no. (3) for Teenage pregnancy (Mean± SD = 6.533± 0.466), while other less confident. On a scale of 1 to 10 (with 1 not confident at all and 10 extremely confident).

DISCUSSION

Nurses-Midwives Knowledge in Pre-Post SBAR:

The study result show in table (1) indicates that there is low mean scores and relative sufficiency in pre test SBAR period in items (7, 12, 13, 17, 18, 20). Moderate mean scores and relative sufficiency in items (2, 3, 4, 5, 6, 8, 11, 16, 19). High mean scores and relative sufficiency in items (1, 9, 10, 14, 15). While in posttest period there is moderate and high mean scores and relative sufficiency in all items except (12, 13, 17, 18, 19, 20) items.

The SBAR guarantees the rights of the nurse for her work (item 12) shows low mean of scores in both periods (1.52, 1.46) , and this because it is new program that needs more than a session and more than Scenario and more time to gain the confidence of the nurses - midwives and health organizations. They did not have previous experience with the SBAR communication. both felt that prior to the initiation of the SBAR tool, the collaboration and teamwork was not so strong in terms of making effective treatment plan, they both felt that they received adequate and organized information about referred patient from the primary care providers who used SBAR format [6] .

The verbal conversation ensures the patient privacy (item 13) (pre: 1.654, post: 1.523). The communication is more useful than writing, but does not guarantee the continued health care discussed. It was stated that SBAR provides a framework for communication between members of the health care team about a patient's condition, and has been found to facilitate both the collection, organization, and exchange of information as well as be an effective strategy to develop teamwork [7] .

The document ensure my presence (item 17), (pre:1.821, post :1.547). In our health institution, confirmation of attendance or the presence for the nurse - midwife in their work areas is not on the patient's report or documentation, but on the fingerprint for the credibility of the daily attendance. It was discussed the need to utilize a tool that concentrated on patients' needs while prioritizing the information shared between caregivers[8].

We receive the case ready without the need for my observations (item 18) (pre-1.988, post -1.345)**.** In the system of our hospitals nursing role is very limited and the specific process of reception and diagnosis is the first duties of the doctor only, but in some cases, especially in the delivery room, the nurse intervenes to provide primary care, especially the expertise in dealing with urgent cases in obstetrics. It was stated that SBAR-based checklist allows for the nurse, as the frontline caregiver in the best position to assess patient condition, to organize and present the situation while recommending to doctor a course of action in succinct, clear and concise terms [9].

Regular documentation ensures continuity of health care for patient item 19) (pre-1.988, post -1.345)**.** As a result of the weakness in nurses- midwives work is the deficit in documentation,. A nursing audit can focus on implementation of the nursing process, on client outcomes, or on both in order to evaluate the quality of care provided, not only evaluates the quality of care of an individual client but also provides an evaluation of overall care given in that health care facility [10] .

Equipment and tools document takes priority more than nursing documentation (item 20) (pre:1.5, post: 0.940). A handoff," or "patient care transfer," is an interactive process of transferring patient-specific information from one caregiver to another or from one team of caregivers to another for the purpose of ensuring the continuity and safety of the patient's care [11] .

Relationship between Pre - Posttest SBAR and Demographic Characteristics:

No significant statistical differences were found between pre , and posttest periods with demographic characteristics, except for work place shows significant differences in pre, and posttest periods at (P-value : 0.001-.040) respectively. Emergency care is a broad specialty. Emergency nurses require a depth and breadth of knowledge and skill to care for patients with undifferentiated and undiagnosed problems. SBAR use is a relatively new phenomenon and this may have played a role in the low usage because nurses may not know the positive aspects of a structured handoff. A study found that SBAR can be used in any setting but can be particularly effective in reducing the barrier to effective communication across different disciplines and between different levels of staff [12] .

Comparison between the Two Pre-Posttest Periods (SBAR) on Overall Domains:

There are significant different correlations between pretest and posttest because the value of the correlation is equal to 0.416 therefore there is significant different means between pre-post in SBAR program. It was expected that the SBAR report tool would keep nurses more focused and would lead to shorter reports , whereas their time on task improved (54% to 66.4%) the overall duration was unchanged [13] .

SBAR Training Feedback

Participants were extremely confident in applying scenario no. (2 & 5) for Placenta praevia, and Abortion (Mean± SD= 6.564± 0.468) respectively, table no.(4) , On a scale of 1 to 10 (with 1 not confident at all and 10 extremely confident) [14]. A study conducted to investigate the impact of using a standardized method called SBAR on work shift report in ICUs to take an effective step in solving existing problems, as well as follow-ups to be made by the nurse of the next shift. Checklists recorded by two observers. The results show that nurses' performance improved after work shift delivery report training using SBAR tool. results indicate that the performance score showed significant statistical difference before and after the intervention and the score has increased after the intervention in general performance and all areas [15].

CONCLUSION

The study concluded that there is improvement in nurses – midwives knowledge concerning SBAR communication tool application after implementation of the program.

Conflict of Interest: ***None declared.***

Ethical approval: for two health directorate (Al-Karkh sector &Al-Russafa sector. and all participating hospitals

Source of Funding- Self

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Assessment of Nutritional Status of Alcoholic Liver Disease (ALD) Patients

Tripti[1], Neeru[2], Karuna Singh[3]

[1]Research scholar, Department of Amity Institute of Food Technology, Amity University, Noida,UP. ,
[2]Lecturer (Home Science), HES(II), Department of Secondary Education, Haryana,
[3]Assistant Professor-III, Department of Amity Institute of Food Technology, Amity University, Noida, UP.

ABSTRACT

Introduction- Malnutrition is an increasingly recognized as complication in both alcoholic liver disease and non- alcoholic liver diseases. It has been considered as an important predictive factor, which greatly affect the short and long-term outcomes of the disease. Malnutrition is very profound and more severe in patients having chronic liver diseases due to alcoholism. Patients with alcoholic liver diseases exhibited a wide range of nutritional deficiencies.

Objective: To assess the nutritional status of alcoholic liver disease patients.

Material and Method: 120 subjects suffering from liver disease attended OPD were taken for study purpose and were divided into two groups. Group-A: 60 patients having ALD and Group-B: patients having NALD. Assessment of nutritional status was done by Child-Pugh classification (scores) to assess severity of the diseases, anthropometric and dietary methods to evaluate nutritional status.

Results: The mean age of ALD patients was 48.8 and non-alcoholic liver disease was 52.1 years. 73.33% of the total patients were suffering from deficiency of both energy and proteins to some extent alongwith 41.67% of them presented with both moderate and severe PCM. There was insignificant difference between both groups in daily food intake in terms of energy, proteins, carbohydrates and fats. All patients were taking less calories and more protein than RDA. According to MAMC, observed that ALD sufferers showed more signs of malnutrition in terms of frequency rather than non-alcoholic liver disease sufferers. But when both groups were compared according to reasons behind the diseases, there was no significant difference was observed between alcoholic and non-alcoholic disease patients.

Conclusion: The analyzed data highlights the protein calorie malnutrition in both groups of ALD and NALD patients. The more suitable measures should be taken to address the problem.

Keywords: *Nutritional status, alcoholics, protein calorie malnutrition (PCM), outpatients, alcoholic liver disease (ALD). Non-alcoholic liver disease (NALD), Mid arm muscle circumference (MAMC), Child-Pugh scores, Malnutrition, Recommend Dietary Allowances (RDA).*

INTRODUCTION

At the start of the medical history, all the medical practitioners noticed that the people who have weak liver function/activity have poor recovery rate due to acute and chronic disease. The reason behind was the poor digestion and absorption of nutrients due to insufficiency of digestive organ i.e. liver. Liver plays an essential physiological function in the digestion, absorption and metabolism of food, thus playing a central role in the maintenance of a healthy nutritional status. There is a strong association between alcoholic disease and nutritional abnormalities, as liver is the main site for the metabolism of alcohol and thus malnutrition. It is also a well-known fact that all the nutrients, whether macro or micro, are metabolized by the help of liver. In fact, metabolic activity of liver accounts for 20-30% of the oxygen consumption and energy expenditure of the

body (Lieber,2004)[9]. Compromised liver functioning in alcoholic liver disease patients result in the development of protein energy malnutrition (PEM) (Mezey,1978)[20].

The term malnutrition can be defined as a condition when body is deprived of or not receiving enough nutrition to maintain health. It may also be defined as a loss of muscle tissue or fat mass. It also leads to impaired immune function along with poor oral intake of nutrients (Merli,1987)[18]. Multiple factors are responsible which contribute to malnutrition including controlled diet recommendations used to restrict the symptoms and associated complications like ascites and hepatic encephalopathy, which enhances the poor nutritional profile, predisposing the sufferers to more infections and leading to worsen the functional hepatic state (McCullough et. al.,1989; Riggio et. al.,2003; Runyon et. al.,1998)[13,23,26]. Sarcopenia is very common in both liver injury and alcohol related liver diseases and it is the major component of malnutrition. Partly, it was thought that the patients having alcoholic liver diseases have more severe malnutrition and it can be assessed by using anthropometry and subjective global assessment criteria. The anthropometry includes their height, weight, MUAC, MAMC, which clearly indicates presence or absence of malnutrition. For the assessment of nutritional status even in cirrhotic patients the anthropometric parameters measurements proved as a reliable and safe tool.

MATERIAL AND METHOD

Study population

Total 120 males were used for this study. Subjects were divided into two groups. 60 subjects were included in Group-A who were suffering from alcoholic liver disease (ALD) and another 60 were kept in Group-B, also suffering from liver disease with no history of alcoholism (Non-alcoholic liver disease).

Inclusion criteria: Only willing male patients having liver disease (Both ALD & NALD).

Exclusion criteria: patients having no signs of any kind of liver disease

Assessment of Nutritional status

Nutritional assessment was carried out by following methods:

Dietary Method: Dietary intake was assessed by means of 24-hr recall method and food frequency questionnaire and administered by researcher.

Anthropometric Method: The anthropometric measurements were performed on the subjects while coming to OPD for their checkups. Various measurements of height, weight, BMI, MUAC and triceps skin fold and MAMC.

Biochemical Method: In biochemical methods, total bilirubin, serum albumin, prothrombin time or INR and haemoglobin levels were also checked.

Child-Pugh Classification for Severity of Liver Disease

Encephalopathy

None (1 point)

Grade 1: Altered mood/confusion (2 points)

Grade 2: Inappropriate behavior, impending stupor, somnolence (2 points)

Grade 3: Markedly confused, stuporous but arousable (3 points)

Grade 4: Comatose/unresponsive (3 points)

Ascites

Absent (1 point)

Slight (2 points)

Moderate (3 points)

Bilirubin

<2 mg/dL (1 point)

2-3 mg/dL (2 points)

>3 mg/dL (3 points)

Albumin

>3.5 g/dL (1 point)

2.8-3.5 g/dL (2 points)

<2.8 g/dL (3 points)

Prothrombin time prolongation

Less than 4 seconds above control/INR <1.7 (1 point)

4-6 seconds above control/INR 1.7-2.3 (2 points)

More than 6 seconds above control/INR >2.3 (3 points)

CTP Score Interpretation

5 to 6 points: Child class A
7 to 9 points: Child class B
10 to 15 points: Child class C

Notes

In cases of Primary Biliary Cirrhosis, Bilirubin point values are sometimes considered differently:

1-4 mg/dL -->1 point

4-10 mg/dL -->2 points

>10 mg/dL -->3 points

RESULTS

Total120 patients, all males, having age mean of 49.8 years, were taken for the study. Equal number of patients was taken having etiology of liver disease (with and without history of alcoholism). The patients were functionally classified on the basis of the Child-Pugh classification of scores.

Table 1 represents that the groups were compared according to age and functioning of liver. Maximum numbers of subjects from both groups fall under the category of Child- Pugh B score which indicates the severity of the liver disease. It was also observed that patients suffering from ALD were more at risk of mortality than non – alcoholic liver disease patients.

Table 1-Comparion between the studied groups regarding age and liver function

Parameter	**Group-A (ALD Patients)**	**Group-B (Non-alcoholic)**	**Total Subjects**
Age (yrs.)	48.8±10.4	52.1±13.6	49.8±10.2
n (subjects)	60	60	120
Child-Pugh A	9 (15%)	13 (21.67)	22 (18.33)
Child-Pugh B	34 (56.7)	32 (53.34)	66 (55%)
Child-Pugh C	17 (28.34)	15 (25%)	32 (26.67%)

On the first visit by the patients in OPD clinic, 73.33% of the total patients were suffering from deficiency of protein calorie malnutrition (PCM) with 41.67% of them having moderate and severe degree of PCM. A higher no. of prevalence of non-PCM and mild energy protein deficiency were observed among Child-Pugh-A patients rather than the patients classified in Child-Pugh B and C (Table 2).

Table 2-Classification according to nutritional status of patients with regard to liver function

Child-Turcotte-Pugh			
Nutritional status (N=120)	A n (%)	B n (%)	C n (%)
Non PCM	12 (54.54%)	12 (18.18%)	8(25%)
Mild PCM	6 (27.27%)	22 (33.03%)	10 (31.5%)
Moderate PCM	4 (18.18%)	26 (39.4%)	10 (31.25%)
Severe PCM	0 (0%)	6 (9.09%)	4(12.5%)
Total patients	22 (18.33%)	66 (55%)	32 (26.66%)

There was insignificant difference between both groups in daily food intake in terms of energy, proteins, carbohydrates and fats (Table 3). All patients were taking less calories and more protein than recommended dietary allowances (RDA for reference sedentary adult male). It was also observed that subjects were taking more total fat than RDA.

According to mid arm muscle circumference (MAMC), observed that ALD patients showed more symptoms of malnutrition in relation to frequency than non-alcoholic liver disease sufferers. But when both the groups were compared in terms of etiology, there was non-significant difference was found between alcoholic and non-alcoholic disease patients (Table 4).

Table 3-Daily food consumption of the ALD patients and non-alcoholics

Nutrient	**ALD patients (Group A)**	**Non-alcoholics (Group B)**	***P* value**
Energy (kcal)	1970.06±678.60	1850.44±548.98	0.17
Protein (gm)	77.36±29.97	76.05±27.98	0.84
Carbohydrate (%)	53.06±12.09	51.68±11.01	0.21
Total fat (%)	35.46±13.98	34.07±7.96	0.1

Values are given as mean ± standard deviation

Energy and proteins are given as kcal and in g/kg of ideal weight/d

Table 4. Classification of the nutritional profile of 60 ALD patients with 60 Non-alcoholics according to mid muscle circumference (MAMC)

Nutritional profile				
MAMC	**Non PCM n (%)**	**Mild PCM n (%)**	**Moderate PCM n (%)**	**Severe PCM n (%)**
ALD Patients (Group A)	16 (26.66%)	14 (23.33%)	18 (30%)	12 (20%)
Non-alcoholics (Group B)	17 (28.33%)	19 (31.66%)	13 (21.66%)	11 (18.33%)
X^2 = 4.02, NS				

DISCUSSIONS

Malnutrition (PCM) is very common feature found in ALD patients, with severe consequences for their nutrition and overall health status (Nompleggi et al., 1994; Levinson et al., 1995; Figueiredo et al., 2005)[21,8,6]. Most of the researchers mainly focused to performed nutritional studies on patients who were hospitalized, but there are few studies on prevalence, consequences and recovery of PCM associated with liver diseases. In this study the occurrence of PCM was evaluated in both ALD and non ALD patients. A previous study also evaluated the occurrence of PCM only in cirrhotic patients which can be seen at a secondary level service OPD (Carvalho et al., 2006)[4].

Alcoholism is the main cause for chronic liver disease found in many other studies including present study and highest no. of cases were males. The mean of all age in present study was 49.8 years comparable with other studies (Mendenhall et al., 1984; Merli et al., 2002; Carvalho et al., 2006)[14,17,4].

There are several methods used for classification of PCM, because it is very difficult to assess the anthropometric and biochemical parameters separately (Abad et al.,1993; Madden et al., 1995; Roongpisuthipong et al., 2001; Tajika et al., 2002)[1,15,25,27]. In this study, the sufferers were diagnosed nutritionally by using the PCM

score proposed by MENDENHALL et al. (Mendenhall et al., 1986)[16]. Similar method of investigation for nutritional assessment was adopted by a previous study (Carvalho et al., 2006)[4].

24-hr dietary recall of patients showed that both the groups were deficient in calories but most of the calories were coming from fats and proteins. Other studies showed a deficient energy protein intake (Yunsheng et al., 2009; Cornu et al., 2000; Bories et al.,1994)[31,5,2]. In a study, patients suffering from severe and moderate PCM did not meet the 70% of the nutrient needs in terms of calorie and protein (Carvalho et al., 2006). A decline nutritional profile in chronic liver disease has been associated with more controlled diets due to severe complications of ALD like ascites, anorexia and loss of weight. The patients also undergo in a hypermetabolic state because of various complications and become more prone of catching risk of infections (Mendenhall et al., 1984,1986)[14,16].

The present study also revealed the association with PCM and liver functioning which is already reported by many researchers (Lautz et al., 1992; Mendenhall et al., 1984; Nomplezzi., 1994)[7,14,21]. While only 18.18% of Child-Pugh A presented moderate and severe PCM, approx. 50% in Child-Pugh B and 44% in Child-Pugh C category. Similar results were reported in a study where there was no correlation found between the Child-Pugh numeric classification scale and protein-energy intake (Carvalho et al., 2006)[4].

There was no significance difference found between two groups in nutritional status, hence ALD and Non-ALD patients as reported by others (Lautz et al., 1992; Lolli et al., 1992; Mendenhall et al., 1984; Nomplezzi., 1994)[7,10,14,21]. Malnutrition in ALD patients is a result of loss of appetite, gastrointestinal tract disorders, poor or no absorption of nutrients and disturbed intestinal function. Many of the previous studies were observed that PCM was more prevalent in alcoholic patients than non-alcoholics. This is a main reason for higher percentage of patients with advanced hepatic dysfunction (Lolli et al., 1992; Roongpisuthipong et al., 2001)[10,25].

In all the anthropometric parameters, only muscle reserves can be assessed by MAMC. It was more affected in alcoholic liver disease patients than non-alcoholics. Similar results were found in previous studies (Madden et al., 1999; McCullough et al., 1989; Mendehall et al., 1984)[11,13,14]. This frequent deterioration in muscle mass in patients having ALD is probably linked directly the effect on skeletal muscle metabolism (Campillo et al., 2003; Plauth et al., 1997; Riordan et al., 1999)[3,22,24].

CONCLUSION

The present study revealed that the lack of nutritional reserves in patients having ALD precedes their hospitalization, further deteriorates the condition. Nutritional assessment and evaluation of these patients must be the part of the routine of OPD checkups regardless of the reasons pertaining to the disease.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Ethical clearance were taken from hospital authorities, concerned doctor. Consent was also taken from individual patients.

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Identification and Characterization of Non-Tuberculous Mycobacteria Isolated from Extrapulmonary Tuberculosis Suspects by Heat Shock Protein 65 by PCR – RFLP

V Praveen Kumar[1], V Sreenivasulu Reddy[2], P Suresh[1], P Vamsi Muni Krishna[1]

[1]Ph.d Scholar, Bharath University, Agaram Road, Selaiyur, Chennai, Tamilnadu,
[2]Professor, Dept. of Microbiology, Sri Lakshminarayana Institite of Medical Sciences, Pondicherry

ABSTRACT

The genus Mycobacteria contains more than 170 officially recognized species. In the last decades, the reports of nontuberculous mycobacteria (NTM) associated with extrapulmonary diseases are increasing. The aim of this study is to know the prevalence of NTM among extrapulmonary tuberculosis cases in a tertiary care hospital in south India. This study was conducted from Mar 2017 to December 2017. Diagnosis was performed by Ziehl-Neelsen staining followed by culture in BacT/ALERT and Lowenstein Jensen culture medium. We applied conventional biochemical test like growth on the LJ medium containing PNBA (para nitro benzoic acid) to differentiate *M.tuberculosis* and NTM and PCR- restriction fragment length polymorphism analysis (PRA) of the *hsp65* gene for species identification. We identified 96 non-tuberculous infection cases from 1138 (AFB) – Positive tuberculosis suspects. The diversity of NTM species were *Mycobacterium abscessus* 17(45.9%) followed by *Mycobacterium fortuitum* 10(27%), *Mycobacterium chelonae* 8(21.6%) and *Mycobacterium simiae* 2(5.4%). Regular documentation and reporting of these NTMs from clinical settings along with their sensitivity profile is essential to be aware of the clinical spectrum of disease associated and preferred treatment options.

