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Original Research Article

Physical activity pattern and its impact on overweight and obesity in south Indian school children, a community based cross sectional study

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Abstract

Background: The burden of childhood obesity and overweight is constantly on the rise across the globe and India. Inadequate physical activity is considered as one of the strong risk factors for this increased burden. Studies on the subject in school children are scarce. **Objectives:** To assess the physical activity pattern and its impact on overweight and obesity in south Indian school children. **Materials & methods:** The study was a cross sectional study, undertaken in private schools of Belgaum City, Karnataka. Out of 92 schools, eight schools were selected, with 2 schools representing each of the 4 zones of the city. A total of 600 children with 75 children from each school were included. Overweight and obesity were defined basing on Based on WHO and International obesity task force (IOTF) BMI cut-off standards for Asia and India. **RESULTS:** The proportion of overweight and obese children was 18.33% (95% CI 15.7% to 21.96%) in the study population. Out of this the proportion of overweight was 11.33% (8.79% to 13.87%) and the proportion of obesity was 7.5% (5.39% to 9.61%). In 60% of the kids have reported jogging frequency less than once a week. Very few children (about 15%) reported regular skipping. Daily participation in outdoor games was reported in 33% of the children. The proportion of children reporting the presence of good playground was 87.67%. The frequency of participation in Physical education in school once, twice and thrice weekly was 14.50%, 76.33%, and 9.17% respectively. The factors, which have shown statistically significant association with reduced risk of obesity, were daily or alternative day participation in aerobic activities like jogging, skipping and swimming. The absence of playground at school was a strong risk factor for increased risk of overweight and obesity (OR=2.89, 95% CI 1.22 to 6.84, p value 0.16). **Conclusions:** The burden of overweight and obesity is high in school children. The factors, which have shown statistically significant association with reduced risk of obesity were daily or alternative day participation in aerobic activities like jogging, skipping and swimming. Absence of playground at school was a strong risk factor for increased risk of overweight and obesity

Keywords: overweight, obesity, school children, physical activity

Introduction:

Childhood overweight and obesity has become an epidemic in the 21st century, initially in the industrialized countries and increasingly in various developing countries as well (1, 2). World Health Organisation (WHO) estimated globally there were about 1.6 billion overweight people aged 15 years and above (3). The trends of obesity among urban Indian adolescents showed a significant increase in prevalence of obesity from 9.8% in 2006 to 11.7% in 2009 and this burden is projected to increase rapidly in near future.(4)

One of the major reasons for the growing burden of overweight and obesity has been the lack of physical activity (PA) across the population groups including the children. Several large-scale studies have found a considerable decline in moderate to vigorous physical activity during late childhood and adolescence (5-7).

Schools have for many years been recognized as important settings for health education. As part of Global health school initiative, WHO has been emphasizing the concept of health-promoting schools(8). It focuses on caring for oneself and others, influencing health-related

behaviors: knowledge, beliefs, skills, attitudes, values, support that strives to improve the health of school personnel, community, the pupils and their families. A recent review of nine studies about their relevance concluded that health promoting schools do have a positive impact on the society (9). Considering that major chunk of time of children and adolescents is spent in school, the role of schools in promoting physical activity is imperative.

Evidence strongly indicate that regular PA has many physical benefits like improved body composition, cardiovascular and muscular fitness, bone density as well as metabolic health(10). It is also recognized that PA in adolescence can have a positive effect directly and indirectly in adult health and hence the promotion of which must start early in life (11).

Efforts directed toward the primary prevention of cardiovascular disease in youth populations have typically focused on the modification of health behaviours such as physical activity, dietary intake, and cigarette smoking. Even though there is a strong emphasis on physical activity in Scholl curriculum in India, in practice, many schools are reported to utilize the time earmarked for physical activity for various academic activities.(12)

Considering scarcity of studies on the subject, the present study has been conducted to assess the physical activity pattern and its impact on overweight and obesity in south Indian school children.

Materials and methods:

The study was a cross sectional study, undertaken in eight private schools of Belgaum City, Karnataka. A list of 92 schools were acquired from Deputy Director of Public Instructions. The final list of schools was selected by stratified random sampling. All the 92 schools were divided in to 4 strata (Zones) and 2 schools were selected from each strata to give equal representation to the entire area. The study was conducted for a period of one year from January 2010 to December 2011. As per the published literature, the prevalence of obesity in children between the age group of 10 to 15 years is six percent in urban areas. Considering this prevalence, with 95% confidence level and 2% absolute error, the required sample size was 564 subjects, which was rounded off to 600. A total of 75 children from each school in the age group of 10 to 15 years studying in 6 to 10 standard (15 children from each class) were selected by systemic random sampling method. The study was approved by Institutional Ethics Committee, Jawaharlal Nehru Medical College, Belgaum. Based on the inclusion criteria the school children were selected and informed consent from the principal and ascent from the children was obtained.

Schools having exclusively boys or girls (Non-Coeducational Schools) and Children having chronic illnesses such as severe malnutrition, endocrinal problems and physically handicapped were excluded.

Data collection:: All the included participants were interviewed by using predesigned and pretested questionnaire. The instruments used in this study included aquestionnaire, weighing machine, measuring tape, sphygmomanometer, stethoscope. All the instruments and techniques were initially standardized. The questionnaire included the information on socio-demographic variables, educational status, theage of menarche in thecase of female children, family formation, personal history, physical activities, dietary habits and anthropometric measurements. Children were interviewed by the investigator. The examination was carried out which included general physical examination, measurement of height, weight, waist circumference, hip circumference, blood pressure and other vital signs. The entire procedure lasted for about 25 minutes for each child.

Socioeconomic status was assessed by Modified B. G. Prasad's Classification(13). Overweight and obesity were defined basing on Based on WHO and International obesity task force (IOTF) BMI cut-off standards for Asia and India.(14)

Statistical methods:

Descriptive analysis of quantitative variables was done using mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. The association between various explanatory variables like, sociodemographic parameters, physical activity parameters and the obesity was assessed by logistic regression analysis. P value < 0.05 was considered statistically significant.

Results:

A total of 600 children were included in the final analysis. Out of 600, 314 (52.33%) were boys and 286 (47.67%) were girls with amale to female ratio being 1.09:1. Among boys and girls, maximum were 15 years old (22.6% and 26.9%). (table 1)

The proportion of children reporting jogging and running daily were 29.83% and 11.33% respectively. The remaining about 60% of the kids have reported jogging frequency less than once a week. Very few children (about 15%) reported regular skipping. The proportion of children reporting skipping rarely and never was 10.83% and 56.5% respectively. Swimming at least once a week was reported by only about 25% of the children and out of the remaining 10% reported swimming rarely and 64.83% of the children never tried swimming. Daily participation

in outdoor games was reported in 33% of the children. About 2.5% and 11.83% of children reported participation in the outdoor games alternate day and once a week. More than 50% of children reported participation in outdoor games rarely or never. (Table 2)

Table 1: Age and gender distribution of study participants (N= 600)

Age (In years)	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
10	36	11.50%	40	14.00%	76	12.70%
11	64	20.40%	18	6.30%	82	13.70%
12	34	10.80%	6	2.10%	40	6.70%
13	58	18.50%	68	23.80%	126	21.00%
14	51	16.20%	77	26.90%	128	21.20%
15	71	22.60%	77	26.90%	148	24.70%
Total	314	100%	286	100%	600	100%

Table 2: Descriptive analysis of Physical Activities in study group (N=600)

Parameter	Frequency	Percent
I. Running Jogging		
Daily	179	29.83%
Alternatively	68	11.33%
Once a week	107	17.83%
Rarely	80	13.33%
Never	166	27.67%
II. Skipping		
Daily	69	11.50%
Alternatively	29	4.83%
Once a week	98	16.33%
Rarely	65	10.83%
Never	339	56.50%
III. Swimming		
Daily	34	5.67%
Alternatively	29	4.83%
Once a week	87	14.50%
Rarely	61	10.17%
Never	389	64.83%
IV. Outdoor games		
Daily	198	33.00%
Alternatively	15	2.50%
Once a week	71	11.83%
Rarely	12	2.00%
Never	304	50.67%
V. Playground		
No	74	12.33%
Yes	526	87.67%
VI. PT Classes Week		
1	87	14.50%
2	458	76.33%
3	55	9.17%

The proportion of children reporting the presence of good playground was 87.67% and the remaining 12.33% had reported that they don't have access to the good playground. The frequency of participation in Physical education in school once, twice and thrice weekly was 14.50%, 76.33%, and 9.17% respectively. (Table 2)

The proportion of overweight and obese children was 18.33% (95% CI 15.7% to 21.96%) in the study population. Out of this the proportion of overweight was 11.33% (8.79% to 13.87%) and the proportion of obesity was 7.5% (5.39% to 9.61%). (Table 3)

Table 3: prevalence of overweight and obesity in study population (N= 600)

BMI Category	Frequency	Percentages	95% CI	
			Lower	Upper
Normal	487	81.17%	78.04%	81.17%
Over weight and Obese	113	18.83%	15.70%	21.96%
Over weight	68	11.33%	8.79%	13.87%
Obese	45	7.50%	5.39%	9.61%

Table 4 : Association between physical activity pattern and overweight & Obesity

Parameter	Odds Ratio	95% CI		p Value
		Lower	Upper	
Running Jogging (Baseline = Never)				
Daily	0.26	0.105	0.643	0.004
Alternatively	0.384	0.182	0.81	0.012
Once a week	0.585	0.35	0.978	0.041
Rarely	0.618	0.341	1.12	0.113
Skipping (Baseline = Never)				
Daily	0.27	0.063	1.162	0.27
Alternatively	0.44	0.193	1.004	0.44
Once a week	0.711	0.392	1.289	0.711
Rarely	1.012	0.54	1.897	1.012
Swimming (Baseline = Never)				
Daily	0	0	.	0.998
Alternatively	0.486	0.241	0.982	0.044
Once a week	0.648	0.307	1.37	0.256
Rarely	2.042	0.97	4.299	0.06
Outdoor Games (Baseline = Never)				
Daily	0.322	0.186	0.56	0
Alternatively	0.806	0.221	2.934	0.743
Once a week	1.264	0.707	2.259	0.43
Rarely	0	0	.	0.999
Playground (Baseline = Year)				
No	2.894	1.223	6.848	0.016
PT classes Week (Baseline = 3)				
1	1.11	0.607	2.029	0.735
2	1.34	0.574	3.127	0.499

The factors, which have shown statistically significant association with reduced risk of obesity, were daily or alternative day participation in aerobic activities like jogging, skipping and swimming. Less frequent

participation (Once a week or less) in these activities did not have a significant impact on overweight and obesity. The absence of playground at school was a strong risk factor for increased risk of overweight and obesity (OR=2.89, 95% CI 1.22 to 6.84, p value 0.16). Lack of regular participation in physical education training at school has slightly increased the risk of overweight and obesity. (Table 4)

Discussion:

The gradual rise in obesity prevalence of obesity in India has been linked to factors like sedentary lifestyle, unhealthy food habits, cultural practices and increasing affluence of middle-class population(15, 16). Moreover, there is a growing body of evidence associating obesity with co-morbidities like type 2 diabetes mellitus, dyslipidemia, hypertension and metabolic syndrome, which are increasingly becoming common among children and urban adolescents(1, 17, 18). More seriously, childhood obesity has been associated with higher risk of morbidity and mortality in adult life(19).

Physical activity is a complex behavioral phenotype that is molded by the interplay of biological and psychosocial factors, together with the physical environment(20). An individual's biological maturity appears to play a role in levels of physical activity(20, 21). However, findings to date have been inconsistent, partly due to the way biological maturity was assessed and partly as to whether other key child characteristics (e.g., BMI) were controlled(22).

In our study, only 33% children participated daily in outdoor games, though, 87.67% of the children reported their schools having a good playground.

The proportion of overweight and obese children was 18.33% in the study population. Out of this the proportion of overweight was 11.33% and the proportion of obesity was 7.5%. Comparatively, in their largest study in Indian subcontinent assessing the secular trends in prevalence of overweight and obesity among urban adolescents, Gupta DK et al., (4) found a prevalence of overweight and obesity of 11.3% and 9.8% in 2006 and 3.9% and 11.7% in 2009 respectively, of which, the increase in obesity prevalence from 2006 to 2009 was significant.

Though, the favorable effects of physical activity for adults are widely documented(23, 24), the benefits among the youth population are not much clear(25, 26). Some studies have reported modest positive outcomes among the younger groups in form of aerobic fitness, body composition, blood pressure, glucose metabolism, skeletal health and psychological health(25, 27). However, in their systematic review of controlled trials, Von Sluijs et al.,(28) found inconclusive evidence either of an effect on interventions targeting low socio-economic populations and environmental interventions or multicomponent interventions and school-based interventions and there

was a need for high-quality research to confirm the same. The emerging problem of childhood obesity is of high relevance in developing countries like India. India is going through concurrent transitions related to epidemiological, demographic and nutritional factors. Further, India is currently in the fourth phase of nutritional transition, which is the shift of nutritional intake from basic to diet-related non-communicable diseases. These swings are largely coupled with behavioral changes in dietary profile and lifestyle and decreased indulgence in physical activity(29). The transitions are more rapid in young individuals.

Conclusions:

The proportion of children who reported participation in regular physical activity was lesser in study population. The factors, which have shown statistically significant association with reduced risk of obesity were daily or alternative day participation in aerobic activities like jogging, skipping and swimming. Absence of playground at school was a strong risk factor for increased risk of overweight and obesity

Limitations:

Generalizability of the study findings is limited, considering the entire study population was drawn from a single town. Cross sectional nature of study precludes drawing any conclusions about causality of the associations, as it is difficult to establish temporal association. The socio economic data acquired from the children may not have been accurate and would have resulted in misclassification of the subjects. The direction and magnitude of its impact on final conclusions could not be assessed

Recommendations:

1. Physical activity should be actively promoted in children and adolescents, through various policy and educational interventions
2. Regular monitoring of school children for overweight and obesity and appropriate preventive interventions are the need of the hour

Conflict of interest: None

Source of funding: Nil

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Original Research Article

COMPARISON OF QUIZ Vs LECTURE METHOD IN TEACHING
COMMUNITY MEDICINE TO UNDER GRADUATE MEDICAL
STUDENTS

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Abstract

Background: Lecturing is one of the primitive and the oldest method of teaching and currently it is the most conventional educational technique. The students prefer learning in active methods with an expert faculty. To make the subject interesting, it is important to try out innovative methods for teaching and learning in which Quiz is one of the various methods described in the literature as self-directed learning. **Objective:** To compare the effectiveness of quiz over lecture method in teaching Community medicine to under graduate medical students in Melmaruvathur Adhi Parasakthi Institute of Medical Sciences (MAPIMS). **Methods:** Descriptive study was undertaken among MBBS students in the Department of Community medicine, MAPIMS. The topic was on “International Health”. For one batch, the topic was covered by using the traditional lecture method. In the succeeding year the topic was covered by using the Quiz method for a different batch. Pretest and post test was conducted for both the methods using 10 MCQs on the covered topics. In addition, feedback was also elicited from the students regarding the teaching method. **Results:** There was a significantly higher level of improvement between the pretest and post test marks conducted by both the methods considered individually. The post test score by the Quiz method was significantly higher compared to the post test by lecture methods. Also the difference in the post test scores over the pretest was significantly higher by quiz method compared to lecture method. The students appreciated the Quiz method as it was different from routine lectures, innovative, interesting, interactive, informative, helped them to come prepared and there was scope for participation. **Conclusions:** Quiz method was effective in teaching “International Health” to under graduate medical students compared to the usual lecture method.

Key words: Quiz method, lecture, community medicine, medical students, pretest, posttest.

INTRODUCTION:

Learning is a complicated phenomenon as it involves complex mental activities such as critical thinking. The goal for the learning methodology personnel is to provide the developers with the best learning tools available, so that they in turn can have thorough understanding, knowledge and relevant skills for their career. Lecturing is one of the primitive and the oldest method of teaching and currently it is the most conventional educational technique. Lecturing is still, the predominant form of teaching in health care professional education.¹ The major disadvantages of lectures is the passive nature of information transmission and lack of active involvement

by students.² Also medical students attention in lecture courses appears to be high only during the first 10 to 15 minutes and then declines abruptly.³ Further evidence indicates that very little learning occurs in lectures as they showed a weak correlation between lecture attendance and course grades in medical school courses.⁴ Moreover traditional lectures often focus on memorization rather than the comprehensive use of information. The conventional lecturing method has failed to transfer concepts to students as effectively as active learning approaches. Therefore, it has been suggested that it is better to use the conventional lectures only for transferring data to students.⁵ Medical students need to learn the skills of problem solving and decision making in addition to receiving

information and knowledge. In spite of this lecture continues to be the most widely used education method since they save time and resources⁶ The students prefer learning in active lectures with an expert faculty.⁷ The Normative Model states that physical therapist professional education curricula should be “designed to foster active, self-directed learning”.⁸ In the opinion of many educators, central to the success of all health care professions education is the development of the autonomous learner who can acquire and integrate new information without the constant presence or supervision of an instructor.⁹ The desire to develop self-directed learners in the health care professions has led to the increasing use of a variety of active learning methods.^{2,9} however, active participation and cooperation of students often leads to better, more effective and permanent learning. Because of this, educational experts emphasize the use of modern comprehensive methods which help students to understand and remember information better.¹⁰ According to “The Medical Council of India” under Regulations on Medical Education, 1997 there is scope for trying innovative approaches. They had also observed that lectures alone are not generally adequate as a method of training and it is a poor method of transferring or acquiring information even less effective at skill development and in generating the appropriate attitudes. It recommends that every efforts should be made to encourage the use of active methods of teaching.¹¹

The term "Best Evidence Medical Education" was coined to describe the implementation of methods and approaches to education based on the best available evidence.¹² One important step in educational design is choosing an appropriate teaching method. Active learning methods are supposed to leave students with a greater level of knowledge and better learning skills compared with students exposed to other forms of learning. Some investigators have reported that students working in groups were more likely to be able to generalize from specific observations, were superior at applying concepts to new situations and had a greater ability to critically analyze what they read and synthesize information from a variety of sources.¹³ Also students perceive active learning methods as higher student course method,¹⁴ compared with lectures.

The subject of Community Medicine is taught across seven semesters in most of the MCI regulated Medical institutions, it is often seen that students start reading the subject only towards final year. To make the subject interesting, it is important to try out innovative methods for teaching and learning in which Quiz¹⁵ is one the various methods¹⁶ described in the literature as self-directed learning is believed to be an important aspect for medical students.

OBJECTIVES: 1) To compare the effectiveness of Quiz method over lecture method in teaching Community

medicine to undergraduate medical students in Melmaruvathur Adhi Parasakthi Institute of Medical Sciences and Research (MAPIMS).

2) To increase the knowledge on the topic “International health” for undergraduate medical students in Melmaruvathur Adhi Parasakthi Institute of Medical Sciences and Research (MAPIMS).

MATERIALS AND METHODS:

The study was conducted with third year MBBS students of two different batches over a period of two years. The topic chosen was “International Health”. This topic was taken for two different batches by lecture method and by Quiz method of 60 minutes each respectively.

The total number of students enrolled for the lecture method was 144. The lecture session was carried out in a large classroom with good light and audiovisual equipment including a white-board, LCD projector and teaching slides. In the beginning the objective of the class was explained to the students. During the session students’ attention was increased by asking questions, giving examples and making conclusions and outlines. The main activity of students was listening, note taking and answering a few questions. Pretest and posttest in the form of 10 MCQs was conducted before and after the lecture respectively.

The quiz competition was conducted for MBBS students studying IIIrd year of another batch in the Department of Community Medicine as an alternative to the usual lecture method. The topic on “International Health” was taught using a series of four rounds in one hour quiz conducted in the existing time table of lecture. The topic and schedule of the quizzes was announced two weeks in advance. The students were required to refer to the standard textbooks and study the content (that was determined in the lesson plan) before the class was held. They were also instructed to gain extra knowledge regarding the topic from the internet and other available sources. There were four sessions by Quiz method ,via.,MCQs, Visual round, Short answers and Rapid fire round. Session I and II of Quiz method had 2 rounds. Session III and IV had only 1 round.

Totally, there were 151 students enrolled by Quiz method. The whole batch was divided into four groups and 5 students in each group was selected as quizzers. If someone was absent on the day of quiz, another student from respective groups was chosen as quizzers. In any particular session students of each groups other than the quizzers formed the audience. The question not answered by a particular team would not be passed to the next team, instead it would be asked to the audience from the same group, failing which Quiz master will answer. This process ensured equal chances for every student to participate. There was no negative marks for wrong

answers. The decision of the Quiz master was final in deciding the correct answer and awarding marks. Cumulative scores of all the rounds was taken to decide the winning team. At the end of Quiz a suitable prize was given to the winning team and audience if the question was passed.

To evaluate the students performance pretest and post test was conducted for all the students for both the methods. A set of ten Multiple choice questions (MCQs) was administered for evaluation of all the students using a over head projector for the pretest and the same questions was repeated in post test. Each question carried 5 marks and time allotted was 10 minutes and the maximum marks was 50. The performance of the individual students was assessed by the cumulative total of answers obtained in pretest and post test. In addition feedback was also elicited after Quiz method by asking questions like:

- 1) What are the factors which facilitated learning?
- 2) What are the factors which hindered learning
- 3) Which round was liked the most?
- 4) Suggestions or comments to improve the sessions.

Sample Size

Based on the number of students present in the third year, 144 students was enrolled for the lecture method. Another 151 students from a different batch was enrolled for Quiz technique. This gave an equal representation in both the groups.

Data analysis

Data was analyzed using the Statistical Package using Microsoft Excel and SPSS software – version 18. Proportion, mean and standard deviation was determined as appropriate. The results of mean pretest and post test scores for the lecture and Quiz method was compared individually by using a paired t-test. Mean pretest scores and the results of posttest evaluation were compared between traditional lecture and Quiz method by using t-test. Comparison of the difference between the score of pre and post-tests was analyzed by t-test. “p” value of less than 0.05 was considered as statistically significant.

RESULTS:

Out of 144 students enrolled in the batch, 133 students attended the lecture. Hence the attendance rate was 92% for lecture. The attendance rate by Quiz method was 94% (142 attended out of 151 enrolled).

Table 1 and 2 gives the evaluation of students by pretest and posttest by lecture and Quiz method respectively. A majority 93(70%) scored less than 40% in lecture method. Another 35 students (26%) had scores between 41-60%. In the posttest 61(46%) scored between 61-80% marks.

Table 1: Evaluation by pretest and post test marks by lecture method:

Pretest scores (%) range	Number of students (%)	Post-test scores (%) range	Number of students (%)
0 – 40	93 (70%)	0 – 40	7 (5%)
41 – 60	35 (26%)	41 – 60	36 (27%)
61 – 80	5 (4%)	61 – 80	61 (46%)
81 – 100	-	81 – 100	29 (22%)
Total	133(100%)	Total	133(100%)

Table 2: Evaluation by pretest and post test marks by Quiz method:

Pretest scores (%) range	Number of students (%)	Post-test scores (%) range	Number of students (%)
0 – 40	104 (73%)	0 – 40	-
41 – 60	34 (24%)	41 – 60	-
61 – 80	4 (3%)	61 – 80	10 (7%)
81 – 100	-	81 – 100	132 (93%)
Total	142(100%)	Total	142(100%)

Table 3. Mean score of pre-test and post-test of two methods

Method	Group	Mean	N	Std. Deviation	t- test (Sig)
Lecture	Pretest	29.24	133	9.6	< 0.0001*
	Posttest	66.31	133	13.42	
Quiz method	Pretest	28.59	142	9.34	< 0.0001*
	Posttest	88.59	142	5.5	

**p value <0.0001 considered as extremely statistically significant*

Table 4. Mean score of pre-test and post-test of two methods

Method	Group	Mean	N	Std. Deviation	t- test (Sig)
Lecture and Quiz method	Pretest	29.24	133	9.6	0.5698
	Pretest	28.59	142	9.34	
Lecture and Quiz method	Post test	66.31	133	13.42	< 0.0001*
	Post test	88.59	142	5.5	

**p value <0.0001 considered as extremely statistically significant*

Table 5. Mean score difference between pre-test and post-test of two methods

Method	Group	Mean	N	Std. Deviation	t- test (Sig)
Lecture and Quiz method	Difference between pretest and post test by lecture method	37.07	133	3.82	< 0.0001*
	Difference between pretest and post test	60	142	3.84	

**p value <0.0001 considered as extremely statistically significant*

Another 27% and 22% of students scored between 41-60% and 81-100% scores respectively. In Pretest a majority of the students, 104 (73%) scored less than 40% by Quiz method. Another 34 students (24%) had scores between 41 - 60%. In the post test evaluation, 132 (93%)

obtained 81 - 100% and the rest 10 (7%) between 61 - 80%. None of the students scored less than 60% in post test evaluation by quiz method.

Table 3 gives the mean score of pretest and posttest by both lecture and Quiz method independently. The pre-test mean score by lecture method was 29.24±9.60 and after the session it was 66.31±13.42. By quiz session, the mean score of pre-test was 28.59±9.34 and the post-test mean score of the same group was 88.59±5.50. Using a paired t-test, the differences between the pre and post-test scores for each group was statistically significant (< 0.0001).

Table 4 gives the mean score between the pretest and posttest scores between lecture and quiz method. The pre-test mean score by lecture and Quiz method was 29.24±9.60 and 28.59±9.34 respectively. This difference was not statistically significant. However the post test mean score by Quiz method was higher (88.59±5.50) compared to the post test mean score of by lecture method (66.31±13.42). This difference was statistically significant (< 0.0001).

For comparing the effectiveness of two methods, a variable showing the difference between pre-test and post-test score was calculated. The mean increase of scores between the pretest and posttest was 37.07±3.82 in the lecture group and was 60±3.84 by Quiz method. These differences was statistically significant (p value <0.0001) (Table 5).

