



# National Journal of Research in Community Medicine *of India*

ISSN: 2277-1522 (Print) ; 2277-3517 (Online)

An Official Publication of Community Medicine  
Faculties Association



Volume 7. Issue 1. Jan.-Mar.2018 (001-072)

Indexed in Index Copernicus & Other database

Not for Sale  
[www.commedjournal.in](http://www.commedjournal.in)

31.03.2018



# National Journal of Research in Community Medicine (NJRCM)



**Volume 7. Issue 1. Jan.-Mar.2018 (001-072)**

**Community Medicine Faculties Association  
Chennai  
India**



## NJRCM- Volume 7. Issue 1.Jan.-Mar. 2018 (001-072)

National Journal of Research in Community Medicine  
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

### Chief Editor:

Dr.M.Logaraj

### Associate Editors

Dr.PurushottamA.Giri  
Dr.Mohd. Haroon Khan  
Dr.ManeAbhayBabruwahan  
Dr.Sanjeev Davey  
Dr.RoselineFathima William  
Dr.R.Balaji

Dr.E.Ravi Kiran  
Dr.K.Vijaya  
Dr.Ramesh Holla  
Dr.M.Sundar  
Dr.G.KalaiSelvan

### Advisory Board Members

#### National

Dr.J.Venkatesh  
Dr.Chavada V K  
Dr.N.Praveen  
Dr.SureshMunuswamy  
Dr.R.Balamurugan  
Dr.G.Chaitanya  
Dr.JyothiConjeevaram  
Dr.K.M.Susmita  
Dr.E.Mathan  
Mr.A.Ganesan

#### International

Dr.Rajmohan (USA)  
Dr. O Dale Williams (USA)  
Dr. J.A Prabha (USA)  
Dr.Somanathan(Canada)  
Dr.T.Ashokkumar(KSA)  
Dr.T.Gayathri(USA)  
Dr.Eswari(UK)  
Dr.S.Rajan(USA)  
Dr.Dr.SushilDohare(KSA)  
Dr. S. Krishna Kumar(Singapore)

Web Site: [www.commedjournal.in](http://www.commedjournal.in)  
Association Site: <https://sites.google.com/site/comfaoffice/who-we-are>  
E-Mail: [dopnjrcm@gmail.com](mailto:dopnjrcm@gmail.com)

#### Address:

Community Medicine Faculties Association  
(Registered Under The Tamil Nadu Societies Registration Act, 1975)  
No: 29/2 (New no.60) Rettaikuzhi Street, Tondiarpet, Chennai – 600 081.

**Disclaimer:** It is purely an internal communication for our members and authors and not for sale. And Community Medicine Faculties Association or chief editor is not a publisher.

#### Manuscript Submission:

<http://www.commedjournal.in/man.html>

**Indexed in Index Copernicus** (<http://journals.indexcopernicus.com/masterlist.php>): ICF value:64.29 and other data base.

**Table of Content**

<b>S.No.</b>	<b>Article-Author</b>	<b>Page No.</b>
	<b>Original Research Article</b>	
1	Cross Sectional Study On Quality Of Life Among Elderly In Poonamallee Block Thiruvallur District Tamilnadu.	01
2	A Cross-Sectional Study On Knowledge And Practice Of Breastfeeding - An Urban And Rural Comparison By Lot Quality Assurance Sampling.	05
3	Decentralization of Treatment Services for Drug Resistant Tuberculosis – A Patient Friendly Strategy from Telangana Region of India	11
4	Study of morbidity pattern among elderly in Anaji, field practice area of J.J.M. Medical College, Davangere.	18
5	Job satisfaction among health care providers in a tertiary care hospital in Gadag, Karnataka.	22
6	Stroke among slum dwellers: Risk factors and health-seeking behavior in elderly residents of Dharavi, Mumbai	26
7	Study On Prevalence And Determinants Of Malnutrition Among Anganwadi Children Of Nagavi Primary Health Centre Area, Gadag.	32
8	Assessment of Sleep quality Index among Working and Non-working Women using Pittsburgh scale	36

<b>S.No.</b>	<b>Article-Author</b>	<b>Page No.</b>
9	A Cross-Sectional Study on Bone Density in Adults from an Urban Area of South India	42
10	A Study On Assessing The Knowledge, Attitude & Practice Among The Victims Of Animal Bites In Trichy, Tamilnadu.	47
11	Influence of environmental factors on road traffic accidents: Hospital based cross sectional study at Tirupati	52
12	Study of Association between Body mass index and Blood Pressure in private school children aged 5-15 years	56
13	Socio demographic profile of patients on Directly Observed Treatment Short Course Chemotherapy in Mandya Tuberculosis Unit, Karnataka	60
14	Comparison Of Outcomes Of Teenage And Non-Teenage Pregnancies At A Rural Maternity Hospital In Ramnagara District, Karnataka – A record Review	66
	<b>Short Article</b>	
15	Shape your breakfast: Breakfast skipping as a risk correlate of Obesity among school children in chennai	70

## **Cross Sectional Study On Quality Of Life Among Elderly In Poonamallee Block Thiruvallur District Tamilnadu.**

**S.Suganathan Soundararajan<sup>1\*</sup>**

<sup>1</sup>Assistant Professor, Department of Community Medicine, Saveetha Medical College, Thandalam, Chennai, India

**Date of Submission** : 23-10-2017

**Date of online Publication** : 07-01-2018

**Date of Acceptance** : 23-12-2017

**Date of Print Publication** : 31-03-2018

**\*Author for correspondence:** Dr.S.Suganathan Soundararajan, Assistant Professor, Department of Community Medicine, Saveetha Medical College, Thandalam, Chennai, India. **Email:**suganathan85@gmail.com

### **Abstract**

**BACKGROUND:** The World Health Organization describes Quality of Life (QOL) as a broad-ranging concept that incorporates individual's physical health, psychological state, level of independence, social relationships, personal beliefs and their association to salient features of the environment. QOL of elderly patients varies geographically across the Globe. Most of them have moderate to poor quality of life. The objective of the study was to assess Quality Of Life among elderly in a rural population. **METHODOLOGY:** The study was a population based cross sectional study conducted among 450 elderly subjects from 60 years and above residing in poonamallee block of Thiruvallur district in Tamil Nadu. Data regarding Quality Of Life was assessed using WHO-QOL-BREF Questionnaire. Informed consent was obtained from all the participants. The ethical clearance was obtained from institutional ethics committee. **RESULTS:** Majority of the study subjects were elderly females 274 (60.9%). Large proportion of elders 222 (49.3%) were in the age group 60-65 years. Large proportion of elders 269 (59.7%) were illiterate. Majority of the elderly 356 (79.1%) were unemployed. The mean scores for male in physical domain was 46.8, for psychological domain is 54.8%, for social domain is 37.9, environmental domain is 61.2. In each domain the mean scores were higher for males showing that males had a better QOL than females and difference is found to be statistically significant. **CONCLUSION:** Early detection and treatment for geriatric health problems can improve elderly peoples Quality Of Life and reduce dependence on others.

**Key-words:** QOL, WHOQOL BREF, ELDERLY

### **INTRODUCTION**

At world level, QOL among elderly is an important issue which reflects the morbidity status and living conditions of geriatric population. Population growth results in increasing life expectancy and increase in proportion of geriatric population in future<sup>1</sup>In Tamilnadu, Population above 60 years was found to be 11.2% behind Kerala which has 12.3%. Tamilnadu has 13.7% elderly living alone which is highest comparing to other states<sup>2</sup>. At present due to less care given for elderly prevalence of Heart disease and urinary problems and myalgia are common morbidity among elders, the chronic morbidity conditions will affect the QOL among elders<sup>3</sup>. WHO defines QOL as an individual perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns<sup>4</sup> The main objective of this study is to assess the QOL among elderly in rural population so the effective strategies can be formed to improve the QOL and can be implemented at state level.

### **MATERIAL AND METHODS**

QOL was assessed using WHO QOL BREF Scale the WHOQOL-BREF instrument comprises 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment. The WHOQOL-BREF is a shorter version of the original instrument that may be more convenient for use in large research studies or clinical trials. The Tamil questionnaire was obtained from the author after obtaining permission<sup>5</sup>. After obtaining IEC approval, The study is a population based cross sectional study done from January-2013 to June 2013 in a rural area, Poonamallee block of Thiruvallur district in TamilNadu it includes 160 villages. The study population comprises of elderly aged 60 years and above after obtaining written informed consent the participants were included in the study. Those who did not give the consent were excluded from the study, villages were selected based on cluster sampling methods for selecting elderly as study subjects.

Thirty clusters were selected by probability proportionate to size method and 15 elderly were selected from each villages to obtain sample size of 450 elders.

**SAMPLE SIZE CALCULATION:** Based on assumption of 25% as prevalence of depression and alpha error 6% and limit of accuracy of 25% of prevalence and a design effect of 2, the minimum sample size required for the study was 400. Though the minimum sample size calculated was 400 it was decided to have a little larger sample size of 450 for better precision.

**DATA ENTRY AND ANALYSIS:**

Data entry and analysis was done using SPSS 16.0 for windows software. Mean scores for the four domains in Quality Of Life with 95% CI were calculated. Descriptive statistics were calculated for background variables including socio-demographic characteristics.

**RESULTS**

Majority of the elders were of 60-65 years age group(49.3%). Out of 450 participants 274 (60.9%) were females and 176(39.1%) were males given in Table 1.

**TABLE 1: Socio Demographic variables of study population**

Socio demographic characters	N	(%)	Socio demographic characters	N	(%)
<b>Age group</b>					
60-65 years	222	(49.3)	Unskilled	58	(12.9)
66-70 years	99	(22.0)	Unemployed	356	(79.1)
>70 years	129	(28.7)	<b>Social class</b>		
<b>Gender</b>					
Male	176	(39.1)	Class I	46	(10.2)
Female	274	(60.9)	Class II	59	(13.1)
<b>Religion</b>					
Hindu	372	(82.7)	Class III	123	(27.4)
Muslim	15	(3.3)	Class IV	117	(26.0)
Christian	63	(14.0)	Class V	105	(23.3)
<b>Education</b>					
Graduate	3	(0.7)	<b>Family members</b>		
High school	82	(18.2)	1-3	246	(54.6)
Middle school	16	(3.6)	4-5	116	(25.8)
Primary school	80	(17.2)	>5	88	(19.6)
Illiterate	269	(59.7)	<b>Living arrangements</b>		
<b>Occupation</b>					
Clerical/shop/farm	26	(5.8)	Living alone	77	(17.1)
Skilled	10	(2.2)	Living with spouse	63	(14.0)
			Living with children	172	(38.2)
			Living with spouse and children	138	(30.7)

About 82.7% were Hindu religion, 59.7% were illiterate,79.1% were unemployed. 27.4% belongs to class III socio economic status according to prasad’s classification and 54.6% elders were living with 1-3 family members and 38.2% were living with childrens. The environmental domain has highest mean score 53.9 given in table 2.

**Table 2: WHO Quality of life mean score for the four domains**

Domain	Mean Scores	Standard Deviation	95% CI
Physical Domain	39.1	25.1	36.71-41.49
Psychological Domain	47.4	24.5	45.14-49.66
Social Domain	32.5	22.3	30.44-34.56
Environmental Domain	53.9	25.3	51.5 – 56.2

**Table 03: WHO Qualities of life mean scores for males and females**

Domains	Mean scores	p value
<b>Physical domain</b>		
Male	46.8	0
Female	34.1	
<b>Psychological domain</b>		
Male	54.8	0
Female	42.7	
<b>Social domain</b>		
Male	37.7	0
Female	29.1	
<b>Environmental domain</b>		
Male	61.2	0
Female	49.2	

When the Quality of Life mean scores were found to be higher in all the domains for males than the females. The p value was found to be statistically significant (<0.05) among males in all the domains indicated in Table 3. The Quality Of Life Mean scores were found to be higher among 60-65 years participants in all the domains it is found to be statistically significant in physical and environmental domain (<0.05) found to be statistically significant indicated in table 4.

According to gender males have higher mean scores in all the domains according to figure 1. Elders between the age group 60-65 years have higher mean scores in all the domains according to figure 2.

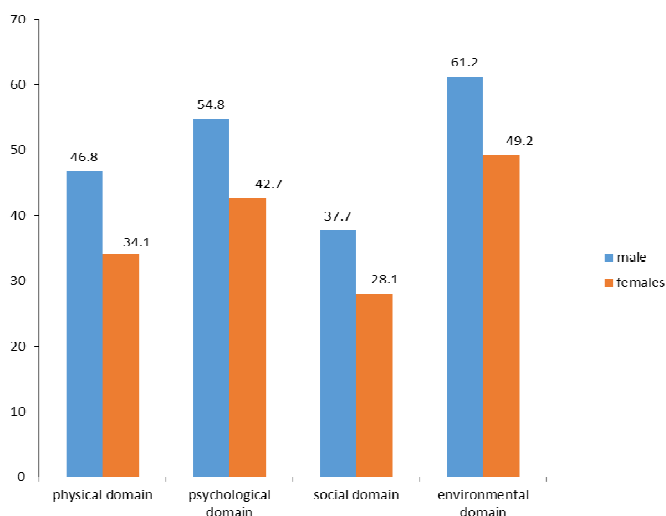
**DISCUSSION**

The present study has shown that elders have a better Quality Of Life in environmental (53.9) compared to other domains. The QOL score is higher than a study

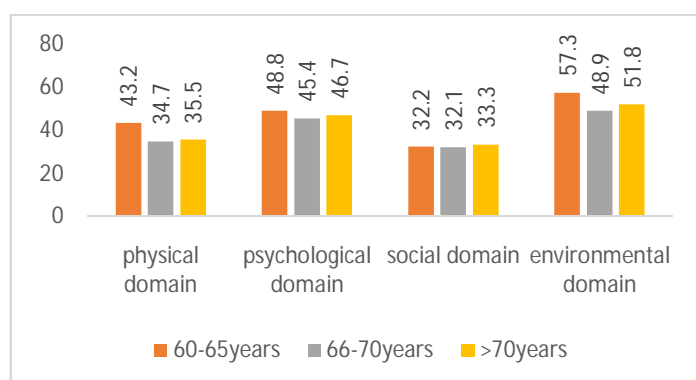
**Table 04: WHO quality of life mean scores for different age groups**

Domains	Mean scores	p value
<b>Physical domain</b>		
60-65 years	43.2	0.001
66-70 years	34.7	
>70 years	35.5	
<b>Psychological domain</b>		
60-65 years	48.8	0.24
66-70 years	45.4	
>70 years	46.7	
<b>Social domain</b>		
60-65 years	32.2	0.41
66-70 years	32.1	
>70 years	33.3	
<b>Environmental domain</b>		
60-65 years	57.3	0.02
66-70 years	48.9	
>70 years	51.8	

**Figure 1. Mean scores according to gender**



**Figure 2. Mean scores according to age group**



done in Kerala by S.E.Thadathil et al<sup>6</sup> (36), and lesser score than a study done at Nemam by Vijayalakshmi<sup>7</sup>. The Quality Of Life scores obtained in psychological domain is found to be (47.4) which is the high domain score next to environmental domain, which is lesser to the domain score in a study done in rural area of Dakshina Karnataka by Shahul et.al<sup>8</sup> (83.3). The psychological domain score is found to be higher than a study done in Mettupalayam by Sowmiya<sup>9</sup> et.al (45.5). The physical domain score is found to be (39.1) which is lower score than a study done in Kerala by S.E.Thadathil et al<sup>6</sup> (42.44). The social domain score is found to be (32.5) which is found to be higher than a study done by Sowmyia et.al<sup>9</sup> (19.56). It was found that participants in the age 60-65 years had a association (p value <0.05) in physical domain and environmental domains comparing to other domains the study results were similar to the results done by Ninh Et.al in Vietnam<sup>10</sup>. The QOL scores were found to be statistically significant (p value <0.01) among males in all the domains, these results were not similar to a study done in Karnataka by Barua et al which showed difference between the two groups was not found to be statistically significant for any of these four domains<sup>11</sup>.

**CONCLUSION:**

When the Quality of life among elderly were assessed, in each domain the mean scores were higher among males showing that males had a better quality of life than the females. In physical and environmental domain, the Quality Of Life scores were higher for younger groups, showing that younger showing that the elders in the age group 60-65 had a better Quality Of Life, compared to be more than 65 years. The QOL scores mean scores were lower in social domain which indicates that there is a need for counselling for elders regarding involving them in groups in social activities which will improve their QOL. Family members should take care of their needs and keep them psychologically happy.

**ACKNOWLEDGEMENT:**

The author thanks all the elderly participants for accepting to participate in this study.

**REFERENCES**

1. Ganesh Kumar S.<sup>1</sup>, anindo maunder, Pavithra G.<sup>2</sup> . Quality of Life (QOL) and Its Associated Factors Using WHOQOL-BREF among Elderly in Urban Pondicherry, India. Journal of Clinical and Diagnostic Research. 2014; 8(1): 54-57.
2. C Shiva Kumar. Greying Tamil Nadu has second highest senior citizens: Report', The New Indian Express. Undefined: 1.
3. Ministry Of statistics and programme Implementation. Elderly in India Profile and programmes 2016.