Keywords: *Heat shock protein 65; Non-tuberculosis mycobacteria; PCR – RFLP; Rapidly growing mycobacteria.*

INTRODUCTION

The nontuberculous mycobacteria (NTM) are a group of *Mycobacterium* species other than the obligate pathogens *Mycobacterium tuberculosis* complex and *Mycobacterium leprae*.[1,2] The American Thoracic Society in their statement endorsed the name Non tuberculous mycobacteria (NTM). NTM are ubiquitous in nature and widely distributed in water, soil and dust they were considered saprophytic organisms for many years but now are recognized as human pathogens. Although humans are routinely exposed to NTM, the rate of clinical infection is low, but infections due to NTM are reported to have increased in the past few years. [3,4,5]

Non ruberculous mycobacteria (NTM) were reported as important agents of infection in immunosuppressive patients. However, there has been an increasing incidence in recent years of infections in immunocompetent hosts. NTM infections in immunocompetent individuals are secondary to direct inoculation either contamination from surgical procedures or penetrating injuries rather than hematogenous dissemination.[4,6] Despite a considerable increase in knowledge about NTM infections, they still represent a diagnostic and therapeutic challenge for several reasons: 1) pathogenic isolates may be indistinguishable from contaminant or saprophytic isolates; 2) timely and reliable identification of isolates may depend on proper communication between clinicians and laboratory staff; 3) lack of standardized susceptibility testing makes adoption of tailored therapies unrealistic;

Corresponding author:
V Praveen Kumar
Ph.D Scholar, Sri Lakshminarayana Institute of Medical Sciences (Affiliated to Bharath University)
Pondicherry – 605502, Mobile: 91 8142037662, 91 7674038096, Email: vpraveenkumar4@gmail.com

and 4) lack of treatment guidelines exposes patients to toxic drugs and disappointing outcomes.[7]

NTM pulmonary disease is the most common, comprising more than 90% of all NTM infections. The cases of extrapulmonary like in the CNS, genitourinary tract and abdomen, the bacterial load is much less as compared to the pulmonary tuberculosis (PTB).[7,8] Many molecular methods like multiplex PCR, DNA probes and /or DNA sequencing, High performance liquid chromatography, Restriction Fragment Length Polymorphism (RFLP) using various target regions including heat shock protein 5 KD gene (hsp 65), ITS and rpoB, have made the characterization of NTM species less ambiguous, more precise, rapid, cost-effective and can be used directly on clinical samples. Hsp 65 gene is used widely for identification of NTM to species level because of its variability compared to some other conserved genes.[6]

The therapy of the disease caused by NTM is often long, strenuous and not always successful. Thus it is important to differentiate infections due to M.tb and NTM at the early stage of the disease.[9] The objective of the present study was to differentiate the mycobacterium species isolated from extrapulmonary clinical samples suspected of having tuberculosis.

MATERIAL AND METHOD

This study includes the isolation of specimens NTM from suspected extrapulmonary tuberculosis from March 2017 to December 2017. The aim of this study is to know the prevalence of NTN among extrapulmonary tuberculosis cases in tertiary care hospital in south India.

Sample collection: Since NTM are ubiquitous in nature and a possible laboratory contaminant, the isolation of these organisms from specimens should meet certain criteria to confirm their etiological significance such as, a). Repeated isolation of the same organism from the patient b). Associated positive clinical and radiological evidence and c). Histopathological condition.[3] The specimens included are blood, CSF, Pus, wound swabs, lymphnode aspirate, tissue and corneal scrapings from suspected cases of EPTB. Patients from all ages were included in the study. Ethical clearance was obtained from Institutional Ethical Committee of Sri Lakshminarayana Institute of Medical Sciences, Pondicherry.

Smear examination, Culture and differentiation of M.tuberculosis and NTM: The specimens were processed on the same day for microscopy and the specimens from unsterile sites such as sputum, urine and gastric juice were decontaminated and concentrated by N-acetyl-L-cystine-NaoH concentration method (LYFECTOL, Tulip Diagnostics). Sterile body fluids such as blood, CSF and pleural fluid were processed without decontamination. The samples were simultaneously inoculated on LJ medium, for each isolate two tubes of Lowenstein-Jensen medium (Hi Media) were used, one containing plain media and the other LJ medium containing Para nitro benzoic acid and incubated at 37°C temperature under aerobic conditions. AFB cultures were also performed simultaneously in BACT/ALERT culture media as well.

In case of keratitis with NTM the type of specimen is corneal scrapings. The corneal scrapings were smeared on glass slides for Gram's stain and 10% KOH mount. Specimens were inoculated directly on blood agar, chocolate agar, brain heart infusion broth, thioglycollate broth and sabouraud dextrose agar are used for culture. Acid fast stain was done as a routine and was included only if the clinical picture was suggestive of NTM.

DNA extraction: Extraction of DNA was done by using NucleoSpin® Microbial DNA from MACHEREY-NAGEL GmbH & Co. KG. 0.5ml of culture from BACT/ALERT culture media was taken using sterile disposable syringe cultures were centrifuged at 10,000 rpm to form a pellet. Add 100 µl Elution Buffer BE to the pellet and resuspend the cells. Transfer the cell suspension into the NucleoSpin® Bead Tube Type B (provided). Add 40 µl Buffer MG. Then, add 10 µl Liquid Proteinase K and close the tube. Agitate the NucleoSpin® Bead Tube on a swing mill or vortexer device. Centrifuge the NucleoSpin® Bead Tube 30 seconds at 11,000 xg to clean the lid. Add 600 µl Buffer MG and vortex for 3 seconds, Centrifuge for 30 sec at 11,000 xg. Transfer the supernatant (~500–600 µl) into the NucleoSpin® Microbial DNA Column, placed in a 2 ml Collection Tube (provided). Centrifuge for 30 s at 11,000 xg. Discard collection tube with flow-through. Put column into a fresh collection Tube (2 ml, provided). First wash: Add 500 µl Buffer BW. Centrifuge for 30 s at 11,000 xg. Discard flow-through and place the column back into the Collection Tube. Second wash: Add 500 µl Buffer B5 to the column and centrifuge for 30 s at 11,000 xg. Discard flow-through and place the column back into the

Collection Tube. Centrifuge the column for 30 s at 11,000 x g. Elute highly pure DNA - Place the NucleoSpin® Microbial DNA Column into a 1.5 ml nuclease-free tube and add 100 µl Buffer BE onto the column. Incubate at room temperature for 1 min. Centrifuge 30 sec at 11,000 xg.

Hsp65-PRA – based identification assay: An approximately 439-bp region of *hsp65* gene was amplified by PCR using two specific primers. The primers of *hsp65* (TB 11/12) insertion gene were TB11(5'-ACCAACGATGGTGTGTCCAT-3') TB12 (5'-CTTGTCGAACCACATACCCT-3'). The PCR was performed with PCR reaction setup, consisting of 1µl of DNA, forward and reverse primers 0.25µl each, master mix 5µl and 3.5µl distilled water. The first PCR was performed by denaturing the samples 3min at 94°C, then 40 cycles including 94°C for 1min, 56°C for 1min, 72°C for 1 min and final extension at 72°C for 10 min. Amplification of 439-bp product of the *hsp65* gene was detected by 2% agarose gel electrophoresis.

Restriction fragment length polymorphism (RFLP): After PCR 65kDa hsp 65 gene amplifier was aliquoted in to two tubes both clinical and quality control strains were digested with the enzymes *BstEII* and *HaeIII* for 3 hours at 37°C. The digested products were visualized on 3% agarose gel electrophoresis and the RFLP patterns were analyzed according to fragment sizes.[10,11,12]

RESULTS

Out of 1138 positive cultures for AFB, 96 (8.4%) were considered as Non tuberculous mycobacteria. Of the 96 Non tuberculous mycobacteria, 59(61.4%) were from pulmonary sites and 37 (38.5%) were from extrapulmonary sites. The predominant age group in our study was 51 - 60 years 14 (37.8%) followed by 41 - 50yrs 9 (24.3%), 61 – 70 yrs 5(13.5%), 31 – 40yrs 4 (10.8%), <20yrs 3 (8.1%) , 21-30 yrs 1(2.7%) and 71 -80 1 (2.7%). Demographic characters of patients were mentioned in the *Table:1.* Of these 94.5% (35/37) were rapidly growing mycobacteria (RGM) and 5.4% (2/37) were slow growing mycobacteria (SGM). The distribution of NTM species is summarised in the *table:2.* The most predominant NTM species among RGM was *Mycobacterium abscessus* 17 (45.9%) followed by *Mycobacterium fortuitum* 10(27%), *Mycobacterium chelonae* 8 (21.6%) and *Mycobacterium simiae* 2 (5.4%).

Table 1: Demographic characteristics of the 37 extrapulmonary non tuberculosis cases.

Characteristic	Patient %
Sex	
Male : 26	(70.2%)
Female: 11	(29.7%)
Age	
<20	3 (8.1 %)
21 – 30	1 (2.7%)
31 – 40	4 (10.8%)
41 – 50	9 (24.3%)
51 – 60	14 (37.8%)
61 – 70	5 (13.5%)
71 – 80	1 (2.7%)
Previous TB treatment	4 (10.8%)
HIV infection	1 (2.7%)
Type II Diabetes mellitus	3(8.1%)
Characteristics of tuberculosis patients (n=37)	

Table - 2: Distribution of NTM species from pulmonary clinical isolates.

NTM species	Pleural fluid	Pus from other sites	Urine	Tissue	Blood	Wound swab	CSF	corneal scrapping
M.abscessus	6	5	2	2	1	1	-	-
M.fortuitum	1	3	-	3	-	2	1	-
M.chelonae	3	2	-	2	-	-	-	1
M.simiae	2	-	-	-	-	-	-	-
Total	**13(32.4%)**	**10(27%)**	**2(5.4%)**	**7(18.9%)**	**1(2.7%)**	**3(8.1%)**	**1(2.7)**	**1(2.7)**

DISCUSSION

Non tuberculous mycobacteria have gained a lot of clinical significance in the last couple of decades in immunocompromised and immunocompetent individuals or patients. Mycobacteria detection to species level is necessary and provides useful information on epidemiology and facilitates successful treatment of patients. Improvement in isolation and identification techniques has led to an increased awareness of the importance of NTM as human pathogens.[13,14]

NTM were characterized phenotypically like growth rate, pigment production, growth on LJ medium containing Para nitro benzoic acid (PNBA), macroscopic and microscopic morphological characters has been applied.

Many studies applied 16S-23S rRNA internal transcribed spacer (10) and *hsp 65* genomic loci for molecular characterization of NTM.[6,13] In our study, we used *hsp 65* gene for identification of mycobacterial species. The polymerase chain reaction and restriction enzyme analysis were carried out by following the techniques described by wong *et al.*[15]

Many studies from India have reported a variation in the incidence of Non tuberculous mycobacteria infections. A study by Chakrabarthi *et al* from Chandigarh reported 7.4% incidence of NTM from various clinical specimens, similarly Das B.K. *et al* reported 8.3% of NTM incidence in their study and *Mycobacterium fortuitum* was the predominant isolate in their studies.[16,17] Our study was conducted in a tertiary care hospital in South India and we found the similar findings, we reported 8.4% incidence of NTM.

In our study we detected four (n=4) different mycobacterial species. According to present study results, NTM infections in our patients include *Mycobacterium abscessus, Mycobacterium fortuitum, Mycobacterium chelonae* and *Mycobacterium simiae.*

In the present study the rapidly growing mycobacteria (RGM) 94.5%, were predominantly isolated from extrapulmonary samples. The most common type of NTM was *M. abscessus* (45.9%). Similar findings were seen with Jyoti Umarao *et al* from Lucknow and Prabha Desikan from Bhopal reported *M.abscessus* as the most predominantly reported species.[18,19]

In our study *M.fortuitum* (27%) and *M.chelonae* (21.6%) were the second and third most prevalent NTM species isolated, in contrast a study by A.K.Maurya *et al* from Lucknow reported *M.fortuitum* as the most common species accounted for 25.7% among NTM species isolated from pulmonary and extra pulmonary specimens.[20] M.V.Jesudasan *et al* reported *M.fortuitum* and *M.chelonae* were the predominant isolates from pus and biopsy specimens of skin and soft tissue infections.[3]

CONCLUSION

Infections with NTM are difficult to diagnose because of lack of appropriate protocol in routine diagnostics. A high degree of suspicion and adequate knowledge of diagnostic procedures are required to eradicate infections with NTM. rapid identification and differentiation to species level by molecular assay may help in targeted therapy and management of infections caused by different mycobacterial species Regular documentation and reporting of these NTMs from clinical settings along with their sensitivity profile is essential to be aware of the clinical spectrum of disease associated and preferred treatment options.

Conflicts of Interest: No conflicts

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The Influence of Health Education to Change Domain Competencies Interprofessional Collaboration on Handling of Malnutrition Case

Risnah[1], Veni Hadju[2], Ridwan Amiruddin[3], Sukri Palluturi[4], Citrakesumasari[5], Untung Sujianto[6]

[1]Lecturer Nursing Fak.Kedokeran Science and Health Science UIN Alauddin, [2]Professor of nutrition Community Health Fak. Unhas University of Makassar, [3]Professor Epidemiology Community Health Fak.Unhas University of Makassar, [4]Professor Health Policy Administration Health Fak.Unhas University of Makassar, [5]Lecturer at the science of nutrition Fak.Community Health University of Hasanuddin Makassar, [6]Lecturer of Science Nursing Fak. University Medical Dipenogoro Semarang

ABSTRACT

Health problems that are very complex requires handling together involving of all health professionals and good collaboration efforts. Malnourished Children become one of health problems and it is important to prepare for the generation of high quality. Health education is expected to increase the knowledge of health workers about collaboration across the profession. competency that will affect the performance of health workers to improve the quality of health services in general. This research aims to assess the difference between the competencies collaboration across health professions in handling the cases of malnutrition in children before the training and three months after the training on the clinic. Using the research design "*Quasi experiment*" with research design using "*pretest and posttest with a control group design*". There are 40 the respondents divided into 20 respondent treatment groups and 20 people in the control group. Sampling techniques *Stratified random sampling.* The results of the study showed that the average knowledge of treatment group pre-intervention and post intervention to have the value of the p domain of 0.330 purpose. The value of the p domain the role of 0.811, value p domain communication 0.000 (<0.05), the value of the p domain 0.000 process (<0.05), the value of the p domain 0.343 cooperation, the value of the p domain 0.031 leadership (<0.05) and the value of the p domain structure of 1000. Recommended researchers next to design health education which is able to improve competency on a different domain.

Keywords*: Interprofessional Collaboration, competencies, malnutrition, health workers*

INTRODUCTION

Collaboration is a mutually beneficial relationship and defined with good agreed by two or more organizations to achieve a common goal[1]. This is the term which is generally used in research and clinical practice and health professional education,. until the collaboration occurred in almost every aspect of health[2]. The problems on the health of very complex requires settlement together with involving all health profession[3].

The Benefits of interprofessional collaboration allows the participants to achieve a more together than they obtain individually, serve groups of people who are larger and grow at the individual level to the organizational level[2]. Working together become very important for the individual to reach interprofessional perspective and the benefits of the work in the working team and the client[4]. Interprofessional collaboration have positive effects on the patient satisfaction, reduce uncertainty and improve the management of the hospital[5]. Interprofessional collaborative practice is very important for the improvement of the results of the Ministry of Health in patients / clients and family[6].

The Consequences of team work which are not effective, patients suffer through excessive procedures, miscommunication and lack of coordination in the ministry[7]. Cause patient complaint repeatedly complain that the service provider does not coordinate

maintenance, so that provide the same information to different health team members[8]. Now many health systems in the countries in the world that implements the fragmented health services which in the end is not able to solve the health problems in the country itself[9].

The problem of malnutrition is a result of various factors that complicated and complex, various researches in various countries that done by many institutions, has been producing various models of determinant of nutritional problems, this is related to the difference of socio-culture of the society in each area. One of the problems caused by poor nutritional status is a condition that is not a maximum of the growth and development of a child. To resolve the problem of malnutrition cross-sectoral action required[10].

Globally, 45 % the death of children under the age of 5 years caused by various conditions of malnutrition[11]. The growth of maximum not suffered by around 8 million Indonesian children, or one of the three sons of Indonesia[12]. In the year 2007 until 2011, the proportion of poor people in Indonesia a decline of 16.6 - 12.5 %, but nutritional problems do not show declines significantly[10].

Jeneponto Regency reported to have enough nutrition problem cartilage that one result is the death on the high enough. Have the status of malnutrition and malnourished categories are problems of tumbling 26.4 percent while malnutrition cases as much as 7 people (0.04%)[13] Infant mortality (AKB) year 2014 as much as 10 per 1000 live births and 2015 as much as 12 per 1000 live births[13].

MATERIAL AND METHIOD

The design of this research is the "*Quasi Experiment*" with research design using "pre-test and posttest with a Control *Group Design»*. Treatment groups following the training activities and collaboration given the module, while the control group was given only the module. Sampling techniques using stratified random sampling.

RESULTS

Table 1. Analysis of the characteristics of respondent health officials

	The treatment		**Controls**		
The characteristic	**The frequency**	**The percentage of**	**The frequency**	**The percentage of**	**The value of the p**
	N = 20	%	N = 20	%	
Age					
20 - 30 years	10	50	14	70	0,819
31 - 40 years	8	40	2	10	
41 - 50 years	1	5	4	20	
51 - 60 years	1	5	0	0	
Gender					1,000
Male	3	15	3	15	
Women	17	85	17	85	
Education					
S1	10	50	10	50	1,000
A Diploma	10	50	10	50	
Working Time					
1 - 5 years	8	40	11	55	0,978
6 - 10 years 11 - 15 years	4 6	20 30	4 2	20 10	
16 - 20 years	2	10	2	10	

Cont... **Table 1. Analysis of the characteristics of respondent health officials**

21 - 25 years	0	0	1	5	
The Profession					
The doctor	2	10	0	0	
Nurses	6	30	7	35	
Midwives	6	30	5	25	0,978
Nutrisionis	4	20	4	20	
Sanitarian	1	5	4	20	
The officer Promke	1	5	0	0	

In table 1 have the entire value of $p > 0.05$ on the characteristics of participants treatment groups and intervention groups which means that there is no initial differences in the characteristics of respondents in both groups.

Table 2. The differences average domain competencies professional traffic collaboration between groups Pre and Post Intervention gift

Domain	Pre-Post		**The value of the *p* The group**	**Δ**	**The value of the *p***
				Domain	
The purpose of					
The treatment	4.00	5.00	0.020	1	0.330
Controls	4.45	5.45	0.020	0.95	
The role					
The treatment	2.60	2.70	0.752	0.1	0.811
Controls	2.65	2.80	0.529	0.15	
Communication					
The treatment	2.60	6.95	0.000	4.35	**0.000**
Controls	4.65	6.60	0.286	1.95	
The Process					
The treatment	6.90	8.10	0.000	1.20	**0.000**
Controls	8.35	7.60,	0.279	-0.75	
The Cooperation					
The treatment	4.40	6.00	0.042	1.60	0.343
Controls	5.00	6.15	0.677	1.15	
The Leadership					
The treatment	5.40	6.45	0.000	1.05	**0.031**
Controls	7.65	7.55	0.033	-0.10	
The structure of the					
The treatment	3.60	3.30	0.281	-0.30	1000
Controls	4.00	3.70	0.108	-0.30	

Table 2. On the treatment group has a value p=0.330. Domain has a value p=0,811 role. Communication Domain has a value p=0.000. The domain of the process of no value p=0.000. Domain can complete the value p 0.343 Cooperation, domain has a value p=0.031 leadership and domain structure have a value p=1000.

DISCUSSION

In the results of the study showed that the average knowledge of treatment group pre-intervention and post-intervention to have the value of the p=0.330. The value of the p domain the role of 0.811, value p domain communication 0.000 (<0.05), the value of the p domain 0.000 process (<0.05), the value of the p domain 0.343 cooperation, the value of the p domain 0.031 leadership (<0.05) and the value of the p domain structure of 1000.

Quality children born from a healthy pregnant mother so since in the womb many efforts have been made to produce the son as a generation with high quality[14]. Government support for the pregnant mother has also presents various government program one of the warranty program delivery[15]. Although there are still areas in Indonesia that implement a program of the health of mothers and children is not running as expected[16].

Nutrition problems occur in each cycle of human life, started since in the womb (fetus), the baby, children, mature and elderly. Nutritional problems in the fact of the matter is that the public health problem and the factors causing the disruption of nutrition is a multi-factor regarding, for that approach and managements must involve various sectors related[17]. Many factors that affect the nutritional status of one of them is the pattern of breastfeeding and MP of breast milk[18]. In fact, the exclusive breastfeeding in Jeneponto Regency in 2013 of 67, 7%, yet to reach national targets namely 80%[19].

The competencies literally come from the word *competence,* which means the ability, authority and skill. In terms of the etymology, competency means merits, expertise from the behavior of a person or leader employees which have a knowledge and skills that good behavior. The characteristics of the competencies which is something that becomes part of the personal character and become part of prioritizing the person in carrying out a job task[20] so it can be deduced that the competency is defined as the ability of a person who can be observed includes the knowledge, skills and work attitude in completing a job or task in accordance with the specified performance standards[21].

The framework is divided into 6 domains that contribute to the purpose of interprofessional collaboration. Sixth the domain is; 1) clarification roles, 2) centered on the patient/client, 3) Working Team, 4) Collaboration leadership, 5) interprofessional communication and 6) related to interprofessional conflict. Treatment is centered on the patient and interprofessional communication is the elements that affect the 4 other domains[6].

It is said that the Collaboration interdisciplinary curriculum and team work requires components for collaborative communication that occurred between members of the team in setting the acceptance of the house maintenance. The interaction of the team requires trust, confidence, and equal efforts by all of the team members. Effective communication can be achieved through communication collaboration between members of the team in interdisciplinary curriculum or professional traffic. So concluded that collaboration in the house maintenance and palliative care settings influenced by effective communication[22].

Although it is understood that the communication occurs when collaborate in collaboration across the profession but the thing that must be noted when collaborate is the existence of mutual respect and mutual trust. As with any other profession the attitude to consult when there is something that is not understood is an important element for noted in practice collaboration across the profession. The term used to describe the ordinary Interprofessional clinical practice involving the patient and the problem of the patient will be handled independently or separately in accordance with the competence of each of the profession as the responsibility of the area handled by the appropriate kind[23]. In communication occurs giving the right information can affect the client satisfaction[24].