Table 6: Details of feedback given by the students after Quiz method:

Questions	Feedback
What factors facilitated learning?	Interesting, interactive, innovative, informative, different from routine classes, helped them to come prepared, scope for active participation, building healthy competition, strong mode of teaching, more effective, playfull education, friendly.
What factors hindered learning?	Required reference from outside (internet)
Which round was liked the most?	Rapid fire round, visual round, MCQs and short answer round in decreasing order
Suggestions for improvement?	Quiz method to be used to teach other topics in community medicine. They also suggested to have more round in each session, especially in visual round.

Table 6 gives the summary of feedback from the students regarding the Quiz method. The responses were facilitated learning as they ensured active participation of the students, was interesting, interactive, innovative, informative, strong mode of teaching, more effective, helped to build healthy competition among groups, friendly and playfull method of education. These responses were encouraging. In the quiz technique 48% of students liked the rapid fire round the most. The rest 41(29%) of students liked the visual round and 27(19%) of them preferred the MCQ round. Only 6 students liked the short answer round. The factors which hindered learning was that visual round required reference from outside source. Suggestions for improvement is to organize more quiz

session for other topics and include more round in each session.

DISCUSSION:

The concept of 'active learning' is gaining much momentum, especially in the field of Medicine. Lectures alone are not generally adequate as a method of training and are poor means of transferring and acquiring information, even less effective at skill development and in generating appropriate attitudes. It is recommended that every effort should be made to encourage the use of active methods on firsthand experience. Medical teachers stretch their extent of information and knowledge in a logical, planned, integrated and sequential manner to the students through different approaches.¹⁷ New methods like problem-based learning, quiz to name a few are being introduced based on the above said concept. It is already reported that group discussions have been employed successfully to teach majority of the topics in Community Medicine in the pre-clinical years.¹⁸ According to Jamaison the quiz followed by a class discussion was beneficial both to the students and the teacher.¹⁹ Finley et al used quiz format for learning about auscultation of heart sounds through computer based independent learning, which was compared with classroom teaching. Both CD-ROM and class room teaching methods were highly rated by the students.²⁰ However, there are very few reports of using quiz as a method of teaching/ learning Community medicine for undergraduate medical students.

The quiz approach ensured greater participation of the students in teaching/ learning subject. In the present study, we wanted to investigate the role of quiz as a learning tool in medical education and to find out whether quiz can serve as an active learning method to undergraduate medical students compared to the traditional lecture method. The ultimate motive was to increase the awareness and interest in the topic. By quiz method the students had an opportunity to gain deep insight in the topic by referring other sources like internet for preparation. It also enhanced their capacity to apply their knowledge critically especially in the visual round. Moreover it also helped them in building a healthy competitive spirit among the teams as well as to evaluate each student by MCQs after the process. The current study, a comparison of pre-test and post-test scores of both the groups showed elevation in posttest scores, and the differences in the average scores was statistically significant. The average pretest scores between the two methods was not significant. The reason being that the student's knowledge on the topic before the class would be similar. The results of this research have shown both the educational methods were able to effectively increase the students' knowledge on this topic.

Some studies have also shown that students prefer teaching methods with more student involvement.²¹ In a study by Yoger²² it was reported that student-led discussions not only produce favorable student performance, but also foster greater participation, self-confidence and leadership ability. Positive learning outcomes occur from team learning as compared to traditional lecture methods.²³ Investigators have indicated that the students scores in nursing and other fields were higher when they were taught using problem based learning, group discussions or role playing than groups taught with traditional lectures.²⁴ The student academic performance was higher when active learning approach was used compared to lecture course.²⁵ Scientists in education see learning as a process of actively exploring information by linking it to previous knowledge and experience.²⁶ Accordingly, the teachers are encouraged not to teach the contents but to teach the students how to learn.²⁷ The students participation in education/learning process and substitution of self-directed learning opportunities for the traditional lecture are being emphasized.²⁸ It is believed that such engagement will deepen the students understanding of the course material, will encourages them to assume a major responsibility in the learning process, will help them improve their intellectual, interpersonal and team work skills, improve their ability and skills to search, obtain and organize information, improve their ability to identify and solve problems and will help them set the foundation for life-long learning.²⁹ Consequently, we can conclude that the more active teaching methods can bring more effective learning than traditional lectures. A different approach to improving students perceptions of active learning courses would be to have a slow, incremental introduction of active learning methods. The overall perception of course effectiveness, however was higher in the active learning course in the PBL curriculum than in the lecture format course.³⁰

Fischer and colleagues observed the methods of lecture and small group discussion were compared and it was reported that although the students significantly preferred the group discussion to the lecture.³¹ Some studies have also shown that most of the university teachers are not familiar with modern teaching methods³² and traditional lectures are still the most popular instructional method in the universities.³³ Factors such as simplicity of lecture presentation, its appropriateness for crowded classes, limitation of time and the massive amount of theoretical content have also made the instructors to use lectures as the most popular teaching method.³³

However some conflicting results have also reported when academic investigators have compared the effects of lectures and more active teaching methods.^{22,23,34} Other researchers have also been compared the effects of lecture and other methods like teaching in small groups and reported that no significant differences were observed.³⁵

Assessment is an educational tool that serves multiple roles; for example, it can provide feedback to learners on areas of strength or weakness and it can provide the teacher insight into the effectiveness of a given approach. To evaluate the student's learning, new teaching strategies should be scientifically investigated through questionnaire, student's comments and evaluation of assessment outcome. Once the deficiencies in teaching curriculum are identified, reinforcement can be applied by various methods which is the principle of value-added adult learning. Another approach to gain student acceptance might be to incorporate active learning courses into the larger curricular framework of small-group, case-based, active learning methods such as problem-based learning (PBL).

Active learning methods (Quiz method) results in higher student performance when compared with the lecture method. Medical educators should design teaching methods and learning activities in which the students are challenged and actively involved in learning process. These findings suggest that more active methods can be used as alternative to the traditional method of teaching. Further studies may be needed to explore specific approaches for allowing students to take more active role in teaching/learning process in classroom.

CONCLUSION:

In conclusion, the Quiz method was effective compared to the traditional lecture method in increasing the knowledge of students. The performance and participation of the students were very much encouraging. The students found the quiz method to be very interesting and useful learning tool. Some of the students suggested that quiz method to be employed to teach other topics in community medicine. Quiz was used to teach successfully to undergraduate medical students.

LIMITATIONS:

Most important problem was that it was very much time consuming. Much of the time was devoted mainly in planning and framing the questions for quiz. Also equality of opportunity is less as all the students cannot act as quizers

Interest of Conflict: Nil

Source of funding: Nil

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Original Research Article

A Study on Surgical Site Infections (SSI) and associated factors in a Tertiary care Hospital in Tumkur, Karnataka

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Abstract

Background: Nosocomial infection or hospital acquired infection refers to the infection occurring in patients after admission at the hospital that was neither present nor incubating at the time of admission. It is one of the public health problems throughout the world. Surgical Site Infections (SSI) are commonest nosocomial infections after urinary tract infection. Surgical site infections have been responsible for the increasing cost, morbidity and mortality related to surgical operations and continue to be a major problem even in hospitals with most modern facilities and standard protocols of pre-operative preparation and antibiotic prophylaxis. **Methodology:** A descriptive type of cross sectional study was conducted. All 1000 patients who got admitted in surgical wards and underwent various abdominal surgeries in District Hospital, Tumkur were included. Surgical sites were examined and graded as clean, clean contaminated, contaminated and dirty based on the extent of intraoperative contamination. The data collected includes details of surgical wound infection, the wound classes, preoperative stay, duration of operation, types of intervention (emergency and elective surgeries), co-morbidity status apart from demographic profile of the patient. Culture and sensitivity testing was done on infected wounds. Data was entered in Microsoft Excel 2013 and Pearson's Chi square test was used for analysis. P value of <0.05 was considered statistically significant. **Results:** Surgical site infections rate was 12.40%. SSIs were common among the aged, females, emergency surgeries, increase in surgical wound class, increase in pre-operative hospital stay, longer duration of surgery and in anaemics, diabetics, hypertensives and obese. Most of the SSIs yielded multiple organisms and the most common organism isolated was Staphylococcus Aureus 53(42%).

Conclusion: The incidence of SSI is high. A pre-existing medical illness, prolonged operating time, the wound class, emergency surgeries and wound contamination strongly predispose to wound infection. Antimicrobial prophylaxis is effective in reducing the incidence of post-operative wound infections for a number of different operative procedures but, timing of administration is critical.

Keywords: Surgical Site Infection, Risk factors, Antibiotic Resistance.

INTRODUCTION

Nosocomial infection or hospital acquired infection refers to the infection occurring in patients after admission at the hospital that was neither present nor incubating at the time of admission. It is one of the public health problems throughout the world.¹Infections acquired in the hospital account for major causes of death, morbidity, functional disability, emotional suffering and economic burden among the hospitalized patients. The Nosocomial Infections (NI) occur among 7-12% of

the hospitalized patients globally.² The World Health organization estimates that 10-30% of all hospital admissions result in healthcare acquired infections.

Despite the advances made in asepsis, antimicrobial drugs, sterilization and operative techniques, surgical site infections continue to be a major problem in all surgical branches.³ Surgical site infections are the commonest nosocomial infections after urinary tract infection.⁴ SSI rate has varied from a low of 2.5% to a high of 41.9%.⁵ The Centre for Disease Control (CDC's), Healthcare-Associated Infection (HAI)

prevalence survey found that there were an estimated more than one lakh surgical site infections associated with inpatient surgeries in 2011.⁶

Emergency procedures, wound class, wound contamination, extremes of age, metabolic disease, immunosuppressant, malnutrition, remote site infection, duration of pre-operative and post-operative hospital stay, pre-existing illness, length of surgical operation are some important factors which influence the incidence of surgical site infections.⁷ The problem of SSI continues to be a problem even after maintaining the standard protocol of pre-operative preparations and antibiotic prophylaxis. A reduction in the infection rate to a minimal level due to antimicrobial prophylaxis prescription could have significant benefits in terms of reducing postoperative morbidity and mortality and wastage of health care resources.⁸

Surgical site infection is the most important cause of morbidity and mortality in the post-operative patients, but it is preventable in most of the cases if proper assessment and appropriate measures are taken by the surgeons, nursing staffs, patients and others in the perioperative period.

This study was undertaken to know the incidence of surgical site infections, factors influencing surgical site infections & antibiotic sensitivity pattern.

MATERIAL AND METHODS

Study Design:

Descriptive type of cross sectional study.

Source of Data:

One thousand patients who underwent various surgeries in District hospital, Tumakuru were taken as study participants.

Sample size calculation:

According to a study done by Amrutham R et al.,²⁴ the surgical site infection rate was 18.14% using this data, the following formula has been applied to determine the required sample size for the study.

$$n = (1.96)^2 pq/d^2 \text{ where } n = \text{sample size}$$

So the sample size calculated was 903. Due to sample loss because of non-response of the participants extra 10% was added to the sample i.e., 90. Hence, the estimated sample size was 993. So the total participants included in the study was rounded off to 1000 subjects.

Period of Study:

The study was conducted during 1st January to 30th April 2017

Inclusion criteria:

1. Abdominal Surgeries done in this hospital.
2. Occurs within 30 days after the operation.

Exclusion criteria:

1. Patient refusal.
2. Patient coming with wound infection after getting discharge from the hospital.

Methodology:

Non-random purposive sampling was used. Approval from Institutional Ethical Committee was taken. After admission short history was taken and physical examination was conducted on each patient admitted in surgical wards. Only the necessary investigations such as complete blood count, urine routine, viral serology were considered. Informed written consent was taken from the patients. A detailed history regarding age, sex, type of illness, diagnosis, preoperative stay, type and duration of surgery performed and the associated co-morbid diseases was obtained from the patients. Data collection sheets were filled in by the investigator himself. All of the preoperative factors such as age, co-morbidity status and nutritional status related to SSI present in the patient were noted down in the data sheet. During the postoperative period, all the patients were closely monitored everyday up to the discharge of the patient from the hospital. Surgical sites were examined and graded as clean, clean contaminated, contaminated and dirty based on the extent of intraoperative contamination.⁹ If any collection of pus identified it was drained out and sent for culture and sensitivity test. Specific antibiotic was given to every patient both preoperative and post-operative periods. Using sterile cotton swabs, two pus swabs/ wound swabs were collected aseptically from each patient suspected of having SSI. Gram stained preparations were made from one swab for provisional diagnosis. The other swab was inoculated on 5% sheep Blood Agar (BA) and MacConkey agar (MA) plates and incubated at 37°C for 48 hours before being reported as sterile. Growth on culture plates was identified by its colony characters and the battery of standard biochemical tests.¹⁰ Antimicrobial Sensitivity Testing (AST) was carried out by modified Kirby Bauer disc diffusion method on Muller Hinton agar and results were interpreted in accordance with Clinical Laboratory Standards Institute guidelines.¹¹ Appropriate care was given to each of the patients of surgical site infection. Antibiotics were changed wherever necessary after getting the report of culture and sensitivity test. Postoperative events were recorded in the data sheet during every day follow up. Data was entered in Microsoft Excel 2013 and analyzed using SPSS version 20 (trial version). Categorical data were presented as frequencies and analyzed using Pearson's Chi-square test. P value of <0.05 was considered statistically significant.

RESULTS

The present study included one thousand various types of abdominal surgical procedures performed [Table.1]. A total of 10 types of abdominal procedures were performed out of which appendectomy, caesarean section, abdominal hysterectomy, exploratory laparotomy,

Table 1: Distribution of subjects on the basis of Factors associated with SSI.

Factors	SSI Status		Total	Chi Square (χ^2)	p Value
	Yes	No			
Age (Yrs)	< 30	47(12.08%)	342(87.92%)	13.71	0.0033
	31 – 40	21(8.37%)	230(91.63%)		
	41 – 50	22(11.40%)	171(88.60%)		
	>50	34(20.36%)	133(79.64%)		
Gender	Male	58(11.13%)	463(88.87%)	1.609	0.205
	Female	66(13.78%)	413(86.22%)		
Preoperative Stay	<2 days	26(7.95%)	301(92.05%)	14.78	0.0006
	2-7 days	60(12.58%)	417(87.42%)		
	>7 days	38(19.39%)	158(80.61%)		
Wound Class	Clean	08(2.65%)	294(97.35%)	103.3	<0.0001
	Clean contaminated	47(10.61%)	396(89.39%)		
	Contaminated	45(21.95%)	160(78.05%)		
	Dirty/Infected	24(48.00%)	26(52.00%)		
Duration of Operation	<1hr	24(4.94%)	462(95.06%)	128.3	<0.0001
	1-2hrs	36(10.40%)	310(89.60%)		
	>2hrs	64(38.10%)	104(61.90%)		
Type of Intervention	Elective	49(7.56%)	599(92.44%)	39.67	<0.0001
	Emergency	75(21.31%)	277(78.69%)		
Co-Morbidity status	Present	78(20.05%)	311(79.95%)	34.31	<0.0001
	Absent	46(7.53%)	565(92.47%)		
Types of Co-Morbidity	Anemia	14(14.89%)	80(85.11%)	12.53	0.0058
	Diabetes Mellitus	34(30.63%)	77(69.37%)		
	Hypertension	21(19.44%)	87(80.56%)		
	Obesity	09(11.84%)	67(88.16%)		
Operative Procedures	Appendectomy	19(11.51%)	146(88.49%)	34.05	0.00006572
	LSCS	39(15.98%)	205(84.02%)		
	Hernioplasty	06(4.48%)	128(95.52%)		
	Exploratory Laparotomy	24(20.87%)	91(79.13%)		
	Abdominal hysterectomy	20(19.42%)	83(80.58%)		
	Cholecystectomy	08(14.29%)	48(85.71%)		
	Splenectomy	0	05(100.00%)		
	Abdominal Tubectomy	02(1.45%)	136(98.55%)		
	Bladder & Prostate surgeries	04(14.29%)	24(85.71%)		
	Colorectal surgeries	02(16.67%)	10(83.33%)		

Figure 1: Distribution of subjects on the basis of Organisms Isolated

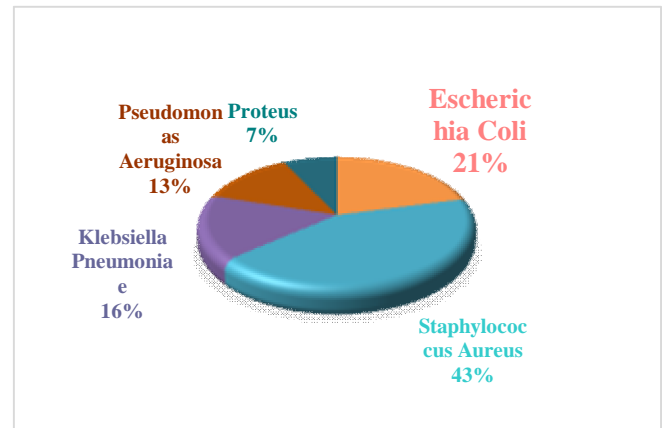


Table 2: Distribution of subjects on the basis of Antibiotic Sensitivity.

Name of Micro organism (No. of cases)	Antibiotics and their sensitivity								
	Ampicillin	Amikacin	Ciprofloxacin	Cotrimoxazole	Norfloxacin	Nitrofurantoin	Ceftriaxone	Imipenem	Vancomycin
Escherichia Coli (26)	5 19.23%	7 26.92%	12 46.15%	13 50%	-	6 23.10%	20 76.92%	26 100%	26 100%
Staphylococcus Aureus (53)	8 15.09%	11 20.75%	23 43.40%	-	18 ###	-	47 88.68%	53 100%	50 94.34%
Klebsiella Pneumoniae (20)	7 35%	12 60%	-	11 55%	-	-	20 100%	20 100%	20 100%
Pseudomonas Aeruginosa (16)	-	9 56.25%	8 50%	-	-	8 50%	16 100%	16 100%	16 100%
Proteus (9)	2 22.22%	-	3 33.33%	-	-	-	8 88.89%	9 100%	9 100%

abdominal tubectomy and hernioplasty accounted for 89.9% of the total surgical procedures.

During the study period 124 patients developed surgical site infections out of 1000 subjects. The Surgical site infections rate was 12.40%.

The age of study subjects ranged between 18 years to 67 years. Majority (38.9%) of them belonged to <30 years age group. Out of 389 patients in this group 47(12.08%) got infected. 167 patients were more than 50 years and among them 34(20.36%) developed surgical site infection. It was found that the frequency of SSI increased with age and this was statistically very highly significant ($P < 0.001$) [Table 1].

Regarding sex distribution of SSI it was observed that among 521 male patients 58(11.13%) developed SSI, whereas among 479 female patients 66(13.78%) developed SSI. Rate of SSI was slightly higher in females. Sex difference in SSI was not statistically significant ($P > 0.05$) [Table 1].

With regard to association between preoperative stay and rate of SSI it was observed that the surgical site infection rates were 7.95%, 12.58% and 19.39% for a preoperative stay of <2 days, 2-7 days and >7 days respectively. The difference had very high statistical significance ($P < 0.001$) [Table 1].

The patients were divided into different groups having different preoperative hospital stay. Highest rate of infection (19.39%) was found in patients having preoperative hospital stay of >7 days. The rate of infection increased as the time lapse between preoperative stay and initiation of operation were increased. However, these differences were statistically very highly significant ($P < 0.001$) [Table 1].

The surgical wounds were divided into various classes according to the degree of contamination.⁹ It was observed that among 302 were clean wounds; SSI developed only in 8(2.65%) of these clean cases. There were 443 clean contaminated cases, among them SSI occurred in 47(10.61%); whereas SSI developed in 45(21.95%) among 205 contaminated wounds. The rate of SSI was as high as 24(48.00%) among 50 dirty cases. The difference had very high statistical significance ($P < 0.001$) [Table 1]. It can be assumed that the infection rate increased with that of degree of wound contamination.

Table 1 shows that the surgeries were divided into 3 groups according to the time taken during the surgery. Highest rate of infection was found with duration of surgery > 2 hrs (38.10%). The rate of infection increased as the duration of operation was increased. The difference in percentage of SSI with duration of operation was statistically very highly significant ($P < 0.001$)

Based on type of intervention it was observed that the surgical site infection rates were higher in emergency cases 75(21.31%) than elective cases 49(7.56%). The difference in percentage of SSI with type of intervention was statistically very highly significant ($P < 0.001$) [Table 1].

In relation to co-morbidity, it was observed that among 389 patients with co-morbid disorders 78(20.05%) developed surgical site infection (SSI). It was clear that associated co-morbid disorders played a vital role as a host related risk factor for SSI. Moreover, the difference was statistically very highly significant ($P < 0.001$). In 94 patients with anemia 14(14.89%) developed SSI, 111 patients were diabetic among them 34(30.63%) developed SSI, 108 persons were hypertensive among them 21(19.44%) suffered from SSI and 76 persons were obese of which 9(11.84%) developed SSI [Table 1].

Staphylococcus Aureus were found as the commonest organism being isolated causing 42% of the surgical site infections followed by E.Coli 21%, Klebsiella pneumoniae 16%, Pseudomonas Aeruginosa 13% and Proteus 8% [Figure 1].

All the cases of E. coli were resistant to Norfloxacin, Staphylococcus aureus were resistant to

Cotrimoxazole and Nitrofurantoin. Similarly Klebsiella Pneumoniae were resistant to Ciprofloxacin, Norfloxacin and Nitrofurantoin, Pseudomonas Aeruginosa were resistant to Ampicillin, Cotrimoxazole and Norfloxacin and Proteus were resistant to Amikacin, Norfloxacin, Cotrimoxazole and Nitrofurantoin. All (100%) the organisms isolated were sensitive to Imipenem [Table 2].

DISCUSSION

This descriptive, cross-sectional study was conducted among 1000 purposively selected patients admitted in surgical wards and getting operated in District Hospital Tumakuru. The study was carried out with a view to determine the incidence of Surgical Site Infections, factors influencing surgical site infections and Antibiotic resistance pattern.

The rate of SSI varies greatly worldwide and from hospital to hospital. The prevalence rate of surgical site wound infection, though preventable, is high (National nosocomial infections surveillance, 1999). The rate of SSI varies from 2.5% to 41.9% as per different studies.^{4, 5, 12, 13} The incidence of SSI in the present study is 12.4% which is in concurrence with the study conducted by Suchitra Joyce B. and Lakshmidevi N.¹⁴

In the present study it was observed that rate of SSI was highest (20.36%) in >50 years age group. It is consistent with the studies done by Patel DA et al,¹⁵ Bandaru NR et al,¹⁶ Jain BK et al,¹⁷ Shah KH et al,¹⁸ Setty NH et al,¹⁹ where the rate of SSI was highest in > 60 yr age group i.e 41.66%, 14.29%, 42.5%, 4.61%, 63.15% whereas according to Gurav PD et al,²⁰ it is highest among < 30 yr age group 39.0%.

Regarding sex distribution it was observed that Rate of SSI was slightly higher in females (13.78%). It is contradictory with the studies done by Patel DA et al,¹⁵ Bandaru NR et al,¹⁶ Jain BK et al,¹⁷ Setty NH et al,¹⁹ Gurav PD et al,²⁰ Amrutham R et al,²¹ Varsha S et al,²² rate of SSI was highest in Males i.e 14.29%, 11.63%, 58.27%, 29.1%, 64.4%, 19.68%, 7.4% respectively.

In the present study with regard to association between Pre-operative stay and rate of SSI it was observed that the surgical site infection rates were higher for patients with pre-operative stay of >7 days (19.39%). Similarly according to a study done by Patel DA et al,¹⁵ Shah KH et al,¹⁸ Setty NH et al,¹⁹ and Patel SM et al,²³ rate of SSI was highest in pre-operative stay of >7 days i.e 66.67%, 44.4%, 42.86% and 33.3% respectively.

In relation to different types of wounds, by the degree of contamination, it was observed that rate of SSI was as high as 48.00% among dirty wounds. It goes hand in hand with the study done by Patel DA et al,¹⁵ Shah KH et al,¹⁸ Patel SM et al,²³ Satyanarayana V et al,²⁴ More SR et al,²⁵ and Singh AK et al,²⁶ rate of SSI was highest in

dirty wounds i.e 23.81%, 37.5%, 40.9%, 56.7%, 54.55% and 79.2% respectively.

In the present study with regard to association between duration of operation and rate of SSI it was observed that highest rate of infection was found with duration of surgery > 2 hrs (38.10%). Similarly according to a study done by Mahesh CB et al,³ Patel DA et al,¹⁵ Shah KH et al,¹⁸ Varsha S et al,²² Patil BS et al,²⁷ and Ganguly PS et al,²⁸ i.e 26.66%, 23.81%, 22.3%, 13.1%, 8% and 61.2% respectively.

Based on type of intervention it was observed that the surgical site infection rates were higher in emergency cases 75(21.31%) than elective cases 49(7.56%). It is consistent with the studies done by Mahesh CB et al,³ Patel DA et al,¹⁵ Jain BK et al,¹⁷ Patel SM et al,²³ Singh AK et al,²⁶ Sharan H et al,²⁹ and Mundhada AS et al,³⁰ i.e 21.05%, 18.75%, 25.98%, 24.14%, 28%, 19.44% and 45% respectively.

In relation to co-morbidity, it was observed that among 389 patients with co-morbid disorders 78(20.05%) developed surgical site infection (SSI). In 94 patients with anemia 14(14.89%) developed SSI, 111 patients were diabetic among them 34(30.63%) developed SSI, 108 persons were hypertensive among them 21(19.44%) suffered from SSI and 76 persons were obese of which 9(11.84%) developed SSI. According to a study done by Bhadauria AR et al,³¹ Surgical site infection was more in patients with pre-existing illness such as anemia 21.13%, obesity 13.62%, hypertension 4.69% and Diabetes Mellitus 8.45%. Similarly in another study done by Setty NH et al,¹⁹ Surgical site infection was more in patients with pre-existing illness such as anemia (62.16%), hypertension (73.91%) and Diabetes Mellitus (83.33%). A similar study done by Jain BK et al,¹⁷ Surgical site infection was more in patients with pre-existing illness such as Diabetes Mellitus (9.35%) and anemia (7.41%).