- www.mospi.gov.in (accessed 25.11.2017).
4. Mosalem FA, Mahfouz EM, Fattah MA, Hassan EE. Quality of life (QOL) among geriatric rural population - El-Minia - Egypt. *El-Minia Medical bulletin* 2009; 20(1): 1-15.
  5. World Health Organization. . World Health Organization. WHOQOL-BREF: Introduction, Administration, Scoring and Generic Version of the Assessment. Programme on mental health. Geneva, WHO. [http://www.who.int/mental\\_health/media/en/76.Pdf](http://www.who.int/mental_health/media/en/76.Pdf) (accessed 25.11.2017).
  6. S. E. Thadathil1, R. Jose2 & S. Varghese3. Assessment of Domain wise Quality of Life Among Elderly Population Using WHO-BREF Scale and its Determinants in a Rural Setting of Kerala.. *International Journal of Current Medical and Applied Sciences*, 2015; 7(1): 43-46.
  7. Vijaiyalakshimi Praveen\*, Anitha Rani M. Quality of life among elderly in a rural area. *International Journal of Community Medicine and Public Health* 2016; 3(3): 754-757.
  8. Shahul Hameed 1\*, Krutarth R Brahmabhatt2, Dipak C Patil3, Prasanna K S4, Jayaram S5. Quality of life among the geriatric population in a rural area of Dakshina Kannada, Karnataka, India . *GLOBAL JOURNAL OF MEDICINE AND PUBLIC HEALTH* 2014; 3(3): 1.
  9. Sowmiya KR1, Nagarani2 . A Study on Quality of Life of Elderly Population in Mettupalayam, A Rural Area of Tamilnadu. *Nat.J.Res.Com.Med* 2012; 1(3): 139-143.
  10. Ninh Thi Ha1\*, Hoa Thi Duy1, Ninh Hoang Le1, Vishnu Khanal2 and Rachael Moorin3. Quality of life among people living with hypertension in a rural Vietnam community. *BMC Public Health* 2014; 14(1): 2-9.
  11. Ankur Barua, R Mangesh, HN Harsha Kumar, Saajan Mathew. A Cross Sectional Study On Quality Of Life In Geriatric Population.. *Indian Journal Of Community Medicine* 2007; 32(2): 146-147.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** S.Suganathan Soundararajan. Cross Sectional Study On Quality Of Life Among Elderly In Poonamallee Block Thiruvallur District Tamilnadu. *Nat J Res Community Med* 2018;7(1):01-04.

© **Community Medicine Faculties Association**

**NJRCM:** [www.commedjournal.in](http://www.commedjournal.in)



## **A Cross-Sectional Study On Knowledge And Practice Of Breastfeeding - An Urban And Rural Comparison By Lot Quality Assurance Sampling.**

**Sandhya Rani Javalkar<sup>1\*</sup>, Radha Y Aras<sup>2</sup>.**

<sup>1</sup>.Assistant Professor in Community Medicine, JJM Medical College, Davangere. <sup>2</sup> Ex-Professor & Head, Department of Community Medicine, Yenepoya Medical College, Mangalore.

**Date of Submission** : 01-12-2017

**Date of online Publication** : 07-01-2018

**Date of Acceptance** : 23-12-2017

**Date of Print Publication** : 31-03-2018

**\*Author for correspondence:** Dr. Sandhya Rani Javalkar, MBBS, MD Community Medicine, Assistant Professor, Department of Community Medicine, JJM Medical College, Davangere -577004, Karnataka. Email Id: [sandhyaranijavalkar@gmail.com](mailto:sandhyaranijavalkar@gmail.com)

### **Abstract**

**Introduction:** Lactation is the ideal way of providing nutrition to the infants. It is the most efficient way to address the energy requirement of the new born and creates a unique bonding between the mother and child. **Objectives:** To compare the knowledge and practices in Breastfeeding in urban and rural areas. **Material and methods:** A community based cross-sectional study was conducted among mothers in Urban and Rural area of Mangalore Taluk, Karnataka. Data was collected by personal interview among 408 mothers using a predesigned pretested questionnaire, information regarding demographic profile, socio-economic status, breastfeeding practices, etc were collected. **Results:** The mean age among the study population was  $25.95 \pm 3.67$  years. Prelacteal feeds are more common among rural mothers 83(68.0%) compared to urban mothers 39(32%). Mothers from rural area 37(13.7%) and urban area 8(5.8%) believed that feeding colostrum can be unhealthy. As many as 129 (69.4%) of rural mothers continued exclusive breastfeeding upto 6months of age compared to 57 (30.6%) urban mothers. **Conclusion:** Although breastfeeding was common, harmful feeding practices like prelacteal feeding and discarding colostrums are still prevalent both in urban and rural areas.

**Key-words:** Breastfeeding, Colostrum, Prelacteal feeding, Exclusive Breastfeeding.

### **INTRODUCTION**

Lactation, is the ideal way of providing nutrition to the young ones.<sup>1</sup> It is the most efficient way to address the energy requirement of the new born with many advantages.<sup>1,2,3</sup> Ideally all mothers can breastfeed, provided they have right information and support from family, the health care system and society at large.<sup>4</sup>

In India, NFHS-4 reported, children under age of 6 months exclusively breastfed were 46.4% and Children under age 3 years breastfed within one hour of birth were 23.4%.<sup>5</sup> As a result children are likely to falter in growth during this critical period of life. The first two years of life provide a critical window of opportunity for ensuring children's appropriate growth and development through optimal feeding.<sup>2</sup> WHO and UNICEF's global recommendations for optimal infant feeding as set out in the Global Strategy are: Exclusive breastfeeding for 6

months (180 days), nutritionally adequate and safe complementary feeding starting from the age of 6 months with continued breastfeeding up to 2 years of age or beyond 3years.<sup>6</sup> Optimal breastfeeding and complementary feeding practices together can prevent deaths and allow children to reach their full growth potential and prevent irreversible stunting, as well as acute undernutrition.<sup>7</sup>

Breastfeeding is further being influenced by many factors like educational level, locality, economic status and women's caste or tribe, place of delivery, prenatal visits to health care facilities and assistance during delivery as well as partner's support.<sup>8</sup> The knowledge regarding existing Feeding Practices among mothers and also the factors influencing these practices can be used to plan measures that concentrate on improving prevalent practices by targeting the socio cultural and economic determinants. The difference in Breast feeding practices

in urban and rural areas are still prevalent even today.<sup>5</sup> Rural women have many drawbacks including socio economic status, decision making capacity in family and many times do not have accesses to right knowledge about breastfeeding. Hence this study was conducted to compare the knowledge and practices in breastfeeding in urban and rural areas and the various factors influencing them.

## MATERIAL AND METHODS

A Community based cross sectional study was conducted among mothers of the children aged 12months – 36 months, for a period of 1 year (Oct 2014- Oct 2015) in Urban and Rural field practice area of Department of Community Medicine, Yenepoya Medical Colleges in Mangalore Taluk. The study areas included Bunder, Bengere, Kudroli, Harekala, Pavoor, Iliyarpadavu, Amblamogaru, Kuttara, Deralkatte, Konaje, Kotekar, Kurnad. Study was initiated after approval from the Institutional Ethics Committee, Yenepoya University. Written informed consent was taken from study participants.

By using lot quality assurance sampling (LQAS) methodology, it is possible to use small sample sizes when conducting surveys population-based areas (lots). According to the WHO methodology of Lot Quality Technique<sup>9</sup> and Breastfeeding information from NFHS data<sup>5</sup> considering desired level of confidence interval as 95% and desired level of accuracy as 5%, the initial sample size is 384. The starting point of the study was anganwadi centre (ICDS Block). There are 227 Anganwadi centre in urban Mangalore area and 447 anganwadis in rural Mangalore area.<sup>10</sup> Based on accessibility and duration of the study for convenience of the researchers 10% of the anganwadi centres were selected in the defined study area. Thus total number of lots was 68 (23+45). Initial sample size is 384, and there are 68 lots. Hence each lot sample size is  $384/68 = 5.64$  that is 6 mothers from each lot (anganwadi centre catering area) were selected by simple random method. Thus total number of mothers (study participants) would be  $68 \times 6 = 408$ . Thus the final sample size became 408.

A predesigned pretested questionnaire was formulated and data was collected by first author by personal interview method. The residential address of these mothers was collected from anganwadi workers from the selected ICDS block and house to house visit was conducted. Each house was randomly selected from that area, and from each house only one mother was included based on the inclusion criteria i.e., Mothers of the children aged up to 24 months. The information regarding demographic profile, socio-economic status, Breastfeeding practices, etc was collected.

Data was compiled in an Excel worksheet and SPSS version 16.0 was used to analyze the data of this study. Results were expressed in relevant tables. Descriptive

statistics were reported as Mean (Standard Deviation) for continuous variables, Frequencies (Percentage) for categorical variables. Relevant statistical tests were applied- Chi square test. P Value less than 0.05 considered statistically significant.

## RESULTS

In the present study, the mean age among the study population was  $25.95 \pm 3.67$  years. As many as 202 (49.5%) mothers were Hindus and 177 (43.4%) were Muslims and 29 (7.1%) belonged to Christian and other religion. As discussed in the methodology 270 (66.2%) belonged to rural area and 138(33.8%) belonged to urban area. There were 143 (35.1%) women educated till secondary school, with only 21(5.1%) illiterate. Majority of the women 319(78.2%) were housewives and only 89(21.8%) of them were employed and contributing to the family income among them majority 54(60.6%) of them being daily wage workers. The mean per capita income of these families, per month INR 3013.44 +/- 1386.8, Majority i.e., 342(83.8%) of them belonged to socio-economic class II and III, according to Modified B G Prasads Socio Economic Classification. Majority of the mothers 273(66.9%) belonged to nuclear families, 75(18.4%) belonged to joint families, and only 18(4.5%) belonging to Three generation family.

**Table 1: Distribution of study participants according to the Knowledge and Practice on pre-lacteal foods given.**

Pre-lacteal foods are healthy for the baby	Rural area	Urban area	Total	
	No(%)	No(%)	No(%)	
Yes	51(18.8)	38 (27.5)	<b>89(21.8)</b>	$\chi^2=4.00$ <b>DF=2</b>
No	193(71.4)	88(63.7)	281(68.8)	
Do not Know	26(9.8)	12(8.6)	38(9.4)	<b>p =0.135</b>
Total	270(100)	138(100)	408	
Practice of Pre-lacteal foods	Rural area	Urban area	Total	
	No(%)	No(%)	No(%)	
Given	83(30.7)	39(28.2)	<b>122(29.9)</b>	$\chi^2=0.2$ <b>DF=1</b>
Not given	187(69.3)	99(71.8)	286(70.1)	
Total	270(100)	138(100)	408(100)	<b>p =0.6</b>

We observed no statistical significant difference among practices among urban and rural areas. Pre-lacteal feeds are more common among rural mothers 83/122(68.0%) compared to urban mothers 39/122(32%). **Table 1** The Most common pre-lacteal feeds are Honey 65(53.6%) , Holy water 31(25.3%), Cows milk (12.1%), followed by sweetened water and others(9%).

Mothers from rural area 37(13.7%) and urban area 8(5.8%) believed that feeding colostrum can be unhealthy for their child. On comparison of urban and rural areas we

found a statistical significant difference (p=0.016) in knowledge of mothers about colostrum. **Table 2.** The most common reasons for not giving colostrums (n=39) stated were elderly advice (51.2%), baby ill/in ICU (30.7%), followed by Fear that it may harm baby and influence of friends(18.2%).

**Table 2: Distribution of study participants according to Knowledge and Practice on feeding of colostrum to new born**

Colostrum	Rural area No(%)	Urban area No(%)	Total No(%)	
Healthy	233(86.3)	130(94.2)	363(88.9)	$\chi^2=5.81$
Unhealthy	37(13.7)	8(5.8)	45(11.1)	DF=1
<b>Total</b>		138(100)	408(100)	<b>p =0.016</b>
Colostrum	Rural area No(%)	Urban area No(%)	Total No(%)	
Not Discarded	244(90.4)	125(90.6)	369(90.5)	$\chi^2=0.005$
Discarded	26(9.6)	13(9.4)	39(9.5)	DF=1
<b>Total</b>	270(100)	138(100)	408(100)	<b>p =0.94</b>

**Table 3: Distribution of study participants according to Knowledge and Practice regarding Exclusive Breastfeeding.**

Knowledge regarding Exclusive Breastfeeding		Rural area No(%)	Urban area No(%)	Total No(%)	
Exclusive Breastfeeding to be continued for	< 6 months	93(34.4)	33(23.9)	126(30.9)	$\chi^2=7.34$
	6 months	161(59.6)	100(72.9)	261(63.9)	DF=3
	>6months	13(4.9)	3(2.2)	16(3.9)	<b>p =0.06</b>
	Do not know	3(1.1)	2(1.5)	5(1.3)	
	Total	270(100)	138(100)	408(100)	
Practice of Exclusive Breastfeeding		Rural area No(%)	Urban area No(%)	Total No(%)	
Duration of Exclusive breast feeding	< 6months	86(31.9)	58(35.3)	144(35.3)	$\chi^2=4.17$
	6 months	129(47.8)	57(45.6)	186(45.5)	DF=2
	>6months	55(20.3)	23(19.1)	78(19.2)	<b>p =0.12</b>
	Total	270(100)	138(100)	408(100)	

In this study only 219(53.6%) had correct knowledge about Early initiation of Breastfeeding within one hour of delivery i.e, 136/219 (62.1%) rural mothers and 83/219(37.9%) urban mothers. Were as in Practice 135/194 (69.5%) rural mothers initiated breast feeding within one hour of delivery compared to 59/194 (30.5%) urban mothers. As many as 84 (20.5%)

mothers had delayed the initiation of breast feeding beyond four hours. Difference in the practice of initiation of breast feeding among urban and rural mothers was statistically significant (p=0.011). We also observed large gap in knowledge 83(60.1%) and practice 59(42.8%) of early initiation of breastfeeding in urban area. The reasons for late initiation of Breastfeeding were Pain abdomen following delivery (Physical inability) 42%, C- section 33%, Elderly advice 13% and Milk not secreted 12%.

In this study, only 161/261(61.6%) rural mothers had right knowledge about Exclusive breastfeeding upto 6months of age compared to 100/261(38.4%) urban mothers. In practice as many as 129/186 (69.4%) of rural mothers continued exclusive breastfeeding upto 6months of age compared to 57/186 (30.6%) urban mothers .We also observed large gap in knowledge 100(72.2%) and practice 57(45.6%) of exclusive breastfeeding in urban area. (**Table 3**)

Further, 237/355(66.7%) rural mothers had right knowledge about continuation of breastfeeding upto and beyond 1 years of age compared to 118/355(33.3%) urban mothers and in practice 199/233(85.4%) rural mothers had continued breastfeeding upto and beyond 1 years of age compared to 95/233(40.7%) urban mothers. We also observed large gap in knowledge and practice of continuation of breastfeeding in urban and rural areas.

Regarding type of Breastfeeding, majority of the mothers practiced demand feeding 325(79.7%), i.e., 225 (83.3%) rural mothers and 100(72.5%) urban mothers, which is significantly high in rural area (p-0.010) and 95(23.3%) of the study participants stated the use of pacifiers. A majority of 203 (75.2%) rural mothers and 110(79.5%) urban mothers did not practice use of pacifier/ artificial teats. 212(52%) of the respondents stated that they faced problems during breast feeding, which were lack of knowledge/family support(33.5%), baby refusing to take feeds(32%), fever/breast nodule (17.5%), cracked nipple (10%) and others (7%).

Statistical association between various socio demographic variables and breast feeding were not significant. However the practice of giving pre-lacteal feeds reduced with increase in educational status in both urban and rural areas and in rural area as the birth order increased, mothers practice of discarding colostrum decreased.

## DISCUSSION

In this study 21.8% of mothers had believed that pre lacteal feeds can be healthy for their child, a similar study conducted by Eram U et al<sup>11</sup> stated 54% believed pre-lacteal feeds are good for the new born. As many as 30.7% mothers in rural and 28.2% mothers in urban area had given pre-lacteal feeds in this study. The prevailing traditional practices of giving pre-lacteal feeds remain same irrespective of urban and rural areas of Mangalore Taluk. A study done by Ashwini et al<sup>12</sup> in

Belgaum Karnataka, the prevalence of pre-lacteal feeding was observed to be 54.2% in urban and 57.1% in rural areas.

Most common pre-lacteal food given in this study was honey 53.6% followed by holy water 25.3%. A study reported by Eram U et al<sup>11</sup> herbal decotion 30%, Honey 25% followed by glucose water 20%. A study conducted by Nguyen P H et al<sup>13</sup> reported the most common pre-lacteal feeds included honey, glucose water, and other liquids.

In this study 11.1% of mothers were under misconception that colostrum is not good for their child. This misconception was more among rural mothers than urban mothers ( $p=0.016$ ). In practice, out of those who actually discarded colostrums, 66.6% were from rural area and 33.4% were from urban area. A similar study conducted by Eram U et al<sup>11</sup> in India stated 57% believed colostrums was useless and discarded it. A study by Banapurmath et al<sup>14</sup> conducted in Karnataka showed that practice of discarding colostrum was observed by 28.60% of mothers.

The commonest reason for discarding colostrums in this study ( $n=39$ ) was elderly advice 51.2%. In a study carried out by Yadav et al<sup>15</sup> in Bihar it was seen that 62.50% urban and 66.40% rural mothers discarded colostrums and it reported the most common reason for doing so in both urban as well as rural area was elder's advice, similar to our study; this shows the influence and importance the elders receive in decisions regarding feeding practices. So, the elders in the family must be targeted in breaking the myths regarding breastfeeding practices

The percentage of mothers belonging to rural area and nuclear family (18/26) and the percentage of mothers from urban area and the nuclear family (9/13) were same i.e., 69.2%. There is no correlation between type of family and feeding colostrums. This may be due to the fact that though the mother belonged to nuclear family, her decisions are being influenced by various factors including cultural backgrounds, elderly family member's advice and friends in both urban and rural area.