Understood together that to improve the quality of health services, needed a system that is coordinated and a collaborative effort between stakeholders. Good coordination to improve the quality of health services in patients, create a more efficient quality and optimum care. This requires coordination and collaboration between health service line in this health officials. The interactive communication is the elements of the founder

of the collaboration between the professional. The price of good self-able to improve relations between the actors in the health system and supports the initiative and the ability to adapt[25].

This is in line with the opinion of[26] which concluded that health care involves the participation of patients, family and various health professional team that is often and very special. The involvement of all members of the team in a cooperation with the way that being coordinated is very important to provide exceptional health services. Structural factors, psychological and education can also determine collaborative behavior in collaboration process across the profession.

CONCLUSION

The conclusion from this article shows that there are differences in the domain of collaboration across health professional competencies in handling the cases of malnutrition in children before the training and three months after the training on the clinic in Jeneponto Regency. It is recommended to do the training activities ongoing and program to be accomplished with good to improve competency collaboration across the profession of health.

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Molecular Identification of Rapidly Growing Mycobacteria Isolated from Pulmonary Specimens at a Tertiary Care Hospital in Pondicherry

V Praveen Kumar[1], V Sreenivasulu Reddy[2], P Vamsi Muni Krishna[1], P Suresh[1]

[1]Ph.D Scholar, Bharath University, Selaiyur, Chennai, [2]Professor, Sri Lakshminarayana Institute of Medical Sciences, Osudu, Pondicherry

ABSTRACT

Background: The prevalence of Rapidly Growing *Mycobacteria* (RGM) infections has been increasing worldwide. RGM have emerged as important human pathogens that cause a variety of diseases ranging from localized cutaneous infections to disseminated infections. Clinical diagnosis is difficult because there are no characteristic clinical features. **Materials and Method:** This study was conducted from Aug 2014 to Mar 2017, aimed to identify species of Rapidly Growing *Mycobacteria* from specimens suspected with pulmonary tuberculosis. We applied conventional biochemical test like growth on the LJ medium containing PNBA (para nitro benzoic acid) to differentiate *M.tuberculosis* and NTM and PCR- restriction fragment length polymorphism analysis (PRA) of the *hsp65* gene for species identification. A 439 bp fragment of *hsp65* gene was amplified and digested by two restriction enzymes, *BstEII* and *HaeIII*. Digested products were analyzed using polyacrilamide gel electrophoresis. **Results:** Thirty seven rapidly growing *mycobacteria* were isolated and identified by growth characters and conventional biochemical tests. PCR-RFLP of hsp65 gene of 37 isolates revealed *M.abscessus* 27 (72.9%), *M.chelonae* 7(18.9%) and *M.fortuitum* 3 (8.1%). **Conclusion:** This study proved that PCR-RFLP of *hsp65 gene* in *Mycobacteria* is more sensitive, specific and effective method for identification of NTM at the species level than conventional phenotypic methods.

Keywords: *Non-tuberculosis mycobacteria, Rapidly growing mycobacteria, Heat shock protein 65, PCR-RFLP.*

INTRODUCTION

Rapidly growing *mycobacteria* (RGM) are ubiquitous environmental acid-fast bacilli that are important human and animal pathogens and are characterised by their growth in culture medium within 7 days of post-inoculum.[1] Nearly one hundred rapidly growing *mycobacteria* (RGM) have been identified, they cause infections in both immunocompetent and immunocompromised individuals, most commonly manifesting as pulmonary or skin and soft tissue infection, and less frequently as a cause of bacteremia, osteomyelitis, endocarditis, peritonitis, lymphadenitis, post-surgical infections, or catheter-related infection.[2,3,4]

The increasing number of infections caused by these organisms has made it clinically important to quickly identify mycobacterial species.[5] The American Thoracic Society and the Infectious Disease Society of America recommend that RGM should be identified to the species level is important to direct the antimicrobial treatment.[6] The species of RGM have different virulence levels in diverse clinical settings and also have different drug susceptibility patterns.[7] The gene for 65kDa heat shock protein exhibits greater interspecies and intraspecies polymorphism than the 16S rRNA. Restriction fragment length polymorphism (RFLP) analysis of DNA amplimers generated by PCR for the identification of *mycobacteria* provides a rapid means for detecting these species-specific polymorphisms.[8]

MATERIALS AND METHOD

This study included the isolation of RGM from all suspected cases of pulmonary tuberculosis received from Aug 2014 to Mar 2017 in the department of Microbiology, Sree Lakshminarayana Institute of Medical Sciences, Pondicherry. Ethical clearance was

taken from Institutional ethical committee.

Sample collection: Since NTM are ubiquitous in nature and a possible laboratory contaminant, the isolation of these organisms from specimens should meet certain criteria to confirm their etiological significance such as, a. Repeated isolation of the same organism from the patient b. Associated positive clinical and radiological evidence and c. Histopathological condition.[6] Three early morning sputum specimens, broncho alveolar lavage, pleural fluid and bronchial wash specimens were received from patients with clinical and radiological findings suggestive of tuberculosis. All the specimens were collected under aseptic conditions in sterile leak proof containers and transported to the laboratory.

Microscopy & AFB culture: The specimens were processed on the same day for microscopy and culture using standard procedures.[9]The specimens were digested and decontaminated using the NALC (N-acetyl L-cysteine) NAOH method. ZN staining was done directly as well as after concentration. AFB cultures was performed by the conventional LJ method and BACT/ ALERT culture media as well.

***Biochemical tests*:** Differentiation of *M.tuberculosis* and NTM was done on the basis of susceptibility of the isolate to PNBA (para nitro benzoic acid). The PNBA test was performed by inoculating the specimen in to two LJ medium tubes with and without PNBA (Himedia). If the test strain was sensitive to PNBA indicated by no growth, it was identified as *Mycobacterium tuberculosis complex*. Growth of the test strain within the tube is indicated by the presence of NTM. H37RV strain was used as control strain.

DNA extraction: Extraction of DNA was done by using NucleoSpin® Microbial DNA from MACHEREY-NAGEL GmbH & Co. KG. 0.5mL of culture was taken using sterile disposable syringes cultures were centrifuged at 10,000 rpm to a pellet. Add 100 µl Elution Buffer BE to the pellet and resuspend the cells. Transfer the cell suspension into the NucleoSpin® Bead Tube Type B (provided). Add 40 µl Buffer MG. Then, add 10 µl Liquid Proteinase K and close the tube. Agitate the NucleoSpin® Bead Tube on a swing mill or vortexer device. Centrifuge the NucleoSpin® Bead Tube 30 seconds at 11,000 xg to clean the lid. Add 600 µl Buffer MG and vortex for 3 seconds, Centrifuge for 30 sec at 11,000 x g. Transfer the supernatant (~500–600 µl) into the NucleoSpin® Microbial DNA Column, placed in a 2 ml Collection Tube (provided). Centrifuge for 30 s at 11,000 xg. Discard collection tube with flow-through. Put column into a fresh collection Tube (2 ml, provided). First wash: Add 500 µl Buffer BW. Centrifuge for 30 s at 11,000 xg. Discard flow-through and place the column back into the Collection Tube. Second wash: Add 500 µl Buffer B5 to the column and centrifuge for 30 s at 11,000 xg. Discard flow-through and place the column back into the Collection Tube. Centrifuge the column for 30 s at 11,000 x g. Elute highly pure DNA - Place the NucleoSpin® Microbial DNA Column into a 1.5 ml nuclease-free tube and add 100 µl Buffer BE onto the column. Incubate at room temperature for 1 min. Centrifuge 30 sec at 11,000 xg.

Hsp65-PRA – based identification assay: An approximately 439-bp region of hsp65 gene was amplified by PCR using two specific primers. (fig:1) The primers of hsp65 (TB 11/12) insertion gene were TB11(5'-ACCAACGATGGTGTGTCCAT-3') TB12 (5'-CTTGTCGAACCACATACCCT-3'). The PCR was performed with PCR reaction setup, consisting of 1µl of DNA, forward and reverse primers 0.25µl each, master mix 5µl and 3.5µl distilled water. The first PCR was performed by denaturing the samples 3min at 94°C, then 40 cycles including 94°C for 1min, 56°C for 1min, 72°C for 1 min and final extension at 72°C for 10 min. Amplification of 439-bp product of the *hsp65* gene was detected by 2% agarose gel electrophoresis.

Restriction fragment length polymorphism (RFLP): After PCR 65kDa hsp 65 gene amplifier was aliquoted in to two tubes both clinical and quality control strains were digested with the enzymes *BstEII* and *HaeIII*. for 3 hours at 37°C. The digested products were visualized on 3% agarose gel electrophoresis and the RFLP patterns were analyzed according to fragment sizes.[10-13]

RESULTS

Patient characteristics of the 37 suspected tuberculosis cases were shown in the table 1: of The 37 stains isolated 26 (70.2%) were from males and 11(29.7%) from females. RFLP patterns of the *hsp65* gene from the isolates and are shown in Fig.1. *BstEII* and *HaeIII* digestion of the isolate resulted in fragments of different base pairs. The combined digestion pattern analysis for *BstEII* and *HaeIII*. was identical to that of *M.*

abscessus, M. chelonae and *M. fortuitum. M. abscessus* 27 (72.9% accounted for majority of isolates followed *M.chelonae* 7(18.9%) and *M.fortuitum* 3(8.1%), shown in the table 2.

Table 1: Patient characteristics of the 37 suspected tuberculosis cases

Characteristic	Patient %
Sex	
Male : 26	26 (70.2%)
Female: 11	11 (29.7%)
Age	
<20	3 (8.1%)
21 – 30	-
31 – 40	4 (10.8%)
41 – 50	7 (18.9%)
51 – 60	13 (35.1%)
61 – 70	8 (21.6%)
71 – 80	2 (5.4%)
Previous TB treatment	7 (18.9%)
HIV infection	-
Other respiratory symptoms	16 (43.2%)
Characteristics for suspected tuberculosis patients (n=37)	

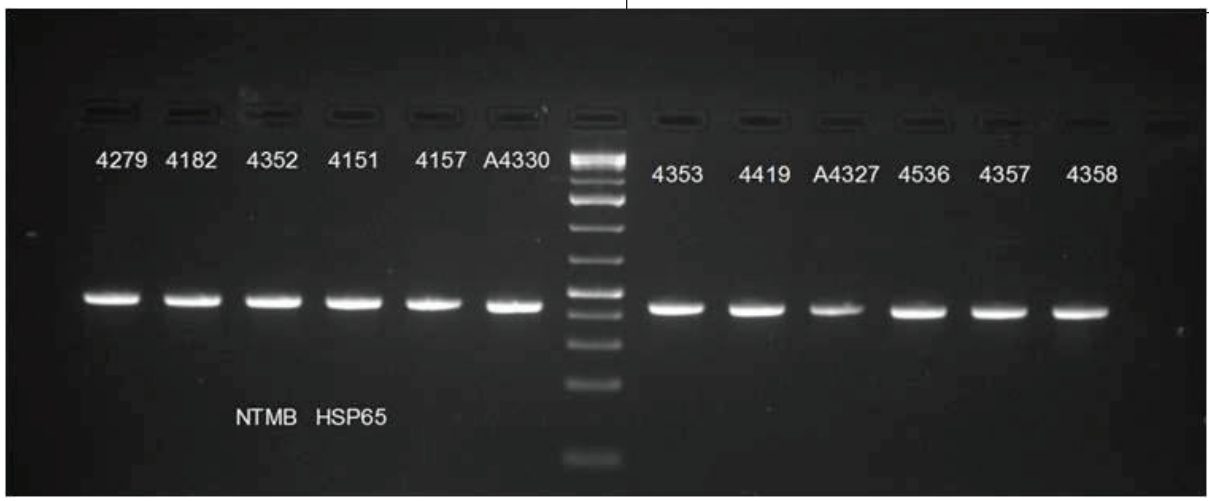

Fig-1: PCR product run in 2% Agarose Gel Electrophoresis (PCR product size is 439bps).

Table - 2: Distribution of NTM from different clinical specimens.

Specimens	*M.abscessus*	*M.chelonae*	*M.fortuitum*
Sputum	9	2	1
Bronchial washings	14	4	2
Bronchoalveolar lavage	3	1	-
Pleural fluid	1	-	-
Total	**27(72.9%)**	**7(18.9%)**	**3(8.1%)**

DISCUSSION

Prevalence of NTM is unknown in India as NTM disease is not a reportable condition and there is lack of awareness among clinicians coupled with lack of laboratory capacity to diagnose these infections. Identification of NTM is of clinical relevance as most of the NTM is notably resistant or only partially susceptible to the standard anti-tubercular drugs and the treatment strategies and the duration of these infections differ from MTB. The most common genomic loci applied in molecular detection of NTM are the 16S-23rRNA internal transcribed spacer, hsp65, 16S rRNA and rpoB gene.[14] In this study we used hsp65 gene for the detection of mycobacterial species. The polymerase chain reaction and restriction enzyme analysis (PRA-hsp65) were carried out using the techniques described by wong et al.[15]

In our study, three (n=3) different mycobacterial species other than Mtb were identified. According to the present study's results infections in our patients including

Mycobacterium abscessus, Mycobacterium chelonae and *Mycobacterium fortuitum* using the two restriction enzymes, *BstEII* and *HaeIII*. were determined.

In the present study the most common type of NTM was *Mycobacterium abscessus*. These results were consistent and inconsistent with a number of studies in India. A study from Bhopal by Prabha Desikan et al reported *M.abscessus* as the most frequently reported species.[16] Paramasivan et al from Chennai, South India has reported NTM from sputum specimens of patients in BCG trial area, *M.avium/intracellularae* was the was the most frequently isolated in their study.[17]

In the present study, *M.chelonae* (18.9%) was the second most prevalent and *M.fortuitum* was the third most prevalent NTM isolated in pulmonary samples. MV Jesudasan from Vellore reported M.chelonae (8.1%) as the most prevalent isolate followed by *M.fortuitum,* both accounted for 67% of NTM isolated from respiratory specimens where as in our study accounted.[6]

CONCLUSION

The identification of rapidly growing mycobacteria (RGM) remains problematic because of evolving taxonomy, limitations of current phenotypic methods and absence of a universal gene target for reliable speciation. This study evaluated a novel method of identification of RGM by amplification of the mycobacterial *hsp65* gene followed by RFLP. Regular documentation and reporting of these NTMs from clinical settings along with their sensitivity profile is essential to be aware of the clinical spectrum of disease associated and preferred treatment options.

Conflicts of Interest: No conflicts

Source of Funding: Self

Ethical Clearance: Institutional ethical clearance obtained

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Potential of Lactobacillus Strains with Antimicrobial Activity against Acinetobacter baummanii

Suresh P[1], V Sreenivasulu Reddy[2], V Praveen kumar[1], P Vamsimuni krishna[1]

[1]Ph.D Scholars at Bharath University Thambram, [2]Professor, Department of Microbiology, Srilaxmi Narayana Institute of Medical Sciences (SLIMS) Osudu,Puducherry, India

ABSTRACT

Bacterial infection constitutes a major public health problem worldwide and excessive use of antimicrobials in health care settings leads to microbial resistance. Increasing antibiotic resistance of pathogens associated with Bacterial infections has also become a major therapeutic challenge for physicians. Thus development of alternative treatment protocols, such as the use of probiotics may help in countering alarming situation of drug resistant and multidrug resistant bacteria. Lactobacillus species bacteria which are one good prototype of probitic are considered useful in minimizing antimicrobial use. The aim of this research was to determine the antagonistic properties of Lactobacillus acidophilus and Lactobacillus casei isolated from the manually prepared buffalo milk curd against Acinetobacter baumannii causing wound infections in humans. Three hundred samples of wound infections were collected and processed for bacterial isolation and antimicrobial susceptibility testing following standard bacteriologic techniques & Vitec –II Campact system. The antibiotic susceptibility test was performed by the disk diffusion method, and antagonistic effect of Lactobacillus strains was investigated by well diffusion method. Total 500 pus samples were collected from patients with wound infection at Tertiary care hospital in Pondicherry, India and processed as CLSI guidelines and with help of Vitec-II campac system, 268 isolates were identified as *Acinetobacter baumannii*. Of these 268 isolates, a total of 109 strains of A. baumannii showed high resistance to tested antibiotics. *Lactobacillus acidophilus* and *Lactobacillus casei* isolated from the manually prepared buffalo milk curd were tested for the antimicrobial inhibitory property against *Acinetobacter baumannii*. Lactobacillus acidophilus had antagonistic properties against A. baumannii. These results are in agreement with other published reports from different countries that indicate that infection control efforts may be achieved with Lactobacillus species. We believe that more attention should be paid to these areas, particularly to create a standardized approach.

Keywords: *Lactobacillus species, antimicrobial susceptibility, Acinetobacter baumannii infections.*

INTRODUCTION

The challenges of treating multidrug-resistant bacteria continue to be a problem in the clinician's practice in providing care for the hospitalized patients. *Acinetobacter baumannii* has proven to be an increasingly important and emerging causative pathogen in health care associated infections. The drug-resistant nature of the pathogen and its unusual and unpredictable susceptibility patterns make empirical and therapeutic decisions even more difficult.

The association of *A. baumannii* with pneumonia, bacteremia, wound infections, urinary tract infections, and meningitis has been well described.[1] *Acinetobacter* is a gram-negative coccobacillus that has emerged from an organism of questionable pathogenicity to an infectious agent of importance to hospitals worldwide. The organism has the ability to accumulate and exhibit diverse mechanisms of resistance, leading to the emergence of strains that are resistant to all commercially available antibiotics.

Corresponding author:
Suresh P
E-mail: sureshraja25@gmail.com

Acinetobacter baumannii is one of the ESKAPE pathogen, a group bacteria which are of clinically important pathogens, predominantly implicated in health care-associated infections that have the potential for substantial antimicrobial resistance.[2]

One of the important features of probiotic Lactobacilli is to achieve antagonistic activity against bacterial pathogens because of their capacity to produce lactic acid and other organic acids that lower the pH and to produce H2O2 and bacteriocin, thereby establishing a hostile environment for the growth and survival of various human pathogenic bacteria. Moreover, antibiotic resistance of the Lactobacillus is a required probiotic property helpful, for the survival of Lactobacillus in presence of antibiotics, especially for those strains that are co-administered with antibiotics. However, such resistance among the probiotic Lactobacillus be essentially innate and non-transferable in nature. The probiotics having innate resistance to kanamycin (K), streptomycin, gentamicin (GEN), vancomycin (VA) and nalidixic acid suggest the preventive and therapeutic administration of such strains in treating bacterial infection in the cases of co-administration with antibiotics.[3] Various health and nutritional effects of lactic acid bacteria have been described, including improvement of the quality of human and animal foods, metabolic stimulation of the synthesis of vitamins and enzymes, stabilization of the intestinal micro flora, competence with intestinal pathogens of the host, innate immune boost, production of antimicrobials, reduction of the risk of colon cancer by neutralizing carcinogens and suppression of tumors by modulating of the probiotic strains.[4,5]

The aim of this research was to study the effect of *Lactobacillus acidophilus* and *Lactobacillus casei* isolated from the Common curd and reducing the rates of *Acinetobacter baumannii* causing infection.[6]

MATERIAL AND METHOD

In total 500 pus samples were collected from patients with wound infection at Tertiary care hospital in Pondicherry, India and processed as CLSI guidelines. All the samples were primarily investigated for morphologic and biochemical characteristics, including Gram stain, motility, catalase, oxidation and fermentation, growth at 42°C, indole and esculin test. Antimicrobial susceptibility testing was performed by the agar diffusion method on Mueller-Hinton agar. All the samples were primarily investigated for morphologic and biochemical characteristics, including Gram stain, motility, catalase, oxidation and fermentation, growth at 42°C, indole and esculin test. Antimicrobial susceptibility testing was performed by the agar diffusion method on Mueller-Hinton agar. Based on biochemical properties and with help of Vitec-II campac system *Acinetobacter baumannii* was identified. 268 isolates were identified as *Acinetobacter baumannii*. Of these 268 isolates, a total of 109 strains of A. baumannii showed high resistance to tested antibiotics. These 109 strains of A. baumannii were transferred into tryptic soy broth after adding 15% glycerol in a 1.5 ml microtube and stored at −20°C.

Preparation of Lactobacillus strains

Using the standard procedure, *Lactobacillus acidophilus* and *Lactobacillus* Isolated from buffalo milk curd and identified after comparing with ATCC Quality control organisms, *Lactobacillus acidophilus*-ATCC9224 and *Lactobacillus casei* –ATCC27139. Lactobacilli Isolated from buffalo milk curd were stored under frozen conditions in the liquid MRS plus glycerol at -70°C.

These frozen isolates were cultured in MRS solid and incubated in a Co_2 incubator and were incubated for 48 hours. The Lactobacilli grown on solid MRS medium was inoculated in liquid MRS medium, and after 24 hour in liquid MRS broth was removed and transferred to another tube of MRS broth in order to strengthen growth.

Antogonistic test

To test the antagonistic effect of *Lactobacillus* against the Acinetobacter baumannii following procedure was followed.

Stored 109 strains isolates of *Acinetobacter baumannii* were first cultured on MacConkey and then on nutrient agar.

The stored *Lactobacillus acidophilus* and *Lactobacillus casei* isolated from the manually prepared buffalo milk curd were inoculated into de Man, Rogosa and Sharpe (MRS) broth and incubated in anaerobic jar at 37°C for 24 hours.