In the present study, Staphylococcus Aureus were found as the commonest organism being isolated causing 42% of the surgical site infections followed by E.Coli 21%, Klebsiella pneumoniae 16%, Pseudomonas Aeruginosa 13% and Proteus 8%. It goes hand in hand with the studies done by Mahesh CB et al,³ More SR et al,²⁵ and Mundhada AS et al,³⁰ the commonest organism being isolated is Staph Aureus i.e 34.44%, 35.48% and 29.16% respectively. It is contradictory according to a study done by Gurav PD et al,²⁰ Bhadauria AR et al,³¹ and Rajput V et al,³² the commonest organism being isolated is E Coli i.e 33.9%, 36.62% and 26% respectively.

For the prevention of surgical site infection the antibiotics used during pre-surgical prophylaxis were Ampicillin, Amikacin, Ciprofloxacin, Cotrimoxazole, Ceftriaxone and Norfloxacin. The antibiotics used during post-operative period were Ampicillin, Amikacin, Ciprofloxacin, Ceftriaxone, Metronidazole, Norfloxacin, Nitrofurantoin, Vancomycin and Imipenam in all of the cases. This has contrasting evidence as showed by Rasul

and Ashraf in their study conducted in 1979 who did not use antibiotics in any of 65 selected cases and there was not a single incidence of wound infection.

According to a study done by Patil BS et al,²⁷ Ciprofloxacin, Cefuroxime and Cefotaxime proved to be some effective antibiotics against gram negative bacilli, Polymyxin-B and Cefotaxime showed the highest efficacy of 100% against pseudomonas aeruginosa. Methicillin (cefotaxin) resistance was noted in 6% of staphylococcus aureus. Similarly in a study done by Gurav PD et al,²⁰ the common sensitive antibiotics were Amikacin, carbenicillin, ceftriaxone, Polymyxin-B. The common resistant antibiotics were cephalixin, ciprofloxacin, Erythromycin, Gentamicin. Rajput V et al,³² in his study the most effective antibiotics were Imipenem, Amikacin, Neticillin, Piperacillin, Tetracycline and Gentamicin. The least effective antibiotics were Penicillin, Cefotaxime, Cefuroxime and Cefoxitin. Similarly in a study done by Setty NH et al,¹⁹ Organisms isolated from the SSIs showed resistance to all groups of antibiotics. Tetracycline encountered majority of the resistance followed by erythromycin. The commonly used antibiotics like Amikacin, Cephalixin and Cefotaxime also encountered resistance. Similarly Negi V et al,³³ in his study Antibiotic susceptibility results revealed that a high degree of resistance was seen for majority of the bacterial isolates. For gram positive bacteria vancomycin, teicoplanin, linezolid and amikacin were found to be the most effective antibiotics. Meropenem, piperacillin-tazobactam, and amikacin were found to be the most effective antimicrobial agents whereas ampicillin, amoxicillin-clavulanate and cefotaxime were among the most resistant drugs.

CONCLUSION:

The incidence of SSI was high. Age, gender, pre-operative stay, duration of surgery, Co-morbid conditions like anemia, hypertension, diabetes mellitus, obesity and prophylactic antibiotic usage were risk factors for SSI. A pre-existing medical illness, prolonged operating time, the wound class, emergency surgeries and wound contamination strongly predispose to wound infection. Staphylococcus aureus was the most common organism associated with SSI. Majority of the SSIs were resistant to multiple antibiotics.

RECOMMENDATIONS:

On the basis of the findings of the study, the following recommendations can be made:

1. Prompt diagnosis, proper assessment, quick resuscitation and appropriate preoperative preparation are keys to better outcome in emergency operations, but undue delay should be avoided in treating any emergency condition.

2. Duration of operation should be optimum to minimize the level of wound contamination and prevention of SSI.
3. Efforts are needed to strengthen infection control programs, appropriate national strategies for prevention of Hospital Acquired Infections, antibiotic stewardship in our institution in order to decrease the prevalence of Hospital Acquired Infections.
4. Appropriate antibiotic prophylaxis should be practiced.
5. Training of Nursing staff, technicians in postoperative wards regarding maintenance of strict aseptic environment needs emphasis. Concepts of barrier nursing and task nursing can go a long way in tackling SSI.
6. Periodic surveillance of SSI will guide the Infection Control Committee in laying down strict guidelines to further decrease the SSI incidence in our setup, which is an indicator of health care in a given system.
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Original Research Article

A STUDY ON NUTRITIONAL STATUS AND ITS DETERMINANTS IN ADOLESCENTS AGED 11 TO 17 YEARS, FROM SELECTED SCHOOLS IN BANGALORE, INDIA

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Abstract

Background: Studies on nutrition and analysis of various factors affecting them remain scarce particularly in south India and more so in Bangalore. **Objectives of the study:** To analyse nutritional status among adolescents between the ages of 11 to 17 years of age. **Method:** A cross sectional study was done with 396 students across three schools in Bangalore North. Data collected was sex, height, weight, type of housing, who they stayed with from classes VI to X. BMI was calculated and grouped according to percentile and analyzed using IBM SPSS Statistics v20. **Results:** Study population was 397(219 males, 178 females). Mean BMI for total was 18.29 kg/m². Among total population (underweight 22.90%, overweight 5.30%, obese 3.30%), males (underweight 26.00%, overweight 3.70%, obese 2.70%) and female (underweight 19.10%, overweight 7.30%, obese 3.90%); Nutritional status varied with various factors, with sex (males 17.87 kg/m², females 18.81 kg/m²), with housing (pucca 18.67kg/m², semi-pucca 17.52kg/m², kutcha 18.29kg/m²), with whom the child stayed with (both parents 18.44kg/m², single parent 17.32kg/m², hostel 17.79kg/m²). **Conclusion:** Males on average had a lower BMI as compared to females. Males has higher percentage of students underweight and comparatively higher percentage of females were overweight and obese. Greater percentage of females remained in the normal BMI range as compared to males. Students in pucca houses had highest BMI and lowest in kutcha houses, same was observed in females. Students staying with both parents had the highest BMI followed by students staying in hostels and the least was seen in students staying with single parents, same pattern was seen among males and females. **Recommendation:** Healthy eating practices and regular assessment of BMI is necessary to maintain the right BMI. Efforts need to be made to improve the housing conditions for students. Every effort must be taken to ensure that the child stays with both parents for better nutrition. Greater care, effort and monitoring is needed in cases of single parents and children living in hostels.

Keywords: Nutrition, adolescence, BMI, housing, caretakers.

INTRODUCTION

Adolescents i.e. individuals aged 10-19 years constitute 243 million i.e., about one fifth of India's population ^[1]. Adolescence is a crucial period of development in children. Not only is it a period of peak physical growth and sexual development but also a time when behavioral patterns and personalities are established with far ranging consequences into the disease pattern in adulthood – more than 33% of adult disease burden stems from behaviors or conditions that originated in their adolescence. ^[2] Also, adolescence is a time for 'catch-up growth' for those with inadequate growth in their earlier years. Hence the need

for caring of the physical and emotional needs of children so that they grow into healthy adults.

Appropriate nutrition remains one of the primary needs for optimal mental and physical growth during this transition period ^[1]. It provides stores to sustain the burden of pregnancy in later years and prevent adult onset of nutrition-related diseases. ^[3] Malnutrition, overweight and obesity run rampant among Indian children hampering every aspect of the child's life, preventing achievement of maximum potential which in turn reduces the quality of life as an adult.

The need for studies on adolescent health cannot be emphasized enough. Bangalore, being the 3rd most populous city in India with a large adolescent population

does not have sufficient studies conducted on its adolescent population to assess their nutritional status despite the need.

This study aims to assess the nutritional status among adolescents in selected schools in Bangalore. It also aims at studying the various familial, social, and environmental factors influencing the nutritional status of adolescents.

OBJECTIVES

1. To assess the nutritional status of adolescents between 11 to 17 years of age.
2. To study the effect of various factors on nutrition on the study population.

MATERIALS AND METHODOLOGY

Study area and sampling: The present study is a cross sectional descriptive and analytical study conducted in 3 schools in Bangalore - EbenEzer Public School, Lake Montfort School and Yuvalok High School. Convenience sampling was used for selection of schools due to their proximity to the researchers, accessibility, cost-restrictions and time constraints.

Study subjects: A total of 396 questionnaires were distributed among students from classes VI to X, which included children from 11 years to 17 years of age. All those that fulfilled the inclusion criteria were included in the study. **Inclusion criteria:** All students who were present on the day data was collected were included in the study.

Exclusion criteria: Students those who did not complete the questionnaire were excluded from the study. Students under 11 years of age and above 17 years of age were excluded from the study. Further exclusions were made for each factor assessed to remove bias that would arise from non-responders to a question.

Collection of data and anthropometry: Based on the objectives of the study, a suitable questionnaire was designed to collect information regarding the student's age, sex, height, weight, type of housing (pucca, semi pucca and kutcha) and whom the students stayed with (both parents, single parent and hostel).

The data was collected over a period of 3 weeks in the month of January 2015. Data was collected during the school hours. The students of each class were seated in the school auditorium with sufficient spacing to prevent copying and discussion. Each question was explained (both in English and the local language) with sufficient time given for clearing doubts and answering the question before moving on to the next one. The questionnaires were collected after completion on the same day.

Anthropometry was done on the same day after data collection. Height was recorded using a measuring tape fixed to the wall. Students were made to stand such that the heels, buttocks, shoulder blades and back of the

head touched the wall; head positioned such that Frankfurt plane and the biauricular plane were horizontal. A wooden scale was kept firmly over the head to compress the hair. The height was recorded in centimeters and later converted to meters.^[4]

Weight was recorded in kilograms, using a mechanical weighing scale. Students were wearing their school uniforms but without footwear. The scale was checked for zero error before recording the weight of each student.

BMI was taken as the indicator for nutritional status and was calculated using the formula:^[5]
$$\text{BMI} = \text{weight} / (\text{height in meters})^2$$

As individuals above the age of 5 years have different environmental variables, the WHO recommends the use of reference growth charts.^[6] Growth patterns differ in different countries due to various environmental, nutritional, genetic factors and timing of puberty. Hence it is necessary to have country specific growth charts to monitor growth between 5 to 18 years of age.^[6] Therefore in the present study, BMI was classified using the Revised IAP Growth charts for Body Mass Index for 5 to 18-year-old Indian Children published by the IAP Growth Chart Committee in January 2015.

The associations between BMI and health risks for Asians are different compared to their western counterparts, the risk of type 2 diabetes and cardiovascular diseases is substantial at BMIs lower than the WHO cut off of 25kg/m².^[7] Therefore cut off values of 23 and 27.5kg/m² have been suggested for Asian adults for overweight and obesity respectively.^[8] As the ratio between weight and height varies with age and sex in adolescence, the cut off values for this age group are age and gender specific.^[5] The cut off values for overweight and obesity in Asian adolescents are >23 adult equivalent and >27 adult equivalent percentiles respectively.^[6] The type of house was classified as kutcha, semi-pucca and pucca houses and each type was explained to the students.^[9]

Statistical analysis: Data was entered into Microsoft Excel 2007 for Windows. Data was scrutinized and cleaned. Statistical analysis was done using IBM SPSS Statistics v20. The data was sorted as per age and sex and grouped according to their BMI as those falling under 3rd, 5th, 10th, 15th, 25th, 50th, 23rd adult equivalent, 27th and >27th adult equivalent percentiles using the IAP body mass index charts. Less than 3rd percentile was taken as underweight, 23rd- 27th adult equivalents as overweight and greater than 27th percentile as obese. Descriptive analysis of the study population was done.

Initially, Levene's statistical test was performed to check the variance between groups. Wherever this was not significant, a One-way ANOVA test was performed to study any significant differences of means between groups. For results that are not significant with ANOVA more robust tests like Welch and Brown Forsythe tests

were performed. $p < 0.05$ was taken as a significant result for all the tests performed.

RESULTS

A total of 397 students were included in the study, of which, 219 (55.16%) were males and 178(44.83%) were females.

The average BMI was 18.29 kg/m^2 . The mean BMI of the males was 17.87 kg/m^2 and females was 18.81 kg/m^2 . The difference between the means was significant with $p = 0.0070$ (Table 1).

Table 1: Population descriptive, mean and standard deviation of BMI

Sex	N	%	Mean BMI (kg/m ²)	SD for BMI
Male	219	55.16%	17.87	3.38
Female	178	44.83%	18.81	3.54
Total	397	100%	18.29	3.48

Table 2: Classification of BMI of students according to IAP guidelines 2015

BMI	Total	%	Males %		Females %	
<3 rd percentile	91	22.9	57	26	34	19.1
3 rd to 5 th percentile	32	8.1	22	10	10	5.6
5 th to 10 th percentile	52	13.1	26	11.9	26	14.6
10 th to 25 th percentile	96	24.2	47	21.5	49	27.5
25 th to 50 th	43	10.8	27	12.3	16	9
50 th to 23 adult equivalents	49	12.3	26	11.9	23	12.9
Overweight	21	5.3	8	3.7	13	7.3
Obese	13	3.3	6	2.7	7	3.9
Total	397	100	219	100	178	100

Table 2 shows classification of BMI of students according to IAP guidelines 2015. Of the total 22.90% were underweight (less than 5th percentile), 5.30% were overweight and 3.30% were obese. Of the males 26.00% and 19.10% females were underweight, 3.70% males 7.30% females were overweight. 2.70% males and 3.90% females were obese.

A total of 397 students were considered for the study on the effect of housing on nutritional status. 68.51% of the total population lived in pucca houses, 28.98% lived in semi-pucca houses and 2.51% lived in kutcha houses (Table 3). Higher BMI recorded in those living in pucca houses, with BMI of 18.65 kg/m^2 and 19.27 kg/m^2 in the total population and in female students respectively. Males students living in Kutcha houses showed the highest BMI of 19.61 kg/m^2 . For the total population and for females ANOVA test was significant with $p = 0.0110$ and $p = 0.0230$ respectively. Brown Forsythe was significant for males, $p = 0.0220$.

A total of 395 students were considered for the association of nutritional status with stay, of which 83.29% of the students stayed with both parents, 10.63% stayed with single parents, and the remaining 6.07% stayed in hostels (Table 3). With children staying with both parents (18.45 kg/m^2) faring better than children with single parents (17.32 kg/m^2) or those staying in

hostels (17.79 kg/m^2), similar pattern was seen in the male population. For the total population Brown Forsythe tests were significant for who the students stayed with $p = 0.0380$. The test results were not significant for the females and males.

DISCUSSION

The study was conducted among 397 students from 3 different schools in Bangalore. The descriptive analysis of the data showed that the mean BMI of females was higher than that of the males by 0.94 kg per square meter. Similar results were obtained by Laxmaiah et al (1.2 kg/m^2), and Haboubi and Shaikh (0.26 kg/m^2) in their respective studies^{[10][11]}. K Venkaiah et al in his study observed that the median BMI of girls was higher than that of the boys in all the age groups from 10 to 17 years^[12].

In a study conducted by Laxmaiah et al, on rural adolescents, the prevalence of overweight was 7.2%, which was higher in the girls (6.6%) than the boys (5.1%)^[10]. In the same study, the prevalence of obesity was 1.3%, more among the females (1.6%) than the males (1%), similar to the present study where a higher prevalence of overweight by 3.6% and obesity by 1.2% in females. 19.10% of females were underweight in the present study whereas a study among adolescent girls in urban slums of Assam, showed the prevalence of thinness to be 25.7%. This difference is due to more favorable socioeconomic conditions in turn leading to better caring practices for children.

The type of housing is an important factor affecting nutrition. The type of one's housing will decide the chances of coming in contact with diseases, rodents, parasites and insects. It is also an indirect indicator of the socioeconomic status of the parents, thus pointing to the income, personal and environmental hygiene, sanitary facilities, accessibility and affordability of potable water, nutritional and health care services. The present study showed that children living in pucca houses had a better nutritional status than those living in kutcha or semi pucca houses. Results are comparable to the observations of K Venkaiah et al where the prevalence of stunting was higher in children living in kutcha houses^[12].

The present study showed that students living with both parents had a higher BMI than those living with single parents or in hostels. Single parent families result from separation or death of one of the parents and it has a negative impact on the child's nutritional status. This also holds true for children in hostels and orphanages. Single parents do not have the luxury of time to look after his/her children leading to poor dietary habits among the children. In economically poor households, lower income of the family leads to decreased buying capacity which affects the nutritional status of the child.

Table 3: Study of various factors affecting nutrition.

I. HOUSING												
Sub variables	Total				Females				Males			
	N	Mean	95% Confidence Interval for Mean		N	Mean	95% Confidence Interval for Mean		N	Mean	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound			Lower Bound	Upper Bound			Lower Bound	Upper Bound
Pucca	272	18.65	18.2	19.09	122	19.3	18.61	19.93	150	18.14	17.55	18.73
Semi pucca	115	17.53	17.01	18.04	49	18	17.14	18.86	66	17.17	16.54	17.8
Kutchha	10	17.46	15.49	19.43	7	16.5	14.08	19	3	19.61	15.24	23.98
Total	397	18.29	17.95	18.63	178	18.8	18.29	19.34	219	17.87	17.42	18.32
Statistical tests	ANOVA test: p = 0.0110**				ANOVA test: p = 0.0230**				Brown Forsythe test: p = 0.0220**			
II. STAYING WITH												
Sub variables	Total				Females				Males			
	N	Mean	95% Confidence Interval for Mean		N	Mean	95% Confidence Interval for Mean		N	Mean	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound			Lower Bound	Upper Bound			Lower Bound	Upper Bound
Both parents	329	18.45	18.06	18.84	150	19	18.44	19.58	179	17.98	17.45	18.51
Single parent	42	17.32	16.44	18.2	20	17.5	16.04	19.04	22	17.13	16.03	18.22
Hostel	24	17.79	16.67	18.91	8	18.4	15.06	21.71	16	17.49	16.56	18.43
Total	395	18.29	17.94	18.63	178	18.8	18.29	19.34	217	17.86	17.4	18.31
Statistical tests	Brown Forsythe test: p = 0.0380**				ANOVA test: p = 0.4870				ANOVA test: p = 0.2050			

** - p is significant

CONCLUSION AND RECOMMENDATION

Reasons for the high prevalence of underweight students and more so in male students need to be studied and solutions found. Every effort must be made to improve the socioeconomic levels of families. Parents must be taught the benefits of staying together and providing a stable environment for the child to study and grow. The present study was conducted on a convenient sample, we recommend that a study be conducted on a random sample so that the results can be generalized.

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Original Research Article

Knowledge and practice regarding Diarrheal Diseases and Drinking Water Usage in Kanyakumari district, South India.

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Abstract

Introduction: Acute diarrheal diseases account for about 8% of deaths among under 5 children in India. Approximately 88% of diarrheal diseases are attributed to unsafe water supply, inadequate sanitation and hygiene. Proper knowledge about diarrhea and its prevention is essential for the people to practice adequate control measures. Proper water usage and handling practice also play an important role in control of diarrheal / water borne diseases. **Objectives:** to assess 1) knowledge and practice regarding diarrheal diseases and 2) the drinking water practices among the population of Arumanai panchayat of Kanyakumari district in South India. **Material & Methods:** A cross sectional study was done among households of Arumanai panchayat of Kanyakumari district between September and November 2015. 150 households that have been residing in the area for > 6 months were included. Data was collected using a pretested semi-structured questionnaire **Results:** Among the respondents, 26.7% (40) believed microorganisms to be a cause of diarrhea, while 88% believed that boiling renders the water safe for drinking purposes. Only 50.7% had prepared Oral Rehydration Solution (ORS) during the last episode of Diarrhea. 40.7% of the respondents washed their hands with soap and water before eating food and only 24% did it after defecation. Half of the households used covered well as their source of drinking water & 97.3% had a toilet at home. 86% boil water used for drinking purposes but only 27.3% boil water for 10 minutes. 44% household do not clean their well frequently & 20.7% use chlorination. **Conclusions:** The degree of knowledge and practice regarding diarrheal diseases and the drinking water practices was found to be inconsistent. The knowledge and use of ORS is better than what is seen in many studies done in India. The community needs further Behaviour change communication including training on proper treatment of water.

Keywords: Diarrhea, ORS, Hand Hygiene, Drinking water, Boiling

deaths worldwide. More than 80 percent of these deaths occur in sub-Saharan Africa and South Asia.¹

INTRODUCTION

Diarrhea and water borne diseases are the leading cause of mortality and morbidity in developing countries.¹ Acute diarrhea is rivalled in importance only by respiratory infection, as a cause of morbidity on a worldwide scale. When the WHO initiated the Diarrheal Diseases Control Programme in 1980, approximately 4.6 million children used to die each year due to dehydration caused by diarrhea.² Diarrhea is still a major killer of children under 5 years, although its toll has dropped by a third over the past decade, from 1.2 million deaths in 2000 to 0.7 million in 2011.³ It now causes about 11 percent of child

In India, acute diarrheal diseases accounts for about 8% of deaths in under 5 years age group. During the year 2011, about 10.6 million cases with 1,293 deaths were reported in India.⁴ India also has the highest estimates of under 5 mortality due to diarrhea in the world.¹ Despite the success of various national programs like Universal Immunization Program, Child Survival and Safe Motherhood (CSSM), Reproductive and Child Health (RCH), Integrated Management of Neonatal and Childhood Illnesses (IMNCI) and Reproductive, Maternal, Neonatal, Adolescent and Child Health

programmes (RMNCH+A), the proportional mortality rate of diarrhea in India still remains high.⁵

Diarrhea is also a leading cause of death during emergencies and natural disasters. Displacement of population into temporary overcrowded shelters is often associated with polluted water sources, inadequate sanitation, poor food hygiene practices and malnutrition—all of which affect the spread and severity of diarrhea.⁴

Safe drinking water has been recognized as a basic element of 'Primary health care' by the World Health Assembly as part of 'Health for All by 2000'.⁴ Water intended for human consumption should be both safe and wholesome and in adequate amounts for fulfilling the requirements of a family or a community. This has been defined as water that is -free from pathogenic agents, free from harmful chemical substances, pleasant to the taste, i.e., free from color and odour; and usable for domestic purposes.⁴

Water is said to be polluted or contaminated when it does not fulfill the above criteria. Water pollution is a growing hazard in many developing countries owing to overuse, decreased groundwater reserves and irresponsible human activity. Without ample and safe drinking water, basic health care services cannot be provided to the community.

Approximately 88% of diarrheal diseases are attributed to unsafe water supply, inadequate sanitation and hygiene.⁶ Water sources and sanitation facilities have an important influence on the health of household members, especially children.⁷ Unsafe drinking water is a major problem, especially in rural areas. Even when a drinking water supply is provided, unhygienic water handling practices result in contamination and thereby produce diarrheal diseases, especially in the vulnerable groups of children and the elderly. Personal hygiene especially hand washing is the most important factor in preventing diarrheal disease transmission. Lack of toilets and the practice of open air defecation in rural areas also cause illness & death among children.⁸

The methods taken to prevent diarrheal diseases are mainly focused at the household level. Thus without proper action by the family diarrheal diseases cannot be brought under control. There are several misconceptions and varied perceptions about diarrheal diseases among lay people, especially in villages. Proper knowledge about diarrhea and its prevention is essential for the people to practice adequate control measures. Water usage and handling practice also play an important role in transmission of diarrheal / water borne diseases. A study incorporating both these aspects is still relevant in any state of India. Information from the community will help the local public health personnel in assessing the need for health education and the aspects of knowledge and

practices that need special focus. It will also help in finding out any other health or public work actions required in the community. Hence this study was conducted to assess knowledge and practice regarding diarrheal diseases and the drinking water practices among the population of Arumanai panchayat of Kanyakumari district in South India.

MATERIAL AND METHODS

Study setting: Kanyakumari district in the state of Tamilnadu, is the southernmost district of mainland India. It receives significant rainfall during both monsoon seasons of India and is comparatively rich in water resources. Arumanai Panchayat of Kanyakumari district is a town panchayat with a population of 16,283 coming from 4,236 households. The overall Literacy rate is 90.5%.⁹ A cross sectional study was conducted among the population of Arumanai Panchayat for a period of 2 months from September to November 2015.

Sampling: A pilot testing of the questionnaire was done among the households and proportion of households with one episode of diarrhea in past 5 years was obtained as 55%. Sample size of 145 houses was arrived at using the formula $n=4pq/d^2$, where the above proportion is considered as p, $q=1-p$ and d is the permissible error (taken as 15% of p). This was rounded off to 150 samples. The sample households were selected from the panchayat household list. Arumanai panchayat has 15 separate locations/villages. 10 households were selected from each area by simple random sampling.

Inclusion criteria: Households whose residents have been residing in the study area for more than 6 months and had a respondent aged more than 18 years at the time of data collection were included in the study. **Exclusion criteria:** Households where the available adult respondent could not answer questions coherently were excluded from the study.

Data collection: Data was collected using a pretested semi-structured questionnaire administered to the respondents in the local language after obtaining informed written consent. It contained questions on basic characteristics of the respondents, knowledge about cause of Diarrheal diseases, perceptions about diarrheal diseases & actions taken when somebody has diarrhea. Questions on Oral Rehydration Solution (ORS) & Hand hygiene were included. Details about the drinking water sources, human waste disposal, water storage & handling, knowledge about water contamination & its prevention, actions taken to purify the water were also asked. If the selected household could not be included in the study, the adjacent house was selected and the respondents were included after obtaining informed consent. Data collected was entered into Microsoft Excel 2010 version. Data was

analysed using SPSS (trial version 20) and frequencies were expressed in percentages.

Ethical consideration: Approval for the study was obtained from the Institutional Ethics Committee. Personal information obtained during data collection was kept confidential.

RESULTS

A total 150 households from Arumanai Panchayat area were included in the study. Out of the 150 respondents, 58(38.66%) were males and 92(61.3%) were females. The age of the study participants ranged from a minimum of 18 to a maximum of 70 years. Among the respondents, 26.7% (40) believed microorganisms to be a cause of diarrhea, while 39 (26%) said diarrhea was caused by poor sanitation.(Table 1) 88% believed that boiling renders the water safe for drinking purposes.