In this study only 53.6% of mothers had right knowledge about early initiation of breastfeeding (within 1 hr) i.e., 62.1% rural mothers and 37.9% urban mothers. The Indian studies conducted in Andhra Pradesh by Sujatha P et al<sup>16</sup> and in Karnataka by Hiregoudar V et al<sup>17</sup> reported correct knowledge to be among 42.7% and 42.5% respectively.

In practice 69.5% rural mothers initiated breast feeding early (within 1 hr) compared to 30.5% urban mothers in this study. This difference was statistically significant ( $p=0.011$ ). There was also large gap between knowledge (60.1%) and practice (42.8%) of early initiation of breastfeeding in urban area in this study. In a similar

study Hiregoudar V<sup>17</sup> et al reported gap in knowledge and practice in initiation of breast feeding within an hour.

Cesarean section was one of the commonest reason for delayed initiation of breastfeeding in many studies<sup>18, 19</sup> including the present study. Other reasons for late initiation of Breastfeeding in this study were Physical inability (Pain abdomen following delivery) 42%, elderly advice/ Family custom 13% and milk not secreted (12%). A study carried out by Gupta et al<sup>20</sup> reported common reasons given for delayed initiation were family custom / belief 52.1%, no secretion of breast milk 31% and discomfort of mother 16.9%.

There was no correlation among the initiation of breastfeeding and various socio demographic factors except for locality of the study participant. A study conducted by Ashwini et al<sup>12</sup> reported that initiation of breast feeding was delayed beyond 4 hours by 24.50% urban and 33.68% rural mothers which was statistically significant.

In a study conducted in Ethiopia by Wolde T et al<sup>21</sup> 87.3% of mothers reported about correct knowledge regarding Exclusive Breastfeeding. In this study 63.9% of total participants had correct knowledge about duration of Exclusive Breastfeeding i.e., 59.6% among rural mothers and 72.9% among urban mothers. However 45.5% mothers practice Exclusive Breastfeeding for 6 months i.e., 47.8% of rural mothers and 45.6% of urban mothers gave exclusive breastfeeding to their infants. This gap between knowledge and actual practice was seen in both rural and urban mothers; more among urban. In this study we observed that though there was better knowledge 58.3% , but practices of Exclusive Breastfeeding was poor 41.6% ( $p=0.055$ ). The practice of Exclusive Breastfeeding in different studies<sup>5,8,22</sup> varies from 9% to 46%. This variation could be due to the influence of the local traditional practices in community.

The practice of continuation of breastfeeding beyond 1 year of age along with complementary feeding in this study is observed among 71.1% of participants. Among rural mothers and urban mothers were 73.7 and 68.8% respectively. We also observed large gap in knowledge and practice of continuation of breastfeeding in urban area of this study. A similar study conducted by Ashwini et al<sup>12</sup> in Belgaum, Karnataka reported that Continued breast feeding for 1 year was 100% in urban and 99.21% in rural area. Few other studies<sup>23,24,25</sup> reported it to be 21.6%, 47% and 72% respectively.

Majority of the mothers practiced demand feeding 79.7% similar to a study conducted by Parekh C et al. 73.6%.<sup>26</sup> In this study i.e., 83.3% of rural and 72.5% urban mothers. Difference in this practice among urban and rural mothers was statistically significant. Probable reason for not practicing demand feeding could be Working women /Help at home or by lack of support from family members.

**CONCLUSION :** Although breastfeeding was observed to be universal practice, harmful Feeding practices like prelacteal feeding and discarding colostrums are still prevalent both in urban and rural areas. There was a gap in knowledge and practices, however the early initiation of breastfeeding, Exclusive breastfeeding, Continuation of breastfeeding after exclusive breast feeding were seen to be in more than 60% of mothers. More than 72% of the mothers practiced demand feeding. We observed gap in knowledge and practices, of breastfeeding more among urban mothers. As there was a gap in knowledge and practice of breast feeding; IEC campaigns should be held on regular basis, as an important component of Obstetric care, Antenatal care and Post natal care to encourage mothers and family members for right breastfeeding practices.

**Acknowledgement:** The authors would like to thank all the participants of the study, we are also grateful to the support received from the faculty members and staff from the Department of Community Medicine, Yenepoya Medical College.

### REFERENCES

1. Akre J, editor. Infant feeding: the physiological basis. World Health Organization; 1990. 67(Suppl.):19
2. WHO. Infant and young child feeding Model Chapter for textbooks for medical students and allied health professionals. Geneva, World Health Organization, 2009. [Internet] Available at: <http://www.who.int/nutrition/publications/infantfeeding/9789241597494/en/> [Accessed on 28 /11/ 2017]
3. WHO. Maternal, newborn, child and adolescent health. Breastfeeding. Available at [http://www.who.int/maternal\\_child\\_adolescent/topics/child/nutrition/breastfeeding/en/](http://www.who.int/maternal_child_adolescent/topics/child/nutrition/breastfeeding/en/) [Accessed on 28 /11/ 2017]
4. WHO. Health topics- Breastfeeding. Available at <http://www.who.int/topics/breastfeeding/en/> [Accessed on June 28 /11/ 2017]
5. National Family Health Survey, India. National Family Health Survey IV (2015-16). Available at: [http://rchiips.org/NFHS/factsheet\\_NFHS-4.shtml](http://rchiips.org/NFHS/factsheet_NFHS-4.shtml) [Accessed on 28/11/ 2017].
6. WHO/UNICEF. Global strategy for infant and young child feeding. Geneva, World Health Organization, 2003. [Internet] Available at: [http://www.who.int/child\\_adolescent\\_health/documents/9241562218/en/index.html](http://www.who.int/child_adolescent_health/documents/9241562218/en/index.html) [Accessed on 28 / 11 /2017].
7. Operational guide to promoting infant and young child feeding practices through the health system. Ministry of Health and Family Welfare. Government of India, 2012.
8. Yadavannavar MC, Patil SS. Socio-cultural factors affecting breast feeding practices and decisions in rural women. International Journal of Plant, Animal and Environmental Sciences. 2011 Jun;1(2):46-50.
9. Lanata CF, Black RE. Lot quality assurance sampling techniques in health surveys in developing countries: advantages and current constraints. World health statistics quarterly. Rapport trimestriel de statistiques sanitaires mondiales. 1990 Dec;44(3):133-9.
10. Government of Karnataka, Department of Women and Child Development. Available at [http://202.138.101.21/dwcd/index.php?option=com\\_students&view=list&layout=resultpage&id=Dakshina+Kannada&Itemid=131&lang=en](http://202.138.101.21/dwcd/index.php?option=com_students&view=list&layout=resultpage&id=Dakshina+Kannada&Itemid=131&lang=en) [Last Accessed on 10.4.17]
11. Eram U, Tamanna Z, Khan I Z, Khan Z, Khalique N. Knowledge And Belief Regarding Pre-Lacteal Feeding In Relation To Educational Status Of Rural Areas In Aligarh (Western U.P.). Indian J. Prev. Soc. Med.2006;37(3): 121-124.
12. Ashwini S, Katti SM, Mallapur MD. Comparison of breast feeding practices among urban and rural mothers: A cross-sectional study. Int J Med Public Health 2014;4:120-4
13. Nguyen PH, Keithly SC, Nguyen NT, Nguyen TT, Tran LM, Hajeebhoy N. Prelacteal feeding practices in Vietnam: challenges and associated factors. BMC public health. 2013 Oct 7;13(1):932
14. Banapurmath CR, Nagaraj MC, Banapurmath S, Kesaree N. Breastfeeding practices in villages of central Karnataka. Indian pediatrics. 1996 Jun 1;33(6):477-9.
15. Yadav RJ, Singh P. Knowledge attitude and practices of mothers about breast-feeding in Bihar. Indian journal of community medicine. 2004 Jul;29(3):3.
16. Sujatha P , Prasad KVS. Knowledge of infant feeding practices among mothers delivered in a tertiary care hospital, Kakinada, East Godavari district, Andhra Pradesh, India. International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS), 2015;2(4), 45-49.
17. Hiregoudar V, Hemagiri K, Gangadhar TG. Breast Feeding practices in Bellary, Karnataka, A hospital based study. J Pub Health Med Res, 2013;1(2):76-80
18. Sinhababu A, Mukhopadhyay DK, Panja TK,

- Saren AB, Mandal NK, Biswas AB. Infant-and young child-feeding practices in Bankura district, West Bengal, India. *Journal of health, population, and nutrition*. 2010 Jun;28(3):294.
19. Garg M, Hasan M, Kapur D. Infant and Young Child Feeding (IYCF) practices in Udupi district, Karnataka. *Journal of Nutrition Research*. 2015 Jun 29;3(1):38-44.
20. Gupta P, Srivastava VK, Kumar V, Jain S, Masood J, Ahmad N, Srivastava JP. Newborn care practices in urban slums of Lucknow city, UP. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*. 2010 Jan;35(1):82.
21. Wolde T, Diriba G, Wakjira A, Misganu G, Negesse G, Debela H, Birhanu T, Ejeta E, Nekemte E. Knowledge, Attitude and Practice of Exclusive Breast Feeding Among Lactating Mothers in Bedelle Town, Southwestern Ethiopia: Descriptive Cross Sectional Study. *Researcher* 2014;6(11):91-97
22. Wu Q, Scherpbier RW, van Velthoven MH, Chen L, Wang W, Li Y, Zhang Y, Car J. Poor infant and young child feeding practices and sources of caregivers' feeding knowledge in rural Hebei Province, China: findings from a cross-sectional survey. *BMJ open*. 2014 Jul 1;4(7):e005108.
23. Motee A, Ramasawmy D, Pugo-Gunsam P, Jeewon R. An assessment of the breastfeeding practices and infant feeding pattern among mothers in Mauritius. *Journal of nutrition and metabolism*. 2013 Jun 24; 2013.
24. Khan AM, Kayina P, Agrawal P, Gupta A, Kannan AT. A study on infant and young child feeding practices among mothers attending an urban health center in East Delhi. *Indian journal of public health*. 2012 Oct 1;56(4):301.
25. Mondal TK, Sarkar AP, Shivam S, Thakur RP. Assessment of infant and young child feeding practice among tribal women in Bhatar block of Burdwan district in West Bengal, India. *Int J Med Sci Public Health* 2014;3:324-326.
26. Parekh C, Bavdekar S, Shaharao V. Study of Infant Feeding Practices: Factors Associated with Faulty Feeding. *J Trop Pediatrics*, 2004; 50(5): 306-308.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Sandhya Rani Javalkar, Radha Y Aras .A Cross-Sectional Study On Knowledge And Practice Of Breastfeeding - An Urban And Rural Comparison By Lot Quality Assurance Sampling. *Nat J Res Community Med* 2018;7(1):5-10.

© **Community Medicine Faculties Association**

**NJRCM:** [www.commedjournal.in](http://www.commedjournal.in)



**Decentralization of Treatment Services for Drug Resistant Tuberculosis – A Patient Friendly Strategy from Telangana Region of India****Chakrapani Chatla\*<sup>1</sup>, Jyoti Jaju<sup>1</sup>, Shanta Achanta<sup>1</sup>, Suryaprakash Chakramahanty<sup>2</sup>, Prabakaran Jayaraman<sup>1</sup>, Jayakrishna Kurada<sup>1</sup>, Ramadevi Sangepu<sup>3</sup>, Sreenivas Achuthan Nair<sup>1</sup>, Malik Parmar<sup>1</sup>**<sup>1</sup>World Health Organization, India Country Office, New Delhi, India, <sup>2</sup>State TB Officer – Telangana State, DM&HS Campus, Koti, Hyderabad, Telangana State, India, <sup>3</sup>Drug Resistant TB Centre, Government General and Chest Hospital, Warangal, Telangana State, India**Date of Submission** : 01-12-2017**Date of online Publication** : 07-01-2018**Date of Acceptance** : 23-12-2017**Date of Print Publication** : 31-03-2018**\*Author for correspondence: Dr. Chakrapani Chatla**, WHO-RNTCP State Consultant, Hyderabad, Telangana State, India. Email: chatlachakri@gmail.com**Abstract**

**Context:** Drug Resistant Tuberculosis (DR-TB) is a major public health challenge in India. In 2016, WHO estimates 79,000 DR-TB cases among the notified pulmonary TB cases emerging annually in India. Revised National Tuberculosis Control Program had initiated treatment services under Programmatic Management of DR-TB through designated DR-TB Centres for each ~10 million population with 20-30 bedded infection control complaint wards manned by a clinical committee of specialists and trained staff to provide the in-patient care for the initial 2 weeks of treatment. The utilization of services at the DR-TB Centre in Hyderabad, Telangana State serving 10 districts, was observed to be sub-optimal mainly due to long distances to be travelled by the patients. Delay in treatment initiation, loss of wages due to travel and travel cost are major challenges in early initiation of the treatment. **Aim:** In this report, we present a patient friendly approach initiated in Telangana State to address these gaps. **Material and Methods:** As a strategic intervention to address these issues, the state TB cell of Telangana developed decentralized district level DR-TB Centres for each ~2 million population with 4-8 bedded ward in each of the 10 districts. These were linked to the DR-TB Centre at Hyderabad that would serve as a nodal-centre for referrals of difficult cases, mentoring and monitoring the quality of the treatment services. **Results:** The proportion of patients initiated on treatment for DR-TB increased from 69% before decentralization in 2010 (123/178) to 89% (727/817) in 2015 after decentralization ( $\chi^2 p < 0.05$ ). Monitoring of patients who were not initiated on treatment and validation of data at regular intervals was additional yield of the decentralization approach followed in the region. **Conclusions:** The approach implemented suggest that decentralization of DR-TB treatment services help in early initiation of treatment and also builds confidence in the patients in availing treatment besides supporting the state in preparedness for incremental diagnosis through newer diagnostic tools.

**Key-words:** Decentralization, Drug Resistant TB, Treatment, Integration, Telangana.**Introduction**

Tuberculosis (TB) is caused by *Mycobacterium tuberculosis* (MTb) which most often affects lungs. TB is treatable and curable disease with complete, consistent and appropriate drug regimen. Drug Resistant Tuberculosis (DR-TB) occurs when patients fail to complete the first line anti TB treatment or newly acquire DR-TB from another person with DR-TB. Resistance to antimicrobials in bacteria is not a new phenomenon and has been a well-established fact in *Mycobacterium tuberculosis* also. According to Annual TB Report 2017,

there would be an estimated 1.3 lakh incident multi-drug resistant TB patients emerge annually in India which includes 79000 MDR-TB Patients estimated among notified pulmonary cases<sup>[1]</sup>.

After successfully establishing the DOTS (Directly Observed Short Course) services across the country in 2006, Revised National Tuberculosis Control Programme (RNTCP) of India has introduced the Programmatic Management of Drug Resistant TB (PMDT) services in 2007 to address the needs of this group of patients and is

now rapidly scaling up services across the country while also expanding services towards universal access<sup>[2]</sup>. Under RNTCP, the patients are categorized to be DR-TB patients when the sputum or an extra pulmonary sample of the patient is confirmed microbiologically for MTb and the bacteria are resistant to the most potent first line anti TB drugs such as Rifampicin (Rif) with or without Isoniazid (INH). As part of PMDT, RNTCP in Telangana State initiated Drug Sensitivity Testing (DST) for Rifampicin and Isoniazid in December 2008 and a DR-TB Treatment Centre in Hyderabad in December 2008.

The current, RNTCP PMDT vision is to provide early and rapid diagnosis and prompt initiation of effective treatment to all DR-TB patients, integrated into RNTCP. However under PMDT, RNTCP envisages 7-10 days of in-patient treatment in the DR-TB Centre for the DR-TB patients during which the Pre-Treatment Evaluation (PTE) of the patient for various parameters such as Liver function tests, Renal function tests, Hemogram and other important baselines physiological functions are performed so that the treatment can be tailor made / altered based on the results of physiological and biochemical tests. The PTE period is also utilized effectively in providing counselling about the duration, mode of treatment for DR-TB and the potential side effects of the drugs, follow-up visits needed, importance of adherence to the drug regimen and precautions to be taken towards reducing transmission of the disease to other members in the family. Once discharged from the DR-TB Centre the patient will be provided with ambulatory treatment in domiciliary fashion with a designated treatment regimen by RNTCP for 2 years which includes Flouro-quinolones and aminoglycosides as mainstay drugs. According to RNTCP a DR-TB Centre can be established for a geographic area covering population of minimum 10 million<sup>[2]</sup>. One such DR-TB Centre was established in Government General and Chest Hospital in Hyderabad city of Telangana State in 2008 December with separate female and male wards having proper airborne infection control measures in place. Telangana Region of India had a population of ~30 million in 2008 with 10 revenue districts and 1 additional TB district. In late 2012, an additional DR-TB Centre was initiated at Government General and Chest Hospital, Hanamkonda in Warangal district of Telangana region according to the guidelines.

On the above of all, for the patient to travel to a DR-TB centre which is far from his/her residence and stay for 7-10 days for PTE would make the initiation of DR-TB treatment even more challenging. At that point of time, there was not much experience of decentralized DR-TB treatment services in India, through there was a plan for RNTCP to progress towards decentralized care.