Using a sterile swab, *Acinetobacter baumannii* of 1/10 McFarland dilutions were inoculated into the surface of nutrient agar. On the surface of nutrient

agar plate, holes 5 mm in diameter and depth were created under sterile conditions. The MRS broth containing *Lactobacillus* was centrifuged at 6000 rpm for 10 minutes. Supernatant was filtered with a bacteriologic filter. Then 100 µL of solution of each of lactobacilli was poured into a separate well. The media were kept in the refrigerator for 2 hours until the liquid was absorbed, then transferred into the incubator and incubated for 14 to 15 hours at 37°C. After incubation, the diameter of the inhibition zones (mm) around the well was measured using a ruler.[8] The antagonistic effect of lactobacillus against *Acinetobacter baumannii* was interpreted on the bases of inhibitory growth zones as follows: negative (−) was <11 mm; medium (+) was 11 to 16 mm; strong (++) was 17 to 22 mm; and very strong (+++) was >22 mm. separate plates were used to test for the antimicrobial inhibitory effect of *Lactobacillus acidophilus* and *Lactobacillus casei* which were isolated from buffalo milk curd.

RESULTS

The 109 strains of *Acinetobacter baumannii* were chosen to test the antimicrobial inhibitory effect of Lactobacillus acidophilus and Lactobacillus casei. These lactobacillus species showed significant antagonistic effect on *A. baumannii.* Lactobacillus acidophilus exhibited more antagonistic effect than Lactobacillus casei. Details are shown in Fig. 1.

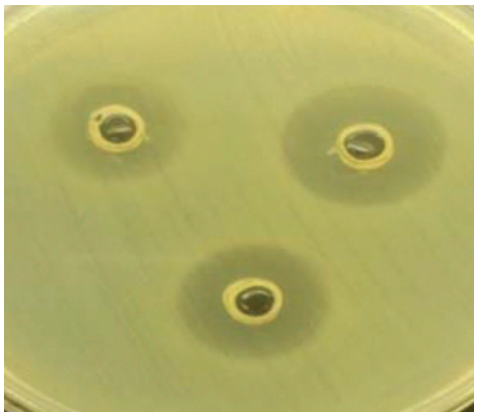

Fig. 1.

Inhibition zone of *Acinetobacter baumannii* caused by *Lactobacillus* spp. (Top left) *Lb. casei* (16 mm). (Top right) Inhibition zone of *A. baumannii* caused *by Lb. acidophilus* (19 mm). (Bottom) *Lb. acido philus with 0.5 McFarland* (17 mm).

Table 1: Antagonistic effect (inhibition zone) of *Lactobacillus Acidophilus*, *Lb. casei* against *Acinetobacter baumannii* isolates

Lactobacillus species	MIC(Minimum inhibition concentration)				
	(-)	(+)	(++)	(+++)	Average
Lactobacillus acidophilus	Nil	Nil	19-22mm	Nil	20mm
Lactobacillus casei	Nil	14-16mm	Nil	Nil	16mm

Inhibitory growth zones were interpreted as follows: negative (−) at <11 mm; medium (+) at 11–16 mm; strong (++) at 17–22 mm; very strong (+++) at >22 mm.

DISCUSSION

Eradication and treatment of infections caused by *A. baumannii* are difficult because of their high resistance to antibiotics and disinfectants [10],[11] . These bacteria can cause serious infections in hospitalized patients because they can grow under a variety of different conditions and have acquired widespread antibiotic resistance. They therefore result in problematic infections that impose high costs on healthcare [12]. Lactobacilli are harmless microorganisms capable of producing acid secretion, bacteriocins and other by-products that can neutralize some pathogens, can regulate the inflammatory response of the immune system and can be used in the treatment of gastrointestinal disorders[13,14].

Our results showed that lactobacilli had an inhibition growth effect on *A. baumannii* . These results are in agreement with previously reported findings that different strains of lactobacilli inhibit the growth of bacteria such as *Staphylococcus aureus, Escherichia coli, P. aeruginosa, Klebsiella pneumoniae,* and *Burkholderia cepacia*[15, 16]. Others have reported that lactobacilli had an inhibitory effect on the growth of both Gram-negative and Gram-positive bacteria [17]. In addition, there is also *in vitro* report of probiotics against pathogenic bacteria [18]. Several previous studies have shown that probiotic factors other than lactic acid, such as bacteriocins, proteinase, peroxidase and exopolysaccharide, can exert antibacterial effects [15]. Some studies have reported that lactobacilli such as *Lb. plantarum, Lb. paracasei, Lb. fermentum, Lb. bokash* and *Lb. boots* isolated from the stool of infants had inhibitory activity against food-contaminated bacteria such as *E. coli, S. aureus,*

Yersinia enterocolitica and *Bacillus cereus*,[9] [19]. A previous study demonstrated the antibacterial effect of *Lactobacillus* isolated from breast milk against the gastrointestinal pathogenic bacteria *E. coli, Shigella, Pseudomonas*and, *Salmonella*[19]. Another study found that strains of lactobacilli lower the effect of production of elastase and biofilm formation[12].

CONCLUSION

Lactobacillus acidophilus and *Lactobacillus casei* present in common curd (buffalo milk curd) had good effects on preventing the growth of *A. baumannii*. These results are in agreement with other published reports from different countries that indicate that infection control efforts may be achieved with probiotic bacteria. We believe that more attention should be paid to these areas, particularly to create a standardized approach.

Ethical Clearance- obtained from Institutional Ethics Committee (Human Studies) Ref.no. IEC/ C-p/49/2014.

Source of Funding- Nil

Conflict of Interest - Nil

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Dole-Dole Tradition in Health Seeking Behavior of Buton Society, Southeast Sulawesi

Andi Asrina[1], Sukri Palutturi[2], Andi Tenri[3]

[1]School of Public Health, Muslim University of Indonesia, Makassar Indonesia, [2]School of Public Health, Hasanuddin University, Makassar Indonesia, [3]School of Social and Political Sciences of Dayanu Ikhsanuddin University, Baubau Indonesia

ABSTRACT

Background: The cause of the disease is naturalistic and personalistic. Perception of the cause and cure of the disease is personalistic and also very close to the habits of the people of Buton.

Objective: The purpose of this study is to examine and analyze the pattern of Buton community health-seeking behavior on infants and under five years based on personalistic etiology.

Materials and Method: This research used a qualitative ethnographic approach. The research site was conducted at Baubau. 12 informants were interviewed: 4 regular informants, 4 key informants, and 4 supporting informants. Data collection processes were by observation technique, in-depth interview, documentation, and FGD. Selection of informants was purposive sampling. Data were analyzed in the cultural domain for the category according to the research focus.

Results: The results showed that the pattern of treatment seeking in infants and under five years who experience diseases starting from home treatment, then to health services and traditional medicine. This may be reversed by the general pattern of treatment seeking that starts from the traditional to the health service, but in the dole-dole tradition the last option is to carry out this ceremony for healing. This tradition is passed down through generations and is considered a way which is powerful in prevention, immunization, and healing in the Buton community especially in infants and under five years who experience health problems.

Conclusions: The conclusion of this study is that the pattern of treatment seeking of the Buton society is based on the belief in traditional healing performed by heredity and is considered more successful than medical treatment. It is suggested that the provision of information increase public understanding of the belief in health (medical) services without leaving a belief in local traditions.

Keywords: *Health, Seeking, Behavior, Treatment, Tradition, Dole-Dole, Buton*

BACKGROUND

Indonesia is known for its cultural diversity which influences many people's social life, including in health field [1,2]. Health and culture adopted by the community are closely related to the main deterrents of healthy-sick perception; causes and cures[3-5]. Every adherent of culture has their respective perceptions about the treatment and cure of a disease that is difficult to receive medically. Although society has entered the modern era and experienced the development of mindset, including socio-cultural development, still many traditions are maintained until now. This also applies to the culture of Buton people who always maintain their traditions, including their health. One of the traditions of the Butonese society that is considered a healing is the dole-dole tradition [6-8]. The dole-dole tradition is a traditional immunization activity in infants and toddlers in Buton culture. This tradition is especially for children who are

Corresponding author:
Sukri Palutturi,
E-mail: sukritanatoa72@gmail.com
Phone : +62 811 4453033

often sick or this tradition as a provision of immunity against the possibility of disease and less normal growth.

Historically, dole-dole originated from the era Sipanjonga *(one of Mia Patamiana,* founder of the kingdom of Buton). Sipanjonga's marriage with *Sibaana* (brother of Simalui) gave birth to a son named Betoambari. It is said that, since infancy, Betoambari always experience sickly. Seeing this condition, Sipanjonga then held a ritual ceremony of treatment for his son. As a result, after the treatment ceremony was completed, Betoambari was gradually healed. This ceremony is called dole-dole (Munafi, et al, 2015). Until now, this tradition is believed to cure diseases, especially in children. Dole-doles are always carried out when the children of the Buton tribe are affected by the disease and do not recover even after receiving medical services.

According to the beliefs of Buton people, children who have passed the dole-dole ceremony will be spared the disease and will recover from the illness suffered. This community belief is based on the ancestors who hold fast the dole-dole tradition and no one dares to break unless it will be affected even worse. This shaped the behavior of the Buton community in the pattern of seeking treatment when there are health problems in children.

The Buton people who believe in the dole-dole tradition as a way to cure the disease are the outcome and the internalized response in their lives thus shaping and influencing behavior. This behavior is not expected to have a negative impact on the belief of the Butonese people on health care in the pattern of seeking treatment. Based on the background that has been described previously, so the purpose of this research is to examine and analyze the pattern of treatment of Butonese people in infants and under five years.

MATERIALS AND METHOD

This type of research used a qualitative ethnographic approach [9-11] to explore the phenomenon of Buton community treatment seeking. The research site was conducted at Baubau. The 12 informants in this study were interviewed, consisting of 4 regular informants, 4 supporting informants namely shaman *(bisa')* and health workers and 4 key informants ie religious figures, community leaders, and local humanist. Data collection processes were by observation techniques, in-depth interviews, documentation and Focus group Discussion related to the pattern of treatment seeking. Selection of informants was conducted by purposive sampling, with criteria: the Buton community who conducted a traditional treatment seeing known as dole-dole tradition. The focus of this research is to analyze the perception of informants about the sign, the perceived symptoms and the way of healing that is believed by the people of Buton.

RESULTS

Characteristics of informants

Table 1 shows the characteristics of informants in the Dole-Dole Tradition study on the Buton. 12 informants have different educational backgrounds: entrepreneurs, housewives, religious leaders, community leaders, humanists and health workers. They have different levels of education from elementary school to post-graduate. Bisa'generally educated elementary or junior high school.

The table illustrates that all age-old informants indicate if dole-dole traditions have been inherent in their lives. The educational background and work of informants varied from the lowest to higher education not necessarily disregarding the traditions that had long been adhered to by their ancestors. This shows that in the dole-dole tradition does not recognize the level of education and age and even work. Anyone with a low or high educational background will always continue to preserve it as long as it becomes a belief.

Health seeking behavior

The results of the search for in-depth information were made to the baby's parents who carried out the doles and believed to be the healing endeavors such as the following informant's expression:

"My first child used to walk the week after the doles. Before in the dole-dole, there is a belief that my child will recover ... this kind of like obligations so it must be dole-dole. This is part of the traditions of the people here, meaning there is confidence and always as expected. My child is already taking medicine, immunization is also but not yet healed because it has not dole-dole. This is not just conservation but belief if it is not implemented then there will always be hurdles such as sickly, weak, disadvantaged, and so on .. "(Srd, 42 years, March 15, 2017).

It can be described that informants consider dole-doles as mandatory because there will be consequences obtained if they are negligent. Despite having wandered away they will return to Buton to carry out the dole-dole tradition, especially for treatment. The same thing was revealed by another informant:

"... what the children feel, the name is *kaepeta* .. everything that is felt just if not take it will not heal, then we have children will not heal. Usually parents see the situation, usually, parents say this not in dole-dole "(As, 45 years, date May 04, 2017)

Based on the informants' expression that this tradition has been carried out since their ancestors, the signs and symptoms suffered by their children can be identified and the treatment according to what is believed to be dole-dole. This information is reinforced by local community leaders, as follows:

"Actually, people do dole-dole with the hope to get the desired results. This hope becomes confidence because it has been to health services but has not healed so that psychologically can feel healing. Not only that, this belief is supported by the intention of being able to '... in essence, people's belief in this tradition (dole-dole) can heal and it happens, let alone one who is full of hope for the healing of his child. Some do not do it because their ancestors did not do it, that's fine "(Lm.Ars, 49, May 14, 2015).

The explanation from local community leaders confirms that the doles are executed with intention and hope to heal so that they get psychic psychically.

Table 1. Characteristics of informant

No.	Informants	Age (year)	Education Level	Occupation
1.	Srd	42	Senior High School	Private
2.	Nrm	42	Vocational High School	Private
3.	Wa.M	50	Senior High School	Housewife
4.	As	45	Bachelor Degree	Teacher
5.	Mr.	62	Elementary School	Bisa'
6.	Sm	62	Elementary School	Bisa'
7.	Nr	72	Junior High School	Bisa'
8.	LM.Ars	49	Master Degree	Religious leader
9.	H.SlH	62	Secondary Technical School	Religious leader
10.	H. Srl	62	Senior High School	Community leader
11.	IK	25	Master Degree	Humanist
12.	Ms	53	Bachelor Degree	Health provider

Source: Primary Data, 2017

DISCUSSION

Based on the research results, it is found that the dole-dole tradition is done through the inheritance process from generation to generation. Despite the modern times but the people of Buton still closely with the traditions that become his life cycle including, dole-dole tradition. They believe that the tradition brings blessings and health and for the future for the child. This tradition became an option in medicine because it was carried out by the predecessors of the Buton community and became a preserved heritage.

According to Koentjaraningrat [12], that at the initial stage of the socialization process, a child is exposed, among others, how to eat, what food to eat, how to urinate, and others. These habits continue to be done until the child is mature and even old. These habits strongly affect the behavior of health that is very difficult to change [12].

Although, in general, people who preserve the-dole dole hard to explain how the tradition can heal, but it can be said that the belief of Buton people will ritual in life comes from his understanding of the cause of the disease. This is the same disclosed by Foster and Anderson (1986), that there are two kinds of causes of disease that is the cause of personalistic and naturalistic.

In the dole-dole tradition, there are two kinds of treatment based on the perceived cause, but more dominant is the personalistic-oriented illness or perceived illness. Buton Society's view of the illness experienced that when the child has felt or the Butonese call it Kaepeta, then the method of healing is to carry out the dole-dole tradition. Involvement of shaman *(bisa')* who leads dole-dole rituals is believed to be healing because of his personalistic treatment, through prayers on the basis of the beliefs of the child's parents to heal.

Based on research, Buton people do dole-dole tradition is intended to prevent the occurrence of things that are not desirable in children such as growth and developmental delays, weakness of the physical condition or the disease.

According to *bisa'*, for treatment, there is really no age limit as long as there is a request from the parent or family to do dole-dole. But in general, dole-dole is done at the age of five because according to the beliefs of Buton people at that age usually have to show symptoms of typical illness such as scabies so it must be done dole-dole. Safitri [13], revealed the implementation of dole-dole is not determined at what age the child. Whenever it can be done the origin of "good days" please take place. Related to the theory of Lawrence Green [14], that which facilitates the formation of behavior is a predisposing factor such as the existence of tradition held by the community.

Analyzing information from dole-dole actors, as well as efforts to treat the disease in children, there are two patterns made by the people of Buton, ie there are first visited the health service but not healed finally treat by doing dole-dole.

There are also people from the beginning have been convinced that what is felt or suffered by his son can only be treated with dole-dole ceremony, but when later not healed also just take advantage of health services. Based on in-depth interviews, this study also found that the health behavior of the Butonese community, the early pattern of its treatment seeking until it was healed, still believes that dole-dole is the solution for those who inherit this tradition. This is in line with research conducted by Syahrun on the traditional medicine of the Butonese people that the Buton society's view of disease is a series of cultural processes.

According to Foster, Anderson [15], the symptoms that appear to each individual will be in different responses as well. When the symptoms that appear on the body is not too felt by people who seek treatment until the disease worsens, otherwise people who are more sensitive to the emergence of symptoms will be faster in seeking medical help and get a fast treatment as well. When associated with the dole-dole tradition, the symptoms of the disease that appear and demonstrated by the child will be known by the parents so that the treatment in accordance with the stages of healthy behavior is believed. This tradition became an option in medicine because it was carried out by the predecessors of the Buton community and became a preserved heritage. At the initial stage of the socialization process, a child is introduced, such as how to eat, what food to eat, how to urinate and others. These habits continue to be done until the child is mature and even grow old. These habits greatly affect health behavior that is very difficult to change [12]. The distinctive signs and symptoms identified by the Butonese community shape their behavior in the search for a treatment of the dole-dole tradition.

CONCLUSIONS

The Buton community in this study has used health services, but the treatment-seeking behavior is based on the signs and symptoms that the traditional healing of dole-dole tradition is considered to be more successful than medical treatment. It is suggested that the provision of information increase public understanding of the belief in health (medical) services without leaving a belief in local traditions

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Salivary Diagnostics in Cardiovascular Disease–A Review

Sunil M Eraly[1], Mithra N Hegde[2], Raksha Bhat[3], Preethesh Shetty[3], Aditya Shetty[4]

[1]Head of the Department, Department of Conservative Dentistry & Endodontics, Malabar Dental College, KUHAS University, Kerala; [2]Head of the Department, [3]Assistant Professor, [4]Additional Professor, Department of Conservative Dentistry & Endodontics, A. B. Shetty Memorial Institute Of Dental Sciences, Nitte University, Deralakatte, Mangalore

ABSTRACT

Saliva is secreted by major salivary glands; namely parotid, submandibular, sublingual and various other minor glands present in the oral cavity. Secreted systematically, it has been known to possess multiple informative proteins and peptides, which may serve as biomarkers in the early detection of various diseases. Early detection of diseases is vital not only to reduce the severity of the disease and avoid complications, but is also critical in increasing the success rate of treatment. In recent years, saliva has been researched extensively as a proficient diagnostic tool due to its ease of sampling and non-invasive access. This review will update on recent advances in salivary biomarkers to diagnose cardiovascular diseases.

Keywords: *Saliva, cardiovascular disease, biomarkers*

INTRODUCTION

Cardiovascular diseases account for majority of the systemic human ailments attaining global significance. However, determination of the prognosis and diagnosis of these diseases poses to be a challenge, necessitating auxiliary clinical evaluation followed by laboratory tests [1]. According to the World Health Organisation, cardiovascular diseases account for approximately 31% of deaths occurring at a global level annually, with the most common being acute myocardial infarction[2]. The other most common cardiovascular diseases include coronary heart disease, ischaemic heart disease, stroke and heart failure [3]. Presently, the diagnosis of cardiovascular diseases is based on clinical evaluation followed by confirmatory laboratory tests such as electrocardiogram and various serum biomarkers[4,5].

Systemic diseases are generally diagnosed following collection of the subjective and objective data subsequent to biochemical analysis of blood and/or urine samples to determine the levels of ions, antibodies, and hormonal levels as well as a broad series of disease-specific biomarkers. However, oral samples were only considered under the suspicion of an oral infection or an oral malignancy. Nevertheless, given the rationale of salivary diagnostics, there has been increased interest in the use of saliva as a biomarker for the diagnosis of oral and systemic diseases. The possibility of obtaining collateral information from an oral sample, which is relatively easy to obtain without any invasive procedures, helps in handling pediatric and geriatric patients, and also for easier sample collection by trained individuals in remote geographical areas when access to health care is limited and phlebotomists are unavailable. A survey done evaluating the dentist's attributes towards chair side screening of medical conditions revealed that the dentist's are willing to carry out chair side diagnosis of systemic diseases if salivary samples are to be collected.[6]

Saliva is an excellent medium to explore and monitor systemic diseases. According to the World Oral Health Report in 2003, an direct relationship exists between oral health status and systemic health as poor oral health is associated with major chronic diseases; poor oral health causes disability; the common risk factors are shared between oral health and major systemic diseases and the systemic health diseases may cause or worsen

Corresponding Author:
Dr. Raksha Bhat
MDS [Conservative Dentistry & Endodontics]
A. B. Shetty Memorial Institute Of Dental Sciences,
Nitte University, Deralakatte, Mangalore-575018
Phone: 9902634770
Email: rkshabhat@gmail.com

oral health conditions [7]. In light of these conditions, it's prudential to evaluate and analyze human saliva as a substitute to serum.

Salivary Biomarkers: Around1000 different proteins and 19,000 unique peptide sequences have been detected in saliva [7,8,9]. Saliva, a plasma filtrate is a mixture of varied secretions produced by the major and minor salivary glands, gingival crevicular fluid, transudations from the mucosa, serum and blood sheds from oral wounds, desquamated epithelial cells, acquired pellicles, by products of various bacteria, viruses and fungi, cellular components and food debris [9–14].

Biomarkers are defined as biological molecules found in blood, saliva and other body fluids or tissues that are signs of normal and abnormal processes, or of a condition or a disease [15]. These biomarkers have been classified as strong, questionable and potential. The biomarkers basically represent the physiological and pathological changes occurring in the human body. The sources of salivary biomarkers mainly include, Host derived biomarkers associated with bone destruction, Host –derived inflammatory biomarkers, Host-derived biomarkers associated with soft tissue destruction and bacteria derived biomarkers. These biomarkers enter saliva through blood by passive diffusion, active transport or extracellular ultra-filtration. Hence, saliva is considered to be the mirror of body's health [16].