Table 1: Perceived cause of diarrhea among respondents

Causes	Frequency (%)
Micro organisms	40 (26.7%)
Poor sanitation	39 (26%)
Indigestion	28 (18.7%)
Eating spicy foods	11 (7.3%)
Intestinal worms	8 (5.3%)
Unclean water	6 (4%)
Chemicals	2 (1.3%)
Eating too much sweets	1 (0.7%)
Do not know	15 (10%)
Total	150 (100%)

Table 2: Measures taken at home to treat a diarrheal episode

Measures	Frequency (%)
Plenty of water	77 (51.3%)
Other fluids like ginger or lime black tea	51 (34%)
Ignore	13 (9%)
Restrict food intake	9 (6%)
Total	150 (100%)

More than half of the people (n=91, 60.7%) were of the opinion that diarrhea was fatal by itself. 74.7 % of the people responded that hand washing reduced the chance of diarrhea.

When a member of the household suffers from diarrhea, 77 families (51.3%) make them take plenty of oral fluids and 34% follow other measures like taking black tea with

lime & ginger syrup.(Table 2) During the last episode of diarrhoea in the family, only 50.7% had prepared Oral Rehydration Solution (ORS) at home. Regarding the purpose of ORS in the treatment of diarrhea, only 50% knew that ORS is used in correction of dehydration.(Table 3) 74.7% said that they will take the person to the hospital when the diarrhea is not responding to home treatment, while the others (25.3%) would rather wait for the diarrhea to settle on its own. Regarding personal hygiene, only 40.7% of the respondents washed their hands with soap and water before eating food and only 24% did it after defecation. (Table 4)

Table 3: Perceived purpose of ORS in the treatment of diarrhea

Purpose	Frequency	Percent
Correction of Dehydration	75	50 %
To cure diarrhea	39	26 %
Do not know	36	24 %
Total	150	100 %

Table 4: Hand-washing Practices among Respondents

Practices		Frequency	Percent
Always washing hands before food	Yes	145	96.7
	No	5	3.3
Before food, washing hands with [#]	Water only	86	59.3
	Soap & water	59	40.7
Always washing hands after defecation	Yes	146	97.3
	No	4	2.7
After defecation, washing hands with [@]	Water only	111	76
	Soap & water	35	24
Ensuring children wash their hands before food	Yes	143	95.3
	No	7	4.7
		# n=145	@ n=146

Half of the households (n=76, 50.7%) used covered well as their source of drinking water, while 25 (16.7%) used uncovered wells. 31 households (20.7%) used panchayat pipe and 17 (11.3%) used bore wells. Pond water was used as a source of drinking water by one respondent (0.6%). 146 respondents (97.3%) had a toilet at home and 132 (88%) had a septic tank at home. Among those houses with their own septic tank, only 74 (56%) of the households had a septic tank at the proper distance of more than 50 feet. Majority of the households, i.e., 91.3% stored drinking water in a closed vessel. 47.3% people dipped the glass into the container where as 52.7% pour out water from the container. 41.3% of people use colour as indicator of contamination of water while 21.3% use odour to detect contamination.

Table 5: Primary method used to prevent diseases spread by unsafe water

Methods	Frequency	Percent
Boiling water	129	86
Using filtration/ purifiers	10	6.7
Preventing water source contamination	4	2.7
Purification of drinking water source	7	4.6
Total	150	100

Among the household measures undertaken to prevent diseases spread by unclean water, 86% (129 people) boiled water used for drinking purposes. Filtration as a means of purifying water was used by only 6.7% of the study population.(Table 5)Among the 86% who boil water before drinking at home, 38% heated the water just until it begins to boil and only 27.3% boiled water for 10 minutes as it should be done ideally. Among the people who use well water, 44% do not clean the well frequently. 58.3% clean the well by removing dirt from the bottom, only 20.7% use chlorination for cleaning the well. Among the panchayat pipe users, 82.7% did not know how often the water is chlorinated.

DISCUSSION

In our study it was found that 26.7% of the people believed microorganisms to be the cause for diarrhea, while 26% thought that diarrhea was the result of poor sanitation. A minority also thought that diarrhea was the result of other causes such as indigestion, unclean water and spicy food. A study by Banda et al. in a Harijan colony of rural Tamil Nadu in 2007 found that villagers associated diarrhea with ‘heat, consuming spicy food or eating mud’. Unsafe water was not attributed as a cause for diarrhea.¹⁰Our findings also compare favourably with a KAP study conducted in 2011 on water handling and sanitation practices in Ichhwar and Astha block in Madhya Pradesh, where 18% respondents in Ichhwar block and 22% in Astha block thought that diarrhea was caused by dirty water or food.¹¹ A reason for this could be the better literacy in our study population compared to Madhya Pradesh. Kuberan also reported germs as the major perceived cause of diarrhea at 72% followed by poor hand hygiene (27%) and spicy foods at 31%.¹²

In our study 60.7% of the participants thought that diarrhea is fatal by itself. In a KAP study conducted by Famara Sillah among mothers about management of children with diarrhea, 92% thought that diarrhea was a serious childhood illness.¹³

Among the respondents in our study, 41.3% of people tend to use color as indicator of contamination of water while 21.3% used odor to detect the contamination of water. This is much lower than the result of 95% of

respondents using physical characteristics alone to identify safe water in an intervention study by Freeman et al. in Krishnagiri district in 2007.¹⁴This may be due to the better literacy and socioeconomic conditions among the residents of Arumanai in our study. About 11% of the mothers in the KAP study by Sillah also identified unsafe water by the color of water alone.¹³

Coming to management of diarrhea, in our study 51.3% of the people take plenty of oral fluids and 34% use other measures like taking black tea with lime and ginger syrup as home remedies. In a KAP study conducted in Nepal in May 2009, 40% of the participants preferred to have home treatment for diarrhea out of which 19% knew the correct home treatment.¹⁵Among our study population 50% of the people prepare ORS at home and 38.7% know that ORS is used for correcting dehydration. In the study conducted in Nepal only 8% knew how to properly prepare and use ORS.¹⁵ In another study conducted to assess mothers’ knowledge and practice of home care management of diarrhea in case of children less than 5years in Nakuru, Kenya, 17.5% of the participants knew that ORS was used in diarrhea and only 7.75% used it.¹⁶Sillah also reported only 20% mothers studied knew the proper way of preparing ORS properly.¹³

74.7% of our study population would seek treatment only when home based measures did not reduce diarrhea. Only 54% of mothers in an urban Delhi slum would seek immediate treatment for diarrhea.¹⁷This is mostly due to perception of diarrhea as a less serious disease. Compared to other studies our study population had better awareness about the use of ORS in diarrhea. The number of people who prepared ORS at home during diarrhea is also more. The two reasons for this could be the increased literacy rate in Tamil Nadu compared to Madhya Pradesh and Delhi slums and the awareness programs conducted here about diarrhea and its prevention and management.

In our study 96.7% of the participants always washed their hands before eating, while 39.3% used soap and water. In Ichhwar block only 20% used soap and water, whereas in Astha block 22% used soap and water.¹¹Similarly in our study 76% washed their hands after defaecation compared to 22% in Ichhwar block and 54% in Astha block. This difference can be attributed to the scarcity of water in Madhya Pradesh compared to Tamil Nadu and also economic and cultural factors. Kuberan et al also found that hand washing before food (70%) was more common than hand washing after defecation (32%) in their study.¹²Another study by Kumar et al in Manipur showed hand washing with water was more commonly followed rather than washing with soap and water.¹⁸Banda et al. showed regular hand washing was followed only by 86% of children under 15 years of age in rural Chennai.¹⁰

Our study revealed covered wells as the source of drinking water in half of the households (50.7%), with uncovered wells (16.7%), piped water (20.7%) and bore wells (11%) being the other major sources of drinking water. Kuberan et al in Chennai found a higher dependence on piped water (42%) and bore wells (37%) as the drinking water source, probably because the study was based in the city of Chennai.¹² Pachori in his study in rural Salem found that majority of the people (85%) depended on piped water system.¹⁹

Most of the respondents in our study (97.3%) had toilets within their homes with 88% having their own septic tanks, whereas only a much lower number of people (62.7%) had toilets within their household premises in rural Salem.¹⁹ The Chennai study by Kuberan et al had higher percentage of houses (75%) with their own toilets.¹² Banda et al. in their study in a Harijan colony found only 30% of the villagers had toilets in their homes, of whom only 86% actually used these toilets with the others preferring open air defecation.¹⁰ This can be attributed to the lower socio educational status and cultural practices of the Harijan community.

Most of our study participants (91.3%) stored water in closed container. Lower percentages of 75% and 83% were reported by Kuberan and Pachori respectively in their studies. This may be due to the higher educational status of our respondents.^{12, 19} In a KAP study conducted in Karachi regarding drinking water handling before and after interventions, it was found that before intervention 96% used a closed container and after intervention 97.5% used a closed container.²⁰ Among our participants 52.7% pour out water from the container, while 47.3% dipped glass into container to collect water from it. 97.5% dipped glass into the container before intervention, whereas after intervention only 35% did so.²⁰ The difference may be due to cultural difference among the two regions.

In our study, 87.3% always boil drinking water at home, but among them only 27.3% boil water for 10 minutes. The villagers of rural Salem also preferred boiling (45%) for disinfecting water with only 39% using other methods.¹⁹ 24% of respondents in a post intervention study by Freeman et al. in Krishnagiri district in 2007 treat drinking water before use by boiling, while 21% use other methods (cloth/ other filters, purifiers).¹⁴ Only 21% of villagers in rural Villupuram treated water by boiling while others (78.4%) did not use any method to treat water at all, as reported by Mittal et al.²¹ Thus, our findings show a better level of knowledge and practice regarding point of use disinfection and treatment of drinking water among the residents of Arumanai, most probably due to better literacy and socioeconomic status.

In our study only 17.3% of the people filtered drinking water at home. In the KAP study conducted in Madhya

Pradesh 19.6% in Ichhwar block and 24% in Astha block used filtration as a method of water purification.¹² Kumar et al reported 63% of respondents using filtration as a method of purification.¹⁵

CONCLUSION: This cross sectional study conducted in Kanyakumari district of south India showed that knowledge about diarrheal disease is inconsistent, with some aspects known to a majority while only a minority knew about certain other aspects. Although the knowledge and use of ORS is better than what is seen in many studies done in India, it is still less than what is expected for an area with such high literacy rate. All of the households practice drinking water purification but boiling (the most common method used) is not done properly by more than two thirds of the households. Measures for safe storage and handling of drinking water are comparatively better followed, but can be improved. Proper hand hygiene is not adequate. Thus there is need for behaviour change communication with respect to diarrheal disease prevention and safe water handling practices. We specially recommend hands-on training on proper method of boiling and on disinfection of household wells.

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Original Research Article

Health Problems and Work Stress of Female Non-teaching Staff at a Tertiary care Institution

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Abstract

Background: Working women's health is of crucial importance, which greatly influences not only their quality of life, but also the productivity of the institution. **Aim and objectives:** To find out the health problems and work stress of the female non-teaching staff working at a tertiary care institution. **Materials and methods:** A descriptive cross-sectional study of 172 female non-teaching staff in a tertiary care institution. A semi structured, pre-designed schedule was applied. Anthropometric and blood pressure measurements were recorded. Hemoglobin concentrations, fasting blood sugar, Thyroid stimulating hormone levels were estimated. Statistical analysis was done with descriptive statistics using frequencies and chi-square test. **Results:** One third of them belong to low socio-economic status. Gynaecological problems and musculoskeletal problems and upper abdominal pain, belching were found among 27.9%, 25%, 25% of the participants respectively. Majority (82.6%) of the staff said that there was no work stress. More than half (51.2%) of the participants were found to be obese ($BMI \geq 23 \text{ kg/m}^2$). Anaemia ($Hb < 12 \text{ g/dl}$) was found in 60% of them. **Conclusion:** Higher number of staff was found with Anaemia, gynaecological and medical problems, and appropriate treatment was given to them.

Key words: health problems, work stress, female non-teaching staff

Introduction:

Women employees constitute an important work force for any institution. Women face a number of challenges at work not only professional but also health issues. Their health problems and work stress can affect the success of departments both directly and indirectly and hence the institution and society.

Studies have shown that health problems are at high prevalence among workers at various occupations. ⁽¹⁻³⁾ Work stress is an important determinant that has to be assessed among employees. Reasons for work stress can be harassment, heavy work load, irregular work schedule, lack of support etc. Many of the job conditions, along with the problem of balancing work and family issues, contribute to stress at the work place. ⁽²⁾ The studies about

health problems and work stress of females working at tertiary care institution are scarce.

Gynaecological problems are at higher prevalence in India. The range of gynaecological morbidity is varying from 40% to 88% in Indian studies. ⁽⁴⁻⁶⁾ Gynaecological morbidity, if untreated, can lead to adverse health outcomes. ⁽⁷⁾

Nutritional Anaemia is a disease syndrome caused by malnutrition in its widest sense. ⁽⁸⁾ It has been defined by WHO as a "condition in which the hemoglobin content of blood is lower than normal as a result of a deficiency of one or more essential nutrients, regardless of the cause of such deficiency". ⁽⁹⁾ Anaemia even when mild causes a significant impairment of maximal work capacity.

Anaemia reduces the work performance and their by productivity. This has great significance on the economy of the country. ⁽¹⁰⁾ Anaemia is the most common nutritional deficiency observed globally.

This study aims at to know the health problems and work stress of female non-teaching staff at Gitam Institute of Medical Sciences and Research.

Objectives:

1. To know the medical and gynaecological problems of the female non-teaching staff.
2. To know the work stress in them.

Material and Methods:

The study was a cross sectional descriptive study among female non-teaching staff of Gitam Institute of Medical Sciences and Research, Visakhapatnam, Andhra Pradesh.

All female non-teaching staff – Nurses, junior assistants, Health workers, Attenders were included in the study. Among 208 female non-teaching staff, 172 participated in the study. Consent was taken from them after explaining about the details of the study. Twenty six members refused to participate in the study, 5 were not available and data of 5 persons were not taken into the study as they were pregnant. Institutional ethics committee approval was taken. The study was done during April 2017 and May 2017.

A pre-designed, pre-tested, semi-structured schedule was administered to collect data about their socio-demographic details, health problems, physical activity of at least 30 min per day, salt intake, fruits, vegetables intake and work stress.

Anthropometric measurements (weight, height), Blood pressure measurement were taken for all the participants. Body mass index was calculated using weight and height. Asia-pacific guidelines for obesity classification were taken into consideration for this study. ⁽¹¹⁾

Blood investigations were done to know hemoglobin concentration, levels of thyroid stimulating hormone (TSH) and random Blood sugar. Consent for blood investigations was given by 125 participants. Reports of TSH and RBS were not given by three members. Therefore data of 122 members was analyzed for TSH and RBS levels.

Results:

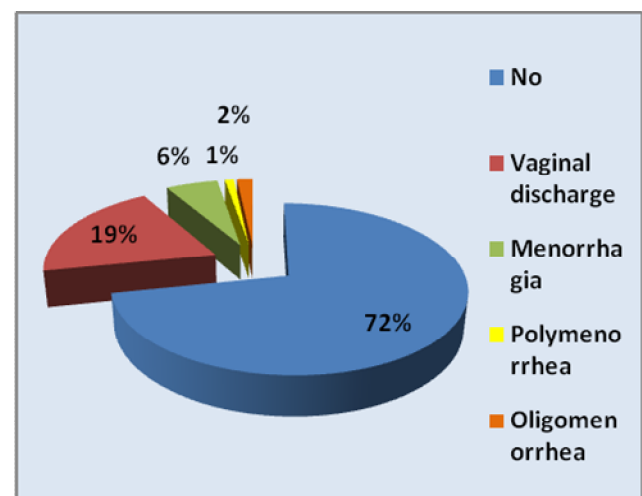
A total of 172 female non-teaching staff participated in the study. Majority (64%) of the participants was less than 30 years, married, and one-third of them belong to low socio-economic status. (Table-1).

More than one fourth (27.9 %) of them were suffering with gynaecological problems (Figure-1).

Table-1: Characteristics of the study participants

Age groups	n	%
Less than 30yrs	110	64
≥ 30 yrs	62	36
Education		
Illiterate	46	26.7
Intermediate & vocational course	22	12.8
Degree	104	60.5
Occupation		
Unskilled	46	26.7
Skilled	126	73.3
Ration card		
Yes	54	31.4
No	118	68.6
Marital status		
Married	111	64.5
Unmarried	54	31.4
Others (widow, separated)	7	4.1

Fig : 1 Gynaecological morbidity among study participants



One quarter of them reported about musculoskeletal problems, upper abdominal pain and belching symptoms (Table-2).

Around 7% of them were known hypertensive, and 5% were known diabetic. It was significant that all known hypertensives were found in the age group more than 30 years (chi square value= 22.48, p value <0.01)

Regarding dietary habits, three fourth (75%) of them were not taking fruits daily, and more than one third (38.3%) were not taking vegetables daily.

Table 2: Distribution of medical problems among the study participants

Medical problems	n	%
Musculoskeletal problems	43	25
Upper abdominal pain and belching	43	25
Hypothyroidism	6	3.5
Skin problems	5	2.9
Respiratory problems	8	4.7
Headache	16	9.3
No	51	29.6
Total	172	100

Around three fifth (60.5%) were physically inactive (they were not doing at least 30 minutes of physical activity per day).

Raised systolic blood pressure, diastolic blood pressure was seen among 4.7% and 7% of the participants respectively. Among the known hypertensive's, half of them were found with raised blood pressure i.e. $\geq 140/90$ mm of Hg because of irregular usage of anti-hypertensives. Hypertension was newly diagnosed among 4.8% of the study subjects. Treatment and health education about diet, physical activity and about adherence to treatment was given to all those who were diagnosed with hypertension.

Blood investigations:

Three fifth (60%) of the staff were found to be anaemic after examination for hemoglobin concentration using cyanohaemoglobin method. The mean hemoglobin level was found to be 11.51g/dl with standard deviation of 1.36 g/dl. (Table-3).

Table 3: Grades of Anaemia based on Hemoglobin concentrations (gm/dl) among the study subjects

Grades of Anaemia Hb gm/dl	n	%
Severe Anaemia (< 8)	4	3.2
Moderate Anaemia (8 -10.9)	29	23.2
Mild Anaemia (11-11.9)	36	28.8
Normal (≥ 12)	56	44.8
Total	125	100
Mean (Hb) \pm SD	11.51 \pm 1.36	

Raised random blood sugar levels were observed among the 5.7% of the staff. Thyroid stimulating hormone levels were raised ($>4.2\mu\text{IU/ml}$) in 18.9% (23 out of 122) of the study subjects. An investigation for T3 and T4 levels was not done during the study period. All the persons with raised TSH levels had been referred to general physician for further evaluation.

Work stress:

Majority (82.6%) of the staff said that there was no work stress, while others (17.4%) said that Irregular work schedule, lack of clarity in the job, heavy work load were the reasons for stress. (table-4)

Table 4: Distribution of work stress and the reasons for work stress among the study subjects:

Work stress	n	%
Irregular work schedule	9	5.23
Lack of clarity in job	7	4.07
Heavy work load	14	8.13
No work stress	142	82.56

When compared with work stress and occupation, 95.7% of unskilled (45 out of 47) and 77.6% of skilled (97 out of 125) staff said that they had no work stress. It was found statistically significant (chi-square value = 7.81; df =1; p = 0.003)

Among non work stress group, 66.2% were found to be in the age group less than 30 yrs. But it was not found statistically significant.

Discussion:

In this study most common medical problems found were musculoskeletal problems (25%), upper abdominal pain and belching (25%). In other studies, high prevalence of musculoskeletal problems was reported, but they were conducted in small-scale industries. ^(1,3)

In the present study, the gynaecological morbidity was 27.9%. In Indian community studies, the prevalence was up to 88%. ⁽⁶⁾ As the present study was conducted among females in a tertiary care institution, the morbidity found was differing from community studies. Vaginal discharge (foul smelling, with or without vaginal itching) was the most common finding (19.8%) in this study. A community study was also quoted that vaginal discharge was the most common symptom. ⁽¹²⁾

The mean hemoglobin in the study population was 11.5 g/dl with standard deviation 1.36 g/dl which is less than the cut off value for anemia among non-pregnant women as per WHO guidelines. ⁽¹³⁾

In the study, 17.2% (21 out of 122) of the staff were newly identified with high levels of TSH, remaining (2 members) had history of hypothyroidism. The prevalence of hypothyroidism in India is 11%. ⁽¹⁴⁾ Even though 17.2% of the individuals were found with raised TSH levels in this study, as T3 and T4 levels were not checked that may be the limitation to this study.

In the study majority of the participants responded that they had no work stress and 17.4% said that they were suffering with work stress. They said that erratic work schedule, lack of clarity in the job, heavy work load were the reasons for the stress. Majority of unskilled workers were said that they had no work stress when compared to skilled staff. More number of staff were coping well with the job was reported in a recent study in a tertiary care institution. They also said that majority of staff in all age groups were coping well with job stress, similar finding was found in this study also ⁽¹⁵⁾.

Conclusion and Recommendation: Majority of the staff were anemic. Most of them were satisfied with their work. Periodic health screening of the employees should be done in order to recognize the health problems at early stage.

Limitation of the study: Healthy worker effect has to be considered while assessing the morbidity among the workers. No validated scale was used to measure the work stress.

Conflict of Interest: None

Source of funding: Nil

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Original Research Article

Obstacles to contraceptive use among married women of reproductive age group in Adilabad District

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Abstract

Introduction: Population explosion has been India's major problem and obstacle to the nation's overall progress. Adoption of family planning method is one of the best solutions to tackle the problem. While real progress has been made in improving access to contraceptives, still many people are not utilizing it. **Objectives:** To determine the percentage of unmet need of contraception, to study socio-demographic determinants associated with unmet need of contraception & to find out the obstacles to contraceptive use faced by the married women of reproductive age group in Adilabad district. **Material and Methods:** Cross Sectional Descriptive study was carried out on 210 married women in reproductive age group attending the gynaecology and pediatric departments of Rajiv Gandhi Institute of Medical Sciences, Adilabad. A pre-designed, pre-tested structured proforma was used to collect data. **Results:** Among the total 210 participants, 75.7% were Hindu and most of them were rural residents (67.6%). Literacy status showed majority (51.4%) had secondary level of schooling. Most of them were housewives (70.5%) while 77.6% had one child or two children. As per data, 135(64.3%) women were not using any method contraception while unmet need of contraception was 32.85% (17.14% for Spacing and 15.71% for Limiting). Major obstacles to use of contraceptives were Lack of awareness & ignorance, Fear of side effects and Family/Husband's opposition. **Conclusions:** Women need correct information on contraceptive methods, especially on side effects and how to manage them. Broader education and communication programs can also help address social and cultural obstacles to family planning, misconceptions.

Keywords: Contraceptive, Obstacles, Married women, Unmet need

Introduction:

Population explosion has been India's major problem and obstacle to the nation's overall progress. Adoption of family planning method is one of the best solutions to tackle the problem¹. One of the National Socio-Demographic Goals for 2010 under the National Population Policy (2000) was to address the unmet needs for basic reproductive and child health services, supplies and infrastructure². Higher fertility is mainly due to unmet need for contraception. While real progress has been made in improving access to contraceptives, still many people are not utilizing it. In the developing world limited access to family planning results in high rate of unintended pregnancies, millions of unsafe abortions & thousands of maternal deaths. Limited access to family

planning is also a leading cause of infant death in developing countries³.

More than 100 million women in less developed countries or about 17% of all married women would prefer to avoid a pregnancy but are not using any form of family planning⁴.

Women with unmet need are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child. The concept of unmet need points to the gap between women's reproductive intentions and their contraceptive behaviour⁵. Unmet need is a valuable programme indicator because it shows how well the populations' felt need for family planning is addressed. ⁶. Data on unmet need can also help family planning programs target activities by identifying women

who are at greatest risk of unintended pregnancy and more likely to adopt a method than other nonusers⁷. As per National Family Health Survey (NFHS)-III (2005-6), the unmet need for contraception in India is 12.8% while the unmet need of contraception in Adilabad is around 12% compared to overall 8% of Andhra Pradesh state⁸.

One of the main objectives of family planning program is to spread the knowledge and awareness about family planning and develop favourable attitude among the people for adoption of Family planning methods. In spite of several initiatives taken up by the government, the contraceptive prevalence rate among the population of Adilabad is low when compared to other districts. While unmet need of contraception is high compared to other district no studies were done on the extent and the reasons for unmet need of contraception in Adilabad District. Hence the present study was conducted in Adilabad District with following objectives.

Objectives:

1. To determine the percentage of unmet need of contraception
2. To study socio-demographic determinants associated with unmet need of contraception.
3. To find out the obstacles to contraceptive use faced by the married women of reproductive age group in Adilabad district.

Material and Methods:

An institution based cross-sectional descriptive study was conducted on 210 married women in reproductive age group attending the Obstetrics & Gynaecology and Pediatric departments of Rajiv Gandhi Institute of Medical Sciences, Adilabad. Taking the wife’s response as proxy for the couple’s contraceptive behaviour, only married women of reproductive age group were recruited. Considering the unmet need of 12 % in Adilabad (as per DLHS-3, 2007-2008)⁹, the sample size was calculated with 95% confidence level. The desired sample was estimated to be 162 but in present study we included 210 married women. The study was undertaken after obtaining approval from the Institutional Ethics Committee. A pretested, semi-structured questionnaire was used to interview the participants after taking the written informed consent.

The questionnaire had 2 parts. Part 1 of the questionnaire recorded information on the socio-demographic characteristics of the respondents like age, education, occupation, religion, residence, married years, and number of living children. Part 2 focused on use of contraceptives, knowledge of contraceptive methods, source of information, reasons for not using contraception, whether the women discuss about contraception with their husbands and decision maker.

Statistical analysis was performed using Microsoft excel. Frequencies and Percentages were calculated while Chi square was used as test of significance.