In this situation, the State TB Cell of Telangana, India developed and implemented the innovative strategy of decentralized provision of DR-TB treatment services at the district level while ensuring maintenance of quality of

care. In this report, we analysed the impact of this innovative decentralization strategy on initiation of treatment at DR-TB treatment Centres under programmatic settings.

### Material and Methods

The scenario of diagnosis of DR-TB and utilization of the treatment services at the DR-TB Centre at Hyderabad was assessed through a situational analysis followed by discussion with various key administrators of RNTCP in Telangana State. The approaches designed by the team were submitted for administrative commitment and approval to MD-NHM (Managing Director–National Health Mission) and Principal Secretary–Health, Medical & Family Welfare (PS) of the then state of Andhra Pradesh in which Telangana region was a part. In 2-3 focussed meetings held in the presence of PS, the approaches to deal with the issue were finalized and named as “**decentralized provision of DR-TB treatment services**” as part of regular health system in collaboration with RNTCP. This plan had envisaged having a DR-TB Centre in every district and as many link wards as possible in all the districts for effective and early treatment initiation. It also laid out a clear monitoring plan to cross check the quality of implementation in these district level DR-TB Centres and sub-district level link wards. These approaches needed some bold decisions by the state health system towards supporting some infrastructure needs and provision of human resources as the then guidelines of RNTCP had some limitations in terms of establishing number of DR-TB Centres in proportion to population and limited number of contractual staff provided under the program.

The approach developed towards the innovative strategy is shown below and had following key components:

1. **Structured reorganization of DR-TB treatment services** with specific functions at each level:
  - a. Nodal DR-TB Centre
  - b. District DR-TB Centre
  - c. Link DR-TB Ward
2. **Ongoing Administrative commitment:** This was specially envisaged to handle the issues/ challenges faced during the rollout of the approach. For example: Issues related to space for wards, human resources and task sharing, funds for repairs, modifications and beautification etc. and issues related to administrative commitment at district level.
3. **A time bound expansion plan:** A phase wise expansion was made which envisaged that every potential District DR-TB Centre will begin functioning as Link DR-TB ward and gradually progress as DR-TB Centre under the direct support and mentoring from the Nodal DR-TB Centre as well as technical and administrative support from state level RNTCP team.

A structured framework for the approach has been developed and agreed upon by all stakeholders (*Figure 1.*). Responsibilities of each focal point in the approach are laid out in *Table 1.*

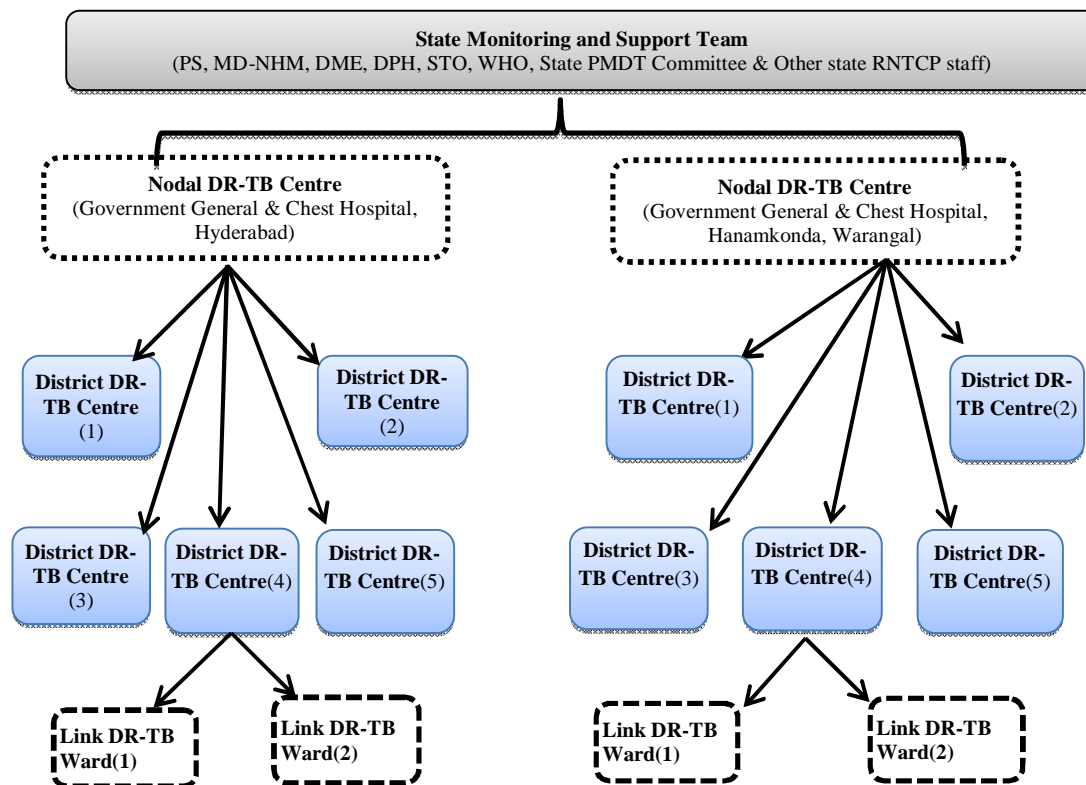
**Table 1: Responsibilities at various layers in the decentralization Approach.**

Layer	Responsibility
State TB Cell	<ul style="list-style-type: none"> <li>To ensure the implementation of decentralization plan of DR TB treatment services with the support of State Monitoring and Support team (SMST), established District DR-TB Centres with airborne infection control compliant wards capable of independently managing DR-TB patients.</li> <li>To ensure availability of necessary funds, human resources (HR) and trainings in line with RNTCP PMDT guidelines</li> <li>To identify administrative bottlenecks in the decentralization process and discuss with the SMST.</li> <li>To ensure the provision of technical and administrative support from state health society for enabling policy decisions and resources not explicitly spelt out in RNTCP guidelines to implement the decentralization plan.</li> </ul>
Nodal DR-TB Centre	<ul style="list-style-type: none"> <li>To provide technical and mentoring support to District DR-TB Centres for ensuring quality of care.</li> <li>To act as a higher reference Centre to provide clinical care for the DR-TB cases with complication or extensive disease referred from District DR-TB Centres</li> <li>To ensure management and documentation of adverse drug reaction issues identified in the field and liaise with pharmacovigilance program.</li> <li>To review and validate the data of all the records and reports from District DR-TB Centres on monthly basis.</li> </ul>
District DR-TB Centre	<ul style="list-style-type: none"> <li>To ensure availability of HR at District DR-TB Centre from the general health system, in coordination with District TB Officer as exclusive staff were not made available under RNTCP at District DR-TB Centre Level.</li> <li>To monitor treatment initiation status of all patients diagnosed with DR-TB from the district based on the reports from Culture &amp; Drug Sensitivity Testing (C&amp;DST) labs.</li> <li>To ensure all the patients get early initiation of treatment.</li> <li>To ensure provision of all laboratory tests are made available for the patients as per PMDT guidelines. To ensure MoU (Memorandum of Agreement) is made with private laboratories for those laboratory tests which are not available within the health facility.</li> <li>To ensure wards are maintained cleanly, hygienic and in compliance with Airborne Infection Control Guidelines.</li> <li>To ensure Pre Treatment Evaluation (PTE) is complete and the patients gets thorough counselling about the drug regimen, duration of treatment, potential adverse drug reactions and the process to be followed till the completion of treatment.</li> <li>To ensure sputum sample is sent to C&amp;DST lab for baseline second line drug resistance analysis at linked National Reference Laboratory under RNTCP.</li> <li>To support all the Link DR-TB Wards attached for quality of treatment services.</li> <li>To complete the registration process for all patients according to PMDT guidelines.</li> <li>To provide registration number for patients from Link DR-TB Wards upon reviewing PTE lab reports shared by Link DR-TB Ward.</li> <li>To attend the review and data sharing meeting called by Nodal DR-TB Centre/ State TB cell and share all the data as needed.</li> <li>To ensure Food, Accommodation, Ancillary drugs needed for the patients are borne by Hospital without charging extra to the patient.</li> <li>To refer the patients on treatment for complications or adverse drug reactions who need clinical intervention at higher Centres to attached Nodal DR-TB Centre.</li> </ul>

Link DR-TB Ward	<ul style="list-style-type: none"> <li>To provide separate male and female wards either in government or private facility where all the speciality clinical services are available as per PMDT guidelines.</li> <li>To ensure availability of human resources at Link DR-TB Ward from the general health system, in coordination with District TB Officer (in case of government facility) or Hospital Administration (in case of private sector) as exclusive staff were not made available under RNTCP at Link DR-TB Ward Level</li> <li>To ensure the PTE lab reports are made available to patients free of cost (even in the Link DR-TB Wards in Private sector).</li> <li>To share the PTE lab reports to attached District DR-TB Centre for the review by District PMDT Committee.</li> <li>To record the PMDT TB registration number provided by the District DR-TB Centre and document the patient details of treatment etc. as per PMDT guidelines.</li> <li>To attend the review or data sharing meeting called by District DR-TB Centre and share all the data as needed.</li> <li>RNTCP (DTC) will identify a point person from the RNTCP to provide technical support on continuous basis (ex: DTO/ MO DTC/ MO-MC) etc.</li> <li>To ensure Food, Accommodation, Ancillary drugs needed for the patients are borne by Hospital without charging extra to the patient.</li> <li>To refer the patients on treatment for complications or adverse drug reactions who need clinical intervention at higher Centres to attached District DR-TB Centre or to Nodal DR-TB Centre.</li> </ul>
-----------------	--

The gradual expansion of the DR-TB Treatment Centres and Link Wards needed a comprehensive strategy and sticking to the plan over a period of time (*Figure 2*). The first DR-TB Centre for Telangana Region at Government General & Chest Hospital (GGCH), Hyderabad was established in December 2008. The DR-TB Centre (DRTBC) catered to the 34 million population of Telangana Region and around 4 million population of Kurnool district from Rayalaseema region of the state. The bed occupancy was almost full with a waiting time of average 7-10 days in general and >1 month in extreme cases. A position of Senior Medical Officer – DR-TB (SMO) and a Statistical Assistant (SA) were recruited under RNTCP. A counsellor was later placed by Lepira Society, a Non-Governmental Organization (NGO) without any funding by the program as the counselling was a highly felt need (*Figure 2-A*). In 3Q2012, the second DR-TB Centre was started at GGCH, Kakatiya Medical College, in Warangal. Warangal DRTBC catered to 6 districts of Northern Telangana with 15 million population. The DRTBC at GGCH, Hyderabad continued to serve 5 districts of Telangana region and Kurnool district of Rayalaseema region. A SMO was recruited under RNTCP for Warangal DRTBC. Counsellor & SA posts were not available for Warangal DRTBC. A Link DR-TB Ward was initiated in RIMS (*Figure 2-B*), Adilabad catering to two districts – Adilabad and Nizamabad. On 30/3/2013, in the DR-TB Committee (DRTBCC) meeting conducted under the chairmanship of In-charge director of RIMS (Rajiv Gandhi Institute of Medical Sciences), Adilabad, it was decided to allot the unused old building belonging to NPCB (National

Figure 1: Framework of decentralization of PMDT Treatment services

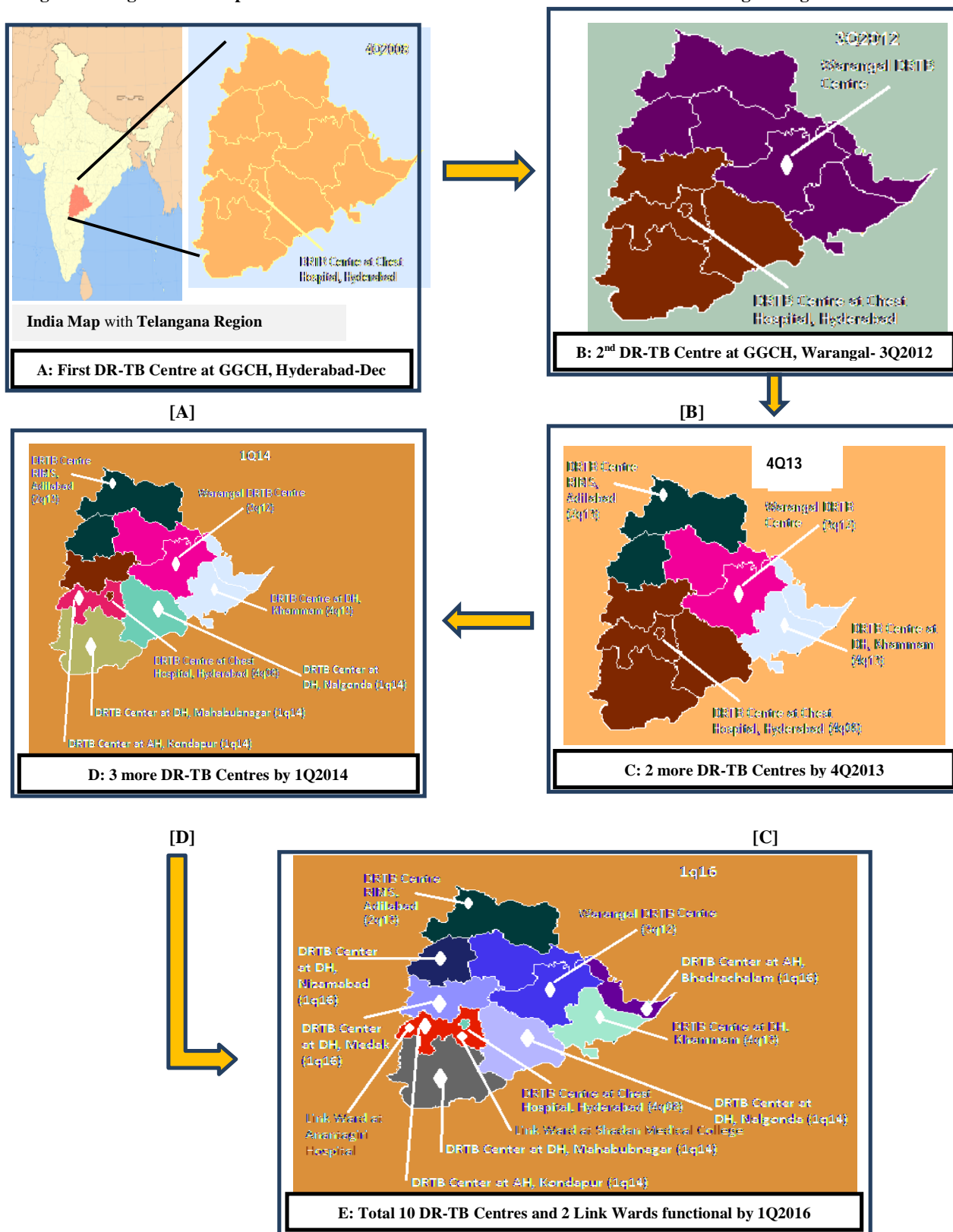


Program for Controlling Blindness) for the DRTB Ward. Advocacy Meeting held on 15/4/2013 at Conference Hall, Secretariat under the chairmanship of Principal Secretary – Health. On 18/5/2013, a Link DR-TB Ward in RIMS for DR-TB patients was started as an attached ward to the Warangal DRTBC. As the services were satisfactory, the Link Ward at Adilabad was upgraded to DRTBC status from June 2013 (Figure 2-C). No additional staffs were provided from RNTCP. RNTCP supported with partial funding in renovating the building along with HDS (Hospital Development Society) funds of RIMS, Adilabad. A Link DR-TB Ward was initiated in District Hospital Khammam catering to two districts – Khammam and Bhadrachalam. DRTBCC was formed on 22/5/2013. Patients were admitted still the linkage continuing with DRTBC, Warangal. As the services were satisfactory, the Link Ward was upgraded to DRTBC status from October 2013. No additional staffs were provided from RNTCP. District Collector approved the funding for establishing Link Ward in DH from the HDS funds on 20/7/2013. Link DR-TB Wards were started and DRTBCCs formed in 3 more districts on the following dates: DH, Nalgonda on 5/10/2013, AH Kondapur, Rangareddy on 6/11/2013, DH, Mahabubnagar on 16/12/2013. The Link Wards were upgraded to DRTBC status from 1/1/2014 (Figure 2-D). No additional staff were provided from RNTCP. Renovations necessary for the Wards were raised from HDS funds with partial support from RNTCP. Link DR-TB Wards were started and DRTBCCs started in 5 more districts on the following dates: AH, Bhadrachalam on 10/9/2013, DH, Nizamabad

(Govt. MC) on 24/4/2014, AH, Anantagiri, Rangareddy District on 17/10/2014, Shadan Medical College (pvt.) on 19/12/2014, DH, Sangareddy, Medak in October 2015. The Link Wards were upgraded to DRTBC status from 1/4/2016 at Bhadrachalam, Medak and Nizamabad. However the Link Wards at Shadan Medical College and Anantagiri Hospital are planned to continue as Link Wards. Renovations necessary for the Wards were raised from HDS funds. No additional staff were provided from RNTCP. More Link DR-TB Wards are planned in the following: Kamineni Medical College, Narketpally (pvt.), SV Medical College, Mahabubnagar (pvt.). However the Link Wards at Shadan Medical College and Anantagiri Hospital are planned to continue as Link Wards (Figure 2-E).