SALIVARY BIOMARKERS IN CARDIOVASCULAR DISEASE DETECTION

Myoglobin, Cardiac troponin I and T, Creatine phosphokinase MB, Myeloperoxidase, brain natriuretic peptide, Exosomal miRNA, C-Reactive Protein, Matrix metalloproteinase-8, and tissue inhibitor of MMP-8 have been proven to be the salivary biomarkers important in the diagnosis of cardiac disease [17-19].

Myoglobin: Myoglobin, a 17,800-d heme protein present in cardiac muscle and skeletal muscle, is briskly discharged into the blood stream subsequent to any muscle injury in a transient pattern. In patients with acute myocardial infarction, the serum myoglobin level is known to become abnormal in about 2 hours, then peaks in about 6 - 9 hours, and again becomes normal in 24-36 hours after the infarction [20]. Hence, the measurement of myoglobin between 2 and 12 hours after the myocardial infarction has high clinical sensitivity and specificity. The levels of serum myoglobin are known to be an effectual auxiliary to electrocardiography in initial diagnosis of myocardial infarction, as myoglobin is known to be released swiftly from an infarcted myocardium than other biomarkers such as troponin and Creatine Kinase MB which is usually detected as early as two hours after a myocardial infarction [21]. Myoglobin has been found to appear in both serum and saliva biofluids. Studies by Miller et al, Mirzaii-Dizgah & Riahi and Florianio et al established the salivary myoglobin levels to be higher within 48 hours of the onset of angina in acute myocardial infarction patients, and to be in correlation with serum myoglobin. Hence, this proves salivary diagnosis of myoglobin to be useful in detecting acute myocardial infarction [15, 19,22].

Creatine Kinase MB: Myocardial muscle creatine kinase is found in the heart. In earlier times, creatine kinase MB was established to be a gold standard for quantitative assessment of myocardial infarction and as an adjunct to diagnosis as well [23, 24]. Creatine kinase MB levels rise up within 3 to 5 hours of myocardial infarction and reaches a peak in the next 24 hours [25]. According to recent studies, the specificity and sensitivity of the isoforms of creatine kinase MB were measured to be upto 95.5% and 93.9%, respectively [26]. Literature demonstrates a higher value of creatine kinase MB in patients with acute myocardial infarction in comparison to non-acute myocardial infarction controls [15,27]. Studies have also proven a strong link between levels of serum and salivary creatine kinase MB establishing the role of saliva based tests as an efficient as well as a convenient way of delivering point-of-care testing of cardiovascular diseases [17].

Cardiac troponin I AND T: Lately, cardiac troponin T and I have replaced myoglobin and creatine kinase-MB as the preferred biomarkers of cardiovascular injury [2]. During an event of any irreversible myocardial damage troponin is released by the myocytes. Troponin, a protein is known to be highly specific to cardiac tissue and also accurately diagnose any cardiovascular disease with a history of ECG changes reflecting ischaemia or ischaemic pain. However, cardiac troponin levels are dependent on the size of the infarct, thus postulating it to be an indicator for the prognosis and diagnosis after a myocardial infarction [4]. Cardiac troponins T and I are known to be highly specific and sensitive with respect to cardiovascular damage. Serum cardiac troponin levels increase within 3 to 12 hours from the onset of pain in the chest, peaks at 24 to 48 hours, followed by return to

baseline values over 5 to 14 days [1]. However, cardiac troponin levels may not be detectable for upto six hours after the onset of myocardial cell injury. Literature demonstrates strong correlation between cardiac troponin –T and cardiac troponin-I in saliva of patients with acute myocardial infarction [19,22,28]. A study by Mirzaii-Diazgah et al demonstrated that both stimulated and unstimulated saliva had a strong correlation with serum cardiac troponin T levels [22]. Due to the high specificity, sensitivity and it being an evidence base for the prediction of the outcome of the disease, the measurement of cardiac troponin I was established as the gold standard test for myocardial infarction [22]. Hence, due to the strong correlation between salivary and serum cardiac troponin levels, salivary diagnostics would prove efficient in cardiac patients.

Brain Natriuretic Peptides: The European Society of Cardiology advocates the analysis of B-type natriuretic peptide and the N-terminal part of the propeptide of brain natriuretic peptide in evaluation of patients with suspected cardiovascular disease [29]. The cardiac brain natriuretic hormones are known to be secreted by cardiomyocytes and possess both smooth muscle relaxing effects, both diuretic and vascular [30]. High concentrations of these hormones in serum are known to be directly proportional to the poor prognosis in myocardial infarction [31]. According to literature, a significant relationship exists between salivary and serum brain natriuretic peptide and plasma NT-pro brain natriuretic peptide [15, 32,33]. Also, salivary brain natriuretic peptide was observed to be significantly higher in symptomatic cardiovascular patients. As symptoms improve, the levels of brain natriuretic peptide are known to disappear. Hence, the levels of brain natriuretic peptide in saliva helps us differentiate cardiovascular patients who are in the phase of decomposition, whereas low levels of brain natriuretic peptide were seen to be associated with improvement in symptoms [32]. The similarities observed between salivary proteins and plasma proteins, along side the important role of brain natriuretic peptide, follow-up, and treatment planning encourages the detection of this factor in saliva in patients with cardiovascular ailments.

Myeloperoxidase: Myeloperoxidase is a leukocyte-derived enzyme, which catalyzes the formation of various reactive oxidant species. Various myeloperoxidase-catalyzed reactions are attributed to be taking place throughout the evolution of cardiovascular disease, including initiation, propagation, and acute complication phases of atherosclerosis. Myeloperoxidase enzyme converts low density lipoprotiens into an atherogenic form, eclectically modifies apolipoprotein A-I, forms dysfunctional high-density lipoprotein, stimulates endothelial dysfunction, develops plaque, promotes myocardial dysfunction and abnormal ventricular remodeling subsequent to myocardial infarction [34]. Kossaify *et al.* and Mirzaii-Diazgah et al determined that salivary myeloperoxidase shared similarities to serum biomarkers [27, 35]. Studies in literature proving salivary myeloperoxidase to be a diagnostic tool for cardiovascular disease have shown to have a sensitivity of 90–100% [5].

Exosomal miRNA: Cells upon fusion of multivesicular bodies with the plasma membrane form exosomes. The envelope of exosomes reflects their cellularity and surface and internal contents including predominant signaling components. They possess a wide array of proteins, lipids, RNAs, non-transcribed RNAs, miRNAs and small RNAs, which are representative to the origin of their cellularity and alternate between donor and recipient cells. Exosomes are thought to play major roles in various pathological conditions, therefore helping in the development of non-invasive salivary diagnostics. Exosomal miRNAs have been known to demonstrate potential as diagnostic biomarkers for cardiovascular diseases and renal fibrosis [36]. Despite the relative facility to collect exosomes from biological fluids, the actual use of exosome-derived proteins or miRNAs as biomarkers has not been yet implemented in clinical practice [37,15].

C Reactive Protien: C Reactive protien has been identified as a strong, independent risk factor associated cardiovascular disease, and is the most extensively studied area. In recent studies Arroyo Espliguero et al. and Raposeiras Roubín have concluded that C Reactive protien is an independent predictor of cardiovascular disease [38,39]. The magnitude of myocardial necrosis is reflected in the serum by the presence of high levels of C Reactive protein. Serum C Reactive protien concentrations increase subsequent to the activation of cytokines in the initial hours of myocardial infarction [40]. Several studies have demonstrated elevated C reactive protein levels were detected in saliva collected from patients in accordance with the plasma levels in ischemic cardiovascular disease in comparision with healthy controls [41,42,43].

Matrix metalloproteinase-8 and tissue inhibitor of MMP-8: Acute cardiovascular manifestations are a result of atherogenesis subsequent to plaque rupture, with extracellular matrix degrading proteases and their regulators playing an important role. Atherosclerotic plaques have been known to rupture, especially when indicated by thin, highly inflamed, and collagen-poor fibrous caps with contain elevated levels of proteases, mainly metalloproteinases (MMPs). Matrix metalloproteinase-8 has a constituted task in the repair and remodeling process of the myocardial tissue following damage. The tissue inhibitor inhibits the matrix metalloproteinase 8. Thus, the ratio of matrix metalloproteinase 8 to tissue inhibitor basically helps decided the prognosis, diagnosis and treatment planning of cardiovascular disease [2]. Miller et al. demonstrated the concentrations of matrix metalloprotinases in saliva were greater in the acute myocardial infarction patients[9].

CONCLUSION

Saliva as a proficient biofluid, has vastly gained scientific attention for diagnosis of medical conditions and dental diseases. Some of the markers discussed herewith are general and non-specific; hence need more research to be demonstrated as specific biomarkers of cardiovascular disease. The recent advent of novel bio nano chip systems has augmented towards innovation in the salivary diagnosis towards detection of cardiovascular diseases. However, despite the advent of newer technologies in the field of salivary diagnosis, further research if necessary to evaluate the applicability and movement of certain cardiac biomarkers into the saliva and its correlation with plasma for it to be used as a biomarker in cardiovascular diseases. Future developments with saliva as a diagnostic tool will help make it a reality, hence benefitting people in developing countries and rural areas. Earlier diagnosis and intervention will help decrease the global cardiovascular disease burdens.

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Antibacterial Activity of Lactobacillus (LB) Strains Isolated from Goat Milk against ESBL Producing E. coli Causing Wound Infections

Suresh P.[1], V. Sreenivasulu Reddy[2], V. Praveen kumar[1], P. Vamsimunikrishna[1]

[1,3]Ph.D Scholar, Bharath University Thambram,Chennai. [2]Professor, Department of Microbiology, Sri LakshmiNarayana Institute of Medical Sciences (SLIMS), Puducherry, India

ABSTRACT

Lactobacillus (LB) species are well known probiotics with beneficial effects to human health. Their antimicrobial activity is one of the most important probiotic characteristics. Wound infections are the most frequent bacterial infections encountered in community settings. Extended spectrum β-lactamases (ESBLs) are enzymes produced by pathogenic bacteria that enable such pathogenic bacteria as multi drug resistant. Treatment of infections by these drug resistant bacteria require newer anti microbialsthat are highly expensive and possibility of many side effects. Microbial products consideredas the best source for therapeutic agents worldwide. Lactobacillus species were isolated from 2 days fermented goat Milk. Theantimicrobial activity of cell-free supernatant and partially purified bacteriocin was determined by well diffusion method and equal mixed culture method. All isolated ESBL were processed and identified as per theCLSI guide lines. The organism was identified by *GN ID* and *AST 280* of *Vitec-II campact* system and *AES* (Advance extended spectrum) tests. The current study showed that ESBL E. coli resistant to Cefazoline (96.6%), Ceftazidime (43.3%), Ceftriaxone (3.3%), Ciprofloxacin (76.6%), Meropenem (0%), Tobramycin (43.3%), Cefotaxime (93.3%), Ceftazidime + cluvalonic acid (3.3%), Cefotaxime + cluvalonic acid (3.3%), Cefperodoxime (96.6%), Piperacillin + Tazobactam (0%), Ampicillin (100%). Lactobacillus species exhibited an antibacterial effect on a narrow range of ESBL strains. However invitro effect is better than large number broad-spectrum antibiotics such: third-generation cephalosporins

Keywords: *PUS, ESBL,CLSI,GN ID,AST280,VITEC-II CAMPACT system(AES).*

INTRODUCTION

Recent trends show extended spectrum β-lactamase (ESBL) producing bacterial pathogen cause various life threatening infections that lead to sepsis related mortality. The ESBLs can make the infection caused by the bacteria much difficult to treat.Wound infection could result in prolonged hospital stay and higher cost of treatment. Gram negative bacteria have been reported to be the major cause of wound infections.[1]Extended spectrum β-Lactamases (ESBL) are enzymes produced by pathogens belonging to Enterobacteriaceae, most commonly Escherichia coli.[2] One group of β lactamases, extended-spectrum β lactamases (ESBLs), have the ability to cause resistance to various types of the newer β-lactam antibiotics, including the expanded-spectrum (or thirdgeneration) cephalosporins (eg, cefotaxime, ceftriaxone, ceftazidime) and monobactams (eg, aztreonam), but not the cephamycins (eg, cefoxitin and cefotetan) and carbapenems (eg, imipenem, meropenem, and ertapenem).[3]

Lactobacillus have long been considered as protective microflora, able to displace and inhibit different pathogens. The Lacto bacillus (LB) are well known probiotics with beneficial effects to human health.[5] Their antimicrobial activity is one of the most important probiotic characteristics.[6] The production of antimicrobial substances by resident or transit Lactobacillus micro flora, to remove the pathogens is under extensive study in recent times.[7], [8] Lactobacillus

Corresponding Author:
Suresh P
Ph.D Scholar,
Bharath University Thambram, Chennai
Email: sureshraja25@gmail.com

species L. fermentum, L. gasseri and L. salivarius isolated from normal flora were tested against antibiotic-resistant clinical isolates. In vitro growth inhibition of Acinetobacter baumannii and Pseudomonas aeruginosa strains was observed.[4] However, the basis of the inhibition of the Gram negative antibiotic-resistant pathogens have not been well established. The widespread antibiotic usage exerts a selective pressure that acts as a driving force in the development of antibiotic resistance.[9] which became a serious global problem.It is also evident that newly introduced antimicrobials also becoming ineffective in short periods due to rapid selection and spread of resistance bacteria. Scientific understanding of the mechanisms of competition between "good bacteria" and pathogens is very vital. In the present study antagonistic activity of 46 Lactobacillus strains isolated from fermented Goat milk against drug resistant Gram positive and Gram negative human pathogens was observed. These observations of in vitro antimicrobial trials could guide microbiologists for further study on the appropriate recommendation of probiotics for clinical practice in health care settings.[1°]

AIM

The aim of this research was to study the effect of Lactobacillus species isolated from the two day fermented goat milk *against ESBLproducing Escherichia coli causing wound infections.*

MATERIAL AND METHOD

A. Collection of samples: After obtaining the Consent from the patients, pus samples were collected from the patients with wound infection admitted in a tertiary care hospital. Samples were collected under aseptic precautions. Total 120 pus samples were collected over a period of 6 months.

B. Culture and Identification E. coli: Pus samples were immediately inoculated onto Blood agar & MacConkeys agar media and incubated at 37^0c for 24hrs. Identification of bacteria from positive cultures was done with standard a microbiological technique which includes AES (Vitec-II Campact system) Grams stain, biochemical reactions.[11]

C. Confirmation of ESBL: A total of 85 E. coli isolated from the pus collected from infected wounds were ESBL producing. All samples were processed and identified as per the CLSI guide lines and *GN ID,AST280 of advance extension spectrumAES(VITEC-II campact system)* semi Automated system of microbiology lab. The antibiotics disk used were Amikacin (30µg), Ceftriaxone (30µg), Ceftazidime (30µg), Ceftazidime/Clavulanicacid, Terimetoperim & Sulfomethoxazole, Gentamicin (10µg), Ciprofloxacin (5µg), Meropenem (10µg), Pipercillin/Tazobactum, Cefazoline (30µg), Tobramycin (10µg), Cefotaxime/Clavulanic acid, Cefotaxime (30 µg), Cefpodoxime (30), Ampicillin (10µg). Standard protocols were used to detected and confirm ESBL producing strains.[12]

D. Isolation and Identification Lactobacillus from 2 days fermented goat milk: Two days fermented goat milk was serially diluted in saline (0.85%) and 100 µl of each dilutions (10-1 - 10-6) were spread plated onto MRS (De Man Rogosa and Sharpe) to isolate the Lactobacillus spp and incubated at 37°C for 48 - 72 h at condation anerobic jar.[14] isolates was selected for further studies. It was identified on the basis of growth, cell morphology, gram staining and catalase activity. Further, identification was performed according to carbohydrate fermentation patterns and growth at 15°C and 45°C in the MRS broth based on the characteristics of the lactobacilli as described in Bergey's Manual of Determinative Bacteriology and 16s rRNA sequencing.[15]

E. Quality control reference of the Lactobacillus isolates: For QC reference, Lactobacillus strains (ATCC NO:9224) which was Frozen in the liquid MRS plus glycerol at -70°C fridge, were cultured in MRS solid and incubated in a Co2 incubator and were incubated for 48hours. The lactobacilli grown on solid MRS medium was inoculated in liquid MRS medium, and after 24hour liquid MRS broth was removed and transferred to another fresh MRS broth, in order to strengthen the growth of lactobacilli.[13]

F. Antimicrobial Activity Determination: Using a sterile swab, ESBL E.coli strain adjusted to 1/10 McFarland dilutions were inoculated into the surface of Muller Hinton agar. On the surface of Muller Hinton agar plate, holes 5 mm in diameter and depth were created under sterile conditions using a Pasteur pipette. The MRS broth containing *Lactobacillus* was centrifuged at 6000 rpm for 10 minutes. Supernatant was filtered with a bacteriologic filter. Then 100 µL of solution

of each of lactobacilli species was poured into a separate well. Plates were kept in the refrigerator for 2 hours until the liquid was absorbed, then transferred into the incubator and incubated for 14 to 15 hours at 37°C. After incubation, the diameter of the inhibition zones (mm) around the well was measured using a ruler.[16] The antagonistic effect of lactobacillus against ESBL E.coli was interpreted on the bases of inhibitory growth zones as follows.[17]

Inhibition zone <11 mm = negative (−)

Inhibition zone 11 to 16 mm = medium (+)

Inhibition zone 17 to 22 mm = strong (++)

Inhibition zone >22 mm = very strong (+++)

Standard *Lb. fermentum, Lb. acidophilus and Lb. casei, Lb.gasseri.* Obtained from the Department of Microbiology, srilaxmi naraya institute of medical sciences Osudu Pondicherry was used as a control.

RESULTS

Among the 120 samples, a total of 85 isolates were identified as *ESBL E.oli* and remaining are non ESBL E.coli and other organisms. In this study Lb. *fermentum*, *Lb. acidophilus* and *Lb. casei, Lb. gasseri* had shown antagonistic properties on ESBL *E.coli*. All the tested *Lactobacillus* strains had a significant antagonistic effect on ESBL *E.coli. Lb.fermentum, Lb. acidophilus* had more significant effect compared to the other lactobacilli (Table 1) & (Table 2).

Table 1: Antagonistic effect (inhibition zone) of Lactobacillus fermentum, *Lactobacillus Acidophilus, Lb. casei*, lactobacillusgasseriagainst *ESBL E.coli* Isolates

Lactobacillus Genus	Inhibitory zone in mm				
	(-)	(+)	(++)	(+++)	Average
Lb.*fermentum*	Nil	Nil	Nil	36-44mm	39mm
Lb.*acidophilus*	Nil	Nil	Nil	23-30mm	30mm
Lb.*casei*	Nil	14-16mm	Nil	Nil	15mm
Lb.*gasseri*	Nil	Nil	17-22mm	Nil	20mm

Inhibitory growth zones were interpreted as follows: Inhibition zone <11 mm = negative (−)

Inhibition zone 11 to 16 mm = medium (+), Inhibition zone 17 to 22 mm = strong (++),

Inhibition zone >22 mm = very strong (+++)

Table 2: Based on turbidity zone of inhibition

Name of the organism	Turbitidity concentration of ESBL E.coli in mac forland		
Lactobacillus sps	0.5 Macforland	1Macforland	1.5Macforland
Lb.fermentum	44 mm	40 mm	35 mm
Lb.acidophilus	35 mm	28 mm	24 mm
Lb.casei	16 mm	13 mm	10 mm
Lb.gasseri	23 mm	21 mm	17 mm

Inhibitory growth zones were interpreted as follows: negative (−), <11 mm; medium (+), 11–16 mm; strong (++), 17–22 mm; and very strong (+++), >22 mm.

Above the values Lactobacillus specious average zone size 35-44mm.

Lb.fermentum based on turbidity average zone of inhibition: 84%

Lb.acidophilus based on turbidity average zone of inhibition: 63%

Lb.casei based on turbidity average zone of inhibition: 29%

Lb.gasser based on turbidity average zone of inhibiton: 44%

DISCUSSION

According to the results obtained in this study, MIC value Lactobacillus sps. isolated from Goat milk(2days fermented)narrow antibacterial spectrum against ESBL E.coli isolated wound infections. The *Lb. fermentum and Lb.acidophilus* an antibacterial effect on a narrow range of ESBL strains. However the effect is isolates the in vitro is better than large number broad-spectrum antibiotics such: third-generation cephalosporins (eg, cefotaxime, ceftriaxone, ceftazidime). E. coli strains were identified by biochemical analysis. The results indicated that all isolates were positive indole, positive MR-VP, negative urea, and negative simon citrate, Except for one strain, other strains were able to move, and in terms of TSI were acid / acid.[11] In vitro activity of the vaginal isolates against pathogenic Ac. baumanii 2762 and 4386, E. coli 2747 and Ps. aueruginosa strains was generally based on the combinative effect of lactic acid and H_20_2. In addition, inhibitory effects of thermostable and proteinase-sensitive.[18] Transplant pyelonephritis caused by an extended spectrum beta-lactamase (ESBL) producing E. coli intestinal colonization is a problem in renal transplant patients. The decline in renal function with recurrent severe infection can result in end stage renal disease necessitating another renal transplantation. However, the risk for recurrent pyelonephritis by ESBL producing E. coli due to persistent colonization is a relative contraindication for another renal transplant procedure. Recently, the first case report was published of a patient with recurrent episodes of transplant pyelonephritis who was decolonized for ESBL-producing E. coli with a fecal microbiota transplantation. Two weeks after fecal transplantation the rectal culture became ESBL negative and during the follow up the patient did not develop symptoms of a UTI.[19]

CONCLUSION

The Two days fermented Goat milk Isolated organisms lactobacillus fermentum, Lactobacillus acidophilus and Lactobacillus casei, Lactobacillus gessari had good effects on preventing the growth of ESBL producing E.coli.