Results:

Table: Prevalence of unmet need of contraception among study population (n=210)

Unmet need	No. (%)
Unmet need for spacing	36 (17.14)
Unmet need for limiting	33 (15.71)
Total unmet need of contraception	69 (32.85)

Table 2: Socio-demographic factors and unmet need for contraception

Sociodemographic factors	With Unmet need (N=69) No (%)	Without Unmet need (N=141) No (%)	Total (N=210)	Test of Significance
Age				
≤ 25 years	51 (73.91)	60 (42.55)	111 (52.38)	X ² =18.28, p< 0.001
> 25 years	18 (26.19)	81 (57.45)	99 (47.68)	
Religion				
Hindu	52 (75.36)	107 (75.89)	159 (75.71)	X ² =0.0069, p> 0.05
Muslim	17 (24.64)	34 (24.11)	51 (24.29)	
Education				
Illiterate	13 (18.84)	32 (22.70)	45 (21.43)	X ² =0.408, p> 0.05
Literate	56 (81.16)	109	165	
Occupation				
Household work	48 (69.57)	100 (70.92)	148 (70.48)	X ² =0.041, p> 0.05
Productive	21 (30.43)	41 (29.08)	62 (29.52)	
No of living children				
< 2	36 (52.17)	63 (44.68)	99 (47.68)	X ² =1.0439, p> 0.05
≥ 2	33 (47.83)	78 (55.32)	111	
Married				
≤ 5 years	53 (76.81)	73 (51.77)	126 (60)	X ² =12.10, p< 0.001
> 5 years	16 (23.19)	68 (48.23)	84 (40)	
Ease of				
Yes	48 (69.57)	120 (85.11)	168 (80)	X ² =6.99, p< 0.05
No	21 (30.43)	21 (14.89)	42 (20)	

A total of 210 married women in reproductive age group were included in the study and interviewed. The mean age of the respondents was 24.29± 3.53 years. About 75.7% were Hindu and most of them were rural residents (67.6%). Literacy status showed majority (51.4%) had secondary level of schooling while 21.43% were illiterate. Most of them were housewives (70.48%) while rests were engaged in some productive work. Majority of the

respondents (77.62%) had one child or two children whereas 14.76% had more than two living children. Regarding married life, 60% of the respondents were from less than 5 years of married life. Most of the respondents (80%) had ease of discussion about contraception with their spouse. As per our data, only 75(35.71%) respondents were using any method of contraception. In our study, Unmet need of contraception was 32.86%; unmet need for spacing was 17.14% while for limiting it was 15.71% (Table 1).

Table 2 shows the association of socio-demographic characteristics with unmet need for contraception. Significant difference was seen between the women with unmet need and without unmet need of contraception for age, married year and ease of discussion about contraception. Major obstacles for the use of contraceptives were Lack of awareness & ignorance (52.32%), Fear of side effects (15.89%), Family/Husband's opposition (13.91) and Medical problem (11.92%) as mentioned in Table 3.

Table 3: Distribution of study population according to Obstacle for contraceptive use (Multiple responses)

Obstacle for contraceptive use	No. (%)
Ignorance & Lack of Awareness	79 (52.32)
Fear of Side Effects	24 (15.89)
Medical Problems	18 (11.92)
Family Opposition	13 (8.61)
Husbands Opposition	8 (5.30)
Divine	6 (3.97)
Social/Cultural Constraints	2 (1.33)
Cost	1 (0.66)
Total	151(100)

Discussion:

This study was conducted to determine the percentage of unmet need of contraception, study the socio-demographic factor associated with unmet need for contraception and to find out the obstacles to use contraceptives among married women of reproductive age group in Adilabad district. The contraceptive use among the respondents was only 35.71% and the unmet need of contraception was 32.85%. Studies done by Pravin N Yerpude et al¹⁰, Choudhary et al¹¹, Bhattacharya SK et al¹² and Patil SS et al¹³ have all reported an unmet need of contraception (between 38-44%) which is higher than that found in the present study (32.85%). The extent of unmet need for contraception in our study is greater than the findings of Srinivasa Kumar et al¹⁴ (9.4%), National Family Health Survey III⁸ (13.2%), Srivastava Dhiraj Kumar et al³ (21.70%), Kanchan Lata et al¹⁵ (23.9%). The unmet need for spacing births in our study was 17.14% and this result was comparable with the findings of Choudhary et al¹¹ (16.15%), Bhattacharya SK et

al¹² (15.83%), Pravin N Yerpude et al¹⁰ (15.71%) but greater than that reported by NFHS-III⁸ (6.3%) Vasudevan K et al¹⁶ (4.9%). We found unmet need for limiting method was 15.71% which is similar to various studies viz. Vasudevan K et al¹⁶ (15.6%), Sudha V et al¹⁷ Kanchan Lata et al¹⁵ (14.5 %) but lower results had been reported by Nisha Ram Relwani et al¹⁸ (8.2%), Bhattacharya et al¹² (25.84%) & NFHS-III⁸ (6.8%), Ray Karmakar P et al¹⁹ (2%). The differences in unmet need may arise due to differences in demographic profile of the community under study, along with other social factors affecting the need.

We found that there was significant association between age of respondent and unmet need of contraception which was also reported by NFHS-III, Vasudevan K et al¹⁶, Srivastava Dhiraj Kumar et al³, Pravin N Yerpude et al¹⁰. Married women of age ≤ 25 years had more unmet need of contraception than women of age > 25 years which might be due to lack of awareness about contraceptives and less opportunity to participate actively in decision making among younger women. In this study most unmet need among younger women was for spacing birth because younger women still want to have more children. Among older women, most unmet need was for limiting births because older women possessed as many children as they want. Similar observations were made by Nisha Ram Relwani et al¹⁸. In our study we also noted that there was significant association between number of married year and unmet need of contraception as it was more in women of ≤ 5 year of marriage than women of > 5 year of marriage. This might be because most couple would prefer to have children within 5 years of marriage. The present study noted that women who had ease of discussion with their husbands on contraception were more likely to have less unmet needs for contraception than women who had no discussion with their husbands on contraception. This difference was statistically significant. Similar findings were mentioned by Vasudevan K et al¹⁶.

We observed that there was no association between religion, place of residence education, number of living children & occupation with that of unmet need of contraception.

In our study, major obstacles mentioned by respondents for the use of contraceptives were Lack of awareness & ignorance, Fear of side effects, Family/Husband's opposition and Medical problem. Similar obstacles were also noted in various studies^{10,14,15,16,17,18}. Overcoming these common obstacles to contraceptive use will enable women to take better control of and improve their reproductive lives.

Conclusion:

Prevalence of unmet need was higher in more fertile age group (i.e., <25 years), therefore family planning program should focus more on this age group. Spacing methods are more applicable to younger age group and permanent

methods to older age group. The most common reason for not using any contraceptive method among married women was lack of awareness & ignorance. Family planning should emphasize awareness, communication and good counseling to the women and explain all sorts of information about side effects and other misconceptions about the new contraceptives. In a traditional society like India, where men are dominant in decision-making, encouraging spousal communication and involving both men and women equally in family planning decision-making is important in bridging the gap between met and unmet need.

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Original Research Article

**AWARENESS, ATTITUDE, AND PRACTICE OF EXCLUSIVE
BREASTFEEDING AMONG MOTHERS ATTENDING A TERTIARY
CARE HOSPITAL IN TAMIL NADU**

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Abstract

Introduction:Breast milk is the ideal food for newborns and infants.It is safe and contains antibodies that protects infants from common childhood illnesses. WHO recommends Exclusive Breastfeeding (EBF) for the first six months of life. **Methodology:** The present cross-sectional study was undertaken among 166 mothers attending a tertiary care hospital in Kanchipuram District between, June and September. An interview was conducted using a questionnaire.The first part of the questionnaire comprised of questions pertaining to the socio-demographic profile of the mothers.Second part was devised to assess the Awareness, Attitude, and Practice of mothers towards Exclusive Breast Feeding. **Results:**The present study was carried out among 166 mothers. In that, most of the mothers 88(53%) belonged to the age group of 19-24. 65%(108) of the women were aware of exclusive breastfeeding and 101(61%) knew that the child should be exclusively breastfed up to 6 months. All mothers were of the idea that exclusive breastfeeding was advantageous to the child. It was also observed that 92 (55.4%) of the mothers had initiated breastfeeding within 1 hour of delivering the child and 162(97.6%) mothers had given colostrums to the child. The proportion of exclusive breastfeeding was only 7.2 %(12). **Conclusion:** The present study showed a very little proportion of exclusive breastfeeding among mothers despite adequate awareness and a positive attitude .Most of the mothers failed to practice owing to inadequate breast milk secretion.

Keywords: Awareness, Practice, Exclusive breastfeeding, Cross-sectional study.

INTRODUCTION

Breast milk is the ideal food for newborns and infants. It gives infants all the nutrients they need for healthy development. It is safe and contains antibodies that help protect infants from common childhood illnesses such as diarrhoea and pneumonia, the two primary causes of child mortality worldwide. Breast milk is readily available and affordable, which helps to ensure that infants get adequate nutrition.¹WHO recommends Exclusive breastfeeding (EBF) for the first six months of life. At six months, solid foods, such as mashed fruits and vegetables, should be introduced to complement breastfeeding for up to two years or more.¹

In addition, breastfeeding should begin within one hour of birth breastfeeding should be "on demand", as often as the child wants .Bottles or pacifiers should be avoided. Breastfeeding also benefits mothers. Exclusive

breastfeeding is associated with a natural (though not fail-safe) method of birth control (98% protection in the first six months after birth). It reduces risks of breast and ovarian cancer, type II diabetes, and postpartum depression. Globally, less than 40% of infants under six months of age are exclusively breastfed¹.

World Breastfeeding Week is celebrated every year from 1 to 7 August to encourage breastfeeding and improve the health of babies around the world. It commemorates the Innocenti Declaration signed in August 1990 by government policymakers, WHO, UNICEF and other organizations to protect, promote and support breastfeeding.²In India, the introduction of liquids and solid or semi- solid foods often takes place before the recommended age of six months. Less than half of children under six months of age are exclusively breastfed. Exclusive breastfeeding drops to only 28 percent for children age 4-5 month. As per the NFHS 3

survey data, the exclusive breastfeeding in India was about 46%.³Predictors of breastfeeding may vary between and within countries. Urban or rural difference, age, breast problems, societal barriers, insufficient support from family, knowledge about good breastfeeding practices, mode of delivery, health system practices, and community beliefs have all been found to influence breastfeeding in different areas of developing countries^(4,5,6)

Despite being inexpensive as well as the healthiest form of nutrition to the newborn, the attitude and practice with regards to breastfeeding are minimal. The present study was undertaken to study the awareness, attitude and practice with regards to breast feeding among mothers.

MATERIALS AND METHODS

The present cross-sectional study was undertaken among 166 mothers attending tertiary care hospital in Kanchipuram District between June and September 2016 in Tamil Nadu. Only the mothers who gave consent for participation in our study were included and thus the sample size was arrived at 166. Mothers between 18-35 years attending Medical College Hospital irrespective of the medical illness or that they accompany a patient and mothers attending immunization OPD in the Hospital were included in the study. Antenatal mothers attending medical college hospital and mothers with infants less than 6 months age were excluded from the study. After obtaining ethical committee approval and informed consent of the patients, an interview was conducted using a questionnaire. The first part of the questionnaire comprised of questions pertaining to the socio-demographic profile of the mothers. Second part was devised to assess the Knowledge, Attitude, and Practice of mothers towards Exclusive Breastfeeding. Scoring of practice of breastfeeding was done. The questions on practice of Exclusive Breast feeding were scored as 1 for correct practice and 0 for any wrong practice. The total practice scores were calculated and used in analysis. Data was entered in MS-Excel sheet spreadsheet. (2007). Data was analyzed using statistical package for social sciences version 20 (trial version). Proportions were used to describe the socio-demographic variables and information on the knowledge, practice, and attitude towards breast feeding. ANOVA was used to compare mean scores between the socio-demographic variables and practice of breast feeding and a p value of less than 0.05 was considered to be statistically significant.

RESULTS

The present study was carried out among 166 mothers. In that, most of the mothers 88(53%) belonged to the age group of 19-24. Only 12 (7.2%) were aged above 30. The educational status of the mother revealed that only 8

Table 1: Socio-demographic variables of the study participants

PARTICULARS	RESPONSE	N	%
Age of the Mother	19-24	88	53
	25-30	66	39.8
	Above 30	12	7.2
Education of the Mother	Illiterate	8	4.8
	Primary	50	30.1
	Secondary	40	24.1
	Higher	48	28.9
	Graduate	10	6
Working status from child birth upto 6 months postnatal	Employed	14	8.4
	Unemployed	152	91.6
Education of husband	Illiterate	2	1.2
	Primary	6	3.6
	High school	56	33.7
	Higher secondary	36	21.7
	Under graduate	54	32.5
	Post graduate	12	7.2
Working status of husband	Employed	158	94
	Unemployed	8	6
Socioeconomic status	Class I	23	13.8
	Class II	32	19.2
	Class III	54	32.5
	Class IV	47	28.3
	Class V	10	6
TOTAL		166	100

Table 2: Awareness and Attitude towards Breastfeeding

AWARENESS & ATTITUDE	RESPONSE	N	%
Are you aware of exclusive breast feeding?	Yes	108	65.1
	No	58	34.9
Did you have any prior knowledge on exclusive breastfeeding before child birth	Yes	72	43.4
	No	94	56.6
Do you think exclusive breastfeeding is essential?	Yes	148	89.2
	No	18	10.8
What was your husband's opinion on exclusive breastfeeding?	Essential	66	39.8
	Not very essential	14	8.4
	Neutral	86	51.8
How supportive was your family while you were exclusive breastfeeding your child?	Supportive	146	88
	Not very supportive	18	10.8
	Ignorant	2	1.2
TOTAL		166	100

(4.8%) illiterates. 48 (28.9%) studied till higher secondary while only 10 (6%) were graduates. The family structure showed that 96(57.8%) belonged to a joint family structure. The working status of the husband showed that the majority 158(94%) were employed. The socio-economic class as derived from the Modified BG Prasad

scale showed that majority 54 (32.5%) belonged to Class III. (Table 1)

KNOWLEDGE AND ATTITUDE TOWARDS BREASTFEEDING

In our study, 108(65%) of the women were aware of exclusive breastfeeding and 101(61%) knew that the child should be exclusively breastfed up to 6months.All mothers were of the idea that exclusive breastfeeding was advantageous to the child while about 83(50%), knew that it prevents diarrhoea and malnutrition.Only 44% of the mothers had prior knowledge on exclusive breastfeeding mainly through healthcare setup and family. (Table 2)

While assessing the attitude towards breastfeeding it was revealed that nearly 90% thought it was essential to the growth and development of the children.50% of the husbands were neutral about breastfeeding practices and 66 (40 %) were positive and encouraging their wives to breastfeed the child.Almost 90 %(149) of the family members were very supportive towards breastfeeding.(Table 2)

Table 3: Breast feeding Practices of Study Participants

PRACTICE OF BREAST FEEDING	RESPONSE	N	%
Time of initiation of Breast Feeding in new born.	Within 1 hr	92	55.4
	1-2 hrs	66	39.8
	>2 hrs	8	4.8
Colostrum given ?	Yes	162	97.6
	No	4	2.4
What were all given during the first 6 months of life ?	Breast milk	12	7.2
	Water	50	30.1
	Cow's milk	20	12
	Formula feeds	76	45.8
Were prelacteal feeds given ?	Yes	58	34.9
	No	108	65.1
How often did you breastfeed the child in the first six months ?	Once a day	2	1.2
	Twice a day	4	2.4
	Thrice a day	72	43.4
	On demand	88	53
TOTAL		166	100

PRACTICE OF BREASTFEEDING

On the assessment of the breastfeeding practices, it was observed that 92 (55.4%) of the mothers had initiated breastfeeding within 1 hour of delivering the child and 162(97.6%) of the mothers had given colostrums to the child. The proportion of exclusive breastfeeding was only 7.2% (12). Nearly 1/3rd(50) mothers had given other supplements like water and 20 (12%) had given cow's

Table 4:Comparison of Sociodemographic variables with Breast feeding Practices

Variables	Mean score	Statistics	P value
Education of mother			
Illiterate	16.75 ± 0.95	3.055	0.014*
Primary	13.20 ± 1.02		
High school	13.44 ± 0.49		
Higher secondary	12.25 ± 0.41		
Under graduate	13.54 ± 0.45		
Post graduate	13.80 ± 0.80		
Working status of mother			
Employed	15.00 ± 1.05	T test - 3.055	0.014*
Unemployed	13.20 ± 0.26		
Education of		4.036	0.048*
Illiterate	15.33 ± 2.19		
Primary	-		
High school	13.39 ± 0.43		
Higher secondary	13.17 ± 0.65		
Under graduate	13.15 ± 0.34		
Post graduate	13.20 ± 0.86		
Birth order			
1	13.39 ± 0.34	3.546	0.018*
2	13.65 ± 0.46		
3	12.36 ± 0.75		
4	13.33 ± 0.88		
Type of family			
Nuclear	13.26 ± 0.42	0.834	0.479
Joint	13.02 ± 0.32		
Three generation	15.63 ± 0.89		
Antenatal care			
Primary health care	14.80 ± 0.71	3.239	0.016*
Secondary health care	12.80 ± 0.24		
Tertiary health care	11.67 ± 0.33		
Place of birth			
Primary health care	15.33 ± 1.67	4.778	0.011*
Secondary health care	15.09 ± 0.79		
Tertiary health care	13.67 ± 1.36		
Home delivery	12.87 ± 0.25		

* Statistically Significant (p<0.05)

milk. 76 (45.8%) of the mothers have used formula feeds to supplement their children, 35% (58) were given pre-lacteal feeds and water was the most commonly given pre-lacteal feed followed by honey. More than half (53%) of the women breastfed the child on demand while others (43.4%) fed their infants thrice or twice a day.(Table 3).On asking for the reasons to start artificial feeds, more than half of the women (55%) responded by saying that there was inadequate milk secretion and only 1/3rd of the

mothers (33%) had given expressed breast milk to their children.

The role of various socio-demographic variables on exclusive breast feeding was assessed by comparing the calculated mean EBF score between the subgroups by using ANOVA test. It was observed that there was a significant difference in the mean EBF score in the variables such as mother's education and working status of mother. Similarly variables such as father's education, birth order, place of birth were also found to have significant differences. (Table 4)

DISCUSSION

The present study carried out among 166 mothers showed the study, the awareness of exclusive breastfeeding was 61%, which was less than the study done by Vijayalakshmi P et al which reported it to be 85%.⁷ A contrasting report was published by in Puducherry which revealed it as 38%.⁸ In the present study, the proportion of Exclusive Breast Feeding was found to be only 7%. This was similar to the findings reported by Kishore MS et al in India with 10%.⁹ The reason for the very low percentage of exclusive breastfeeding was due to inadequate milk sufficiency. In contrast, a study conducted in another tertiary care setup in India revealed that the exclusive breastfeeding proportion to be 27%.⁷ Another study in Nigeria reported the exclusive breastfeeding proportion to be 31%.¹⁰ In other developing countries such as East Asia/Pacific have the highest rate of exclusive breastfeeding (43.0%) followed by Eastern/Southern Africa (41.0%).¹¹ A Similar study carried out in Mauritius revealed the proportion to be 18%.¹²

Nearly 56 % (92) had initiated breastfeeding within 1 hr in the present study this more than double of the NFHS-3 survey report which shows that only one-quarter (25%) of the children in India are being breastfed within one hour of birth. About 1/3rd of the mothers had given water to the children before the age of 6 months; this was less compared to the study done in Puducherry territory. Nearly half of the mothers had given formula feeds to their children. A study done in Ghana reported it to be 25 percent.¹³ The main reason for giving the formula feeds was so to improve their child's weight.

Despite the low proportion of exclusive breastfeeding in our study, the support from the family for breastfeeding was very high. Additionally, a study by Februhartanty showed that husbands provided emotional support by sharing problems related to nutrition and health status of the infant¹⁴. Similar support was also provided by husbands in the present study.

CONCLUSION

The present study showed a very little proportion of exclusive breastfeeding among mothers despite adequate knowledge and a positive attitude most of the mothers failed to practice owing to inadequate breast milk secretion and prevalence of various customs. Though there is good awareness of breastfeeding, the practice of breast feeding was not found to be satisfactory in the current study. Education status, working status, place of birth of parents do seem to have a profound role in the correct practice of breastfeeding. In addition, the awareness created through various platforms like mass media and internet have not produced the desired impacts. It is necessary to promote proper feeding habits because, improper feeding habits can lead to detrimental effects on the children's growth and development. To ramp up the correct feeding practices, more intervention is required from the stakeholders. Our study carries all the inherent limitations of a cross-sectional study and being a hospital based study, the external validity of our study is minimal and we recommend further studies with higher sample size to further evaluate breast feeding practices.

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Original Research Article

Attitude of adolescent boys towards females: An Urban-Rural comparison from Sangli District (MH) of India.

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Abstract

Introduction: Cultivation of positive gender attitude in the adolescents, is required for development of gender tolerant society. The current research was planned to study the attitude of young adolescent boys towards females and compare the urban-rural differences in the attitude. **Methods:** **Study type:** Cross sectional study. **Study subjects:** Students studying in the schools from Sangli district (Maharashtra state), India. **Sample size:** Sample collected was 416. **Sampling Technique:** Cluster Random Sampling- One stage. **Duration of study:** 12 months from September 2013 to August 2014. **Study tool:** A pre-designed, self-administered questionnaire. **Statistical analysis:** Percentage and Chi-square test used in the analysis. **Results:** Number of students included in the final analysis was 416. Negative attitude towards women, occupation related gender stereotyping and crime against women was observed in 177(42.5%), 393(94.5%) and 22(5.3%) students respectively. Positive attitude towards women was associated with urban area, nuclear family and educated mother. **Conclusion:** Many male students have unsatisfactory attitude towards women. Proper guidance and education at a very early age is important in development of proper attitude towards women.

Keywords: Stereotyping; Gender Bias; Social Discrimination; Adolescents, Male.

Introduction:

Currently there has been a shift in world economy, by 2030 India and China will dominate global saving and investment, says the World Bank report.¹ Promotion of gender equality and empowerment of women is a target set in Millennium development Goals. Fruitful efforts are being made in women education and employment.²

Gender discrimination, which is also known as sexism is defined as, "Prejudice or discrimination based on gender or behaviour or attitudes that foster stereotyped social roles based on gender."³ While stereotyping is defined as, "An oversimplified perception or conception especially of persons, social groups, etc."⁴ Even today in countries like India the attitude towards women is far from liberal. They are treated unequally and with chauvinistic mind-set. There is apathy towards involving women in important roles in society and huge gender bias exists.⁵ The roots of this psyche can be traced to bringing up of the Indian boys.

The Community stresses upon gender specific roles in the society and also gender specific freedom even in trivial

issues like clothing. Bezerra et al., from Brazil observed gender discrimination to be important stressor among working women.⁶ In a research conducted in Turkey among college students by Ozan et al., it was observed that the enhancing effect of the traditional structure on gender discrimination is still continuing.⁷ While Khan AZ from Lahore observed that thirty five percent of the college students had faced the negative influences of gender bias and gender discrimination which had led to their impaired professional growth.⁸ Thus gender stereotyping also influences career choices.⁹ Recently there has been a sharp rise in the crime against women in the country.¹⁰ The current situation is described as an epidemic of crime against women.¹¹ Increase in the involvement of the juveniles in the crime against women is a matter of concern. Many juveniles believe that fault in rape case lay in hands of victim as they provoke being raped.¹² The law itself has very little provision to provide a punishment that would deter involvement of juveniles in any serious crime.¹³ However adolescents can be guided to develop a positive attitude towards women.

Very few studies assess the attitude of Indian males towards female and those among the adolescents are virtually non-existent. Today's adolescents are tomorrow's adults. If positive gender attitude is cultivated in them then it will go a long way in development of gender tolerant society. Keeping this in mind the research was targeted towards adolescent boys. It tries to understand the gender bias, occupation related gender stereotyping and attitude towards crime against women in adolescent boys; also the urban-rural differences in the attitude of adolescent boys.

Material & Methods:

It was a cross sectional study. The study population was school going adolescents from the Urban and rural area of Sangli District (Maharashtra state), India. Due ethical considerations and permissions were acquired for the study. As the relevant prevalence was not available even after extensive literature search, a pilot study was conducted. Calculated sample size based on its result was 193 for each group i.e. Urban and Rural.

Initially it was decided to include all the secondary school students (i.e. Vth to Xth graders) in the study. However the ethical committee on considering the cultural sensibilities instructed to include only IXth and Xth graders in the study. While conducting the pilot study it was observed that institutes were reluctant to spare the time of Xth graders for the study as it considered as important academic year, in which there are centralized state-level examinations and the college education is decided on the performance of that exam. Hence it was decided to only include IXth graders in the study.

Sampling was done by using cluster random sampling-one stage. All the rural and urban schools in Sangli district of Maharashtra state were listed as clusters and selected by simple random method. To fulfil the requisite sample size, three urban and four rural schools were included in the study. The permission was taken from each of the respective institution head. Parents were called on specific day and after briefing about the project and ensuring anonymity the consent was obtained. Then the data was collected. Students who declined to participate even after parent consent were excluded from the study. Similarly the students absent at the time of data collection or the students whose parent didn't attend the meeting or declined to consent were excluded from the study. Remaining all eligible students from the selected schools were included in study, hence the final sample size came to 416; 195 urban and 221 rural.

Duration of study was 12 months from September 2013 to August 2014.

Study tool was a pre-designed, self-administered questionnaire. The questionnaire had four sections. Section-I consisted of demographic variables, like age, residence etc. Section II had a tool to measure level of occupation related to gender stereotyping. Fifteen

professions like pilot, nurse, bus conductor, doctor etc. were enlisted. Students had to answer whether they associate these professions with males or females or both genders. While analysing, every answer as "both genders" was given 1 point while any other answer i.e. either "males" or "females" was given 0 point. Total points scored were added, which could be from 0-15. The score of 0-4 points to be considered as strong stereotyping, 5-8 as moderate stereotyping, 9-12 as mild stereotyping and 13 – 15 as no stereotyping.