The cohorts included for the analysis were all the patients diagnosed with DR-TB under programmatic settings in Telangana Region from 1<sup>st</sup> December 2008 till 31<sup>st</sup> December 2015. The data necessary for the analysis was collected through the PMDT TB Registers, Culture & DST Lab Registers, and data generated from e-SMARTS (a software monitoring tool developed for PMDT in Hyderabad), quarterly PMDT reports generated at district, state and DR-TB Centre level. All the analysis was conducted utilizing MS-Excel. Chi-Square analysis was performed to compare categorical variables. Since, the data generated was part of national programme and was analysed within the programmatic units, confidentiality was maintained under programmatic settings.

Figure 2: Diagrammatic depiction of Phase wise decentralization of PMDT Services in Telangana region



**Results**

The decentralization process implemented by RNTCP in Telangana State has resulted in increase of number of DR-TB Centres from 1 to 10 and the Link DR-TB Wards from None to 2. The approach also facilitated initiation of Link DR-TB wards in private sector which is very essential for End TB Strategy. The treatment initiation among those diagnosed with DR-TB under RNTCP has increased significantly over time due to decentralization of treatment services (Figure 3 & Table 2).

**[E]**

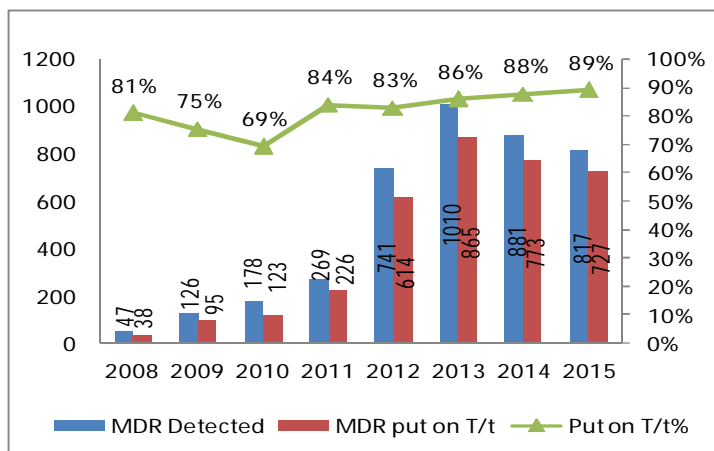
It can also be observed that the treatment initiation from 2008 to 2010 decreased from 81% to 69% (Figure 3). This decrease is mainly due to 3 reasons. One, the diagnosis of DR-TB cases increased from 47 in 2008 to 126 in 2009 and 178 in 2010 while the DR-TB treatment centre catering to these patients was only one located at GGCH, Hyderabad. The other reason being non-acceptance for treatment by the patients as DR-TB was a relatively newer diagnosis and the confidence of patients

on the treatment protocols was not strong enough during the initial days of PMDT. The third reason being the distance to be travelled to get admitted into the only available DR-TB treatment centre in Hyderabad from long distances. As the expansion of DR-TB centres took place, all these factors could be negated to a major extent which reflected in increase in treatment uptake in later course of PMDT (Figure 3).

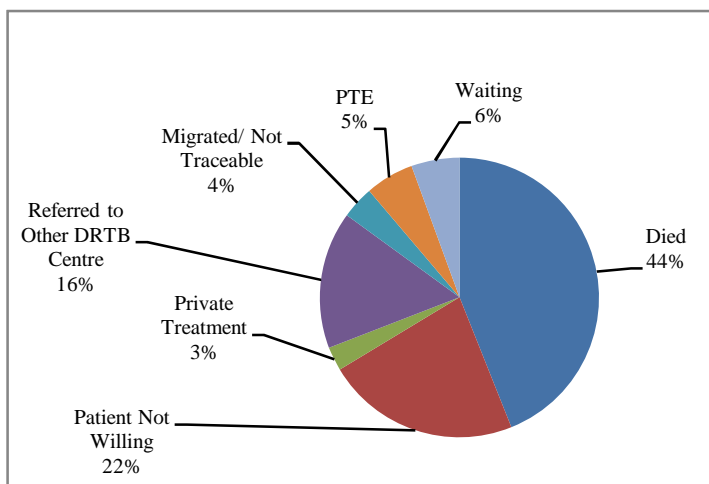
**Table 2: Chi-Square Analysis of Patients initiated on treatment versus not initiated over time**

Cohort	Initiated on Treatment	Not Treated	Total	Chi-Square Value	P-Value
2008	38 (80.9%)	9 (19.1%)	47		
2015	727 (89.0%)	90 (11.0%)	817	2.8976	0.088711
2009	95 (75.4%)	31 (24.6%)	126		
2015	727 (89.0%)	90 (11.0%)	817	18.0182	<b>0.000022</b>
2010	123 (69.1%)	55 (30.9%)	178		
2015	727 (89.0%)	90 (11.0%)	817	46.4131	<b>&lt;0.05</b>

**Figure 3: Treatment initiation among the DR-TB diagnosed from 2008 – 2015**



**Figure 4: Among the non-treated DR-TB from 2008 – 2015, reasons for not initiation of treatment**



When analysed for the reasons for non-initiation of treatment it was observed that 44% of the patients were severely ill by the time of diagnosis with DR-TB and thus died due to DR-TB even before initiation of treatment (Figure 4).

### Discussion

Drug Resistant TB is one of the major challenges being faced in India. The decentralized approach for providing treatment services for DR-TB under PMDT (Programmatic Management of Drug Resistant TB) in India have shown very good and promising results in increasing number of cases put on DR-TB regimen under programmatic conditions. Antimicrobial resistance among patients with various infectious diseases in general and in Tuberculosis patients specifically has become a major challenge to the public health services in India and in Telangana State. With nearly 60-70% of health care access being accessed from private sector in states like Telangana, it is more important to become aware of the challenges posed to the society and in turn to the health care of future generations to come by irrational, incomplete, insufficient usage of antimicrobial agents.

Impediments towards universal access to DR-TB treatment are many, ranging from insufficient donor funding to poor laboratory diagnostic capacity and health system challenges, including the need to encourage ambulatory care models<sup>[3]</sup>. In our settings it was observed that smooth fund flow could be achieved by decentralization coupled with administrative commitment, though there are no quantitative measurements for this change. However, it was clearly felt by the hospital staff that it was easy to mobilize funds for few DR-TB patients in each of the DR-TB Centres compared to mobilizing funds for all the patients in 1 or 2 initial Nodal DR-TB Centres as the case load was high and the funds consumed by the Nodal DR-TB Centres were high in view of the hospital administrators. After decentralizing the proportion spent in each DR-TB Centre was less compared to the overall spending of the hospital and thus could easily get approval for various investigations, medicines or other needs such as food for patients and attendants etc. without a feeling of burden on the administrators.

Several large scale DR-TB programmes have demonstrated that decentralization will improve access to care and management without compromising treatment outcomes<sup>[4-7]</sup>, including programmes that have task shifted initiation of DR-tuberculosis treatment to trained nurses and paramedical staff<sup>[8]</sup>. Decentralisation has been a crucial strategy for expanding access to treatment for HIV and has been associated with better patient outcomes than with hospital-managed care, mainly due to improved retention<sup>[9,10]</sup>; there is a broad consensus that to improve early health-seeking behaviour, promote adherence to medication, and minimise defaulting, HIV care is best

provided as close as possible to the patient's home and community. These lessons for patient support are clearly applicable to DR-tuberculosis because default rates from care commonly exceed 20%<sup>[11]</sup>. In most high-burden settings, the DR-TB epidemic is driven primarily by direct transmission of DR-TB strains. Therefore, efforts to reduce transmission should be directed at diagnosing and treating as many cases as possible and as early as possible<sup>[12]</sup>.

Our analysis also demonstrates that decentralized DR-TB treatment Centres at district level could be an intervention that has benefits for the patients in terms of prompt treatment initiation for almost 90-95% of lab confirmed DR-TB patients in lesser time, travel distance and cost for treatment initiation. This also can benefit the health system due to its low cost, further integration and enhanced ownership by harnessing district hospital services.

**Limitations:** Our study had limitations in terms of detailed data related to reasons for non-initiation of treatment before the decentralization leading to inability to compare the reasons before and after decentralization. Lack of data on financial implications on patients or health system before and after decentralization was an issue in analysis cost-effectiveness of the approach.

**Conclusions:** We conclude by recommending decentralization of DR-TB treatment centres at least upto district level in every district of India as a cost effective intervention to enable prompt initiation of appropriate treatment of lab confirmed DR-TB patients and reducing delay in initiation of treatment. Decentralization also helps in meeting the growing demand for treatment expected with the expansion of rapid molecular test and the move towards universal DST over the next few years thus in turn reducing the chain of transmission effectively.

**Acknowledgements:** We acknowledge the support rendered by the Telangana State health administration, district health administrators and all cadres of field staff who contributed a lot in making the decentralization process successful as envisaged. We also acknowledge Dr. T. Rani Samyuktha, the then State TB Officer of Andhra Pradesh and Late Dr. Rajyalaxmi Kapila for their support in implementation of the strategy successfully.

### References

1. WHO. WHO Global TB Report, 2016. Geneva.
2. "Guidelines for PMDT in India" published by Central TB Division, Government of India, May 2012.
3. Fitzpatrick C, Floyd K. A systematic review of the cost and cost effectiveness of treatment for multidrug-resistant tuberculosis. *Pharmacoeconomics* 2012; 30: 63–80.
4. Shin S, Furin J, Bayona J, Mate K, Kim JY, Farmer P. Community-based treatment of multidrug-resistant tuberculosis in Lima, Peru: 7 years of experience. *Soc. Sci. Med.* 2004; 59: 1529–39.
5. Brust JC, Shah NS, Scott M, Chaiyachati K, et al. Integrated, home-based treatment for DR-TB and HIV in rural South Africa: an alternate model of care. *Int. J. Tuberc. Lung Dis* 2012; 16: 998–1004.
6. Malla P, Kanitz EE, Akhtar M, et al. Ambulatory-based standardized therapy for multi-drug resistant tuberculosis: experience from Nepal, 2005–2006. *PLoS One* 2009; 4: e8313.
7. MedecinsSansFrontieres. Scaling up diagnosis and treatment of drug-resistant tuberculosis in Khayelitsha, South Africa. Cape Town: MedecinsSansFrontieres, 2011. <http://www.msf.org.za/publication/scaling-diagnosisand-treatment-drug-resistant-tuberculosis-khayelitsha-south-africa> (accessed May 23, 2013).
8. Farley LDJ, Mlandu N, Ndjeka N, Richard P, van der Walt M. Nurse initiation and management of DR-TB-HIV: lessons from operational research. 43rd Union conference on lung health; Kuala Lumpur; Nov 13–17, 2012.
9. Fatti G, Grimwood A, Bock P. Better antiretroviral therapy outcomes at primary healthcare facilities: an evaluation of three tiers of ART services in four South African provinces. *PLoS One* 2010; 5: e12888.
10. Fayorsey RN, Saito S, Carter RJ, et al. Decentralization of pediatric HIV care and treatment in five sub-Saharan African countries. *J Acquir Immune Defic Syndr* 2013; 62: e124–e130.
11. Toczek A, Cox H, du Cros P, Cooke G, Ford N. Strategies for reducing treatment default in drug-resistant tuberculosis: systematic review and meta-analysis. *Int J Tuberc Lung Dis* 2013; 17: 299–307.
12. Nardell E, Dharmadhikari A. Turning off the spigot: reducing drug-resistant tuberculosis transmission in resource-limited settings. *Int J Tuberc Lung Dis* 2010; 14: 1233–43.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Chakrapani Chatla, Jyoti Jaju, Shanta Achanta, Suryaprakash Chakramahanty, Prabhakaran Jayaraman, Jayakrishna Kurada, Ramadevi Sangepu, Sreenivas Achuthan Nair, Malik Parmar. Decentralization of Treatment Services for Drug Resistant Tuberculosis – A Patient Friendly Strategy from Telangana Region of India. *Nat J Res Community Med* 2018;7(1):11-17.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

**Study of morbidity pattern among elderly in Anaji, field practice area of J.J.M. Medical College, Davangere.**

**Vanitha S S.<sup>1\*</sup>, Shubha D. B.<sup>1</sup>, Sujatha M G<sup>2</sup>**

1. Assistant professor, Department of Community Medicine, J J M Medical College, Davangere.2. Postgraduate student, Department of Community Medicine, Mandya Institute of Medical Sciences, Mandya

**Date of Submission** : 05-11-2017

**Date of online Publication** : 07-01-2018

**Date of Acceptance** : 25-11-2017

**Date of Print Publication** : 31-03-2018

**\*Author for correspondence:**Dr. Vanitha S S, D/O Shivakumar S B, #1645/92, 12<sup>th</sup> Cross, Vidyanagar, Davangere-577005.Karnataka, India. E-mail: [vanitha4988@gmail.com](mailto:vanitha4988@gmail.com)

**Abstract**

**Introduction:** Elderly or old age consists of ages nearing or surpassing the average life span of human beings. The boundary of old age cannot be defined exactly because it does not have the same meaning in all societies. Government of India adopted ‘National Policy on Older Persons’ in January, 1999. The policy defines ‘senior citizen’ or ‘elderly’ as a person who is of age 60 years or above with the objective of identifying the morbidity pattern and socio-demographic profile of elderly population in rural area.**Material and methods:** Cross sectional study. **Study period:**1<sup>st</sup> June to 31<sup>st</sup> August 2015 (3 months) ,**Study area:**Anaji village a field practice area of J.J.M. Medical College. The data was collected using pre-tested, pre-designed proforma.**Results:** Out of 116 elderly 59% were in the age group of 60-69 years, the mean age of study participants was 68.5. Among study participants 59.5% were male and 40.5% were female. Musculoskeletal problems were the most common accounting for 71.5% followed by ocular problems 60.3%, cardiovascular problem 26.7% and endocrine problem 19.8%.**Conclusion:**The present study showed a high prevalence of morbidity among elderly was noted, particularly musculoskeletal and ocular conditions.

**Key-words:**Elderly, Rural, Morbidity, socio-demographic, Ageing.

**Introduction**

Elderly or old age consists of ages nearing or surpassing the average life span of human beings. The boundary of old age cannot be defined exactly because it does not have the same meaning in all societies. Government of India adopted ‘National Policy on Older Persons’ in January, 1999. The policy defines ‘senior citizen’ or ‘elderly’ as a person who is of age 60 years or above.<sup>[1]</sup>

The unprecedented increase in human longevity in 20th century has resulted in the phenomenon of population ageing all over the world. Countries with large population such as India have large number of people now aged 60 years or more. The population over the age of 60 years has tripled in last 50 years in India and will relentlessly increase in near future. In 2001, the proportion of older people was 7.7% which will increase to 8.14% in 2011 and 8.94% in 2016.<sup>[2]</sup>

Old people have limited regenerative abilities and are more prone to disease, syndromes, and sickness as compared to other adults. Non-communicable diseases requiring large quantum of health and social care are

extremely common in old age, irrespective of socio-economic status. Disabilities resulting from these non-communicable diseases are very frequent which affect functionality compromising the ability to pursue the activities of daily living. The treatment/ management of these chronic diseases is also costly, especially for cancer treatment, joint replacements, heart surgery, neurosurgical procedures etc thereby making it out of bound for elderly whose income decreases post retirement and more so for the elderly in the unorganized sector and dependent elderly women.<sup>[2]</sup>

The phenomenon of population ageing is becoming a major concern for the policy makers all over the world, for both developed and developing countries, during last two decades, for this we need the pattern of morbidities that are distributed among elders and how effectively we can reach that population to minimise the suffering by knowing the socio-demographic profile that determines the affordability and accessibility of elderly person to available services. With this view the current study was undertaken with the following objectives.

**Objectives:**

1. To identify the morbidity pattern of elderly population.
2. To know the socio-demographic profile of the elderly population

**Materials and Methods**

The present study was approved by institutional ethical committee. It was a cross sectional study done in AnajiPHC, a rural field practice area of J.J.M. Medical College. The study was carried out for a period of three months. The Anaji field practice area covers 9 villages and population of 9740. The population of elderly is 776 from all the 9 villages, 15% of 776 elderly population was included in the study that is 116, probability proportionate sampling was taken from each village.

The written informed consent was taken from the study participants in local language before collecting the data. The data was collected using pre-tested, pre-designed proforma. The information on socio-demography profile includes age, sex, religion, pension, living arrangements, literacy status and type of ration card and information on complaints were collected by face to face interview with study participants. Examination of study subjects includes both general physical examination and systemic examination of the study participants.

**Statistical analysis:** Data was entered in micro-soft excel. Statistical analysis was done using SPSS version 16.0. Results are presented in Percentages and proportions.

**Operational definitions**

**Ocular diseases:** Diagnosed by the investigator in the field with the help of Snellen’s chart, torch and digital tonometry with clinical signs and symptoms.

**Endocrine diseases:** Diagnosed diabetic, thyroid conditions and those were on hormonal therapy.

**Cardiovascular Morbidities:** Particularly ischaemic heart disease, congestive cardiac failure, valvular heart disease was accepted as diagnosed by clinician earlier with necessary investigations. It also includes

**Hypertension:** a) Defined as systolic blood pressure (SBP) of 140mmHg or more and / or diastolic blood pressure (DBP) of 90mmHg or more and/or b) Subjects on anti-hypertensive medications.

**Respiratory morbidities:** a) This condition was diagnosed from clinical examination: presence of abnormal breathing sounds like ronchi, crepitations, on auscultation. And/or b) Chronic obstructive pulmonary disease and tuberculosis were accepted as diagnosed by clinician earlier with necessary investigations.