Ethical Clearance: Taken from SRILAXMI NARAYANA INSTITUTE OF MEDICAL SCIENCES, Institutional Ethics Committee (Human Studies) Ref.no. IEC/C-p/49/2014.

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Analysis of Nuptiality Data through Life Table Approach

Chitra Rani Chauhan[1], A. K. Maini[1], Ajay Bhagoliwal[2], Anju Gahlot[2]

[1]Assistant Professor, [2]Professor, Rama Medical College Hospital Research Centre Kanpur

ABSTRACT

Nuptiality has a strong association with socio demographic and economical change in society. So, it has immense importance to study the female age at marriage in society. In rural India, mostly marriages take place at early ages. In this study, gross nuptiality tables for female nuptiality of rural population of Uttar Pradesh, India have been constructed for the five consecutive decades 1951-61, 1961-71, 1971-81, 1981-91 and 1991-2001. It is observed that nuptiality rates are changing with time. Initially, the rate is small at the age group of 10 and increase rapidly till reaches to maximum at the age group 20. We also calculate expected number of years of single life remaining to a single person at age x. It is also observed that the age at marriage is increasing as the time passes.

Keywords: *Nuptiality Estimation, Cohort, Life Table*

INTRODUCTION

A complicated individual phenomenon like marriage, with very strong familiar and social interlocks can be studied from different angles and at different levels. Numerous studies have found that the process of union formation happens in a systematic way. The pattern of marriage is undergoing some discernible changes throughout the world. It has played a major role in determining the growth rate of population through its linkage to marital fertility.

Historically changes in the Nuptiality pattern has played very significant role with respect to demographic transitions in many of the European countries (Van de Wale, 1972)[1]. The experience of several less developed countries where population growth rate has recently slowed down also demonstrates this aspect (Das et al., 1998)[2].

The changes increases in respect of marriage age and age at consummation of the marriage and the resultant reduction in proportion of women remaining in married state are directly linked to fertility and thus determine the future trend of demographic transition. In India, major shifts have been observed in the age at marriage [3].

The age of female at the time of marriage is very important due to many reasons. These reasons depend on many factors such as social, economic, and demographic changes in population. This is probably one of the causes of the rise in nuptiality witnessed in certain countries; in other instances the increased mobility has mainly resulted in a considerable reduction of the number of consanguineous marriages [4].This work attempts to examine the scenario of marriage in Uttar Pradesh state of India.The aim of current work is to construct nuptality table for rural settings of Uttar Pradesh

Theoretical perspectives and previous findings: There are more adolescents in India today than ever before. According to the law and age at marriage for females in India by **(**Pathak, K.B. (1980) near the beginning of study period, 1992, India had 38 million adolescent women; by 2005, that number had grown by nearly half, to 50.5 million **(**Pathak, K.B. (1980)**[5]**). The three states with the largest female adolescent populations—Andhra Pradesh, Maharashtra and Uttar Pradesh—together account for one-third of all adolescent women in the country, with nearly 16% of the total living in Uttar Pradesh alone. Within most states, 15–19-year-old women now make up at least 10% of the state's population.5 An earlier start to a general decline in fertility is evident in the three low fertility states of Goa, Kerala and Tamil Nadu, as adolescent women account for a smaller proportion of the total state population in those three states (8–9%) than they do elsewhere (10–13%)[6].Young women's marital and reproductive behaviors are conditioned by where they live, and most adolescents still live in rural areas. Fewer than three in 10 women aged 15–19 currently reside in urban areas. That proportion has increased, on

average for the country as a whole, by an annual rate of about 1% (i.e., the percentage residing in urban areas rose from 25% in 1992 to 28% in 2005)[7]. However, the pace of urbanization has varied from state to state. It was most rapid in the northeastern state of Arunachal Pradesh, where the proportion of adolescent women residing in urban areas increased by 6% each year. As expected, urban adolescent women are generally better off economically than their rural counterparts: Only 27% of the former group live in households in the lowest three wealth quintiles, compared with 79% of the latter group. As of 2006(Report on Population projection, Government of India, 2006)[7], 28% of all 15–19-year-old women were members of scheduled tribes or castes, groups that have historically been socioeconomically disadvantaged; the proportion was higher in rural areas than in urban areas (31% vs. 22%). Currently, fewer than half of adolescent women in Bihar and Jharkhand in the East, and in Rajasthan in the North, have been to school for at least six years. On the other end of the spectrum, Goa in the West, Himachal Pradesh in the North and Kerala in the South had already virtually met the primary school completion goal for 2015 as of 2006, with 92–98% of 15–19-year-old women receiving this much schooling. Although till date, marriage is universal in the Indian context, there are certain shifts observed in the age at marriage, i.e., a consistent increasing trend in respect of mean and median age at marriage over cohorts born since 1916 for males and since 1921 for females[8].

In Uttar Pradesh, marriage age increased by 1year during 1901-1951 and by 1 year per decade thereafter. 33% of females aged 10-14 years were married in 1971, but under 1% were married at this early age in 1992-1993. A similar sharp decline occurred among females aged 15-19 years; by 1992-1993 only 40% were married at this early age. The difference in ages between men and women has remained at around 4 years [9]. Uttar Pradesh being the most populous and having almost lowest level of the mean age at marriage in the country received increasing attention to know what is happening to the age at marriage especially among females at the individual level. So there is need to have a detailed picture of the age patterns of marriage in these states. Women in Uttar Pradesh tend to marry at an early age **(Singh S & Samara R (1996)[10]**.32% of women age 15-19 are already married, and an additional 8% that they were married but "**gauna"** has yet to be performed.

DATA AND METHODOLOGY

Study area: The study is conducted in the area of Rural Health Training Centre(RHTC), Department of Community Medicine, Rama University, Kanpur.

Study participants: Study subjects are local residents of selected the village from RHTC area in Kanpur.

Inclusion criteria for subjects: Women, who were ever married and born in between 1931 to 2001, be included in the study.

Exclusion criteria for subjects: The following category of women be excluded from study-

- Who are unmarried.
- Born before 1931 and after 2001.
- Who are unable to give their history because of mental illness, physical disability.
- Who were not signing the informed consent.

Ethical approval: The study has been approved by the Ethics Committees of Rama University, Kanpur. Informed consent in the local language will be taken from subjects during filling designed questionnaire, in written.

Questionnaire and tools for measurement: Subjects be interviewed with the help of pre-designed and pre tested schedule to elicit the information pertaining to socio-demographic characteristics such as religion, caste, type and size of family, educational level, age atconsummation of the marriage, age at first pregnancy etc.

Sampling technique, Data Collection & Analysis method: A cross sectional study design is adopted for this study in a community area. In the first stage 30 clusters will be selected from 25 villages of Kanpur District, where cluster defines a village whose population is more than 2500. In each cluster we divide all eligible population into seven birth cohort and in each cohort we do complete enumeration by conducting house to house survey using designed questionnaire. The birth cohorts will be taken from1930 to 2000 with decade difference. Data is analyzed by using $R_{3.1.1}$ package & SPSS 21.0 Version software.Following method is used for nuptiality estimation:

Nuptiality Table method: In this method, the basic data for the calculation of nuptiality rates will be the proportions in the decade synthetic birth cohorts 1931-1940, 1941-1950, 1951-1960, 1961-1970, 1971-1980,

1981-1990 and 1991-2000. The decade synthetic cohort for a particular decade will a hypothetical cohort subjected to the average marriage experience of the decade in question. The method followed for the estimation of nuptiality rates for a decade will be adopted from that of **Mertens (1965) [19].** Then retrospectively trace all cohorts of single persons over time from the youngest age at which marriage may occur. We assume the incidence of mortality to be the same for the single as for the total population and the single population to be depleted by two modes of decrement, namely, marriage and death. The following symbols will be used:

x: Age at years;

$_5n_x$: Five-year nuptiality rate for a single life at age x;

l_x: Number single at age x

$_5L_x$: Number of years lived as never married in the year of age (x, x+5)

T_x: Number of years lived as never married above age x

e_x^0: Expected number of years of single life remaining to a single person at age x

RESULT & DISCUSSION

The gross nuptiality tables for female nuptiality of rural population of Uttar Pradesh, India for the periods 1951-61, 1961-71,1971-81,1981-91 and 1991-01 have been constructed in the table 1-5 respectively.

Table 1: Gross Nuptiality Tables for Female Nuptiality of Rural Population of Uttar Pradesh, India for the Period 1951-1961

x	$_5n_x$	L_x	$_5L_x$	T_x	e_x^0
0	---	133	665	2640	20
5	---	133	665	1975	15
10	0.0677	133	643	1310	10
15	0.4435	124	483	668	5
20	0.9275	69	185	185	3
25	---	5	--	0	0

Table 2: Gross Nuptiality Tables for Female Nuptiality of Rural Population of Uttar Pradesh, India for the Period 1961-1971

x	$_5n_x$	L_x	$_5L_x$	T_x	e_x^0
0	---	335	1675	6738	20
5	---	335	1675	5063	15
10	0.0299	335	1650	3388	10
15	0.4492	325	1260	1738	5
20	0.9330	179	478	478	3
25	---	12	---	0	0

Table 3: Gross Nuptiality Tables for Female Nuptiality of Rural Population of Uttar Pradesh, India for the Period 1971-1981

x	$_5n_x$	L_x	$_5L_x$	T_x	e_x^0
0	---	547	2735	11603	21
5	---	547	2733	8868	16
10	0.0128	546	2713	6135	11
15	0.2690	539	2333	3423	6
20	0.8934	394	1090	1090	3
25	---	42	---	0	0

Table 4: Gross Nuptiality Tables for Female Nuptiality of Rural Population of Uttar Pradesh, India for the Period 1981-1991

x	${}_5n_x$	L_x	${}_5L_x$	T_x	e_x^0
0	---	278	1390	6023	22
5	---	278	1385	4633	17
10	0.0036	276	1378	3248	12
15	0.1418	275	1278	1870	7
20	0.9958	236	593	593	3
25	---	1	---	0	0

Table 5: Gross Nuptiality Tables for Female Nuptiality of Rural Population of Uttar Pradesh, India for the Period 1991-2001

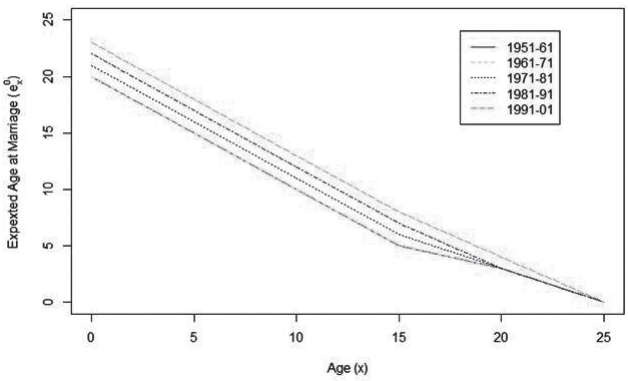
x	${}_5n_x$	L_x	${}_5L_x$	T_x	e_x^0	x
0	---	465	2320	10523	23	0
5	---	463	2308	8203	18	5
10	0.0348	460	2260	5895	13	10
15	0.0766	444	2135	3635	8	15
20	0.5366	410	1500	1500	4	20

First of all, it is observed that nuptiality rates for females are changing with time. However, no particular trend is observed for nuptiality rate for all the periods considered in the study. The rates decline in the period 1961-71 for all the age group with respect to the period 1951-61 and similar trend is observed for all the considered period. Initially, the rate is small at the age group of 10 and increase rapidly till reaches to maximum at the age group 20.

The expected number of years of single life remaining to a single person at age x is same for both the periods 1951-61 and 1961-71. Although, expected number of years increase for further periods that indicates that as time passes the age at marriage increases slowly but still it is more or less same at the age of 20 and 25. We have also attempted to show the trend through figure and from figure 1, we can clearly see that expected number of single life to a single person at age x is low for the period 1951-61 and high for the period 1991-01 i.e. clearly indicating that the age at marriage is increasing as the time passes.

Rural areas lagged behind urban areas in the shift to a later marriage age. The median age at first marriage among illiterate females in the aged 25-29 years was 14.4 years, and it was 20.4 years among females with a high school degree. In rural areas of Uttar Pradesh, marriage age varied by region. In rural areas, almost half of women age 15-19 have already married. Older women are more likely than younger women to have married at an early age; 57 percent of women who are now age 45-49 married before they were 15, compared with 20 percent of women age 15-19.

Figure 1: Expected Age at Marriage for Various Periods



Although this indicates that the proportion of women who marry young is declining rapidly, 62 percent of young women age 20-24 in Uttar Pradesh still marry before reaching the legal minimum age of 18 years. On average, women are more than four years younger than the men they marry.There were lots of studies related to fertility and mortality but very little, to nuptiality. One reason for this might be that striking changes have occurred in the past in fertility and mortality with little change in marriage. In India there is a trend of early marriage. The states like Madhya Pradesh, Bihar, Rajasthan and Uttar Pradesh have substantially lower age at marriage (NFHS-III). So there was need to have a detailed picture of the age patterns of marriage in these states.

The female marriage pattern exhibits wider variations from state to state in India with regard to magnitude and direction. But from the following table it was observed that in rural Uttar Pradesh highest frequency occurs in 10 - 15 age group.

CONCLUSION

Uttar Pradesh being the most populous and having almost lowest level of the mean age at marriage in the country received increasing attention to know what is happening to the age at marriage especially among females at the individual level. So, it has immense important for analyzing the marriage habits of a population, a systematic construction and analysis of nuptiality tables for the Indian population has not been attempted so far. In the field of marriage for the Indian population, it is proposed that construction and analysis of nuptiality tables over different periods would constitute a definite advancement in the study of Indian nuptiality. A comparative study of nuptiality tables over different periods may help us to determine the extent to which marriage rates with probabilities of marrying and the changing pattern of mean ages at marriage. In view of the above, this study examines nuptiality status in rural U.P., with particular reference to changes in marriage age over time.

Conflict of Interest: Nil

Source of Funding: Self

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Prevalence of Group a *Streptococcal* Infection among Healthy School Children in Chennai

B. Krishna Prasanth[1], S. Kalpana[2], N. Aravindha babu[3], K. M. K. Masthan[4], S. Bhuminathan[5]

[1]Assistant Professor & Epidemiologist, Department of Community Medicine, Ponnaiyah Ramajayam Institute of Medical Sciences, Manamai-Nallur, Chennai; [2]Research Officer, Department of Epidemiology, The Tamilnadu Dr. MGR Medical University, Chennai; [3]Professor, [4]Professor& Head, Department of Oral pathology, Sree Balaji Dental College & Hospital, Bharath Institute of Higher Education & Research,Chennai; [5]Registrar, Bharath Institute of Higher Education & Research,Chennai

ABSTRACT

Objective: To study the prevalence of Group A Streptococcal (GAS) carriers among healthy school children residing at Chennai.

Methods: A total of 730 school children were screened and enrolled to this study. Two throat swabs were collected from all the children irrespective of their symptoms. Throat swabs were cultured and bacterial culture was isolated and confirmed by streptococcal group identification kit. *Beta haemolytic streptococci* isolates were further sero-grouped by agglutination tests by using specific antisera.

Results: 730 school children between the age of 5 to 15 years were enrolled in this study. The mean age of the study group was 7.6 years. Out of the 313 culture positive cases, 217 (29%) were Group A *Streptococci*, 64 (8%) were Group B *Streptococci* , 18(2.4%) were Group C *Streptococci ,2*(0.27%) were Group D *Streptococci ,* 1(0.1%) were Group F *Streptococci ,* 2 (0.27%) were Group G *Streptococci and 9(1.2%*) were mixed Group C and F *Streptococci*. Among the 29% GAS positive children, 64% were transient carriers, 27% were recurrent carriers and 9% were chronic carriers.

Conclusion: All the GAS positive cases were referred to Primary Health Centre for treatment. Identification of the GAS and treating them, not only prevents them from developing non -suppurative complications, but also prevent the spread of GAS to their family members and other children.

Keywords: *Group A Streptococcus, carrier throat swab, asymptomatic children*

INTRODUCTION

The Group A *Streptococci* (GAS) is a form of β-hemolytic Streptococcus which causes several suppurative and nonsuppurative infections.It is responsible for most cases of sore throat/pharyngitis and rheumatic fever. Other types (B, C, D, F and G) may also cause throat infection. In India ,Sore throat remains the most common problem encountered in school going children and isolation rate of GAS in children with pharyngitis have ranged from 4.2% to 13.7%[1, 2], which is comparable to the rates reported from other developed countries. The Group A *Streptococcus* (GAS) associated diseases and sequelae continues to have a devastating effects on the public health and the national economy, as they mainly affect children and young adults[3]. GAS frequently gets colonized in the throats of asymptomatic persons. There are few studies which have described the natural history of the pharyngeal carriage with GAS[4]. A *streptococcal* carriage has been defined as the recovery of GAS from the nasopharynx or the oropharynx in the absence of any evidence of an acute infection[5].GAS has remained a significant human pathogen for centuries. It causes a wide variety of infections in humans, which range from mild upper respiratory and skin infections

Corresponding Author:
Dr. B. Krishna Prasanth
Assistant Professor & Epidemiologist,
Department of Community Medicine,
Ponnaiyah Ramajayam Institute of Medical Sciences,
Manamai-Nallur, Chennai
Email: mail2kristain@gmail.com

to non-suppurative sequelae like Acute Rheumatic Fever (ARF) and Rheumatic Heart Disease (RHD). Although ARF and RHD have declined in many parts of the world, they continue to be major causes of cardiovascular morbidity and mortality in India[6]. Prompt diagnosis and treatment not only shortens the duration of clinical illness and the transmission of disease, but also helps in preventing complications such as Rheumatic fever & Acute glomerulonephritis. Irrational use of antibiotics should be avoided in individuals who turn out negative on throat culture.

MATERIALS AND METHOD

A total of 730 (400 boys and 330 girls) healthy school children from Chennai,studying in class V were enrolled in to this study. The age of the study group ranged from 5-15 years.The school children were selected based on the inclusion criteria such as absence of URT infection, no antibiotic treatment in the past one month before taking the samples and no history of adenoids or tonsillectomy. Those who had undergone treatment previously were excluded from the study. Institutional ethical clearance was obtained and after obtaining informed Consents/ assent from the school authority and the parents, the students were enrolled in to the study. Two throat swabs were collected and inoculated to 5% sheep blood agar plates The streaked plates were incubated at 37° C for 24 to 48 hours. All the *beta haemolytic* colonies were identified and sero grouped by the latex agglutination method .The latex kit identifies the groups A, B, C, D, F and G of the Lancefield group of *Streptococci*.

Two swabs were collected at an interval of 2 months to classify them as transient (first culture- positive and the subsequent two cultures- negative), recurrent (first two cultures- positive and the third culture- negative) and chronic carriers (all the three cultures positive).

RESULTS

Totally 730 children were enrolled in to this study. The mean age of the study group was 7.6 years. Out of the 313 culture positive cases, 217 (29%) were Group A *Streptococci*, 64 (8%) were Group B *Streptococci* , 18(2.4%) were Group C *Streptococci ,2*(0.27%) were Group D *Streptococci ,* 1(0.1%) were Group F *Streptococci* and 2 (0.27%) was Group G *Streptococci and 9(1.2%*) were mixed Group C and F *Streptococci*. Among the 29% GAS positive children, 64% were transient carriers, 27% were recurrent carriers and 9% were chronic carriers. Male children were more affected with GAS infection than females according to this study.

Table 1: Age distribution of GAS positives cases

Age in years	GAS	GBS	GCS	GDS	GFS	GGS	Mixed	Total
5-8	107	18	8	0	0	0	8	141
8-10	34	38	3	2	1	0	1	79
10-12	36	8	5	0	0	2	0	51
13-15	40	0	2	0	0	0	0	42
Total	217	64	18	2	1	2	9	313

Table 2: Gender wise distribution of GAS positive cases

Age in years	GAS		GBS		GCS		GDS		GFS		GGS		Mixed		Total
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
5-8	77	30	15	3	6	2	0	0	0	0	0	0	5	3	141
8-10	19	15	27	11	2	1	2	0	1	0	0	0	1	0	79
10-12	25	11	8	-	4	1	0	0	0	0	2	0	0	0	51
13-15	32	8	0	0	-	2	0	0	0	0	0	0	0	0	42
Total	153	64	50	14	12	6	2	0	1	0	2	0	6	3	313

DISCUSSION

In the present study, the carrier status of GAS (29%) among culture positives seems to be very high compared to other studies done in India. Other studies have reported that the carrier status of GAS were between 2.5-14.3% [7,8], 8.4% in Chennai[9],2.3% in Vellore. The epidemiological picture of streptococcal infections in India is quite different from that of other developed

countries, suggesting the existence of some serotypes within a population in some particular geographical locations.

The GAS throat carriage is an important public health issue, as the infection often leads to post *streptococcal* sequelae and also there is increased risk of transmission to family members and other children in the community (10).