Section-III consisted of Tool to measure attitude towards females. It was based on Attitudes toward Women Scale for Adolescents (AWSA). It is validated and internationally used 12-itemed scale.¹⁴ Permission was obtained to use and modify the scale according to cultural and social requirements. With the help of experienced faculty members and the pilot study, the scale was modified. Two questions regarding "dating" from the original scale were omitted, as they were culturally not relevant. Ten socially relevant questions regarding women were added; like attire, time restrictions, driving, education, friendship with boys, etc. Each question in the 20-itemed scale could be answered with five point Likert scale. For most of the questions points were awarded from 1 to 5 for an answer stating from strongly disagree to strongly agree respectively. While for some questions (Question No. 2, 4, 7, 10, 11, 17 and 19) the points system was reversed. The total scoring obtained was between 20 and 100. Students scoring below 50% (20 to 60) were considered to be having positive attitude, while rest of them negative attitude.

Section IV had 15 questions to measure attitude towards crime against women like harassments, eve teasing, dowry, stalking etc. Each question could be answered as not a crime (0 point), small crime (1 point), moderate crime (2 points) and severe crime (3 points). Total points were in between 0 to 45. Score of ≥ 35 was considered as strong positive attitude (attitude of strong condemnation), 24 – 34 was considered as positive attitude (attitude of opposition) and scores ≤ 23 was considered to be negative attitude (attitude of acceptance as normal) towards crime against women.

Questionnaire was in English language. All the students had English as compulsory language in their curriculum hence it was well understood. However the investigators were present while data collection to resolve any queries arising without altering the opinion.

Interpretations of all the scores were decided with help of published literature^{12,13,14} and consultation with field experts. These were finalised after the pilot study. All the scales had good internal consistency (Cronbach's α , $r = 0.62 - 0.76$) and test-retest reliability (Spearman correlation coefficient, $r = 0.71-0.77$).

Statistical analysis have been done using Microsoft excel 2007 and IBM SPSS-22; using Percentages, Mann-Whitney test and Regression.

Results:

Total of 442 study participants, 416 had completed the questionnaire and hence included in the final analysis.

Mean age of the students was 14.71(±0.805) years with the range of 13-17 years. Majority of the students belonged to rural area 221(53.1%) and nuclear family 239(57.45%).

Only 20(4.8%) had illiterate mother; while 241(57.9%) and 155(37.3%) had school educated and college educated mother respectively. Mother of majority students i.e. 322(77.4%) were home-makers, while rest were working mothers.

The mean scores for occupation related to gender stereotyping, attitude towards women and attitude towards crime against women were 7.5 (std. deviation:±2.99, range:0-15, 60.35 (std. deviation:±9.01, range:36-90) and 34.65 (std. deviation:±6.78, range:6-45) respectively. On comparing mean scores of students from Urban and Rural area, statistically significant difference in mean scores was observed for occupation related to gender stereotyping and attitude towards women. (Table 1)

On considering interpretation of the scores, occupation related stereotyping was absent in 23(5.5%) students; while mild, moderate and severe stereotyping was reflected in respectively 125(30%), 197(47.4%) and 71(17.1%) students. Doctor and Prime-Minister were the occupations associated with both genders by maximum students, 282(67.8%) and 254(61.1%) respectively; while rickshaw driver and babysitter were associated with both genders by least number of students, 99(23.8%) and 100(24%) respectively. It was not statistically associated with type of family and mother's occupation. However higher proportion of students from joint family 171(96.6%) and having homemaker mother 308(95.7%) displayed stereotyping as compared to students from nuclear family 222(92.9%) and having working mother 85(90.4%) respectively. Students with educated mothers had had lower stereotyping as compared to illiterate mothers, the difference was statistically significant (Chi-square=22.257, d.f.=6, p=0.001) (Figure 2). Similarly students from rural area had significantly higher stereotyping as compared to urban area. (Table 2)

Positive attitude towards women was present in 239(57.9%) students. Majority of students had good attitude on considering each item of scale separately. However, 164(39.4%) students believed that, girls should be more concerned about being good house-wife than pursuing career. Similarly 178(42.8%) agreed that swearing should only be done by boys. Nearly 30% of them agreed that girls should not be friends with boys or females are not good drivers or girls should return to house early. Similarly nearly half of them 193(46.4) disagreed that girls should wear jeans or skirts.

Attitude towards women was associated with Mother's education (Chi-square=37.626, d.f.=2, p=0.000) and type

of family (Chi-square=17.221, d.f.=1, p=0.000). Higher the education of the mother, better was the attitude of students towards women (Figure 2). Positive attitude was observed in students living in nuclear families 158(66.1%) as compared to joint families 81(45.8%). The students from urban area had in general better attitude towards women as compared to rural (Table 2). Binary logistic regression was applied, with attitude towards women as dependent variable; while permanent residence, type of family and mother's education as independent variables. Enter method was used to identify most significant predictors. Chance accuracy rate for the model is 70.2%, which is greater than calculated chance accuracy rate (57.5%). Permanent residence and type of family were the highly significant predictors for presence of attitude towards women. (Table 3)

Figure 1: Relationship of Mother's education and Occupation related stereotyping

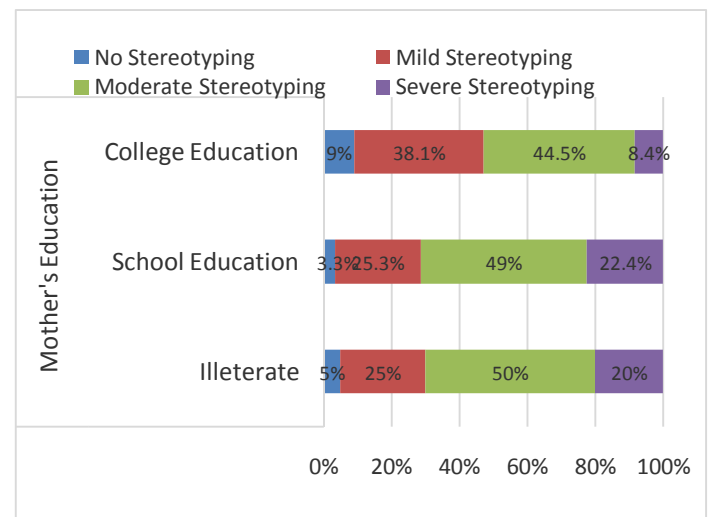


Figure 2: Relationship of Mother's education to Students' attitude towards women

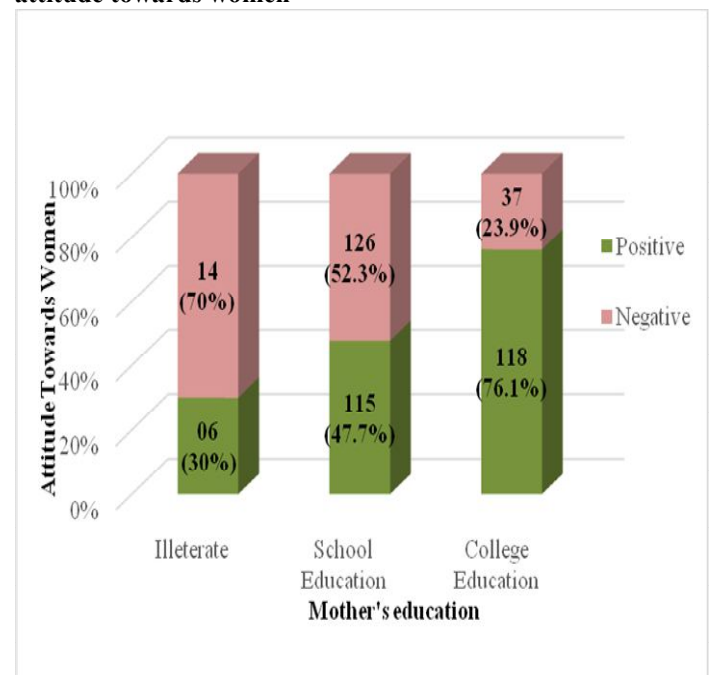


Table 1: Comparing Mean scores of various scales among Urban and Rural students

Scale Scores	Variable	Mean Score (±Std. deviation)	Mann-Whitney Test					
			Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	P-Value
Occupation related Stereotyping	Urban	8.36 (±3.02)	241.34	47061.5	15143.5	39674.5	-5.3	0.000
	Rural	6.73 (±2.76)	179.52	39674.5				
Attitude towards female	Urban	55.56 (±6.59)	143.73	28027.5	8917.5	28027.5	-10.3	0.000
	Rural	64.58 (±8.75)	265.65	58708.5				
Attitude to crime against women	Urban	34.07 (±6.28)	197.37	38487.5	19377.5	38487.5	-1.8	0.076
	Rural	35.16 (±7.16)	218.32	48248.5				

Table 2: Association of various variables with Occupation related stereotyping

Particulars		Permanent Residence		Total	Pearson Chi-Square Value	P value
		Urban	Rural			
Occupation related stereotyping	Severe Stereotyping	18	53	71	29.79	0.000
		9.2%	24%	17.1%		
	Moderate Stereotyping	86	111	197		
		44.1%	50.2%	47.4%		
	Mild Stereotyping	73	52	125		
		37.4%	23.5%	30%		
No Stereotyping	18	5	23			
	9.2%	2.3%	5.5%			
Attitude towards females	Positive	155	84	239	72.91	0.000
		79.5%	38.0%	57.5%		
	Negative	40	137	177		
		20.5%	62.0%	42.5%		
Total		195	221	416		
		100.0%	100.0%	100.0%		

Table 3: Binary logistic regression model depicting association of permanent residence, type of family and mother's education with attitude towards female.

Particulars	B	S.E.	Wald	P	OR (95% CI for OR)
Permanent Residence	1.766	.325	29.600	.000	5.85 (3.09, 11.05)
Type of Family	.595	.222	7.150	.007	1.81 (1.17, 2.80)
Mother's Education	.012	.286	.002	.966	1.01 (0.58, 1.77)
Constant	-3.949	.872	20.482	.000	.019

SE=Standard error, OR=Odds ratio, CI=Confidence interval

We observed that 239(57.5%) students had positive attitude regarding crime against women and it was not statistically associated with any socio-demographic factor. Majority of students believed actions like rape, molestation, eve-teasing and acid attack as a crime;

however 6(1.4%), 15(3.6%), 22(5.3%) and 7(1.7%) students respectively believed that these were not a crime. Similarly emotionally hurting a girl-friend, dowry and pinching in the crowd was also not considered as a

crime by 31(7.5%), 25(6%) and 22(5.3%) students respectively.

Discussion:

Total 416 male students from the age group 13-17 years participated in the study; 195 and 221 from urban and rural area respectively.

The mean scores of all the participants suggested moderate gender stereotyping, borderline negative attitude towards women and positive attitude regarding crime against women (attitude of opposition).

Mild to severe occupation related gender stereotyping was observed in 393(94.47%) students. In India religious and traditional beliefs are important part of life, this may have been an important factor in development of such attitude. The observations are similar to the results obtained by Hensley L.¹³

Majority of students were not able to associate the jobs of rickshaw driver, babysitter etc., with both the genders. Jobs like rickshaw driver are male dominated jobs with hardly any women venturing in these occupations. Similarly, not many students believed that babysitter can be male. However for occupations such as doctor and prime-minister most of the students were open to the idea of associating it with both genders. The day-to-day experiences and history play an important role in the development of an attitude.

Negative attitude towards women was present in 177(42.5%) students. Most of the boys with educated mother, living in urban area and belonging to nuclear family had positive attitude.

However it was observed that the many of students agreed to the statements like girls should be more concerned about being good housewife rather than pursuing career. The deep seated concept of patriarchal family system in our society, secondary status given to women's career might be responsible for the result. Similarly, most of the students had housewife mother which may also played a part in development of such an attitude.

Similarly many students have traditional negative view about friendship with boys, choice of clothes and time of return to house for girls.

Considering crime against women, 239(57.5%) students had positive (opposing) attitude. The result is somewhat different than observations by Kershner R.¹² Current media outcry, people's movement against these crimes may have influenced the adolescents and developed a better attitude among them.

When considering crimes individually, rape was rightfully considered as crime by majority of the students. The current nationwide highlighted incidences of rape and then outburst of people against them may have helped in development of such a positive attitude among the students. However, still 6(1.4%) students did not associate rape with crime. This situation exists because these students might be unaware of the gravity of rape

and its implications on the victim. Here our education system, teachers and parents might be failing in actually educating the students regarding the grievous social issues.

Similarly, three to six percent of these students failed to recognize molestation, eve teasing, dowry demand etc. as a crime. The casual approach of the society towards these crimes may be the reason behind such an attitude towards them.

Conclusion:

The majority students involved in the study had positive overall attitude towards females. However some issues regarding the undue importance to the housewife role of the women, problem regarding girls' attire and time restrictions are present among the students.

They also had very positive attitude in case of crime against women. However substantial amount of these students still have not understood the gravity of crimes like eve-teasing, dowry and molestation.

The strong occupation related gender stereotyping still exists among them. While the traditionally male dominated occupations continue to be associated with the males.

Overall attitude among students from urban area and having educated mother is better than others.

Appropriate guidance and education at a very early age along-with involvement of parents is very important in development of positive attitude towards female. Female education of graduation and above will go a long way in shaping positive attitude in future generations. Focus should be given especially in rural areas. Similarly it is very important to impress the horrors of the crime against women in them since early age.

Limitations of the study:

This is a self-administered questionnaire based study, hence reporting bias cannot be totally eliminated. There is a lack of geographical coverage since the study is conducted in one district only. Many confounders like current emotional state, personality, past experiences etc. may be present. Similarly, difference in understanding level is not considered.

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Conflict of interest:

The authors declare that there is no conflict of interest. The current study was self-funded by the authors. The pilot study of the current research was part of Short Term Studentship project for Indian Council of Medical Research by the fourth author.

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Original Research Article

Trend of Extrapulmonary Tuberculosis in Port Blair

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Abstract

BACKGROUND- Extrapulmonary Tuberculosis (EPTB) remains a major public health problem accounting for 0.8 million EPTB cases globally. **AIM:** The objective of this study was to describe the basic demographic correlates, new cases of extrapulmonary tuberculosis and site affected by extrapulmonary TB. **MATERIALS AND METHODS:** Retrospective data mining from records pertaining to extrapulmonary tuberculosis maintained by the Port Blair tuberculosis unit (TU) from 2012 to 2014, working under Revised National Tuberculosis Control Programme. **RESULTS:** Out of total TB (1340) cases registered for treatment from 2012 to 2014, EPTB cases were 425 (31.70%) . Males(n=231, 54.35%) were affected more than females(n=194, 45.65%). Pleural TB was the commonest type of EPTB (n = 224, 52.71%), followed by lymph node TB (n = 97, 22.82%). **CONCLUSION:** The burden of EPTB is more among the productive age group. Males were affected more than females. There is a need to strengthen surveillance programs to accurately estimate the burden of all kinds of extrapulmonary tuberculosis

Keywords : Extra pulmonary tuberculosis, Pleural TB, Port Blair

INTRODUCTION

Tuberculosis (TB) remains a major public health problem globally. According to World Health Organization report there exist 0.8 million Extra pulmonary Tuberculosis cases among the 6.1 million of new TB cases which have been reported in 2013 .¹

Tuberculosis can infect any organ system of the body with pulmonary tuberculosis being the most common manifestation. Though extrapulmonary tuberculosis hardly spreads from person to person, it is still considered to be an important health problem due to its destructive nature.^{2, 3,4,5,6}

The term EPTB has been used to describe isolated occurrence of tuberculosis at body sites other than the lung (e.g. pleural TB, bone TB, intestinal TB, and lymph nodes TB).^{3,7}

The most commonly affected sites of extrapulmonary involvement are pleura, followed by lymph nodes. Mycobacterium tuberculosis is presumed to spread in

sequence from primary lung site to various organs and tissues of the body.^{8,9,10}

Extrapulmonary organ involvement of TB is estimated as 10-34% of patients who are not infected with human immunodeficiency virus (HIV), whereas the frequency is about 50-70% in patients infected with HIV.⁸

EPTB comprises of 20% of all TB cases in India.¹¹ Prevalence of extra pulmonary tuberculosis varies between 8.3-13.1% among different districts of the county according to the cohort analysis by Central TB Division, Ministry of Health & Family Welfare in 2002.^{11,12}

The term Extrapulmonary tuberculosis encompasses all forms of TB other than pulmonary TB (PTB). It has a broad spectrum of clinical manifestations therefore poses a real diagnostic challenge.¹³ TB statistics from the government Revised National Tuberculosis Control Programme (RNTCP) show that population covered in Andaman & Nicobar Islands by RNTCP is 400000, smear positive patients diagnosed in 2015 was 129, total patients registered for treatment in 2015 was 584, new smear positive cured in 2014 was 85%, smear positive retreatment registered in 2014 was 71.^{14,15}

Studies on incidence of various forms of EPTB are scanty with this background we conducted the present study with the following objectives-

- 1) To study the new cases of extra pulmonary Tuberculosis in Port Blair
- 2) To study demographic correlates and clinical presentations of Extra pulmonary Tuberculosis .

MATERIALS AND METHODS: This study was done over a period of three years in Port Blair TU from January 2012 to December 2014. There are 09 TU functioning in Andaman & Nicobar Islands - three each in South Andaman District, North & Middle Andaman District, & Nicobar District .Port Blair TU is one of the TU situated in South Andaman District and is functioning in GB Pant Hospital attached to the medical college. Other TU's are situated in different islands of South Andaman district. In this retrospective data mining from 2012 to 2014, the researchers collected data pertaining to all extrapulmonary cases registered under Port Blair Tuberculosis unit (TU) working under Revised National Tuberculosis Control Programme. We analyzed data of all the extrapulmonary cases collecting information on Demographic data, TB registration code and site of EPTB of all extra-pulmonary tuberculosis cases.

Ethical Clearance was obtained from the Institutional Ethics Committee. The data was cleaned & entered in MS-Excel spread sheet and analyzed using IBM SPSS 20.0 software (Chicago).

RESULTS:

The total number of diagnosed tuberculosis cases from 2012 - 2014 was 1340, of which extra pulmonary TB accounted for 425 cases (31.72%) and pulmonary TB cases accounted for 915 cases (68.28%). (Table 1)

Table 1: Pulmonary & Extra pulmonary TB Cases (2012-2014)

Year	Pulmonary TB	Extrapulmonary TB	Total new cases
2012	352 70.26%	149 29.74%	501
2013	274 67.65%	131 32.35%	405
2014	289 66.59%	145 33.41%	434
Total	915 68.28%	425 31.72%	1340

Incidence rate of Extrapulmonary Tuberculosis in 2012 was 39.11 /100000, in the year 2013 it was 34.29/100000 and in 2014 incidence was 37.86/100000 (Figure 1)

On comparison of pulmonary with extra pulmonary TB cases pulmonary TB cases among males were more 624 (72.98%). (Table 2)

Out of 425 extrapulmonary TB cases, 231 were males (54.35%) and 194 cases (45.65%) were females. (Table 3) .There were 39 (9.18%) children among 0- 14 years of age group suffering from Extrapulmonary TB, 269 cases

Figure 1: Year-wise incidence cases (2012 -2014)

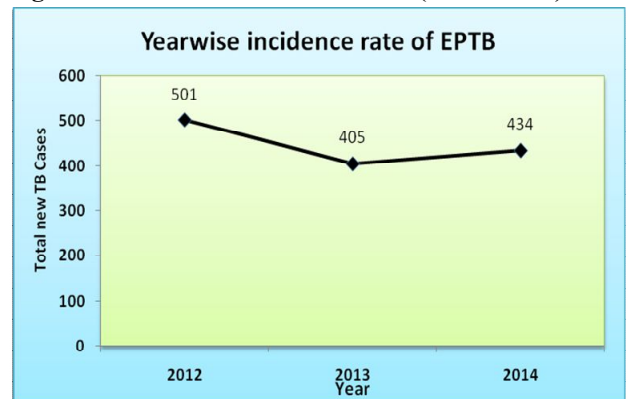


Table 2: Gender wise distribution of Extrapulmonary & Pulmonary cases (2012-2014)

Gender	Extra-pulmonary	Percent	Pulmonary no.	Percent	Total
Male	231	27.02	624	72.98	855
Female	194	40	291	60	485
Total	425	31.7	915	68.28	1340

(63.29%) were between 15 to 44 years, 92 cases (21.65%) were among 45 to 64 years and 25 cases (5.88%) were above 65 years of age. The statistical analysis indicates that age and gender are significantly associated among EPTB cases (p<.05). In our study male to female ratio was about 1.2:1. (Table 3 .)

Table 3: Age-wise distribution of Extrapulmonary cases(2012-2014)

Age (Yrs)	FEMALE		MALE		TOTAL	
	N	%	N	%	N	%
0 -14	18	4.24	21	4.94	39	9.18
15 - 44	138	32.47	131	30.82	269	63.29
45 - 64	32	7.53	60	14.12	92	21.65
> 65	6	1.41	19	4.47	25	5.88
TOTAL	194	45.65	231	54.35	425	100

*Chi-square = 12.569, d.f.=3, p = 0.006, significant
Age and gender were significantly associated in EPTB cases.*

Pleural TB constituted 52.71% (n = 224) of all EPTB cases , Lymph node TB constituted 22.82% (n = 97) of EPTB cases, TB Abdomen 10.59% (n=45), Bone TB constituted 7.76 % (n = 33 cases) , Genito-urinary TB constituted 0.47 % (n = 2), TB Meningitis 3.53% (n=15),TB Eye 0.94% (n= 4) ,TB Skin 0.47% (n= 2), Miliary TB 0.24%(n=1),TB Endometrium 0.24%(n=1), TB Ileocaecal junction 0.24% (n=1) of all EPTB cases. (Table 4)

Table 4: Age & Site of Extrapulmonary TB

Site	AGE (IN YEARS)				N	%
	0-14	15-44	45-64	>65		
Pleural Effusion	9	142	52	21	224	52.71
Lymphadenitis	14	71	12	0	97	22.82
TB Abdomen	3	30	10	2	45	10.59
Bone & Spine	5	15	11	2	33	7.76
TB Meningitis	7	5	3	0	15	3.53
Eye	1	1	2	0	4	0.94
Genito-urinary	0	2	0	0	2	0.47
Skin TB	0	2	0	0	2	0.47
Disseminated TB	0	0	1	0	1	0.24
Endometrium	0	1	0	0	1	0.24
Ileo-caecal	0	0	1	0	1	0.24
Total (%)	39 (9.18)	269 (63.29)	92 (21.65)	25 (5.88)	425 (100)	100

DISCUSSION:

This study was conducted to assess age, gender, and clinical presentation site of 425 extrapulmonary tuberculosis patients under Port Blair TU diagnosed in Andaman and Nicobar Islands during 2012-2014.

EPTB was more likely to occur in male patients n=231 (54.35%) compared to females n=194 (45.65%) who suffered from EPTB in our study which is similar to another study done by Khattab et al in Qatar.¹⁷

Similar results were reported from another study done in Mysore in a tertiary hospital by Archana Rao K et al and study done in tertiary hospital in Kannur, Kerala by Mavila R et al.^{18,19}

Dissimilar results were reported in a retrospective analysis of Tuberculosis patients diagnosed in a tertiary care hospital in western Nepal, where it was observed EPTB was more common at younger ages (< 25 years) and in another study done in Germany, females had extrapulmonary tuberculosis almost twice as frequently as males.^{20,21}

The contrast in results in both studies could be due to the difference in culture. In Germany, men and women work outdoors and they have equal risk for infection, whereas in India majority of women do not work.

There is preponderance rise of females affected by EPTB in our study the reason probably could be because of joint family system in our country and the social stigma attached to Tuberculosis which discourages women from seeking medical care.^{22,23}

In our study male to female ratio was about 1.2:1 which was almost similar to study done by S Rama Prakash et al.¹⁶ Study done by Archana Rao et al in a tertiary hospital in Mysore reported male to female ratio to be about 1.5:1.¹⁸

The commonest age group affected with EPTB in our study belonged to 15-44 yrs (n=269, 63.29%, Chi-square = 12.569, df=3, p = .006). and less pronounced among

older age group. Similar results were reported from other similar studies.^{7, 16, 18, 24, 25}

This age group (15-44 years) is affected more compared to other age group which can be explained by the fact that this age group of people are under lot of physical and psychological stress as they are productive age group and they form the major part of working population which indirectly poses a major burden on their family and on the economy of the country.

The most common site of EPTB being pleura (n=224, 52.71%) followed by TB lymphadenitis (n=97, 22.82%) similar to the study done by Ozvaran MK, et al and Nabil A et al.^{7, 8}

The site predilection of Extrapulmonary Tuberculosis was different in other studies. In study done by Khattab et al in Qatar the most frequent site was lymph nodes followed by pleura.¹⁷

In another study done in a tertiary hospital in Nepal the commonest site for EPTB were lymph nodes (42.6%) followed by intestines (14.8%).²⁰

Pleural TB is commonly associated with rupture of subpleural focus into the pleura (reactivation or secondary TB. Prevalence of pleural TB in our study suggests more relation to secondary or reactivation TB.

Conclusion:

Burden of EPTB is more in the reproductive age, between 15 and 44 years which emphasizes the importance of strengthening the services for this vulnerable group. Early diagnosis of EPTB is necessary to decrease TB morbidity and mortality. DOTS remain central to the public health approach to TB control by WHO. The real picture of EPTB is still not clear due to defects in diagnosis, poor awareness about the disease, difficulties in identification of the infectious agent, absence of pathognomonic features, etc. There is a need to strengthen surveillance programs to accurately estimate the burden of all kinds of TB. Raising awareness among physicians about EPTB and guidelines for diagnosis and treatment of EPTB may result in more timely and adequate diagnosis. To prevent resistance rational use of first- and second-line anti-TB drugs along with better compliance is the need of the hour to prevent resistance.