**Gastrointestinal disorders:** History of Gastritis or constipation or faecal incontinence were considered.

**Nervous system disorders:** Such as cerebral infarction, epilepsy, hemiplegia, neuritis, tremors, anxiety, dementia and depression etc. already diagnosed by neuro physician and psychiatrist with necessary investigation and accepted as such.

**Genito-Urinary Disturbance:** History of Urinary hesitancy or Stress incontinence or Urge incontinence were considered.

**Skin:** Any skin conditions found on clinical examination.

**Ear Nose Throat(ENT) diseases:** Impaired hearing is defined as inability to hear a whisper at a distance of 1 meter, nose and throat condition found during examination.

**Masculo-skeletal diseases:** As kyphosis, arthritis and spondylitis already diagnosed by orthopedician with necessary investigation and these cases were accepted as such or having pain-full/stiff/swollen joints during the current clinical examination.

**Results**

**Table 1: Distribution of elderly according to socio-demographic profile**

Variables	Categories	Male (n=69)		Female (n=47)		Total (n=116)	
		N	%	N	%	N	%
<b>Age groups</b>	60 – 64	14	20	20	43	34	29
	65 – 69	24	35	11	23	35	30
	70 – 74	16	23	6	13	22	19
	75 – 80	6	9	5	11	11	10
	>80	9	13	5	11	14	12
<b>Religion</b>	Hindu	69	100	45	96	114	98
	Muslim	0	0	2	4	2	2
<b>Living arrangements</b>	Single	10	14	8	17	18	16
	Joint family	24	35	9	19	23	20
	3 <sup>rd</sup> generation family	35	50	30	64	65	56
<b>Pension</b>	No	25	36	28	60	53	46
	IGNOAPS	32	46	17	36	49	42
	Others	12	17	2	4	14	12
<b>Ration card</b>	No	0	0	1	2	1	1
	APL	19	28	12	26	31	27
	BPL	50	72	34	72	84	72
<b>Literacy status</b>	Illiterate	16	23	26	55	42	36
	Literate	53	77	21	45	74	64

**IGNOAPS:** Indira Gandhi National Old Age Pension Scheme  
**APL:** Above Poverty Line, **BPL:** Below Poverty Line

**Table 2: Distribution of elderly according to literacy level**

Literacy level	Sex		Total	P value
	Male	Female		
	N (%)	N (%)	N (%)	
<b>Illiterate</b>	16 (23)	26 (55)	42 (36)	0.0001
<b>Literate</b>	53 (77)	21 (45)	74 (64)	

**Table 3: Distribution of elderly according to morbidity pattern and age groups and sex**

System affected	60 – 64 years			65 – 69 years			70 – 74 years			75 – 79 years			80 – 84 years		
	M (14)	F (20)	Total N=34 (%)	M (24)	F (11)	Total N=35 (%)	M (16)	F (6)	Total N=22 (%)	M (6)	F (5)	Total N=11 (%)	M (9)	F (5)	Total N=14 (%)
Ocular	10	11	21 (62)	11	9	20 (57)	12	2	14 (64)	1	4	5 (46)	5	5	10 (71)
Endocrine	6	6	12 (35)	10	3	13 (37)	6	1	7 (32)	0	1	1 (9)	1	3	4 (29)
Cardio-vascular	8	7	15 (43)	7	3	10 (29)	9	2	11 (50)	0	1	1 (9)	7	3	10 (71)
Respiratory	0	0	0	4	0	4 (11)	3	0	3 (14)	1	2	3 (27)	1	2	3 (21)
Gastro-intestinal	3	1	4 (12)	2	1	3 (9)	1	0	1 (5)	0	0	0	1	2	3 (21)
nervous system	0	1	1 (3)	0	0	0	2	0	2 (9)	0	0	0	1	0	1 (7)
Genito-urinary	1	6	7 (21)	5	3	8 (23)	1	1	2 (9)	0	0	0	0	2	2 (14)
Skin	0	0	0	1	0	1 (3)	1	0	1 (5)	0	0	0	0	0	0
ENT	3	2	5 (15)	1	0	1 (3)	0	2	2 (9)	0	0	0	5	1	6 (43)
Musculo-skeletal	9	15	24 (71)	19	9	28 (80)	11	5	16 (73)	3	0	3 (27)	7	5	12 (86)

We visited 280 houses in search of elderly and interviewed 116 individuals above 60 years. Out of 116 elderly 59% were in the age group of 60-69 years, the mean age of study participants was 68.5. 59.5% were male and 40.5% were female in which majority belong to Hindu religion, 16% were living alone, 20% were belongs to joint family and majority 56% were belongs to 3<sup>rd</sup> generation family, 42% were benefited from Indira Gandhi national old age pension scheme, those were previously employed in different categories occupation and availing post retirement pension accounts for 12%, only one person not had ration card and she was living alone. 72% were belongs to BPL family, 27% belong to APL family one person not having any ration card. (Table 1)

Among participants, 77% of males were literate, only 45% of females were literate overall literacy level of study participants was 74%, there was a statistically significant difference in literacy level with sex was noted. (Table 2)

Most common morbidity noted was musculoskeletal problems 71.5% (83) had musculoskeletal problem most commonly arthritis in which 42.2% (49) were male and 29.3% (34) were female and age group between 60-69 years accounts for 44.7% (52), followed by ocular problems 60.3% (70) of study subjects had ocular problem in which 33.6% (39) were male and 26.7% (31) were female majority had cataract and age group between 60-69 years accounts for 35.3% (41) of cases. 40.5% (47) individuals had cardiovascular problem 26.7% (31) were male and 13.8% (16) were female majority had hypertension and age group between 60-69 years accounts for 21.5% (25), 31.8% (37) individuals had endocrine problem in which 19.8% (23) were male and 12% (14) were female majority had diabetes and age group between 60-69 years accounts for 21.5% (25). (Table 3)

## Discussion

In the present study the mean age of study participants was 68.5% ± years in a study in Dakshina Kannada<sup>[3]</sup> the mean was 66.9 ± 6.3 years, 59% were in the age group of 60 – 69 years in a study in Maharashtra<sup>[4]</sup> 60 – 70 years accounts for 64% in Gulberga study<sup>[5]</sup> 60 – 69 years accounts for 68%. In the present study 59.5% were males 40.5% were females in study by Ayan Ghosh<sup>[6]</sup> 45.5% were males and 54.5% were females, in Jadhav V.S et al<sup>[7]</sup> study 52.5% were males and 47.5% were females. In the present study 74% were literate in Dakshina Kannada<sup>[3]</sup> study 37% were literate, in Gulberga study<sup>[5]</sup> 23% were literate. In the present study 72% were below poverty line (BPL) card holders, in Dakshina Kannada<sup>[3]</sup> study 66.1% were below poverty line (BPL) card holders.

In the present study elders are suffered from one or more health problem of which the major problems were musculoskeletal (71.5%), ocular problems (60.3%) mainly cataract followed by cardiovascular problems (45.6%). Similarly a study in Dakshina Kannada,<sup>[3]</sup> The ICMR report on the chronic morbidity profile in the elderly states that hearing impairment was the most common morbidity, followed by visual impairment.<sup>[8]</sup> A study on ocular morbidities among the elderly population in the district of Wardha noted that refractive errors accounted for the highest number (40.8%) of all the ocular morbidities, closely followed by cataract (40.4%).<sup>[9]</sup> the study in Delhi, the problems related to vision and hearing were the commonest.<sup>[10]</sup>

Major morbidities of the study were impaired vision followed by hypertension and joint problems and in the study at Chandigarh<sup>[11]</sup> (most common diseases in order of their magnitude were hypertension (58%), joint pains/arthritis (50.5%), and cataract (19.1%). In Situation Analysis of The Elderly in India, 2011,<sup>[11]</sup> the most

common disability among the aged persons was locomotor disability.

### Conclusion:

The present study showed a high prevalence of morbidity among elderly was noted, particularly musculoskeletal and ocular conditions.

### Recommendation:

1. Strengthen the activities for early diagnosis the elderly morbidities in community.
2. Improve the awareness regarding available health services.
3. Although in this study we focused on medical problems of elderly for overall improvement of health of elderly, integrated approach by health and health related sectors is needed.

### Limitations of the Study

1. Presence of family members during interview and examination might have influenced the response of the respondents ex. income.
2. No laboratory investigation was done.
4. The mental morbidity of the elderly subjects was not assessed thoroughly.

**Acknowledgment:**The author would like to thank all the study participants.

### References

1. Situation analysis of the elderly in India, 2011, Central statistics office, ministry of statistics & programme implementation, government of India.  
[mospi.nic.in/sites/default/files/publication\\_report\\_s/elderly\\_in\\_india.pdf](http://mospi.nic.in/sites/default/files/publication_report_s/elderly_in_india.pdf) accessed on 22-3-2016.
2. Operational guidelines national programme for health care of the elderly (NPHCE), 2011, Directorate General of Health Services Ministry of Health & Family Welfare Government of India.  
[https://www.mohfw.gov.in/.../8324324521Operational Guidelines NPHCE final.pdf](https://www.mohfw.gov.in/.../8324324521Operational%20Guidelines%20NPHCE%20final.pdf) accessed on 5-2-2016.
3. Hameed S, Kumar N, Naik PM, Sachidananda K, Prasanna K S. Morbidity Pattern Among the Elderly Population in a Rural Area of Dakshina Kannada, Karnataka - A Cross Sectional Study. *Ntl J of Community Med* 2015; 6(2):89-92.
4. Kamble V, Avchat S S, Ghodke Y D, Goyal R C, Dhumale G B. Health Status of Elderly

Persons in Rural Area of India. *Indian Medical Gazette*. 2012 Aug ; 145 (8): 295-299.

5. Chandrashekhar R, et al, Morbidity pattern among geriatric population in urban and rural area of Gulbarga, *medicainnovatica*; 2014; 3(2); 36-41.
6. AyanGhosh, DeblinaSarkar, Ranabir Pal, Bijoy Mukherjee, A Profile of Common Morbidities among Elderly Rural Indian Population, *American Journal of Public Health Research*; 2015; 3(5A) 29-33.
7. Jadhav V.S et al. A study of morbidity profile of geriatric population in the field practice area of rural health training centre, paithan of Govt. Medical College, Aurangabad, *IOSR Journal of Pharmacy*; 2012; 2(2):184-188.
8. Guerra RO, Alvarado BE, Zunzunegui MV. Life course, gender and ethnic inequalities in functional disability in a Brazilian urban elderly population. *Aging ClinExp Res*. 2008;20:53-61.
9. Singh MM, Murthy GV, Venkatraman R, Rao SP, Nayar S. A study of ocular morbidity among an elderly population in a rural area of central India. *Indian J Ophthalmol*. 1997;45:61-5.
10. Dey AB, Soneja S, Nagarkar KM, Jhingan HP. Evaluation of the health and functional status of older Indians as a prelude to the development of a health programme. *Natl Med J India*. 2001;14:135-8.
11. Swami HM, Bhatia V, Dutt R, Bhatia SPS. A community based study of the morbidity profile among the elderly in Chandigarh, India. *Bahrain Med Bull* 2002; 24(1): 13-16.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:**Vanitha S S., Shubha D. B, Sujatha M G. Study of morbidity pattern among elderly in Anaji, field practice area of J.J.M. Medical College, Davangere. *Nat J Res Community Med* 2018;7(1):18-21.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)



## **Job satisfaction among health care providers in a tertiary care hospital in Gadag, Karnataka.**

**Roshan Mudaraddi<sup>1</sup>, Waseem Anjum<sup>2\*</sup>, Vijay G<sup>3</sup>, Vijayraj Bajantri<sup>3</sup>, Vijaykumar C<sup>3</sup>**

1. Assistant Professor, Department of Community Medicine, Gadag Institute of Medical Sciences, Gadag. 2. Assistant Professor, Department of Community Medicine, Sri Devaraj Urs Medical College, Kolar. 3. II year MBBS student, GIMS, Gadag.

**Date of Submission** : 15-07-2017

**Date of Online Publication** : 07-01-2018

**Date of Acceptance** : 25-11-2017

**Date of Print Publication** : 31-03-2018

**\*Author for correspondence:** Dr. Waseem Anjum, Assistant Professor, Department of Community Medicine, Sri Devaraj Urs Medical College, Kolar, Karnataka. E mail: drwazanjum@gmail.com

### **Abstract**

**Background:** Job satisfaction refers to a sum of all positive and/or negative feelings that an individual holds towards his or her job. Employees who are more satisfied with their job will usually have more attendance, are more worthy and they are satisfied with their lives. **Objective:** To determine job satisfaction level among health care providers working in Gadag Institute of Medical Sciences, Gadag Government Hospital. **Methodology:** A Cross Sectional study was conducted in Gadag Institute of Medical Sciences, Gadag Government Hospital for a period of one month from 1/5/2017 to 30/5/2017. Doctors, nurses, pharmacist and lab technicians who were willing to participate and present during the study period were included. Using 5 point Likerts scale, their job satisfaction level was assessed using job satisfaction scale developed by Pawan Kumar and Khan AM for Government Hospitals. **Results:** In our study we found 62.7% of the subjects were in the age group of 21-30 years, 56.4% were females, 57.14 were married and 61.1% and 14.3% were nurses and doctors respectively. Highest job satisfaction was seen in pharmacist (3.2) and least job satisfaction with doctors (2.72). Among different domains, organizational facility is with least score and interpersonal relation and cooperation with highest score. **Conclusion:** From this study we conclude that permanent and contract basis job hardly makes any difference in job satisfaction. Inter-personal relation and cooperation domain is the most important for job satisfaction. Doctors are the least satisfied with their job. Hence a study in detail to determine the factors relating to that and how we can improve them has to be done.

**Key-words:** Job satisfaction, Health care providers, Cross Sectional study, Government Hospital.

### **INTRODUCTION**

Job satisfaction refers to a sum of all positive and /or negative feelings that an individual holds towards his or her job. Job satisfaction is the level of contentment employees feel about their work, which can affect performance<sup>1</sup>. Locke (1976), defines job satisfaction as a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience.

Employees who are more satisfied with their job will usually have more attendance, are more worthy, and they are satisfied with their lives<sup>1</sup>. Researchers have observed that dissatisfied employees, if remain in the organization, may involve in counter-productive activities as theft, poor service, destructive rumours and sabotage of equipment. Employee's job dissatisfaction gives rise to

high level of turnover intention which ultimately leads to actual workers turnover<sup>2</sup>.

Over the years, studies have shown that experiencing stress in the work setting leads to undesirable consequences on the well-being and safety of an individual and invariably for the organization. Occupational stress leads to reduced productivity and performance, increased sickness and absenteeism, decreased motivation, and morale among employees<sup>3</sup>.

Job satisfaction is most essential driving forces for determining the quality of services of health care organizations<sup>4</sup>. It means that we form attitudes towards our jobs by taking into account our feelings, our beliefs and our behaviour<sup>4</sup>. A lot of research has been done on client satisfaction in the health sector, but it is in limited

context for provider’s satisfaction in health care system.Over the years it has been seen that our health care workers are not satisfied with their professional lives<sup>4</sup>.Job satisfaction does not only depend on payment but also depend on working environment.

**OBJECTIVE:** To determine job satisfaction level among health care providers.

**MATERIALS AND METHODS**

A Cross Sectional study was conducted in Gadag Institute of Medical Sciences, Gadag Government Hospital for a period of one month from 1/5/2017 to 30/5/2017. Total staff strength consisting of doctors, nurses, pharmacists and laboratory technicians of GIMS government hospital is 272. After removing staffs who didn’t gave consent to the study, and who did not return the filled questionnaire and staffs who returned with half-filled form, the total sample size came to be 126.

Inclusion criteria:–

- 1) Doctors, nurses, pharmacist and laboratory technicians of Gadag Institute of Medical Sciences (GIMS), Gadag, Karnataka who gave consent and available during our study period.
- 2) Permanent staff – working experience of at least one year in current institute
- 3) Contract based staff – working experience of at least six months in the current institute.

Hospital was visited for one month from 1/5/2017 to 30/5/2017 and consent of each participant was taken and the questionnaire was administered. Individual responses were taken after reading out the questions and explaining them wherever they find it difficult to follow.

Job satisfaction level was assessed using job satisfaction scale developed by Pawan Kumar and Khan AM<sup>4</sup> for Government Hospitals, which has five point Likert scale. The scores being

- 1- I am very much dissatisfied
- 2- I am dissatisfied
- 3- Can’t say
- 4- I am satisfied
- 5- I am very much satisfied

Cut off being 2.5, above which indicates satisfaction and below 2.5 meaning dissatisfaction.

The questionnaire includes – socio-demographic profile and questions relating to job satisfaction.

Questionnaire was administered to the participants after taking consent and explaining them the purpose of the study.Whichever question they found difficult, was explained to them. Details of the scoring was told. After collecting all the proforma, data was entered in excel sheet and analyzed. The mean score was calculated in each domain for the participants. Quality control was done by ensuring focused group discussion

regarding most common difficult questions collected from pilot study using the Likert’s scale by investigators prior to the start of the study.

**RESULTS**

**Table. 1:Showing distribution according to age group, sex and marital status of staffs**

	Frequency	Percentage
<b>Age (Years)</b>		
21-30	79	62.7
31-40	28	22.2
41-50	9	7.14
51-60	10	7.96
<b>Gender</b>		
Male	55	43.6
Female	71	56.4
<b>Marital status</b>		
Married	72	57
Unmarried	54	43

The age group between 21-30 years was 62.7%, which is the highest. Next highest distribution was in the age group of 31-40years with 22.2%. Least was in the age group of 41-50 years.56.4% of the respondents were females and the remaining 43.6% were males.The distribution of married and unmarried study subjects were 57% and 43% respectively(Table 1).