The prevalence of GAS was high among males compared to female according to this study, while some studies have reported that the prevalence of β-haemolytic streptococcal pharyngitis was higher among females than males in Delhi and other places in India [(11)], others have reported that GAS pharyngitis did not vary according to sex . Prevalence of other streptococcal groups such as group C and group G which are genetically related to GAS is very low according to the present study. [(12)] Other group of streptococcus may also carry virulence factor of GAS and may lead to major complication like acute renal failure and hence this study highlights the need for preventive measures and awareness among school going children about personal cleanliness, mode of transmission of the disease, identifiaction of symptoms and prompt referral to the physician when in need. This study also throws insight in to the importance of providing clean water, proper drainageand hygenic sanitation in schools as a community prevention measure.

CONCLUSION

This study highlights the importance of regular surveillance to keep the GAS carriage in control, by treating the infected children with antibiotics at the appropriate time. Identification of GAS carriers and treating them, not only prevents these children from developing non -suppurative complications, but also prevents the spread of GAS infection to their family members and others in community.

Ethical Approval: This study was appoved by the ethics committee of The Tamilnadu Dr.MGR Medical University with reference ECMGR0309030

Conflicts of Interest: none

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A Retrospective Study of Clinical and Ultrasound Correlation in the Diagnosis of Acute Appendicitis

N. Parthiban[1], N Sundharrajan[2], B. Krishna Prasanth[3], N Pavan Kumar[4], Thota Siddhartha[5]

[1]Assistant Professor, [2]Post Graduate, Department of General Surgery, Aarupadai Veedu Medical College and Hospital, Pondicherry; [3]Assistant Professor & Epidemiologist, Department of Community Medicine, Ponnaiyah Ramajayam Institute of Medical Sciences, Chennai; [4]Post Graduate, Department of Radiology, Sree Balaji Medical College and Hospital, Chennai; [5]Post Graduate, Department of General Surgery, Aarupadai Veedu Medical College and Hospital, Pondicherry

ABSTRACT

Acute appendicitis is a one of the common abdominal emergency with a lifetime prevalence of about 7 %[1]. Diagnosis of acute appendicitis includes clinical examination, laboratory tests, diagnostic scoring systems, computer programs as physician aids and imaging examination. The clinical diagnosis of acute appendicitis remains a challenge to physicians and surgeons with a significant portion of patients initially misdiagnosed due to atypical clinical presentations and nonspecific laboratory tests. Diagnostic scoring systems show wide variance in the diagnostic accuracy of the condition. Hence imaging modalities like ultrasound has gained major importance in the diagnostic work-up of patients with suspected acute appendicitis in order to keep both the negative appendectomy rate and the perforation rate low. Delay in diagnosis increases the risk of perforation and associated complications. Now, Ultrasonography (USG) is used to facilitate the diagnosis of acute appendicitis in an increasing extent in the current scenario in order to minimize the chances of both its under-diagnosis and over-diagnosis. The objective of this study is to determine if USG could change the clinical decision in the management of suspected acute appendicitis.

Keywords: *acute appendicitis, ultrasound, appendicectomy*

INTRODUCTION

Acute appendicitis is one of the most frequently encountered acute surgical emergencies and the diagnosis can often be made clinically[2,3]. Even in typical presentation, the diagnosis of acute appendicitis can be a little challenging. On the other hand, atypical presentation is never uncomplicated, thus patients may end up either in negative appendicectomies (i.e. false positive cases) or the surgery may be delayed with adverse outcomes[3]. Alvarado has pioneered a scoring system which was later modified by Kalan et al[4,5]. Including a valuable diagnostic tool like ultrasonographic imaging to clinical diagnosis has been considered to upgrade the positive predictive value of acute appendicitis. And this has aided in minimizing the negative appendicectomy rates[6,7]. Both Ultrasound scan and computed tomography have been shown to be efficacious in this aspect. Yet the decision making continues to be a diagnostic challenge.

The aim of this study was to determine the accuracy of clinical and radiological assessment in diagnosing acute appendicitis and therefore to ascertain whether preoperative ultrasonography would alter the clinical decision in the management of a suspected acute appendicitis.

METHODOLOGY

This is a retrospective analysis of a prospectively maintained data and therefore no ethical clearance was sought for. Records of patients who underwent appendicectomy from March 2015 to September 2016 in a tertiary level care hospital were analyzed. A total of 66 patients who had full records of Modified Alvarado Score (MAS) assessed by a consultant, ultrasound scan findings, operative findings and postoperative histopathological reports were selected. The elements of MAS together with values assigned to each parameter are as follows,

Ÿ Migratory right iliac fossa pain (1 point)

Ÿ Tenderness in the right iliac fossa (2 points)

Ÿ Rebound tenderness in the right iliac fossa (1 point)

Ÿ Anorexia (1 point)

Ÿ Nausea/vomiting (1 point)

Ÿ Fever >37.5°C (1 point)

Ÿ Leukocytosis (2 points)

Ultrasound was performed by a consultant radiologist for the respective purpose. Ultrasound detection of a non-compressible blind ending tubular structure of more than 6mm in diameter noted in the right iliac fossa (RIF) (or right hypochondrium (RHQ)), free fluid in RIF, presence of appendicolith and or increased appendicular vascularity were considered positive for acute appendicitis radiologically. Failure to spot appendix or detection of normal appendix was regarded as a criterion for negative ultrasound scan. These 66 patients were divided into 3 categories.

First category was those patients whose score was 7 or more points in MAS and they were considered to be having clinical appendicitis. They were taken up for appendicectomy irrespective of ultrasound scan findings. Others with a lesser score underwent appendicectomy only when the ultrasound scan showed a positive finding.

The second category comprised of those who underwent appendicectomy despite a MAS of 4-6 and negative ultrasound scan findings. This group was observed for progression of symptoms without starting antibiotics. Since their score either remained the same or escalated over the ensuing 1-2 days, they were also deemed to be clinically positive for acute appendicitis.

The third set of patients comprised of those who underwent appendicectomy with MAS of 2-3 with positive ultrasound findings.

Those who were taken up for surgery had it done either laparoscopically or by the conventional open method depending on the practicality of the emergency list. All laparoscopic and open appendicectomies were undertaken by a consultant surgeon.

Definitive diagnosis of appendicitis was made either by

- Macroscopic appearance intraoperatively and/or
- Histologically in case of less obvious macroscopic findings.

Macroscopic appearance such as noncompressible distended appendix with features of red serosa and with prominently distended vessels along the whole length of appendix contributes to a diagnosis of a grossly inflamed appendix. Meanwhile, only distension of appendix with dilated vessels coursing along the appendix without inflamed serosa is considered as minimally inflamed appendix. Histological diagnosis of appendicitis was made in cases with transmural infiltration of appendix with neutrophils or scattered neutrophils in appendeceal mucosa.

RESULTS

Over the study period, 56 patients aged from 9 to 83 years underwent preoperative ultrasonography. Male to female ratio was 57:43. 40 patients underwent laparoscopic appendicectomy and 16 patients, open appendicectomy. Patients who underwent appendicectomy includes those from MAS of 2-9 (Table 1).

Table 1: Summary of Distribution of Patients in Each Category of MAS

Alvarado score	Total number of patients	Findings of Ultrasonography	Inflamed Appendix	Non Inflamed Appendix (Macroscopic or Microscopic)
2-4	10	Positive-10	8	2
		Negative-0		
5-6	8	Positive -5	8	0
		Negative -3		
7-9	38	Positive -26	36	2
		Negative -12		

There were 10 patients who scored MAS of 2 to 4. Their sonographic findings confirmed all of them to have appendicitis, out of which only 8 patients had inflamed appendices.

Five out of eight patients in the category of MAS 5-6, were detected to have sonographic evidence of inflamed appendices. Sonographic findings of acute appendicitis were evident in 26 out of 38 patients admitted with MAS of 7, 8 and 9. Out of the remaining 12 patients in this category, 10 had inflamed appendices in spite of not being visualized by USG. Overall, 41 out of 56 patients were reported positive via ultrasonography, out of which 39 patients had appendicitis. Out of 15 negative sonographic findings, 13 actually had inflamed appendices. Therefore, ultrasonography in our study has an overall sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and disease prevalence of 75%, 50%, 95%, 13.3% and 92.86% respectively (Table 2).

Table 2: Summary of Overall Comparison of USG and Clinical Findings

	Ultrasonography		Clinical Examination	
	Positive	**Negative**	**Positive**	**Negative**
Inflamed	39	13	46	8
Non Inflamed	2	2	0	2
Sensitivity	75%		85%	
Specificity	50%		100%	
Positive Predictive Value	95%		100%	
Negative Predictive Value	13.3%		20%	
Disease Prevalence	92.86 %		96.4%	

Inflamed appendices were found in 44 out of 46 patients, who were clinically positive for appendicitis. 8 out of 10 patients who were clinically negative had inflamed appendices. Overall, for clinical examination, our results showed sensitivity, specificity, PPV, NPV and disease prevalence of 85%, 100%, 100%, 20% and 96.4% respectively (Table 2).

DISCUSSION

In routine clinical practice, the decision to undertake appendicectomy hinges on clinical grounds and it is usually undertaken without preoperative imaging in most of the cases. However, this strategy is likely to result in negative appendicectomies particularly in atypical presentations. It is extensively believed that preoperative imaging with USG and computerized tomography (CT) scan can curtail the negative appendicectomy rate[6,7]. We made a retrospective analysis to ascertain if performing a routine preoperative USG would change the clinical decision in undertaking appendicectomy.

There were 18 patients admitted belonging to MAS of 2-6.

3 out of the 18 patients had negative findings in USG. However, owing to persistent pain over the subsequent 1-2 days, they were suspected to have appendicitis clinically, in spite of a negative finding in USG. After they underwent appendicectomy, it was found that all three of them had inflamed appendices.

10 of these 18 patients did not have clinical features strong enough to warrant appendicectomy on clinical grounds alone (all of these patients had their Full Blood Count done as a part of MAS and the urine reports excluded urinary tract infection as the cause for abdominal pain). Nevertheless, their USG suggested acute appendicitis and hence all of them (10 patients) proceeded to appendicectomy. While 8 of them had appendicitis, 2 had normal appendices. These 10 patients with MAS of 2-6 did not have compelling features to undergo appendicectomy on clinical grounds alone. If not for the positive USG findings, they would have either been prematurely discharged or kept under observation which would have ultimately extended the period of their hospital stay.

Therefore, it can be inferred that those 10 patients were operated promptly, attributed to the additional evidence provided by the USG. Accordingly, USG in this category of patients has allowed not only timely intervention with overall presumed benefit of reduced hospital stay, but also has minimized the potential complications associated with delayed diagnosis. Consequently, it could be argued that ultrasonography, in our study, has positively contributed to change the mode of management of 10 patients in otherwise clinically unsuspected acute appendicitis.

Although this approach, i.e., USG directed surgical decision in this category has given rise to negative appendicectomy rate of 20% (2/10) it still within the

acceptable negative appendicectomy range[8]. It is far below the negative appendicectomy rate of 40% (2/5) observed for clinically guided appendicectomy in this category of patients. Ultrasonography, in evaluating this group of patients has shown superior sensitivity, PPV, NPV and disease prevalence in comparison with those of clinical examination.

Contrarily, USG paints a different picture in assessing patients having high probability of acute appendicitis. Total number of patients belonging to this category (MAS of 7-9) was 38 and all of them underwent appendicectomy based on clinical diagnosis alone. All, except 2 patients had inflamed appendices. Ultrasonography, however, detected inflamed appendices in only 68% cases (26/38), all of whom had appendicitis. Only 2 of the remaining 12 patients had normal appendices while others (10 patients) clearly had inflamed ones. The assessment of patients with USG in this cohort seems to be inferior to clinical assessment as shown by high sensitivity, PPV and NPV for clinical examination, each rated above 95%. Although USG has marginally higher PPV, it has a very low NPV of 13%. Therefore normal USG in this cohort is unreliable, because such negative findings are unlikely to change the mode of management in this category (with MAS of 7-9) of patients. This finding in our study supports the conception of performing appendicectomy on clinical grounds alone irrespective of USG findings in those admitted with typical history of acute appendicitis.

CONCLUSION

Ultrasound scan is an important and inevitable imaging modality in evaluating patients with suspected acute appendicitis with equivocal presentation with MAS of less than 6 points. It is likely to deliver important decision making findings to the overall management of patients in said category. Henceforth, performing USG in this category is recommended.

Patients getting admitted with a typical history of appendicitis with MAS of 7-9 are unlikely to be benefitted from the findings of USG and performing a preoperative scan in this group is perhaps not mandatory.

Conflicts of Interest: None

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Association of HbA1c Levels with Body Mass Index in a Patient Diagnosed with Polycystic Ovary Syndrome

Zeina F. Fuad[1], Enas Jaleel Alobaidy[2]

[1]Department of Biochemistry, [2]Department of Obstetrics and Gynecology, College of Medicine, University of Diyala, Iraq

ABSTRACT

Polycystic ovary syndrome (PCOS) is thought to be the most well-known endocrine issue in ladies of regenerative age manifested with various metabolic disturbances and a wide spectrum of clinical features such as menstrual abnormalities, obesity, and hyperandrogenism. This study was aimed to measure the association between HbA_{1c} and body mass index (BMI) in PCOS women. This study was performed in AL-Batool hospital for obstetric and gynecological diseases in Ba'quba city/ Iraq May 2017 to January 2018. It includes 42 patients with PCOS aging from 20-37 years and 42 healthy control. Fasting venous blood samples were obtained for analysis of fasting blood glucose (FBG), hemoglobin (Hb) and HbA1c. BMI was calculated for all study participants by the present weight in Kg dividing by the square of height in meters. This study involved 42 cases of PCOS (case group) and other 42 participants were free of disease (control group). The mean age among patients of case group was significantly higher than that in control group (26.95 ± 4.77 versus 23.9 ± 2.71, P=0.015). 90.5% of patients in control group had normal BMI level while 42.9% of patients in the case group were class I obese. Mean of BMI among patients of case group was significantly higher than that of the control group (29.84 ± 4.22 versus 22.8 ± 2.02, P=0.001). According to HbA1c level, all patients in control group and 90.5% of patients in the case group were non-diabetic. The mean of HbA1c among patients of case group was significantly higher than that in control group (4.76 ± 0.88 versus 3.9 ± 0.6, P=0.001). In the present study, it was found that there is a significant positive correlation between HbA1c and BMI (r= 0.567, P= 0.001). BMI is positively correlated with HbA1c and associated with glycemic control in PCOS.

Keywords: *Correlation, HbA1c, BMI, PCOS*

INTRODUCTION

The most common endocrinopathy in women of reproductive age is Polycystic ovary syndrome (PCOS) which affecting about 21% of patients [1]. It manifested with various metabolic disturbances and a wide spectrum of clinical features like menstrual abnormalities, obesity, and hyperandrogenism. The current incidence of PCOS in women is related to change in lifestyle and stress [2]. Manifestations of androgen excess (e.g., hirsutism) may cause substantial distress in patients, and the PCOS is the most common cause of anovulatory infertility [3]. Patients with PCOS are at a higher risk for coronary heart disease (CHD) compared with healthy women (OR = 1.2 - 12.9), CVD (OR = 2.8 - 3.4), dyslipidemia (OR = 2.9 - 3.2), hypertension (OR = 1.4), impaired glucose tolerance (IGT) (OR = 2.5), myocardial infarction (MI) (OR = 2.6 - 4.2), metabolic syndrome (OR = 2.1) and obesity (OR = 1.9 - 2.4), type 2 diabetes mellitus (T2DM) (OR = 2.2 - 3.6) [4, 5, 6]. Insulin resistance is proposed as a key pathophysiological feature of PCOS contributing to both metabolic and reproductive disturbances [5]. Increased insulin leads to increased androgen production from the ovarian thecal cells and this hyperandrogenemia is responsible for androgenic obesity [10]. Among women with PCOS, there is increasing attention on the complications related to metabolic disturbances. An economic evaluation reported that about 40% of the financial expenses of PCOS can be ascribed to T2DM in

Corresponding Author:
Zeina F. Fuad
Department of Biochemistry,
College of Medicine, University of Diyala, Iraq
Contact: +9647703926080
Email: zenafarooq@yahoo.com

the USA. This highlights the requirement for prevention of long-term complications by appropriate screening, diagnosis and management [7]. International Diabetes Federation defined PCOS as a significant non-modifiable risk factor associated with T2DM [8] and patients with PCOS are also expected to have a more rapid conversion from IGT to T2DM [9]. A widely used marker of chronic glycemia is Hemoglobin A1c (HbA1c) which reflects the average blood glucose levels (BGL) over a two to three months' duration. It can be assessed in the non-fasting state as it has a higher repeatability than fasting glucose [11]. It may be affected by genetic, hematologic, and illness-related factors [12]. In patients with PCOS, the present screening recommendations for T2DM incorporate the measurement of fasting plasma glucose (FPG) and the utilization of an oral glucose tolerance test (oGTT, 75 g oral dextrose) in obesity, advanced age, individual history of gestational DM or family history of T2DM cases [13]. High HbA1c concentrations have been linked with other risk factors for CVD and the existence of metabolic syndrome in many other non-PCOS clinical conditions and populations [14]. It appears that a one percent increase in the absolute HbA1c concentration in patients with or without PCOS is related to a 10-20% increase in the risk of CVD [14, 15, 16]. Worldwide, the prevalence of high HbA1c in patients with PCOS has not yet been set up. Previous studies have stated that high HbA1c concentration was seen in 10% of patients with PCOS in Turkey and Austria [16, 17] and 31% in Korea [18].

PATIENTS AND METHOD

This study was approved by the approval of the Research Ethics Committee of Diayla university, Iraq which were performed at AL- Batool Teaching Hospital of Obstetric and Gynecological in Baquba city/ Iraq from May 2017 to January 2018. It includes 42 patients with PCOS aging from 20-37 years and BMI of 25 to40kg\ m2, who achieved criteria of PCOS (amenorrhea or oligoameanorreha and clinical or biochemical evidence of hyperandrogenism after excluding other pathology) , and 42 healthy control with regular menstrual cycle and not on any management were registered as controls. After getting printed consent from the cases and controls, full history was gained and noted in their respective preform. They were subjected to physical examination and anthropometric measurements, a pregnancy test was done to rule out pregnancy, ultrasonography of abdomen and pelvis were achieved in all subjects of this study. And exclude patients who had a history of any drug intake and pregnancy. Fasting venous blood samples were obtained for analysis of fasting blood glucose (FBG), hemoglobin (Hb) and HbA1c.

For determination of the concentrations of FBG and Hb in serum, the sensitive electrochemiluminescence immunoassay (ECLIA, Roche Diagnostics) on Cobas Integra 400 plus was used, while for HbA1c, Sysmex XT-2000i hematology analyzer was used which based on fluorescence flow cytometry technology. For anthropometric measurement, all study participants were measured by using a calibrated weighing scale and stadiometer. BMI is calculated by the present weight in Kg dividing by the square of height in meters.

RESULTS

This study involved 42 cases of PCOS (case group) and other 42 participants were free of disease (control group). Study patient's age was ranging from 20 to 37 years with a mean of 25.42 years and standard deviation (SD) of ± 4.13 years. The mean age among patients of case group was significantly higher than that in control group (26.95 ± 4.77 versus 23.9 ± 2.71, P=0.001). BMI of study patients was ranging from 18.9 to 38.2 Kg/m² with a mean of 26.32 ± 4.83 Kg/m². 90.5% of patients in control group had normal BMI level while 42.9% of patients in the case group were class I obese. Mean of BMI among patients of case group was significantly higher than that of the control group (29.84 ± 4.22 versus 22.8 ± 2.02, P=0.001) as shown in table (1).

Table 1: Age and BMI among patients' study groups

Variable	Study Group		P-value
	Case Group (Mean ± SD)	Control Group (Mean ± SD)	
Age (Years)	26.95 ± 4.77	23.9 ± 2.71	**0.001**
BMI (Kg/m²)	29.84 ± 4.22	22.80 ± 2.02	0.001

In this study, normal FBS was seen in 83.3% of study patients (100% in control group and 66.7% in case group). Regarding hemoglobin level, 76.2% of patients in case group had normal Hb level while 52.4% of patients in control group were anemic. About HbA1c level, all patients in control group and 90.5% of patients in the case group were non-diabetic (HbA1c < 6). (Figures 2, and table 2).