Limitations of the study

Treatment details and follow up study after treatment was not done. Clinical presentations of different types of EPTB not studied.

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Original Research Article

**Psychological morbidity among geriatric population living in old age homes
and with their families: A Comparison study**

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Abstract

Context: Rise in number of nuclear families, coupled with a decline in the social value of the elderly has led to an increase in the number of 'Old age homes', where old people are also prone to depression with lack of family support being the major reason. **Aims:** To know the difference in prevalence of Psychological morbidity between the elderly people living in Old age homes and those living with their families in the community. **Settings and Design:** A Community based cross sectional study was conducted in Kanchipuram on two different groups of elderly people of 100 each, aged 60 years and above. One group of elderly living with their family and other elderly group living in the old age homes were selected. **Methods and Material:** Socio-demographic data was collected using a semi-structured, pre-tested questionnaire. Folstein's mini mental status examination scale was used to assess the cognitive functioning. Yesavage's Geriatric Depression Scale-shorter version, was used to detect depression. Data was analysed using SPSS version 21 statistical software. **Results:** Among the participants, 51% and 49% were females and males respectively. The mean age among the free living elderly was 65.8±0.38 years, while it was 67.2±0.39 years in the old age home living elderly. Elderly living in the institution (65%) are happy and providential than elderly living in the community (62%). More than half (57%) of the elderly were depressive among those living in home with their family, and it was 52% among those living in old age home the difference is not statistically significant.

Conclusions: Old age home institutions are playing a major role in supporting the elderly people with all their basic needs and good health care, reflecting lower psychological morbidity when compared to elderly living in the community.

Key-words: Elderly, Old age home, Community, Depression, Cognitive impairment.

Introduction:

The rapid progress of India's Economy has brought with it a blessing in the form of increased longevity and a curse in the form of decreased quality of life of those extra years lived.¹⁻³ One of the key determinants of quality of life is 'Mental health' and it is now an established fact that 'Psychiatric morbidity' increases with age & hence is more prevalent in geriatric than in non-geriatric group.^{4,5} Loneliness, neglect, abuse and poverty are some of the common social problems faced by elderly, as a result of which they are at an increased risk of Psychiatric morbidity.^{6,7} The phenomenon of changing role of the family, which has been a support system which protected the elderly from these social problems is adding fuel to

the fire. The rise in number of nuclear families, coupled with a decline in the social value of the elderly has led to an increase in the number of 'Old age homes' in India. The lack of family support to such institutionalised elderly persons was initially a cause of concern, but of late there have been studies which have proved otherwise.⁸ A study by Purna Singh et.al, in urban Andhra Pradesh, compared the Psychiatric morbidity between the elderly People living in old age homes and those living with their families in the community revealed that the former had less psychiatric problems than the latter.⁴ A similar study by Nagaraj et.al.,⁹ in rural Karnataka, showed that there was no significant difference in the Psychiatric Morbidity between such groups. The external

validity of the results of these studies is of question due to their low sample size.

In the Modern civilization people tend to value their money most rather than lives. With increased amount of stress and work load, the care and affection towards the elderly had faced a decline which had resulted as one of the major reason for depression among old age people. Work life balance is a major concern for most of the people .Amount of quality time spent with their family members especially with elders had come down relatively faster.

A new terminology called ‘workaholics’ has gone viral and made many to get glued to their feet. As the marathon of earning gets prolonged, issues faced by the elders in the family were not addressed properly. As a result there is a huge risk of psychological morbidity. Elderly living with their family are also under equal risk due to above factors.¹⁰ Old people living in old age home are also prone to depression, lack of family support being the major reason.⁹ Hence, this study focused on whether institutional care (or absence of family support) has any association with Psychiatric morbidity in the elderly of this region.

Objectives: To know the difference in prevalence of psychological morbidity between the elderly people living in old age homes and those living with their families in the community.

Materials & methodology:

A Community based cross sectional study was planned to conduct on two different groups of elderly people aged 60years and above. First group with 100 elderly people living with their family and second group with 100 elderly living in the old age homes were taken for the study. Non probability convenience sampling design was used to take the sample.

We have selected two old age homes randomly in which 100 elderly people were living. Kanchipuram town has been divided into a total of 50 wards in which we have selected 15 wards by simple random sampling technique. We have again selected seven elderly people randomly from each of those selected wards, and a total of hundred elderly people living with their families in the community were selected for the study.

People aged 60 years and above (age was confirmed by an authentic document/certificate) were selected to participate in the study. And those subjects who were not oriented were also included in the study in the presence of an informant with consent. Elderly people in the community who were living alone were excluded from the ‘community living’ group.

The data was collected from July 2014 to December 2014. All the 100 subjects of the old age home were approached for data collection with pretested questionnaire. Data regarding demographic details, depression status by using the geriatric depression status

of shorter version and cognitive functions and blood pressure was recorded.

Instruments used: 1. Socio-demographic data was collected using a semi-structured, pre-tested questionnaire. 2. Folstein’s Mini Mental Status Examination Scale was used to assess the cognitive functioning, in terms of orientation (time and place), attention, memory power, and literary ability. Based on the score (maximum: 30), the subjects were graded as normal (≥ 24), mild (20–23), moderate (10–19), and severely impaired (< 10). 3. Yesavage’s Geriatric Depression Scale — shorter version, a 15-question instrument, was used to assess whether the subject was having depression. The subjects were categorized as Depression Absent (≤ 5) or Present (> 5). Sleep pattern among the subjects was categorized as ‘normal’ or ‘disturbed’ (difficulty in falling asleep, reduced duration, and poor quality of sleep).

Statistical Analysis: Data was analysed using SPSS version 21 statistical software. Proportions and Chi-square test was used to establish statistical association between the socio-demographic variables, place of living and Psychiatric Morbidity. $P < 0.05$ was considered significant.

Results:

In the total elderly collected 102 (51%) were females and 98 (49%) were males. The mean age among the free living elderly were 65.8 ± 0.38 years, where as in the old age home living elderly were 67.2 ± 0.39 years. Majority of the elderly 168 (84%) were in the age group of 61-70 years the remaining 32 (16%) were in the age group of 71-80 years. The prevalence of hypertension was increasing with the age from 14.4% to 18.8% details has been provided in table 1 and table 2. Based on the living status, the elderly living in the institution (65%) are happy and providential than elderly living in the community (62%). In relation to sex, females (65.7%) are happier compared to males (61.2%), and there was relative decline in happiness (53.1%) with increasing age (71-75) years details has been provided in table 3.

Table 1 : Distribution based on the living status and Systolic Blood Pressure

Sex		Systolic Blood Pressure group			Total
		Normal <120	Pre hypertension 121-139	Hypertension >140	
Female	Count	25	63	14	102
	% within Sex	24.50%	61.80%	13.70%	100.00%
Male	Count	20	64	14	98
	% within Sex	20.40%	65.30%	14.30%	100.00%
Total	Count	45	127	28	200
	% within Sex	22.50%	63.50%	14.00%	100.00%

X^2 value=0.484 at Df 2 p=0.78 NS

The physical activity reduces as the age exceeds, according to this study males (80.6%) outnumbered the

females (75.5%). Elderly in the institution are comparatively less physically active (56%). The elderly in the institution are basically satisfied compared to elderly in the community as their basic requirement (food, shelter, health support etc.) has been satisfied by the institution on time.

TABLE 2 : Distribution based on the based on Sex and Diastolic Blood Pressure

Sex		Diastolic Blood Pressure group			Total
		Normal <80	Pre hypertension 81-89	hypertension >90	
female	Count	57	32	13	102
	% within Sex	55.90%	31.40%	12.70%	100.00%
male	Count	54	31	13	98
	% within Sex	55.10%	31.60%	13.30%	100.00%
Total	Count	111	63	26	200
	% within Sex	55.50%	31.50%	13.00%	100.00%

χ^2 value=0.017 at Df 2 p=0.99 NS

TABLE 3: Distribution based on the Living status and feeling happy response

Category		feel happy		Total
		No	Yes	
Free Living	Count	38	62	100
	% within Category	38.00%	62.00%	100.00%
Institutionalized	Count	35	65	100
	% within Category	35.00%	65.00%	100.00%
Total	Count	73	127	200
	% within Category	36.50%	63.50%	100.00%

Table 4: Distribution based on the living status and cognitive impairment

Living status		Mini Mental Status Score group			Total
		Question	Mild	Moderate	
Free living in community	Count	2	41	57	100
	%	2.00%	41.00%	57.00%	100.00%
old age home	Count	73	25	2	100
	%	73.00%	25.00%	2.00%	100.00%
Total	Count	75	66	59	200
	%	37.50%	33.00%	29.50%	100.00%

χ^2 =122.3; df=2, p value=0.00001 S

The overall prevalence of depression was 64.5%. More than half (57%) of the elderly were depressive among those living in home with their family, and it was 52% among those living in old age home. The overall prevalence of cognitive impairment was 62.5%. Regarding living status, the difference in proportions of cognitive impairment between the two groups of elderly were statistically significant (p=0.0001) details has been provided in the table 4. Disturbed sleep pattern was higher among males (60.78%) than females (52.95 %),

mainly in >70 years of age group (71.88%), and in those living in the community (67%).

Table 5: Distribution based on the living status and depression status

Living status		GDS score				Total
		Normal	Mild Depression	Moderate depression	Severe depression	
Free living in community	Count	43	30	23	4	100
	%	43.00%	30.00%	23.00%	4.00%	100.00%
old age home	Count	48	24	19	9	100
	%	48.00%	24.00%	19.00%	9.00%	100.00%
Total	Count	91	54	42	13	200
	%	45.50%	27.00%	21.00%	6.50%	100.00%

χ^2 =3.24; df=3, p value=0.35 NS

Almost equal number of elderly were people suffering with depression in both free living elderly and the elderly living in old age (57% & 52%) respectively details has been provided in table 5. There is also a random increase in the memory problem with increasing age 90.6% in (71-75 years) age group, and it was more in males (80.6%) than females (75.5%).

Discussion:

Increased number of nuclear families, high cost of living, workload are all some of the social problems in the society leading to psychological morbidity among elderly. Depression may become as a major social burden in future. In the present study 84% of the elderly were found in the age group 60 to 69 years, with males and females contributing 49.0% and 51% respectively.

Mean SBP (Systolic Blood Pressure) among the elderly was 136.4±21.4 mm of Hg and it was 135.2±20.6 mm of Hg and 136.6±23.7mm of Hg in men and women respectively. In a similar study conducted by Garg et al¹⁰ mean DBP was 81.5±3.64 mm of Hg, little higher compared to present study. In this study a total of 33.0% elderly had systolic hypertension where men account for 44.4% and women 45.6%.

In our study the overall prevalence of depression was 45.5%, more among elderly living with the family in the community (62%) than those living in old age home (47%). This may be due to difference in opinions with the family members or attitude of the family members towards old age people and this needs further research. Our study results almost consistent with other studies conducted by Harinder Sekhon et al.¹¹ and Pracheth R et al,¹² which was found to be 62.16%, & 53.7% respectively. Our results differed from the studies conducted by Jk W,¹³ Steffens DC et al.¹⁴ where overall prevalence of depression in the elderly was estimated to be 39.04% and 43.32% respectively. This difference in the prevalence of depression amongst the elderly might be due to difference in study settings, family composition and support.

Based on the living status the elderly living in the institution (65%) are happy and providential than elderly in the community (62%) hence we can conclude that elderly in the institution are facing less physiological problems. This finding is in accordance with a study done by Purna Singh⁴ where the prevalence of psychiatric illness was more among the individuals living in the community (33.3%) than in the people living in the old age home (30%). In another study conducted by Tiwari S, and Chowdhury A in urban area, the normal range of depression was found to be 13.0%-49.2%, which was similar to our result (45.5%) and in other studies conducted in different part of India.¹⁵⁻¹⁷ There is a relative decline in happiness (53.1%) with increasing age (71-75 years) similar to Purna Singh's study.⁴

In the study done by Swarnalatha N¹⁸ the prevalence rate of depression was more in females (56.5%) than in males (37.5%) where as in our study the rate of depression is more among males (61.2%) than in females (65.7%), it may be due to different composition of people and different statistical tools and socio demographic variables used.

Conclusion: The prevalence of psychological morbidity was more among elderly living with their family in community than elderly in old age home. From this study it has been proved that institutions are playing a major role in supporting the elderly people with all their basic needs and good health care.

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Original Research Article

Knowledge, Attitude & Practices Regarding Hepatitis B Virus Infection among Health Sector Personnel

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Abstract

Background: Hepatitis B is one of the most important infectious occupational hazards for health sector personnel. The infected victim not only suffers incalculable harm, but may, sometimes, inadvertently transmit the infection to patients treated by him. Protection from this disease starts with the knowledge and awareness regarding hepatitis B infection; hence this particular study was conducted with **aim** to study knowledge, attitude and practices regarding Hepatitis B Virus infection among health sector personnel. **OBJECTIVES:** To determine and analyze knowledge, attitude and practices regarding Hepatitis B infection among various strata of health sector personnel. **MATERIALS & METHODS:** It's a cross sectional study conducted in Sangli district. Medical & paramedical ancillary staffs consisting of nurses, laboratory technicians those come directly in contact with patients or their body fluids working both in government as well as private sector were taken for the study. Two sets of questionnaires were prepared, one for doctors & other for nurses & laboratory technicians. **Analysis:** chi square test and percentage was used. **Results:** Doctors in the study more than 50% didn't know the correct mode of hepatitis b transmission. Attitude towards vaccination was seen significantly high in private sector doctors, as more than 83% had taken hepatitis b vaccine as compared to only 36% from government set up had taken vaccine. Only 41% of Nurses' from private sector had taken vaccination and the finding was not significantly different from government set up nureses' where vaccination was found in only 36%. **Conclusion:** Awareness regarding Hepatitis B especially for health care workers, at all levels is essential. Immunizing them to protect against acquiring HBV infection could be one of the simplest solutions for the medical fraternity in India. Need of CME for doctors every 5 years to not only refresh but also to update their existing knowledge was felt during this study.

Keywords: Hepatitis B, Health Sector, Immunization, Government, Private sector.

Introduction

Hepatitis B virus infection (HBV) is a global public health problem. Nearly two billion people in the world have been acutely infected by HBV and there are nearly 350 million people chronically infected with HBV¹. At least 15-25% of chronically HBV infected people will die due to liver disease caused by HBV and this constitutes nearly one million people each year. It is the most common cause of chronic liver disease, including cirrhosis of the liver and hepatocellular carcinoma worldwide². An effective vaccine is available for over two decades and has brought about remarkable changes in the global epidemiology of HBV infection. However, the significance and the magnitude of the

problem vary from country to country. The developed countries of Northern Europe and America have considerably controlled the infection by means of effective immunization, improved sanitation, and implementing various blood safety measures where HBV infection is less than 1% of the population contributing to about 5-10% chronic liver diseases in contrast to the situation in the developing countries of Asia, Africa where this infection occurs in 5-10% of the general population and is responsible for more than 50% of chronic liver diseases constituting a public health priority. Importantly, in many countries of this region, particularly China and Taiwan, an effective immunization programme is changing the epidemiological situation very fast with

decrease in the prevalence, incidence as well as impact of HBV infection³.

The situation in India is that it has the second largest pool of HBV carriers in the world next only to China. There are 43 million estimated HBV carriers in India⁴. Nearly 10% of them (4.3 millions) are highly infectious. Nearly 4 to 7% of the population is infected by the virus, and chronic infection of hepatitis B constitutes more than 50% of the chronic hepatitis cases in the country. This, in the context of a large population would spell off a projected increasing burden of infection and liver disease due to HBV in this country in the years to come. In this perspective, the HBV epidemiology in India becomes relevant not only nationally, but also internationally, because of the possibility that India may soon have the largest HBV infection pool in the world.

Approximately 25% of the exposed persons will get liver disease. Nearly one third of the patients of acute hepatitis, two thirds of the cases of chronic liver disease and hepatocellular cancer in India, are due to HBV infection. Liver disease due to HBV infection is considered to be the fourth important cause of mortality in the most productive period of life (15-45 years). It is established well that HBV infection is a public health problem in our country and its importance for morbidity and mortality has not been realized because it is a silent killer. HBV related liver disease is not a dramatic event like many other killer diseases; hence it is being ignored by the public, professionals and the government.

Risk of Hepatitis B virus (HBV) infection, in health care workers was emphasized in early fifties. Studies have shown that there is a three to five fold risk of acquiring the HBV infection in health care workers compared to general population. Hence it is considered as one of the most important occupational hazards of health care workers in developed and developing countries.³

One of the most serious threats health care personnel face during their clinical work is the possibility of exposure to blood-borne pathogens through needle stick injury, with the attendant risk of infection with HIV, HBV or HCV. Hepatitis B is the most important infectious occupational disease for health care workers. The high risk of being infected is the consequence of the high prevalence of virus carriers in the assisted population, the high frequency of exposure to blood and other body fluids and the high contagiousness of hepatitis B virus (HBV). Yet the problem of exposure to contaminated blood among the health care workers has received inadequate attention, more so in India. The magnitude of the problem can be gauged from the fact that 4.4 million HCWs in the US receive approximately 800,000 needle sticks and other injuries from sharp objects annually. An estimated 16,000 of these objects are

contaminated with HIV, and even more are contaminated with HBV or HCV⁴.

48% of all graduating medical students recalled being exposed at least once to potentially infectious body fluids during their last two years of medical school.⁵ A recent American study revealed that 32.8 percent students reported experiencing occupational exposures to blood or other potentially infectious materials. Of these, 39% reported two or more exposures each.

Transmission is rare in persons who have been immunized. Transmission rate is as high as 30% among those who are not immune. Infected health care personnel face daunting prospects including Difficulties securing health insurance, Loss of income from their job and financial destitution, Long term disability, premature death⁶.

Lifelong infection can lead to lot of psychiatric morbidity in some of the individuals and it is a new avenue of study which is planned in next step of this study where healthcare providers will be subjected to S.R.Q. questionnaire to assess their psychiatric morbidity due to chronic nature of the disease and uncertain fate of the infected individual.⁷

Prevention starts from awareness and it has been observed even though Hepatitis B is highly infectious chronic disease it can very well be prevented with effective vaccination and its long term advantages are very much cost effective⁸. Hence this study of knowledge, attitude and practices regarding Hepatitis B Virus infection among health sector personnel is undertaken. The analysis of data and information so gained through this study will help design and put into practice methods to augment information dissemination, healthy attitudes, education & communication programme and better immunization practices both amongst the health sector personnel as well as indirectly in society as a whole. Also it can stimulate, hasten and strengthen the march towards prevention and possibly in a long way to reduce the HBV burden and the economic ramifications of HBV infection and its consequences in India. Needles stick injury; improper handling of human waste and secretions are the causes of concern for hepatitis b spread.

Objectives:

1. To assess the knowledge regarding hepatitis B disease, its causative organism, its spread, and its prevention and control measures in various strata of health sector workers.
2. To assess the attitude towards hepatitis B disease and

3. To assess the practices regarding Hepatitis B disease amongst the various strata of health sector workers.

Materials and Methods

A cross-sectional study was conducted in Sangli district. Health-care workers included in the study were medical & paramedical ancillary staffs which include doctors, nurses & laboratory technicians who come in contact directly with patients or their body fluids from government and private sector were included in the study. Persons included for study from Governmental health services in Sangli district were from Primary Health Centers, Rural Hospitals, District Hospital and Government Medical College Hospital whereas those from Private health service set up were from tertiary care referral institutes, few medium sized (15-25 bedded) nursing homes and private practitioners' having clinics in rural as well as urban area. They include qualified postgraduate doctors, MBBS, BAMS, BHMS doctors, Dentists, GNM & ANM nurses working in government & private hospitals. Unqualified but trained nurses working in many private hospitals, Laboratory technicians were also included for study but Class IV workers like ward boy & ayabai were excluded from the study because they were found to have very poor knowledge of the subject from our ground level pilot study. The included staffs then were divided into 3 strata as 1) Doctors 2) Nurses 3) Laboratory technicians.

Prevalence of HBV infection is approximately 8.2% in health care workers in India¹⁰. Accordingly, the sample size was calculated considering 5% allowable error. A sample size of 120 for each category was thus considered sufficient. Therefore 120 Doctors, 120 Nurses, 120 Laboratory Technicians were included for the study. The total sample size was 360.

From the total sample size 50% of the sample was selected from government health sector and 50% from the private sector. Government sector sampling was further divided, as 60% of sample from PHC, 20% of sample from Rural Hospital and 20% of sample from District Hospital & Govt. Medical college Hospital. Out of 59 PHCs in Sangli district 36 PHCs were selected by simple random sampling technique. One doctor and one nurse from each PHC were taken in the sample. There are 13 Rural Hospitals in Sangli district, 12 rural hospitals were selected similarly. One doctor and one nurse from each rural hospital were randomly selected for the sample. From District Hospital of Sangli every 5th doctor & every 10th nurse was selected. And from Govt. Medical College Every 5th doctor & 8th nurse was selected.

Study subjects from Private sectors were divided as 50% from rural area and 50% urban area. From rural

area 30 nursing homes were selected by simple random technique. One doctor & one nurse from each nursing home were considered for the study whereas from Urban Area 12 doctors & 12 nurses were selected by simple random technique from tertiary care institutes. 6 Dentists & their assistants were also selected randomly. 6 doctors & nurses from medium sized nursing homes & 6 general practitioners & their assistants from the city. Laboratory technicians were also selected by simple random technique from rural & urban areas. After determining the information needed for proposed aims and objectives of the study two questionnaires were developed. One questionnaire in English for doctors & another questionnaire in local vernacular language i.e. Marathi for nurses & laboratory technicians. The questionnaire was standardized.

The questions were designed to elicit responders' knowledge, attitude & practices regarding HBV infection. The purpose of the study was explained verbally. There was test for peer evaluation of the draft questionnaire & for corrections & further revisions. Before the questionnaire was administered to the sample, a pilot study was conducted & tested for inter reliability. The questionnaires were distributed personally with the help of one co-worker after taking oral consent. We explained purpose, procedure, risks & benefits of the study. They were asked to fill up the questionnaire pro forma & it was collected after half an hour. The data was entered in the excel sheet personally and it was cross checked by the co-investigator to find out any lacunae or mistakes in the data entry, thus the data entry quality was maintained. The analysis was done manually using calculator for calculating p values after entering the values in table and it was also cross checked using primer in biostatistics application.

Results

The doctors' knowledge about hepatitis B disease was assessed with questions like how Hepatitis B is spread, what is its causative agent, what are its mode of transmission, what are consequences of the disease, what is the course of disease. What is sero-conversion? One of the important questions amongst these was: what are the correct mode of disease transmission and its causative agent. Following tables show results of it.

Chi square value is 13.613 with 2 degrees of freedom at 5% level. $P = 0.001$. Highly significant. This table suggests there was significant difference between the knowledge level of government sector doctors and private sector doctors regarding the key question of mode of hepatitis B disease transmission.

Table 1. Distribution of doctors according to their knowledge regarding the modes of transmission of the disease.

Doctors	Governmental set-up	Private set-up	Total
Know correct mode of disease transmission and agent	25	34	59
Don't know the correct mode of disease transmission and agent	8	17	25
Correct Mode or Agent of disease Transmission (Not both)	27	9	36
Total	60	60	120

Doctors Attitude was tested using questions like their vaccination status, what if they are not vaccinated, have they vaccinated their family members following is the key table showing their attitude regarding Hepatitis B vaccination.

Table 2. Distribution of doctors according to their attitude - Whether they have taken vaccine

Doctors	Governmental set-up	Private set-up	Total	95% CI
Vaccine Taken	22	50	72	P = 0.000
Vaccine Not taken	38	10	48	
Total	60	60	120	

Chi square value is 25.312 with 1 degree of freedom at 5% level. This table clearly depicts that attitude of private sector doctors was on positive side in coherence with their knowledge about the disease.

When the above data was presented graphically, it can easily be understood that doctors, working in government set up have not taken vaccine against Hepatitis B.

Doctors Practices regarding hepatitis B disease were tested with questions like do they get needle stick injuries, its frequency, post exposure measurements post needle stick injury, Measures one should take if he/she is HbsAg positive. Following are the findings regarding one of the

important practices in doctors regarding measures they take after accidental needle stick injury.

Figure 1. Hepatitis B vaccination status

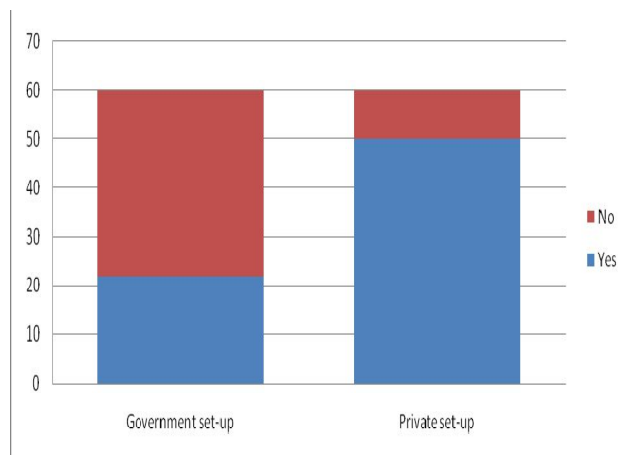


Table 3. Measures they follow after accidental needle stick injury

Doctors	Governmental set-up	Private set-up	Total	95% CI
Correct post exposure measurement	21	18	39	P = 0.697
Wrong Post exposure measurement	39	42	81	
Total	60	60	120	

Chi square value is 0.152 with 1 degree of freedom at 5% level, P = 0.697(not significant). It is clear from this analysis that there is no significant difference between practices followed by doctors from both the sectors. They did not know about the simple measure like washing hand after needle stick injury under running water for 5 minutes is a very good practice.

Nurses' knowledge regarding hepatitis B was assessed with the questions like whether Hepatitis A and B are same or different disease, its modes of transmission, its progress, availability of vaccine against it, preventive measures like universal safety measures. One of the questions to assess the knowledge regarding hepatitis A and B disease showed the following results

Table 4. Whether Hepatitis A & Hepatitis B are different diseases.