**Table.2: Overall job satisfaction according to type of employment**

Type of Employment	Frequency	Percentage	Overall job satisfaction
Permanent	70	55.5	3.05
Contract	56	44.5	3.09

The permanent employees constituted 55.5% and contract basis were 44.5%, and their overall job satisfaction was 3.05 and 3.09 respectively. This shows that type of employment hardly plays any role in job satisfaction and hence indirectly shows money is not everything for job satisfaction(Table 2).

**Table. 3:Overall job satisfaction according to type of occupation**

Occupation	Frequency	Percentage	Overall job satisfaction
Doctors	18	14.3	2.72
Nurses	77	61.1	3.12
Pharmacist	9	17.4	3.2
Lab technicians	22	7.1	2.94

Overall job satisfaction with respect to cadre, we found that highest job satisfaction is with pharmacist (3.2), followed by nurses (3.12), then comes lab technicians (2.94) and least satisfied are doctors with scoring of 2.72.

**Table. 4: Domain wise job satisfaction**

Domains	Overall job satisfaction
Factor 1: privileges attached with jobs	2.6
Factor 2: interpersonal relation and cooperation	3.5
Factor 3: working environment	3.3
Factor 4: patient relationship	3.2
Factor 5: organization facility	2.59
Factor 6: career development	3.4
Factor 7: human resource issues	3.3

Overall job satisfaction according to domains, highest score was 3.5 being in interpersonal relation and cooperation and least score of 2.59 being in organization facility.

## DISCUSSION

In our study, the age group between 21-30 years was 62.7%, which is the highest. Next highest distribution was in the age group of 31-40 years with 22.2%. Least was in the age group of 41-50 years. According to age wise distribution, upto 66.7% were middle age group (31-50 years)<sup>5</sup>, 15% were in the age group of 20-30 years in a study done by Cesar Carrillo Garcia<sup>5</sup> in Spain. Increasing age was found to be associated with higher levels of satisfaction<sup>6</sup>. A longitudinal study among Norwegian doctors by Nylenna et al showed positive correlation with age (job satisfaction better with growing age)<sup>7</sup>. This may be attributed to fact that as age increases, expectations decrease and are replaced by gradual acceptance of the situation and adaptation<sup>8</sup>. In our study 56.4% of the respondents were females and the remaining 43.6% were males. Female constituted 73.4% and male 26.6% in a study done by Cesar Carrillo Garcia<sup>5</sup> in Spain. Females were found to be more satisfied than their male colleagues<sup>9,10,11</sup>.

In our study we found, irrespective of nature of employment whether permanent or contract the job satisfaction level remained the same, with doctors being least satisfied (score 2.72) and pharmacist being most satisfied (score 3.2). A study done by Poonam Jaiswal et al, mean job satisfaction was highest for nurses (0.68), followed by doctors (0.66)<sup>12</sup>. A study done by Anne Ene and Adah-Ogoh in Nigeria, more than half (53.2%) of the respondents were dissatisfied with their job<sup>13</sup>. A study done by Sharmista Bhattacharjee et al showed more than 50% of the participants were satisfied<sup>6</sup>. Study done by Sharma M<sup>14</sup> and Madaan N<sup>9</sup> showed the same result. But a

study done by Chaudary S and Bannerjee A<sup>15</sup> showed job satisfaction to be 40%. A study done in European union<sup>16</sup> showed 25% job dis-satisfaction, where as a study done in Karachi showed only 32% were satisfied with their jobs<sup>17</sup> and 43.6% in a study in Sri Lanka<sup>18</sup>. A study done by Jackie Mamitsa and Banyana Ramasodi, showed 53.4% were not satisfied with their current job and 26.2% of the participants were highly dissatisfied<sup>19</sup>.

In our study none of the employees were planning of resigning the job, reason being carrier development. Carrier development being the second in list for reasons for job satisfaction in contrast to other studies mainly because it is a new government medical teaching hospital with many promotions due and also super speciality clinics being planned in future. 33% of the respondents said that, they are likely to leave their current job<sup>13</sup>.

In our study we found, organization facility and privileges attached with jobs are the main domains for job dissatisfaction. Causes for dissatisfaction were – management support (69%), implementation of policies and procedures (66%), employee benefit including salary and wages (33%)<sup>13</sup>. 82.4% were satisfied with their opportunity to develop<sup>18</sup>. Many employees rated motivational factors like good working relationships with colleagues (96%), environmental factors (92%) and good physical conditions (93%) as more important than income (76%)<sup>20</sup>.

**LIMITATION OF THE STUDY:** Sample size could have been increased by giving more time to participants and trying to convince them that their names will be kept confidential. If we could get chance to collect data from private hospital institutions and compare with this study we could have come with some more factors affecting job satisfaction. Unfortunately in a place like Gadag, we don't have large private institutions to do the same.

**CONCLUSION:** From this study we could see that permanent and contract basis job hardly makes any difference in job satisfaction, making it clear that money is not the criteria for job satisfaction. Inter-personal relation and cooperation domain is the most important for job satisfaction because this is very important for duty adjustment and trust on each other and also assistance during operating the case. The domain with organizational facilities is the least satisfied area, which is obvious in a government hospital. This is one area where the government has to improve the infrastructure.

Doctors are the least satisfied with their job among all the participants. The reasons being hectic duty hours, lack of surgical instruments for surgery, lack of availability of various diagnostics at the facility, and most importantly slowness in administration. Hence a study in detail to determine the factors relating to that and how we can improve them has to be done.

**ACKNOWLEDGEMENT:**

We would like to thank all doctors, nurses, laboratory technicians and pharmacist for their valuable time and willingness to participate. I would also like to thank Kumar P and Khan AM for their job satisfaction level questionnaire.

**REFERENCES:**

1. Singh JK, Jain Mini. A study of employees' job satisfaction and its impact on their performance. *Journal of Indian Research*. 2013;1(4):105-111.
2. Samad S. The contribution of demographic variables: Job characteristics and job satisfaction on turnover. *J Int Manage Stud*. 2006;1(1):1-12.
3. Vinothkumar M, Arathi A, Joseph M, Nayana P, Jishma EJ, Sahana U. Coping, perceived stress, and job satisfaction among medical interns: The mediating effect of mindfulness. *Ind Psychiatry J* 2016;25:195-201.
4. Kumar P, Khan AM. Development of job satisfaction scale for Health care providers. *Indian J Public Health*. 2014;58:249-55
5. Cesar Carillo-Garcia. *Rev. Latino-Am. Enfermagem*. 21(6); Nov-Dec 2013: 1314-20.
6. Bhattacharjee S, Ray K, Roy JK, Mukherjee A, Roy H, Datta S. Job satisfaction among Doctors of a Government Medical College and Hospital of Eastern India. *Nepal J Epidemiol*. 2016;6(3):595-602.
7. Nylenna M, Gulbrandsen P, Forde R, Aasland OG. Unhappy doctors? A longitudinal study of life and job satisfaction among Norwegian doctors. *BMC Health Services Research*. 2005;5:44.
8. Groenewegen PP, Hutten JBF. Workload and job satisfaction among general practitioners: a review of the literature. *SocSci Med*. 1991;32(10):1111-1119.
9. Madaan N. Job satisfaction among doctors in a tertiary care teaching hospital. *JK Sci* 2008;10:81-3.
10. Jabbari H, Pezeshki MZ, Naghavi-Behzad M, Asghari M, Bakhshian F. Relationship between job satisfaction and performance of primary care physicians after the family physician reform of east Azerbaijan province in Northwest Iran. *Indian J Public Health*. 2014;58:256-60.
11. Sibbald B, Enzer I, Cooper C, Rout U and Sutherland V. GP job satisfaction in 1987, 1990 and 1998: Lessons for the future? *FamPract*. 2000;17:364-371.
12. Jaiswal P, Gadpayle AK, Singhal AK, Sachdeva S, Modi RK, Padaria R, et al. Job satisfaction among hospital staff working in a Government teaching hospital of India. *Med J DY Patil Univ* 2015;8(2):131-7.
13. Anne Ene, Adah-Ogoh. Assessment of job satisfaction among health care workers in primary health care centres in the Federal Capital Territory, Nigeria. [Cited on 10/07/2017] Available from <http://hdl.handle.net/11394/4888>.
14. Sharma M, Goel S, Singh SK, Sharma R, Gupta PK. Determinants of Indian physicians' satisfaction and dissatisfaction from their job. *Indian J Med Res*. 2014;139(3):409-417.
15. Chaudhury S, Bannerjee A. Correlates of Job Satisfaction in Medical Officers. *Med J Armed Forces India*. 2004;60(4):329-332.
16. Bensing JM, Brink-Muinen, A Van Den, Boerma W, Dulmen S Van. The manifestation of job satisfaction in doctor-patient communication: A ten-country European study. *International Journal of Person-Centered Medicine*: 2013;3(1):44-52.
17. Khuwaja AK, Qureshi R, Andrades M, Fatmi Z, Khuwaja NK. Comparison of job satisfaction and stress among male and female doctors in teaching hospitals of Karachi. *J Ayub Med Coll Abbottabad*. 2004;16(1):23-7.
18. Rodrigo MDA, Dissanayake A, Galhenage J, Wijesinghe S, Kurupparachchi K. Job satisfaction and mental health of Sri Lankan doctors. *South Asian Journal of Psychiatry*. 2013;3(1):14-17.
19. Ramasodi, Jackie Mamitsa Banyana. Factors influencing job satisfaction among healthcare professionals at South Rand Hospital [Cited on 10/07/2017] Available from <http://hdl.handle.net/10386/214>.
20. Peters DH, Chakraborty S, Mahapatra P, Steinhardt L. Job satisfaction and motivation of health workers in public and private sectors: cross-sectional study. *Hum Resour Health*. 2010;8:27.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Roshan Mudaraddi, Waseem Anjum, Vijay G, Vijayraj Bajantri, Vijaykumar C. Job satisfaction among health care providers in a tertiary care hospital in Gadag, Karnataka. *Nat J Res Community Med* 2018;7(1):22-25.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

## Stroke among slum dwellers: Risk factors and health-seeking behavior in elderly residents of Dharavi, Mumbai

AmitaMukhopadhyay<sup>1\*</sup>, Daksha Pandit<sup>2</sup>, Uma Sundar<sup>3</sup>, SikandarAdwani<sup>4</sup>

1 Associate Professor, Community Medicine, Akash Institute of Medical Sciences and Research Centre, Bengaluru.2 Professor and Head, Dept. of Community Medicine (Retd.)&3 Professor of Medicine and In-charge, Neurology Services, LokmanyaTilak Municipal Medical College and General Hospital,Mumbai.4 Director, Radiant Superspecialty Hospital, Amravati, Maharashtra

Date of Submission : 05-11-2017

Date of online Publication : 07-01-2018

Date of Acceptance : 25-11-2017

Date of Print Publication : 31-03-2018

\***Author for correspondence:**Dr. AmitaMukhopadhyay, MD,408, Navami VarshaApts, Uttarahalli-KengeriMn Rd,Srinivasapura, Bangalore-560060. Email id: dr.amukho@gmail.com

### Abstract

**Background:** Population ageing has led to an epidemic of cardiovascular diseases in developing countries. Poverty increases the vulnerability to chronic diseases such as hypertension and stroke, with the elderly poor being especially at risk, both in terms of disease incidence and challenges to secondary prevention.**Objectives:** To determine the prevalence of risk factors of stroke in elderly residents of Dharavi, Mumbai, and to study the health seeking behavior of stroke patients identified in the community.**Methods:** A random sample of 1726 individuals aged  $\geq 60$  years (730 men, 996 women, average age 66 years) was selected from a health post area in Dharavi and studied to evaluate stroke risk factors. Stroke survivors were interviewed in depth for health-seeking behavior.**Findings:** Approximately 60% of the participants were illiterate and from the lower economic class. In men, 30.55% smoked and 26.71% used alcohol, and 46.79% of the women used smokeless tobacco. Only 24.86% ate fruits and vegetables daily; 49.15% had high risk waist-hip ratios. Self-reported prevalence of hypertension and diabetes were 16.34% and 7.42% respectively. Of 66 stroke survivors identified, close to 80% found medicines and physiotherapy unaffordable, and 43.94% had tried unconventional treatments to cure paralysis.**Conclusions:** Our findings reflect widespread presence of risk factors and poor health care access in elderly slum-dwellers. The necessity for tobacco control, awareness campaigns and effective behaviour change interventions at the grassroots level has become imperative in the context of growing urbanization and population ageing.

**Key-words:**Epidemiology, Geriatrics, Health services, Non-communicable disease, Stroke, Substance-use, Tobacco

### Introduction

Developing countries are witnessing a major public health challenge in the form of cardiovascular diseases. Populations are ageing due to multifarious factors including improved lifespan, access to health care facilities and well implemented health programs to manage infectious disease and maternal-child mortality. According to the Global Burden of Diseases 2015 study(1), cardiovascular diseases accounted for one-third of all deaths globally. The poor are more vulnerable to chronic diseases because of material deprivation and psychosocial stress, higher levels of risk behavior, unhealthy living conditions and limited access to good-quality health care (2). The elderly among the poor are especially at risk, due to the cumulative effects of long

term tobacco and alcohol abuse, longstanding hypertension and diabetes and diets that become poorer as income shrinks. Furthermore, once affected by a major cardiovascular disease such as stroke, their age and poverty act as barriers to accessing health care and continuing secondary prevention. The objectives of the present study were to determine the prevalence of selected risk factors of stroke in slum-dwellers aged  $\geq 60$  years, and to study the health seeking behavior of stroke patients identified in the community.

### Materials and Methods

Dharavi is a large and well-known slum in Mumbai, with a population of roughly a million. It is the field practice area of the Community Medicine department of a major hospital and teaching institute. Primary health care needs are served by *health posts* with well-defined service

provision areas. Detailed methodology including sample size estimation and participant selection has been published elsewhere (3). For the present study, 1726 elderly residents of Kumbharwada Health Post area were interviewed to collect data on risk factors of stroke. Identified stroke patients and their family members were interviewed in-depth to study their health seeking behavior. Risk factors were grouped as follows:

*Common modifiable factors:*

1. Substance use: Smoking tobacco; alcohol; smokeless tobacco
2. Unhealthy diet: Low fruit and vegetable intake
3. Physical inactivity: Frequency of physical exercise; hours of inactivity in a day

*Intermediate risk factors (4):*

1. Overweight/Obesity: Waist and hip circumferences were measured following the technique described in the MONICA Manual(5).Waist Hip Ratio (WHR) was chosen over Body Mass Index (BMI) as an indicator of obesity because evidence indicates stronger association of measures of central obesity such as WHR with risk factors such as diabetes, while for cardiovascular mortality they are comparable to BMI (6).
2. Hypertension; Diabetes mellitus; Raised blood lipids/angina/ischemic heart disease: Self-reporting by participants was used to assess these factors, based on history of diagnosis of the respective condition/s by a health professional, with proof of diagnosis and/or treatment in the form of medical records and prescribed drugs.

**Operational definitions:** Substance use (smoking tobacco, alcohol and smokeless tobacco) was classified into 3 categories: Current - used the respective substance at least once during the last one year, Ex - used at least once in lifetime, but not during the last one year, and Never – not used even once in lifetime. Smoking more than 20 cigarettes/bidis per day was defined as high risk (7). Less than daily consumption of fruits and vegetables was defined as low intake considering the low income of the study population, which would have made the recommended 5 daily servings unaffordable for most of them. Participants were defined as mostly inactive if more than half of their daytime hours were spent sitting or lying down. Physical exercise was defined as any activity which resulted in sustained sweating, increased heart rate or increased breathing rate. Participants were carefully questioned to rule out similar symptoms resulting from coronary or respiratory disease. Frequent exercise was defined as exercising 4 or more days per week. Waist-hip ratio was defined as high risk if it exceeded 0.9 in men and 0.85 in women. Abdominal obesity was defined as waist circumference exceeding 102 cm in men and 88 cm in women (8).Stroke was defined as a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function

lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin (9).

**Results**

Out of 1726 participants interviewed, 66 individuals were identified with stroke.

**Table 1. Socio-demographic characteristics**

Characteristics	Men No. (%)	Women No. (%)	Total No. (%)	$\chi^2$ value	P value
<b>Population</b>	730 (42.3)	996 (57.7)	1726	40.99	<0.001
<b>Age (years completed)</b>				29.01	<0.001
60 - 64	304 (38.4)	487 (61.6)	791		
65 - 69	221 (48.4)	236 (51.6)	457		
70 - 74	118 (50.9)	114 (49.1)	232		
75 - 79	49 (43.4)	64 (56.6)	113		
≥ 80	38 (28.6)	95 (71.4)	133		
<b>Marital Status</b>				521.54	<0.001
Married	623 (85.3)	305 (30.6)	928 (53.8)		
Widowed	93 (12.7)	675 (67.8)	768 (44.5)		
Other	14 (1.9)	16 (1.6)	30 (1.7)		
<b>Education</b>				354.67	<0.001
Illiterate	242 (33.2)	776 (77.9)	1018 (59.0)		
Primary (≤ std. X)	457 (62.6)	216 (21.7)	673 (39.0)		
Higher (≥ std. XI)	31 (4.2)	4 (0.4)	35 (2.0)		
<b>Occupation</b>				723.82	<0.001
Unskilled	224 (30.7)	203 (20.4)	427 (24.7)		
Skilled	119 (16.3)	42 (4.2)	161 (9.3)		
Unemployed	387 (53.0)	148 (14.8)	535 (31.1)		
Home-manager	0 (0.0)	603 (60.5)	603 (34.9)		
<b>Economic status</b>				11.28	<0.05
Lower (≤Rs.1000)	366 (53.4)	564 (61.6)	930 (58.1)		
Middle (Rs. 1000-2500)	306 (44.7)	340 (37.2)	646 (40.4)		
Upper (≥Rs.2500)	13 (1.9)	11 (1.2)	24 (1.5)		
<b>Total</b>	685 (100)	915 (100)	1600 (100)		

\*Economic status based on monthly per capita income in rupees. †126 respondents did not provide information on economic status.