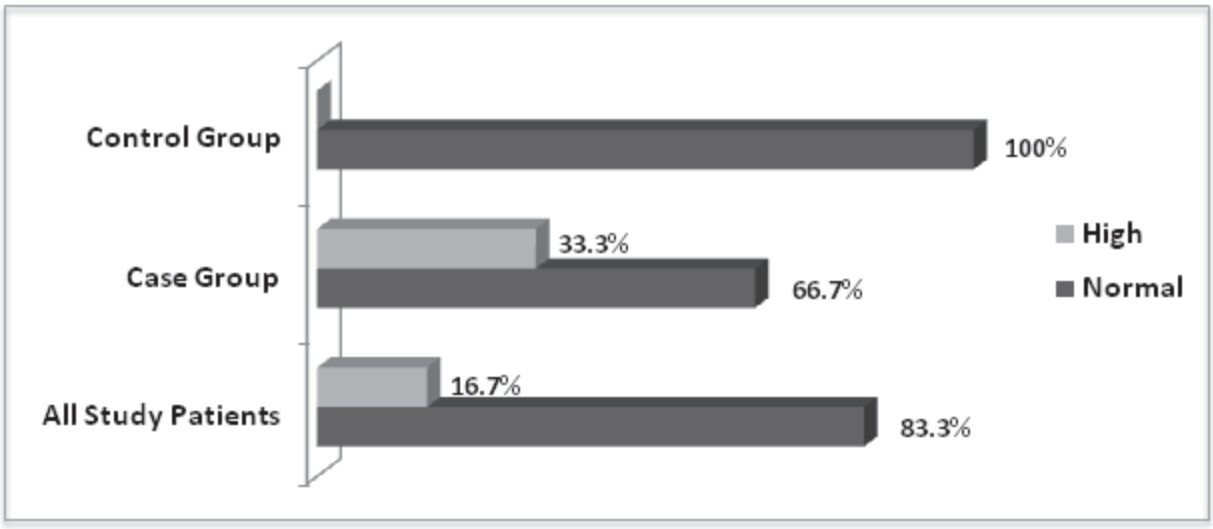

Figure 1: Distribution of study patients' groups by FBS level

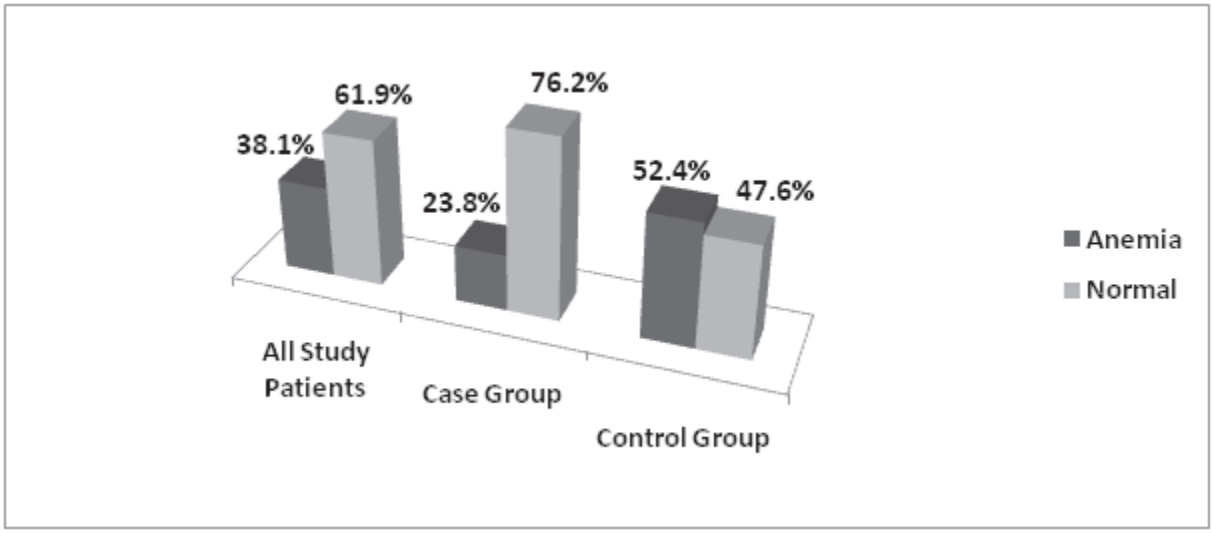

Figure 2: Distribution of study patients' groups by Hb level

Table 2: Distribution of study patients' groups by HbA1c level

HbA1c level	Study Group		Total No. (%)
	Case Group No. (%)	Control Group No. (%)	
Normal	38 (90.5)	42 (100.0)	80 (95.2)
Pre-Diabetes	4 (9.5)	0 (0)	4 (4.8)
Total	42	42	84

Comparison between study groups by means of FBS, HB, and HbA1c is shown in the table (3). We noticed that the mean of FBS among patients of case group was significantly higher than that in control group (95.87 ± 12.59 versus 88.09 ± 5.27, P=0.001). Regarding Hb, the mean of Hb among patients of case group was significantly higher than that in control group (12.82 ± 1.14 versus 12.03 ± 0.6, P=0.001). About HbA1c, the mean of HbA1c among patients of case group was significantly higher than that in control group (4.76 ± 0.88 versus 3.9 ± 0.6, P=0.001).

Table 3: Comparison between study groups by means of FBS, HB, and HbA1c

Variable	Study Group		P-value
	Case Group (Mean ± SD)	Control Group (Mean ± SD)	
FBS (mg/dl)	95.87 ± 12.59	88.09 ± 5.27	0.001
Hb (g/dl)	12.82 ± 1.14	12.03 ± 0.6	0.001
HbA1c (%)	4.76 ± 0.88	3.90 ± 0.6	0.001

In the present study, it was found that there is a significant positive correlation between HbA1c and BMI (r= 0.567, P= 0.001). (Figure 3)

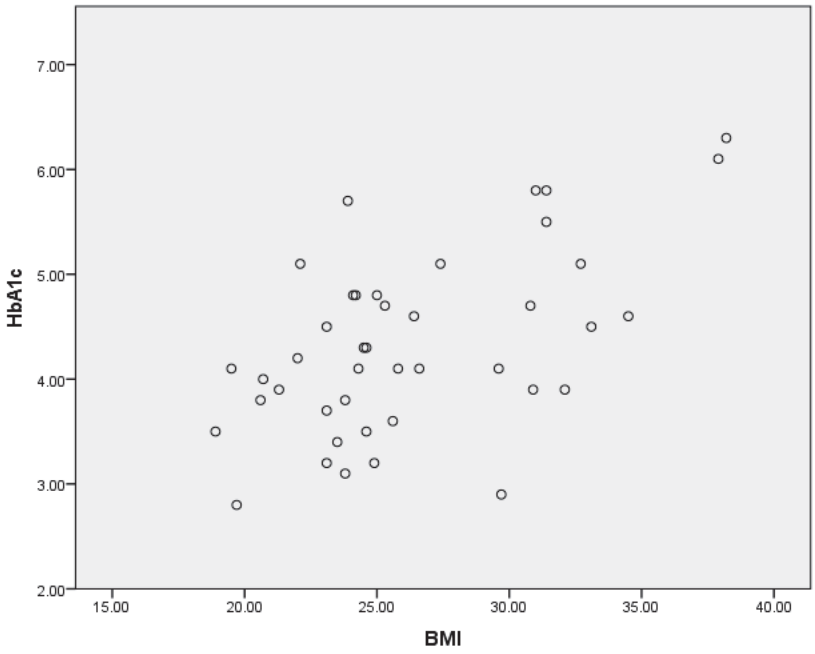

Figure 3: Correlation between HbA1c and BMI (r = 0.567, P = 0.001)

DISCUSSION

HbA1c is a commonly used marker of chronic glycemia, and it reflects the average BGL over a two to three-month duration. ADA (American Diabetes Association, 2013) has been suggested HbA1c as a screening tool due to its advantages over FG and OGTT such as greater convenience (fasting is not required) and less day-to-day variability during periods of stress or illness [16]. HbA1c is formed by the condensation of glucose with the N-end of each beta chain to form an unstable Schiff base. The Schiff base may dissociate or may undergo an Amador rearrangement to form a stable ketamine called as HbA1c. It has been established that HbA1c is an index of long-term blood glucose concentrations and as a measure of the risk for the development of microvascular complications in patients with diabetes mellitus [10]. Severe anemia can show false high HbA1c value as the old red blood cell (RBC) population is higher than non-anemic conditions. In hemolytic anemia, the HbA1c value is falsely low as the lifespan of RBC is less. Therefore, it is mandatory to rule out anemia in this study to avoid false results [19]. In this study, class I obesity was seen in 42.9% in patients with PCOS while 33.3% of them were overweighed (76.2% of patients with PCOS were above the normal BMI level)[20]. Both Lerchbaum Metal and Gomathi K et al [20,21] were found that the prevalence of obesity was 24.8% and overweight was 21.8% among PCOS women. This might be explained by a fact that excess triglycerides enter into cells and activate proteins kinase C-ε and C-θ, ultimately reducing the glucose uptake. This leads to compensatory hyperinsulinemia which can stimulate excess fat deposition by hypertrophy and hyperplasia of adipose cells in the excess calorie environment. This is further aggravating insulin resistance by increasing obesity as a vicious cycle [22].

This study showed a significantly higher mean of FBS, Hb, and HbA1c among patients had PCOS than that among control patients. In comparison, Bala M et al [10] was found a higher mean of FBS and Hb among patients had PCOS than that among control patients but this difference was statistically not significant while it showed a significantly higher mean of HbA1c in patients with PCOS than that in control patients, while Medeiros et al[23] concluded amongst amazonian PCOS women, that HbA1c was elevated in approximately 40% of PCOS patients and had a positive association with a number of anthropometric, metabolic causes and androgen levels[15, 23].

In the current study, observations showed that 17 cases (81%) had increased BMI (≥ 25 Kg/m2) and two cases of them (9.5%) had an increased HbA1c

(prediabetes). No cases had both normal BMI and increased HbA1c levels. Among controls, we found that 9.5% of them had increased BMI and no one had increased HbA1c. Though obesity is more prevalent among PCOS women, about 19% of PCOS women are not obese. Hyperinsulinemia causes direct hypothalamic effects which lead to abnormal appetite and gonadotropin secretion resulting in increased LH secretion in PCOS. This increased level of LH causes excessive androgen production in the ovaries [24].

In the present study, it was found that there is a significant positive correlation between HbA1c and BMI (r = 0.567, P = 0.001). This result was in accordance with Kumar A et al and Medeiros et al [23,25] were are found that HbA1c had a positive correlation with BMI (r = 0.265, P = 0.001). Another agreement had been reported in a study conducted with Bala M [10] when it concluded a positive correlation of HbA1c with BMI (r = 0.439, p =.001).

CONCLUSION

HbA1c was elevated in nearly 9.5% of PCOS patients and it showed a positive correlation with BMI, so BMI could be associated with glycemic control in PCOS. Future clinical studies ought to be led to better understand the association and correlation of HbA1c with BMI in PCOS patients.

Conflict of Interest: The author declares no conflict of interest.

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Appraisal of Nurses' Knowledge and Attitude Regarding Infection Control Measures

Dergham Majeed Hameed[1], Ali Hussein Ali Aldakheel[2], Sameer Razzaq Oleiwi[3]

[1]Assistant Professor, PHD Degree in Nursing Science, [2]Assistant Instructor, Master Degree in Nursing Science, [3]Instructor, PHD in Nursing science, AL Muthanna University, Iraq Al Muthanna city

ABSTRACT

Background: Infection control continuously is a major part of nursing role. This role increasingly became a primary preventive cause of many diseases well as a vital part in decreasing hospital risks, stay and cost which are a vital aim of all medical care and nursing precisely.

This study aims to: Assess the nurses' knowledge and attitude toward infection control, Al Hussein General Hospital, 2018.

Method: Descriptive design was used. In total 140 nurses in Al Hussein General Hospital were self-administered questionnaire, including five parts to assess their knowledge and attitude regarding infection control.

Results: Showed that knowledge level and attitude regarding prevention and control of infection.

Conclusion: Nurses' knowledge and attitudes needs frequent training to update their knowledge and attitudes toward infection control.

Recommendations: Providing specific pre-service and in-service training program periodically about infection control to up to date knowledge, attitude, and experience.

Keywords: *nurses; infection control; knowledge; prevention.*

INTRODUCTION

The millstone of prevention of almost all contagious diseases is proper infection control policy and application. Nurses are the primary health team member in fighting infection inside and outside the hospitals by their knowledge, attitude and application of infection control all the time in all health care settings [(1)]. Elisabete et al 2013, support these aspects regarding the importance of nursing adherence to infection control measures [(2)].

Contagious are diseases caused by infectious agents. These agents mainly present in hospital among patients [(3)]. Alnoumas, et al mentioned that health care staff has the opportunity to increase the risk of infection or decrease it according to their level of performance regarding infection control of diseases and accordingly decrease hospital stay and affect patients' wellness [(4)]. The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) mentioned that, health care–associated infections (HAIs) are an important issue in medical care aspect as they 7.6% of hospitalized patients will acquire a HAI [(3, 5, 6)].

Infection control in hospital includes isolation precautions and specific organism infection control and second part is crucial parts of nursing care inside and outside the hospital [(7)].

The Standard Precautions as published by the CDC in 1996 and updated in 2015; are thither protocol wander prepare for transmission of infection in different healthcare settings [(8,)]. Infection transmission occurs instantaneously enclosing the 6 elements of the "Chain of Infection" is present and compatible [(9)].The most important thing is application of this knowledge into

Corresponding Author:
Dr. Dergham Majeed Hameed
Assistant Professor
PHD Degree in Nursing science
AL Muthanna University, Iraq Al Muthanna city
Email: derghamsuh@yahoo.com

actual practice all the time mainly by nurses [10]. Standard safety measures to break the Chain of disease are the fundamental and best way to anticipate transmission of contamination.

Here it come the importance of collecting data about nurses' knowledge and attitude toward infection control in order to maximize these knowledge and enforce positive attitude toward infection control practice.

The point of the investigation:

This investigation means to: To survey medical caretakers' learning and state of mind with respect to counteractive action and control of contamination, in Al Hussein General Hospital, 2018.

MATERIAL & METHOD

Research Design: The unmistakable research configuration was utilized to complete this examination.

Setting: This investigation was directed at Al Hussein General Hospital.

Subjects: 140 of medical caretakers took an interest in this examination were chosen from attendants working in most healing center wards, and consented to take part in the investigation and finish the survey were incorporated into the investigation.

Subjects Estimation method:

Epi info Program version 7

Population size =280

Expected frequenc5%

Acceptable error=5%

Confidence coefficient=90%

Minimum size=140

Tool: One tool was used for data collection "Nurses' knowledge and attitude of infection control ", self-administered questionnaire, it consisted of five parts [11]. First part was regarding demographic profile, nurses' qualifications, educational and training background and their knowledge source. Second part was regarding using standard precautions regarding different infectious diseases. Third part was concerned with using of equipment to protect nurses from infection transmission. Fourth part concerned with nurses' compliance of application of infection control measures. Fifth part includes questions regarding the conditions of applying infection control measures or not. All parts were modified by the researchers with scientific jury consultation after reviewing literatures.

Statistical analysis of the data [12]

Information was encouraged to the PC and investigated utilizing IBM SPSS programming bundle adaptation 20.0. (Armonk, NY: IBM Corp) [13] Subjective information was portrayed utilizing number and percent. Quantitative information was depicted utilizing range, mean, and standard deviation. The criticalness of the acquired outcomes was judged at the 5% level.

Scoring system of knowledge:

	Incorrect answer	Correct answer
Score	0	1
Percent score = sum score/max. score x100		

METHOD

To carry out the study:

1. Authorization to lead the investigation was acquired from the senior of the Faculty of Nursing, the director and the nursing director of Al Hussein General Hospital.
2. Tool was adopted from Mitchell (2014) and modifications were done by the researchers after consultation jury of five expertise's in medical-Surgical nursing and nursing education for validity of the tool in our society.
3. Reliability of the tool using test-retest and proved to be reliable (r= 0.955).
4. Pilot study was carried out on approximately 10% of the sample to test the clarity and applicability of the tool. Accordingly, the necessary modifications were done.
5. Tool was distributed for data collection to nursing in all hospital units after explaining the purpose of the study, the researcher stayed with the nurses to explain any misconceptions and the expected time for completing the tool was about 30 minutes.
6. After completion of data collection, the necessary statistical analysis was done.

RESULTS

The investigation was completed to evaluate medical attendants' information and attitude regarding control of contamination, in Al Hussein General Hospital, 2018. Dispersion of the examined cases indicated by demographic-statistic information, they divided into nurses and nurses assistant, studying nursing years with mean 3.91 ±1.33 and experience years mean 9.26 ±8.68.

Table 1: Dispersion of the examined cases according to demographic data (n = 140)

	No.	%
Job		
Nursing	120	85.7
Nursing assistant	20	14.3
years of studying nursing		
Min. – Max.	1.0 – 9.0	
Mean ± SD.	3.91 ± 1.33	
Years of experience		
Min. – Max.	0.01 – 36.0	
Mean ± SD.	9.26 ± 8.68	

Table (2): the mean value of nurses' knowledge regarding using standard precautions was (21.07 ± 5.53). As regard to nurses' attitude toward infection control measures the mean value was (8.02±3.18). Regarding barriers of disease infection control the mean value was (4.98±2.29).

Table 2: Nurse's knowledge scores about infection control measures domains

	Mean value
Knowledge regarding using standard precautions	
Total score	
Min. – Max.	7.0 – 32.0
Mean ± SD.	21.07 ± 5.53
% score	
Min. – Max.	16.67 – 76.19
Mean ± SD.	50.17 ± 13.16
Attitude regarding application of infection control measures	
Total score	
Min. – Max.	0.0 – 14.0
Mean ± SD.	8.02 ± 3.18
% score	
Min. – Max.	0.0 – 87.50
Mean ± SD.	50.13 ± 19.90
Barriers of disease infection control	
Total score	
Min. – Max.	0.0 – 10.0
Mean ± SD.	4.98 ± 2.29
% score	
Min. – Max.	0.0 – 100.0
Mean ± SD.	49.79 ± 22.87

Table (3): there was no factual noteworthy between medical attendants' learning of contamination control measure areas with statistic information.

Table 3: Relation between nurse's knowledge of infection control measures domains with demographic data

	Knowledge regarding using standard precautions	Attitude regarding application of infection control measures	Barriers of disease infection control
Job			
Nursing	68.91 ± 11.94	68.18 ± 15.73	72.08 ± 17.48
Nursing assistant	67.38 ± 11.06	63.13 ± 12.65	66.0 ± 19.30
t(p)	0.535(0.593)	1.363 (0.175)	1.419 (0.158)
Qualification			
School	70.24 ± 5.67	67.19 ± 7.86	67.50 ± 9.57
Diploma	68.36 ± 12.16	65.83 ± 14.69	68.44 ± 20.88
Technical	66.34 ± 11.24	68.01 ± 16.89	74.12 ± 18.13
BSC	72.35 ± 12.83	69.15 ± 15.39	72.58 ± 13.16
Master	76.19 ± 6.73	56.25 ± 8.84	60.0 ± 0.0
Others studies	68.71 ± 9.95	69.64 ± 14.63	67.14 ± 17.04
F(p)	1.194(0.315)	0.420(0.834)	0.786(0.562)

t, p: t and p values for **Student t-test**

F,p: F and p values for **ANOVA test**

*: Statistically significant at $p \leq 0.05$

DISCUSSION

As indicated by the WHO, 7.1 million instances of HAI happen each year. One out of each 20 individuals experiences healing facility disease. This prompts 99,000 instances of death consistently and forces an expected cost of $ 32 million to society [14]. The major important concept to prevent infection is using the professional knowledge and adopting positive and right attitude to carry out the universal precautions to prevent infection [15]. At the same time, through doctor's facility treatment for intense maladies, individuals with long haul infections will cure as well and clinic treatment will turn out to be more modern and subsequently healing center stay will be longer which this leads in to [16].The imperative way in preventing infection is the understanding of infection control basics as universal precautions. There was a significant relation between infection rate in health care setting and increasing awareness among health care team members [17].

Nurses are the first line and the most important health team members in preventing infection as they contact patients each moment daily [16]. Subsequently, the point of this examination was to evaluate medical attendants' learning and state of mind with respect to avoidance and control of disease, in Al Hussein General Hospital 2018.

The aftereffects of the present examination demonstrated that 89.3% of medical attendants detailed that they are in need to enhance their insight about disease control measures. In this quintessence, Kable, Visitor, and McLeod (2011) found that only 33% of their contemplated medical attendants went to in-benefit instructional classes about contamination control to improve their knowledge [18]. In this regards, (Rasslan, 2011) decided that it is very important to have a more complete and comprehensive training program in order to have qualified professionals to take over infection prevention and control activities [19].

As regard for knowledge regarding using standard precautions the studied nurses had poor knowledge, which may be resulted from surrounding circumstances as the ware years in Iraq. In this essence Sarani etal. (2016) found that about half of their studied nurses had poor knowledge [20], while, Yang Luo et al. found that nurses had average level of knowledge about infection control [21].

The findings of the present study showed that most studied nurses had moderate attitude about infection control as they comply to infection control guideline as they comply with the routine policy of the hospital and they missing the role model either from head nurses or physicians. Findings of Sarani etal. (2016) is consistent with the present findings as they reported that the nurses in their study had a moderate attitude toward infection control [20]. Also, Ibrahim and EL-Shafie concluded that the overall attitude of medical understudies is an uplifting demeanor toward contamination control measures yet does not impact consistency with the affirmed disease control rules [22]. In contrary of that Chisanga (2017) found that nurses had positive attitude toward infection control but they had not enough time to comply with guidelines and they are work loaded [23]. Naderi study (2017), the participants gained high scores, which speaks to that most work force demonstrated an uplifting demeanor towards disease control accepts [24].

As for the connection between medical attendants' information of contamination control measures area and their statistic information, there was no noteworthy connection between medical attendants' involvement and their insight scores; this has concurred with El-Syed etal. (2015) as she found the discoveries [25] while the consequences of the two examinations negating with Whyte, Ward, and Eccles (2009) who consider the connection amongst information and clinical execution in the learner and experienced basic care medical caretakers and discovered expanded when encounter expanded [26].

CONCLUSION

This study was conducted on nurses and nurses assistant in at general hospital in Al Hussein - Iraq to assess their knowledge and attitude toward infection control. This study confirms that nurses' needs frequent training to update their knowledge and as a result improve their attitudes toward infection control.

Recommendation: Based on the present study results it is recommended that: health institutes needs to plan regular educational programs on infection control and universal standard precautions which focus on both

nurse and patient safety in in-services training, include infection control courses in nursing institutes and faculties of nursing.

Ethical Clearance: Prior permission was taken from the Dean Nursing college ethics committee before conducting the study.

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Conflict of Interest: Nil

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