Nurses	Governmental set-up	Private set-up	Total	95% CI
correct	47	59	106	P= 0.001
incorrect	13	1	14	
Total	60	60	120	

The result here clearly indicates that knowledge in nurses working in private sectors was significantly high as compared to nurses working in government sector.

Nurses' attitude was assessed with questions like whether they have taken vaccine against hepatitis B, whether there is necessity of vaccination, family members vaccinated or not, should government arrange health education programs for their knowledge. Following is the finding about one of the key questions regarding their vaccination status against hepatitis B is described here:

Table 5. Distribution of nurses according to their attitude - Whether they have taken vaccine?

Nurses	Governmental set-up	Private set-up	Total	95% CI
Yes	21	25	46	P= 0.573
No	39	35	74	
Total	60	60	120	

Chi square value is 0.317 with 1 degree of freedom at 5% level. P =0.573(not significant). There was no significant difference between attitudes of the nurses from both sectors.

Nurses' practices regarding hepatitis B disease was assessed with questions like frequency of needle stick injury; measures they take post exposure, do they educate their subordinate workers viz. Ayabai, sweeper regarding measures they should take to avoid accidental exposure against this dreadful disease. Following table describes about measures nurses' take post needle stick injury are they correct and adequate or not.

Chi Square Value is 4.051 with one degree freedom; P = 0.044(significant). Here nurses working in private sector were seem to have practicing correct

measure of post needle stick injury protocol in comparison to government sector nurses.

Table 6. Measures Nurses follow after accidental needle stick injury

Nurses	Governmental set-up	Private set-up	Total	95% CI
Correct post exposure Measures	22	34	56	P = 0.044
Wrong post exposure measures.	38	26	64	
Total	60	60	120	

Discussion

The results of the study indicate that knowledge regarding hepatitis b is poor in various strata of health sector workers. Doctors and nurses from private sector hospitals have shown higher degree of knowledge and positive attitude as compared to government set up Doctors and nurses. This could be due the reason that private hospital employees need to constantly update their knowledge and practices so as to prove and improve their services whereas government sector employees seem to be constantly under work pressure and time constrain due to lot of collateral responsibilities beside patients' care! And due to that they might be failing to update their knowledge. Practices regarding hepatitis b disease in both the sectors have not shown any significant difference meaning both the health sector doctors were not following correct post exposure measures to protect themselves from this disease and so they were risking their lives in the hands of this highly infectious virus. Even the nurses from private set up have shown significant high knowledge level as compared to the nurses' from government sector this may be due to the felt need of constantly updating themselves to survive in the private set up. Pankaj puri in his article about tackling the hepatitis B burden in India have mentioned that the problem is serious because many cases are undiagnosed!¹¹The clinical cases of hepatitis b are like the tip of iceberg and could pose trouble by spreading it more by subclinical or chronic cases. Though present study objectives can be achieved with this study design, the generalization of findings for overall government and private sector workers would be wrong and not recommended. The long term complications of the disease were not known by lot many study participants which could be linked with their inability to generate their

interest in getting knowledge about it. From the present study most of the health care workers have agreed that there is need for proper health education regarding HBV infection. From our finding in the present study and literature review we also feel that vaccination is the best way of prevention against this silent killer disease and similar were the findings in the Berky et al study¹². Hepatitis B vaccine is the first vaccine recommended to healthcare providers to protect them as well as prevent spread of the disease amongst the catering population¹³ and this suggestion is as per the recommendation of the center of disease control and prevention. Even Prof. Raman Bedi in his article mentioned the need of patients' safety and looking at the infectivity and carrier rate of hepatitis B antigen (HbsAg) in India there surely is a need to change the concept of patients' care in India.¹⁴. Our study findings also suggest that the class 3 and class 4 workers have very poor knowledge about this disease and they are at risk of contracting it and spreading it to their families in its due course, so they should be vaccinated as like other health care workers.

Recommendations: Hepatitis B is highly infectious disease however very effective vaccine against it is available and after analyzing the study finding we recommend that this vaccine should be given compulsory and at subsidized rate if not free to all the healthcare workers by government as its long term advantages are very much cost effective. The sero conversion i.e. protective anti Hbs titre should also be checked in the health care providers as they are at constant risk of exposure.

Conclusion: The knowledge and attitude regarding this highly infectious diseases is poor and looking at the infectivity of this virus even a single exposure can lead to transmission of this disease in one third of the individuals, therefore sensitization regarding importance of taking hepatitis B needs to be targeted and more such studies should be conducted in community as well as in the medical colleges where medical students are now supposed to have early clinical exposure! They should be vaccinated when they enter the medical colleges and their sero-conversion (anti Hbs titre) be checked to assure safety of future workforce of the nation.

Limitations of study: It was a cross sectional study and all the parameters like knowledge, attitude and practices were assessed based on their responses to the questions. Therefore correct estimation of these broad terminologies might not have been possible but for the proposed aim of the given study the questionnaire methods seems to be correct.

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Conflicts of interest: Nil

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Original Research Article

A cross sectional study to assess the existing manpower in community health centres in a district of Tamilnadu.

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Abstract

BACKGROUND: Community health centres (CHC) provide referral and speciality care. Under National Rural Health Mission, Indian Public Health Standards were set for CHCs in 2007, and revised in 2012. Manpower is one of the essential resource to provide good quality of health care. The objective of this study was to assess the existing manpower in CHCs of a district, Tamil Nadu. **MATERIALS AND METHODS:** A Cross Sectional Study was conducted in 13 CHCs of a district and data were collected in terms of Manpower from October – November 2016, using a standard structured IPHS facility survey format for CHC. **RESULTS:** Obstetricians and Gynaecologists were present in only 4 CHCs and Anaesthetist were present in 3 CHCs. None of the other specialists as prescribed in IPHS were available in any of the CHCs. All the specialists/general duty medical officer posts were occupied by MBBS doctors. About 56.4% (66 out of 117) Nursing staff (includes Staff nurse, ANM) were available. About 76.9% (20 out of 26) Lab technicians and 92.3% (12 out of 13) Ophthalmic assistants were available. Pharmacists were available as recommended. Nil Radiographers present. Data Entry Operators were available more than needed. Only 23.1% (3 out of 13) Dressers, 3.8% (1 out of 26) ward boys, 15.4% (2 out of 13) OT attendants were present. But 23 in place of 13 Multipurpose Workers were available. About 30.8% (4 out of 13) OPD attendants, 7.7% (1 out of 13) Chowkidars and 30.8% (12 out of 39) Sweepers were present. **CONCLUSION:** As per IPHS standards, human resources availability was less, which is one of the basic resource to provide good quality of care. The policy makers have to ensure the availability of adequate manpower in CHC.

KEYWORDS: Community health centres, IPHS, Manpower.

Introduction:

Health is central to concept of quality of life. Health care services, a part of basic social services of country, provided by state government. In 1946, Bhore committee envisaged the importance of rural health services. In 1977, India adopted the Attainment of Health for All by 2000 A.D1. In Alma Ata declaration, 1978, concept of primary health care was declared².

Health is one of the factors responsible for socio economic development. To improve the quality of life, Government of India launched National Rural Health Mission on April, 05, 2005, now combined with National Urban Health Mission as National Health Mission from 2013. The main strategy of NRHM is to improve the rural

health care delivery system by upgrading the public health infrastructure in rural areas³.

Health care delivery in India is envisaged at three levels, namely primary, secondary and tertiary. Secondary level of care includes the provision of essential preventive and curative services by Community health centres and District hospitals to improve the health status of the population⁴.

Under NRHM, Indian Public Health Standards (IPHS) were set for Health Sub Centres, Primary Health Centres, Community Health Centres and District Hospitals in 2007. Latest revised guidelines were published in 2012. IPHS standards are to provide optimal expert care to the

community, to achieve and maintain an acceptable standard of quality of care.

There are 385 community health centres in Tamil Nadu⁵. Each Community Health Centre caters a population of 80,000 – 1,20,000, with 30 beds and should have specialists in Surgery, Medicine, Obstetrics and Gynaecology, Paediatrics with X-ray and laboratory services. Community Health Centres were designed to provide the referral services and specialist care services⁶.

A study in Nellore, Andhra Pradesh in 15 CHCs (2012) shown that, 6.7% General Surgeon, 13.3% physicians, 46.7% obstetrician and Gynaecologist, 13.3% paediatrician, 26.67 % anaesthetist were present. About 50.67% Staff nurse, 66.7% Pharmacist, 46.7% Lab technician, 53.33% Radiographer, 53.33% Ophthalmic assistant, no Multipurpose Workers were present.⁷

One of the basic resource required for providing quality health care is human resources⁸. Shortage of Manpower in any health care facility will affect the delivery of health services to the people. This study was undertaken with objective to assess the existing manpower in Community health centres of a district, Tamil Nadu, in comparison with IPHS.

Materials and methods:

A Cross Sectional Study was conducted in Tamil Nadu from October – November 2016. All the Health Unit Divisions(HUD) were enlisted and out of 42 HUDs, one HUD (Madurai) was selected by Simple Random Sampling method. Then all the community health centres in that selected HUD were included in the study. Data was collected by visiting all CHCs and the information about existing clinical and support manpower was obtained using a standard structured IPHS facility survey format for CHC. Ethical approval was obtained from Institutional Ethics Committee, Madras Medical College, Chennai. Official permission to conduct the study was obtained from Directorate of Public Health, Chennai. The data obtained were entered in MS Excel sheet and analysed using standard statistical techniques. Descriptive statistics were used to analyse data.

Results:

Of the required total manpower of 442 members (13 CHCs), as recommended by IPHS standards 2012, only 53.2% (235 members) were available. On an average, 50.2% manpower were available in each CHC, ranging from 38.24% (13 out of 34) to 70.59% (24 out of 34).

Now the results will be depicted in terms of clinical and supportive manpower separately.

Table 1 : Existing Clinical Manpower in CHCs:

S.No	Clinical Manpower	Recommended as Per IPHS norms	Available Manpower (%)	Existing gap (%)
1	General Surgeon	13	0 (0%)	13 (100%)
2	Physician	13	0 (0%)	13 (100%)
3	Obstetrician & Gynaecologist	13	4 (30.8%)	9 (69.2%)
4	Anaesthetist	13	3 (23.1%)	10 (76.9%)
5	Paediatrician	13	0 (0%)	13 (100%)
6	Public Health Programme Manager	13	0 (0%)	13 (100%)
7	Eye surgeon	13	0 (0%)	13 (100%)
8	Duty Medical officers	26	52	0

Existing Clinical Manpower in CHCs:

Clinical Manpower includes Specialists like Physician, General surgeon, Obstetrician and Gynaecologist, Anaesthetist, Paediatrician, Eye surgeon and Public Health Programme Manager and Duty medical officers. Of those required in the specialists category, only 50.4% (59 out of 117) were available. Only 4 of the 13 CHCs had Obstetrician and Gynaecologist accounting for 30.8% in Obstetrics and Gynaecology category. Among Anaesthetists, only 3 CHCs had anaesthetists accounting for 23.1% availability. None of the other Specialists were available. Instead, Duty medical officers with MBBS qualification were posted in the place of specialists. (Table 1).

Table 2 : Existing Support Manpower Available in CHCs:

S.No	Support Manpower	Recommended as Per IPHS norms	Available Manpower (%)	Existing gap (%)
1	Nursing Staff	117	66 (56.4%)	51 (43.6%)
2	Pharmacist	13	13 (100%)	0 (0%)
3	Lab technician	26	20(76.9%)	6 (23.1%)
4	Radiographer	13	0 (0%)	13 (100%)
5	Ophthalmic assistant	13	12 (92.3%)	1 (7.7%)
6	Data Entry Operator	13	19 (146.2%)	0
7	Dresser	13	3 (23.1%)	10 (76.9%)
8	Ward Boys	26	1 (3.8%)	25 (96.2%)
9	Multipurpose Workers	13	23	0
10	OT attendant	13	2 (15.4%)	11 (84.6%)
11	OPD attendant	13	4 (30.8%)	9 (69.2%)
12	Sweepers	39	12 (30.8%)	27 (69.2%)
13	Chowkidars	13	1 (7.7%)	12 (92.3%)

Existing Supportive Manpower in CHCs:

Supportive Manpower includes Nursing staff, Pharmacist, Lab technician, Radiographer, Ophthalmic assistant, Data entry Operator, Ward boys, Multipurpose workers, Dresser, Operation Theatre (OT) attendant, Out Patient Department (OPD) attendant, Sweepers and Chowkidars. About 54.2% (176 out of 325) support manpower available in total. Among them, 56.4% (66 out of 117)

Nursing staff (includes Staff nurse, ANM) were present. About 76.9% (20 out of 26) Lab technicians and 92.3% (12 out of 13) Ophthalmic assistants were available. Pharmacist were available as recommended. Nil Radiographers present. Data Entry Operators were available more than required. Of total, 23.1% (3 out of 13) Dressers, 3.8% (1 out of 26) ward boys, 15.4% (2 out of 13) OT attendants were present. But 23 in place of 13 Multipurpose Workers were available. Only 30.8% (4 out of 13) OPD attendants, 7.7% (1 out of 13) Chowkidars and 30.8% (12 out of 39) Sweepers were present. (Table 2).

Discussion:

This study results shows that about 50.4% of total clinical manpower were available. Among that 50%, 88% (52 out of 59) were Duty Medical Officers, only 12% were specialists. Only 7 specialists were available, that too 30.8% (4 out of 13) were Obstetrician and Gynaecologist and 23.1% (3 out of 13) were Anaesthetist. None of the others Specialists were available.

Though IPHS clearly prescribes the posting and availability of one speciality doctor in each of the categories like Surgeon, Physician, Obstetrician & Gynaecologist, Paediatrician, Anaesthetist, Eye surgeon and Public Health Programme Manager in each of the CHCs. All the medical officers post sanctioned in the CHCs in Tamil Nadu are Assistant Surgeon posts which can be occupied by either Specialists or Duty Medical officers. Though CHCs were meant to function as first referral unit, lack of specialists, forces to refer the patients to higher facility, those where previously referred from Primary health centres/Sub centres to seek the speciality care in CHCs. This inturn is increasing the burden of medical officers, to do the work of specialists in addition to their duties. Moreover, workload also increased in District hospitals and other tertiary care centres as no specialist were available in CHCs.

Sodani P R et al in their study (2010) mentioned that, 30.8% of General surgeon, 38.5% of Physician, 38.5% of Obstetrician and Gynaecologist, 30.8 % of Paediatrician, 7.7% Anaesthetist, 41% of medical officers were available in their study area of 13 CHCs in Bharatpur district of Rajasthan.9

Another study in Nellore, Andhra Pradesh in 15 CHCs (2012) shown that, 6.7% General Surgeon, 13.3% physicians, 46.7% obstetrician and Gynaecologist, 13.3% paediatrician, 26.67 % anaesthetist were present.7

Raman Chauhan et al in their study (2011) mentioned that nil specialist, adequate General Duty Medical Officers

were available in 7 CHCs of Shimla, Himachal Pradesh.10

From the above studies, we found that Specialists availability in CHC is less. But Duty Medical officers were available in excess. Though specialists are less, we are giving the necessary care by hiring the specialists when needed. But we need the permanent post specialists to improve the quality of care, since CHCs acts as First referral unit, the availability of specialists is necessary to provide good quality of speciality care for the cases referred from PHC's.

Pharmacists, Data entry operators were available as recommended, Ophthalmic assistants 92.3% (12 out of 13) and 76.9% (20 out of 26) lab technician were available. About 56.4% (66 out of 117) Nursing staff (includes Staff nurse, ANM) were present. Other than those, basic workers were (<50 %) far below recommended. But 23 in place of 13 Multipurpose Workers were available, because in some CHCs, Dresser/OPD attendant/OT attendant/Chowkidars/ Sweepers were also appointed under Multipurpose Workers cadre. If these posts were correctly appointed as per sanctioned cadre, their availability increases, with more betterment of that work.

Sodani P R et al in their study (2010) mentioned that, 78.4 % Nursing staff, 30.8% Pharmacist, 66.7% Lab technician, 50% Radiographer were available in their study area of 13 CHCs in Bharatpur district of Rajasthan.9

Study in Nellore, Andhra Pradesh in 15 CHCs (2012) shown that, 50.67% Staff nurse, 66.7% Pharmacist, 46.7% Lab technician, 53.33% Radiographer, 53.33% Ophthalmic assistant, no Multipurpose Workers were present.7

Raman Chauhan et al in their study (2011) mentioned that Adequate Nursing staff & Group 4 workers were available, 4 CHCs had Lab technician, Pharmacist and Ophthalmic Assistant, 3 CHCs had Radiographer in 7 CHCs of Shimla, Himachal Pradesh.10

From these studies, we can say that we are at better place compared to others in account to Pharmacist, Lab technician, Ophthalmic assistant, Data entry operator. We have to improve the availability of Nursing staff still much. But we have nil Radiographers at present. As shown in results, total Sanitary/Hospital workers were below 50%, so improve their availability.

Overall, this study results shows that we have to improve the availability of Specialist & Nursing staff as a first step, as we are lacking much. As the total manpower is concerned, we have achieved around 50%, still half way to go.

Conclusion:

CHC acts as a First Referral Units. Community Health Centres deals with the cases referred from PHC and cases which needs speciality services. The availability of Specialists and Support Manpower is necessary to provide good quality of health care. Especially Obstetrician and Gynaecologist & Anaesthetist is required for MCH care services. But in this study we have seen that only 7 specialists (30.8% Obstetrician and Gynaecologist, 23.1% Anaesthetist) were available. Also, basic health workers were less than 50%. The existing persons face the problem of not knowing their job responsibilities, because they have to compensate the work of lacking manpower, which in turn compromises the job satisfaction of workers and quality of care and causes psychosomatic problems like stress. The patients have to wait long time for seeking medical care. This study depicts the need to provide full efforts to strengthen CHCs with respect to human resources to provide better care to the people, who seek their medical care largely from Government health care facilities.

Recommendations:

In order to provide the quality health services, policy makers have to ensure the availability of the permanent specialists. Improve the availability of Basic health workers, for betterment of sanitation and hygiene in health care facilities.

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Short Article

84 outbreaks of Hepatitis A in last five years in Kerala State – are we resigning to fate?

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Several outbreaks of hepatitis A have been reported from Kerala State in recent years.¹⁻¹⁰ Weekly reports of outbreaks retrieved from the official website of Integrated Disease Surveillance Project showed that there were 84 outbreaks of hepatitis A reported from Kerala in the past five years.⁹ Many were explosive including more than 100 cases. As per the official figures, there were 22 deaths due to hepatitis A in last two years.¹⁰ The details were shown in Table 1 and 2.

Hepatitis A costs!

Though Hepatitis A is a self-limiting viral disease, it causes significant morbidity. Most people with hepatitis A feel sick for about two months and many need care in the hospital. People affected with HAV may take a few months to return to work, school, or daily life and so itself HAV infections can lead to economic losses and social consequences in the community. A study report showed that average out of pocket expenditure, including direct and indirect expenses, to a family due to one of its member affected with hepatitis A in Kerala as Rs. 24025 (SD Rs. 8315).¹¹ This has not considered the emotional stress and mental agony of the family. When the disease is shifting to higher age group, as seen in Kerala, it leads to severe manifestations and fatality.

Real figures might be much higher!

An average of 8268 hepatitis A suspected cases per year is reported to State's official disease surveillance system which depends mainly on daily telephone based reporting from all Government health institutions. Segregated private sector data on hepatitis A is not available with the Public health department.¹² Apart from the 'fearful' reporting at the bottom level and tendency to hide cases,

confirmatory tests for hepatitis A are being offered only in six laboratories in Government sector and this has contributed so much to the weaknesses in the official surveillance system.¹² As 70% of the people in the State depend on private sector for their health care needs, the real figure of hepatitis A would be at least three times higher than the official figures.

Table 1: Details of hepatitis A outbreaks reported from Kerala 2012-2016

Year	Total Number of outbreaks reported	Number of outbreaks with affected cases more than 20	Number of outbreaks with affected cases more than 50	Number of outbreaks with affected cases more than 100
2012	14	7	1	0
2013	19	12	3	0
2014	18	9	4	1
2015	20	11	3	0
2016	13	10	2	1

Huge outbreaks of hepatitis A to be expected in Kerala- Irony in hepatitis A epidemiology!

Presentation of disease is determined by the age of exposure, which tends to be asymptomatic or subclinical during childhood and symptomatic usually among older children adolescents and adults. Infected children under 6 years of age do not usually experience noticeable symptoms, and only 10% develop jaundice, but they often pass the disease to others. Among older children and adults, infection usually causes more severe symptoms, with jaundice occurring in more than 70% of cases. Immunity after infection is probably life-long. In areas with very poor sanitary conditions and hygienic practices,

most children have been infected with the hepatitis A virus before the age of 10. Those infected in childhood do not experience any noticeable symptoms, but will develop life- long immunity. So outbreaks of HAV are uncommon in areas with very poor sanitation because older children and adults are generally immune, as they contracted the disease during childhood. Symptomatic disease rates in these areas are low and outbreaks are rare.

Table 2: District wise distribution of outbreaks of hepatitis A in Kerala

District	2012	2013	2014	2015	2016
Thiruvananthapuram	0	1	0	0	0
Kollam	2	4	3	3	0
Pathanamthitta	0	1	0	0	0
Alapuzha	2	0	0	0	0
Idukki	0	0	0	0	0
Kottayam	2	0	0	0	0
Ernakulam	0	0	2	5	2
Thrissur	2	3	3	7	4
Palakkad	0	2	0	3	1
Malappuram	3	1	4	2	6
Kozhikode	0	0	2	0	0
Wayanad	2	3	1	0	0
Kannur	1	4	3	0	0
Kasargod	0	0	0	0	0

But in Kerala with a comparatively better sanitation and hygiene and a better standards of living, children often escape infection in early childhood. Ironically, these improved economic and sanitary conditions led to a higher susceptibility in older age groups and higher disease rates, as infections occur in adolescents and adults, and large outbreaks can occur. The HAV antibody sero prevalence rates reported from Kerala was <10% in children below 5 years when compared to 60-80% from many other parts of the country.¹³⁻¹⁶ These findings along with age distribution of cases during hepatitis A outbreaks in the State suggest that a substantial proportion of individuals in Kerala were not exposed to HAV until adulthood. A mild contamination of water with HAV in such scenario is sufficient to lead to explosive hepatitis A outbreaks. Under favourable conditions HAV may survive in the environment for months. Person to person spread from asymptomatic and symptomatic cases represents an important transmission mechanism. These findings reiterate the fact that huge outbreaks of hepatitis A have to be expected in the state in coming years.

A reporting of over 300,000 cases including 47 deaths associated with consumption of raw clams in Shanghai, China in 1988 represents an example of the magnitude of HAV infection in susceptible population. Community-wide outbreaks of HAV infection are often prolonged and difficult to control. Usually they persist for 6-18 months, until the pool of susceptible persons is exhausted. Same is the experience with hepatitis A outbreaks in Kerala. This

scenario has to be faced by any community undergoing economic transitions and improving living standards. Many such countries with similar scenarios have formulated economically viable policies for control of the disease.

Ensuring water quality and food safety- the real challenge!

Recent reports showed that only 29.3 per cent of the houses in the State are serviced by the water supply network and just 23.4 per cent get treated water. The key to providing microbiologically safe drinking water lies in understanding the various mechanisms by which water gets contaminated, and formulating interventions at critical points to decrease and prevent contamination of drinking water. The mechanism for water quality surveillance is poor in the State. The districts constantly reporting maximum number of hepatitis A cases are ill equipped to do water quality testing. At least two major outbreaks of Hepatitis A in the State have been due to the mixing of sewage with the drinking water supplied through piped water distribution.^{2,3} Intermittent water supply, closely running pipelines and drainages, frequent breaks in the pipelines, contaminated water sources, not ensuring scientific chlorination of water supply in rural areas are some of the factors that favours transmission of HAV through water distribution system. Sixty-two per cent of the households in Kerala depend on wells for drinking water, but the increasing number of constructions and dwellings made it impossible to maintain the safe distance between drinking water sources and sewage. The infrastructure to treat sewage is also grossly inadequate.

Is it time to think of Hepatitis A Vaccines?

“The best way to protect against hepatitis A is by getting the hepatitis A vaccine” says World Health Organisation.¹⁷ As far as India is concerned; Hepatitis A is hyperendemic on account of over-crowded living conditions and lack of proper sanitation, almost universal exposure of children to the virus leading to predominant subclinical infections and life-long immunity. Use of vaccine for prevention of hepatitis A is obviously therefore not considered. However, the epidemiological transition should force Kerala to modify the views in relation to use of hepatitis A vaccine. Indian Academy of Pediatrics has also recommended Hepatitis A vaccine at 12 months of age for all children

Inactivated vaccines have been in use for more than two decades. Several studies have documented good immunogenic potential and excellent efficacy in pre-exposure prophylaxis of hepatitis A vaccine.¹⁸ Many country experiences have shown that the disease incidence, not only in the vaccinated cohorts but also in

the whole population, have come down within a few years of the start of mass vaccination. There is also convincing evidence that the vaccine confers herd immunity if the main spreaders of the virus are targeted for immunization.¹⁹⁻²¹

Even after exposure to the virus, a single dose of the vaccine within 2 weeks of contact with the virus has protective effects.²²⁻²⁴ Criticism has been raised that vaccine has not come to the minds of the health officials in the State even to control outbreaks.²⁵ Cost is a major concern for universalising hepatitis A vaccine. But, considering the out of pocket expenditures due to hepatitis A, the health system cost for treating the patients and the public health system cost to deal with the outbreaks, the cost for hepatitis A vaccine in Kerala might be justified.

Way Forward

A broader social approach to Hepatitis A prevention is the need of the hour, with strengthening of awareness campaigns, strengthening of the water supply and sanitation programs along with public health efforts to improve water quality and food safety. The situation also demands capturing epidemiological data regarding HAV systematically and economic analysis of initiating HAV vaccination in the State.

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