**Table 2. Stroke risk factors**

	Men		Women		Total		$\chi^2$ value	P value
Risk factors	C	PR%	C	PR%	C	PR%		
<b>Smoking</b>								
Current	223	30.55	11	1.1	234	13.56	192.07	<0.001
Ex-smokers	68	9.32	5	0.5	73	4.23	52.67	<0.001
<b>Alcohol use</b>								
Current	195	26.71	4	0.4	199	11.53	181.41	<0.001
Ex-drinkers	101	13.84	4	0.4	105	6.08	87.78	<0.001
<b>Smokeless T.</b>								
Current	298	40.82	466	46.79	764	44.26	36.94	<0.001
Ex-users	29	3.97	25	2.51	54	3.13		NS
<b>Fruit/vegetable intake</b>								
Daily	169	23.15	260	26.1	429	24.86		NS
<Daily	561	76.85	736	73.9	1297	75.14		NS
<b>Obesity</b>								
High WHR	355	51.37	451	47.52	806	49.15	132.03	NS
Abd. Obesity	12	1.74	163	17.18	175	10.67		<0.001
<b>Physical exercise</b>								
Never	285	39.04	387	38.86	672	38.93	65.45	NS
Frequent	100	13.7	253	25.4	353	20.45		<0.001
<b>Physical inactivity</b>								
Inactive	81	11.1	126	12.65	207	11.99		NS
Active	333	45.62	491	49.3	824	47.74		NS
<b>Intermediate RF</b>								
HTN	89	12.19	193	19.38	282	16.34	38.36	<0.001
DM	51	6.99	77	7.73	128	7.42		NS
IHD	19	2.6	36	3.61	55	3.19		NS

C indicates prevalent cases; PR, prevalence rate; P, Chi square P value; Smokeless T, Smokeless tobacco; WHR, Waist-hip ratio; Abd. Obesity, Abdominal obesity; RF, Risk factors; HTN, Hypertension; DM, Diabetes mellitus; IHD, Ischemic heart disease; NS, Not significant. \* Waist and hip circumference could not be measured in 39 men and 47 women, therefore group totals for this section are Men: 691, Women: 949 and Total: 1640.

Demographic characteristics (Table 1): Mean age of the participants was 66.06 years (range 60-105 years). More than half of them were female. Hinduism and Buddhism were the predominant religions practiced. The proportion of widows was much higher among women than men, and the literacy rate in women was much less than in men. Most of the participants belonged to the lower economic class; a majority of the men reported being unemployed or engaged in unskilled occupations. Most of the women were home-managers.

**Prevalence of risk factors of stroke (Table 2)**

**Substance use:**

Among 234 participants (13.56%) who were current tobacco smokers, a majority preferred bidis (192, 82.05%) followed by cigarettes (39, 16.67%) and hookah (2, 0.85%). Only 11 women (1.10%) smoked compared to 223 (30.55%) men. Seventy-three participants (4.23%) reported being ex-smokers. Mean frequency of smoking was 9.33per day (range 1-50 per day). High risk smoking ( $\geq 20$ /day) was reported by 43 (18.38%) individuals; 3 (1.28%) of them smoked more than 40 a day. Mean

duration of smoking habit was 29.95 years (range 5 to 60 years).

Current alcohol use was prevalent in 199 participants (11.53%), with 105 (6.08%) being ex-drinkers. Only 4 women (0.40%) reported drinking, compared to 195 (26.71%) men. Among current drinkers, 42 (21.11%) reported consuming alcohol 5 or more times per week. Country liquor was the most frequently used type of alcohol, favored by 117 (58.79%) individuals, followed by "Indian Made Foreign Liquor" (IMFL) and beer, used by 65 (32.66%). Mean duration of drinking habit was 26.86 years (range 6 months to 50 years). The maximum amount of alcohol imbibed at a time ranged from half a glass to 4 bottles of country liquor, and half peg (15 ml) to 2 quart bottles (250 ml) of Indian Made Foreign Liquor (IMFL).

Smokeless tobacco in various locally available forms, such as masheri (a substitute for toothpaste), gutkha, pan masala, zarda, and dry snuff, was currently used by 764 (44.26%) participants. However, the proportion of current women users (466, 46.79%) was significantly higher than men (298, 40.82%),  $p < 0.05$ . Mean duration of habit was 29.58 years (range 6 months to 70 years). Mean frequency of use was 3.5 times a day (range 1 to 20 times per day).

#### **Diet**

Daily consumption of fruits and vegetables was reported by 429 (24.86%) individuals. Of the remaining 1297 participants, 532 (30.82%) reported occasional or nil intake.

#### **Physical exercise and inactivity**

We noted a significant gender difference among the 353 (20.45%) participants who reported frequent physical exercise; 253 (25.40%) women compared to 100 (13.70%) men,  $p < 0.01$ . This may have been because the strenuous household chores like washing clothes, sweeping and mopping were done by women. General inactivity levels were similar in both sexes, with 672 participants (38.93%) who never exercised, and 207 participants (11.99%) being inactive most of the time. The 824 (47.74%) individuals who were mostly active, kept busy in walking, buying groceries and doing light housework or yoga.

#### **Obesity**

A high risk WHR was seen in 806 (49.15%) out of 1640 participants measured and 175 (10.67%) were found to have abdominal obesity. The prevalence of abdominal obesity was significantly higher in women than in men, 17.18% versus 1.74%,  $p < 0.001$ , which may be due to the lower cut-off in women.

#### **Self-reported intermediate risk factors:**

In the course of interviewing, 378 (21.90%) of the 1726 participants reported being diagnosed with hypertension by a health professional. However, only 282 had proof of diagnosis in the form of prescriptions or medicines, yielding a 16.34% prevalence rate. Prevalence was significantly higher in women than in men, 19.38% versus 12.19%,  $p < 0.001$ . Diabetes mellitus was self-reported by 177 (10.25%) participants; 128 were

confirmed, yielding a 7.42% prevalence rate. The prevalence of self-reported ischemic heart disease was 3.19%. Rheumatic heart disease was also documented in 8 individuals (0.46%), of whom 2 were stroke patients.

#### **Stroke survivors in the community**

##### **Descriptive characteristics**

Sixty-six stroke survivors (38 men, 28 women) were identified following clinical examination and medical records review. There was evidence of hypertension in 54 (81.82%) cases; 13 (19.70%) had diabetes mellitus, 22 (33.33%) reported smoking tobacco, 26 (39.40%) reported alcohol use, 38 (57.58%) reported using smokeless tobacco and 26 (39.40%) had high risk waist-hip ratios. Nineteen stroke survivors (28.79%) were severely disabled, requiring assistance for activities of daily living.

##### **Health seeking behavior**

A government health facility was initially accessed by 43 of 66 stroke patients (65.15%) at the time of stroke. Only one had continued the same for follow-up. The others cited overcrowding, lack of personalized attention and dissatisfaction with immediate treatment outcomes. The main reason reported for accessing government facilities in the first place was the low cost; given sufficient resources they would prefer to seek treatment from private health care providers. Irregular follow-up visits were reported by 31 (46.97%) patients because of difficulties with expense, transportation or escort, and 52 (78.79%) reported poor compliance with antihypertensives, oral hypoglycaemics and cholesterol lowering agents chiefly due to unaffordable prices and irregular availability at hospital pharmacies. A majority had not had physiotherapy or rehabilitative exercises (56; 84.85%).

Out of 66 stroke patients, 29 (43.94%) had utilised alternate/unconventional modes of treatment such as injection into the carotid sinus area, massage and Ayurvedic treatment either as a first choice or as follow-up to conventional treatment modalities, mainly due to a belief in the power of these therapies to cure residual paralysis.

#### **Discussion**

The association of tobacco usage with increased stroke risk is well documented (10), as are the benefits of cessation (11). We found widespread use of tobacco in both sexes, although smoking was rare in women. Our rates are higher than the results from the District Level Household and Facility Survey 2012-13 (DLHS-4) for Maharashtra state (12), which showed regular smokeless tobacco use in 29.0% of urban men and 6.0% of urban women, and smoking prevalence in the same group, of 6.2% 0.4% respectively. Many countries have incorporated fruits and vegetables in school meal programs in an effort to encourage healthy diets and reduce future mortality (13). However, the feasibility of increasing intake in the elderly in a low income setting is

questionable, given food inflation rates (14). Besides, a significant portion of the participants' income would have been diverted into buying tobacco and alcohol products. This would apply especially to men, of whom more than 25% drank and of those a fifth drank almost every day. Such high risk behavior is compounded by obesity and inactivity. Almost half of those we surveyed had a high risk waist-hip ratio, less than half reported high daytime activity and only about 20% reported frequent physical exercise. The India phytonutrient survey report 2016 shows that on average, respondents in the above 60 age group consumed only three servings of fruit and vegetable as against the WHO recommendation of five(15). The Indian Migration Study done in 2005-7(16), reports similar findings in its rural sample, with 75.7% of men and 93.1% of women aged 60-69 years, reporting low fruit and vegetable intake. In the same age group, alcohol consumption was 28.4% in men and 6.9% in women, and low physical activity was reported by 71.2% of men and 57.1% of women.

We observed a self-reported hypertension prevalence of 16.34%, which is indicative of very low awareness and poor access to health care; hypertension, being asymptomatic, is usually diagnosed when an individual seeks medical attention for other complaints. Low prevalence of self-reported cardiovascular conditions has also been observed in the rural study population, which included 1600 villages from 18 Indian states (16). The authors observed a clear social trend in self-reported hypertension, with prevalence being 3.6%, 5.5% and 8.6% in low, medium and high socio-economic groups respectively.

In addition to worsening risk, financial constraints are also a barrier to health care after the occurrence of a stroke. Most of the stroke patients we interviewed expressed dissatisfaction with government health services. Close to 80% of them were deprived of essential medicines and rehabilitative services due to problems with accessibility and expense. Low education and awareness levels would also have been responsible for many of them resorting to unconventional treatments for paralysis. Even stroke survivors from Britain, with its advanced health care system and relative economic well-being, report challenges to secondary prevention due to lack of knowledge, complexities of medication and influence of comorbidities (17).

**Conclusion:** Poverty, now recognised as an important underlying factor in chronic diseases, is linked in a vicious cycle with the three common and modifiable risk factors responsible for the vast majority of chronic disease deaths: unhealthy diet, physical inactivity and tobacco use (2). Our study of elderly adults in a low-income slum population reveals high rates of smoking, alcohol use and obesity coupled with low prevalence of protective behaviours like physical exercise and regular fruit and vegetable intake. The prevalence of intermediate risk factors, though self-reported, is not inconsequential, yet

may reflect only the tip of the iceberg as far as the real load of undiagnosed disease in the community is concerned. Stroke survivors are unable to avoid further morbidity and disability due to financial restrictions on medicines and rehabilitation measures. Tobacco control, awareness campaigns, and lifestyle and behaviour change, supported by accessible and affordable secondary prevention facilities, are interventions that must be implemented without delay, on a national scale with grassroots level penetration.

## References

1. Roth GA, Johnson C, Abajobir A, Abd-Allah F, Abera SF, Abyu G, et al. Global, Regional, and National Burden of Cardiovascular Diseases for 10 Causes, 1990 to 2015. *J Am Coll Cardiol.* 2017 Jul 4;70(1):1-25. <https://doi.org/10.1016/j.jacc.2017.04.052>
2. World Health Organization. Chronic diseases and health promotion, Part Two. The urgent need for action. WHO 2017. Available at [http://www.who.int/chp/chronic\\_disease\\_report/part2\\_ch2/en/index1.html](http://www.who.int/chp/chronic_disease_report/part2_ch2/en/index1.html). Accessed Nov 18, 2017.
3. Mukhopadhyay A, Sundar U, Adwani S, Pandit D. Prevalence of Stroke and Post-stroke Cognitive Impairment in the Elderly in Dharavi, Mumbai. *JAPI.*2012;60:29-32.
4. World Health Organization. Cardiovascular diseases (CVDs) Fact sheet. WHO, May 2017. Available at <http://www.who.int/mediacentre/factsheets/fs317/en/>
5. World Health Organization. MONICA Manual, Part III: Population Survey. Available at <http://www.ktl.fi/publications/monica/manual/part3/iii-1.htm>.
6. Huxley R, Mendis S, Zheleznyakov E, Reddy S, Chan J. Body mass index, waist circumference and waist:hip ratio as predictors of cardiovascular risk—a review of the literature. *Eur J Clin Nutr.* 2010 Jan;64(1):16-22. doi: 10.1038/ejcn.2009.68.
7. Schane RE, Ling PM, Glantz SA. Health Effects of Light and Intermittent Smoking: A Review. *Circulation.* 2010;121(13):1518-1522. doi:10.1161/CIRCULATIONAHA.109.904235.
8. World Health Organization. Waist circumference and waist-hip ratio: report of a WHO expert consultation, Geneva, 8–11. WHO, 2011. Available at [http://apps.who.int/iris/bitstream/10665/44583/1/9789241501491\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44583/1/9789241501491_eng.pdf)
9. National Collaborating Centre for Chronic Conditions (UK). Stroke: National Clinical Guideline for Diagnosis and Initial Management of Acute Stroke and Transient Ischaemic Attack (TIA). London: Royal College of Physicians

- (UK); 2008. (NICE Clinical Guidelines, No. 68.) 1, Introduction. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK53302/>
10. Boffetta P, Straif K. Use of smokeless tobacco and risk of myocardial infarction and stroke: systematic review with meta-analysis *BMJ*2009; 339 :b3060
  11. Stacey A. Kenfield, Meir J. Stampfer, Bernard A. Rosner, Graham A. Colditz. Smoking and Smoking Cessation in Relation to Mortality in Women. *JAMA*. 2008;299(17):2037–2047. doi:10.1001/jama.299.17.2037
  12. Ministry of Health & Family Welfare, Government of India, and International Institute for Population Sciences. District Level Household and Facility Survey -4. State Fact Sheet Maharashtra. Available at <http://rchiips.org/pdf/dlhs4/report/MH.pdf>. Accessed November 23, 2017.
  13. Qian Y, Nayga Jr.RM, Thomsen MR, Rouse HL. The effect of the Fresh Fruit and Vegetable Program on childhood obesity. *Appl Econ Perspect Pol*. 2016;38:260-275. doi:10.1093/aep/ppv017
  14. Dessus S, Herrera S, De Hoyos R. The impact of food inflation on urban poverty and its monetary cost: some back-of-the-envelope calculations. *Agricultural Economics*. 2008;39:417–429. doi: 10.1111/j.1574-0862.2008.00348.x
  15. Mukherjee A, Dutta S, Goyal TM. India's Phytonutrient Report. ICRIER, 2016. Available at [http://icrier.org/pdf/India\\_Phytonutrient\\_Report\\_Ex\\_summary.pdf](http://icrier.org/pdf/India_Phytonutrient_Report_Ex_summary.pdf)
  16. Kinra S, Bowen LJ, Lyngdoh T, Prabhakaran D, Reddy KS, Ramakrishnan L et al. Sociodemographic patterning of non-communicable disease risk factors in rural India: a cross sectional study *BMJ*2010; 341 :c4974doi: 10.1136/bmj.c4974
  17. Jamison J, Graffy J, Mullis R, Mant J, Sutton S. Barriers to medication adherence for the secondary prevention of stroke: a qualitative interview study in primary care. *The British Journal of General Practice*. 2016;66(649):e568-e576. doi:10.3399/bjgp16X685609.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** AmitaMukhopadhyay, Daksha Pandit, Uma Sundar, SikandarAdwani. Stroke among slum dwellers: Risk factors and health-seeking behavior in elderly residents of Dharavi, Mumbai. *Nat J Res Community Med* 2018;7(1):26-31.

© **Community Medicine Faculties Association**

**NJRCM:** [www.commedjournal.in](http://www.commedjournal.in)



## Study On Prevalence And Determinants Of Malnutrition Among Anganwadi Children Of Nagavi Primary Health Centre Area, Gadag.

Rajashree Kotabal,<sup>1</sup>Pralhad Dasar,<sup>2</sup>Rekha Sonavane<sup>3\*</sup>

<sup>1</sup>Assistant Professor, Department of Community Medicine, Shimoga Institute of Medical Sciences, Shivamogga, Karnataka.

<sup>2</sup>Professor and Head, Department of Community Dentistry, Shri Arobindo Dental College, Indoor, Madhya Pradesh

& <sup>3</sup>Professor and Head, Department of Community Medicine, Gadag Institute of Medical Sciences, Gadag, Karnataka

Date of Submission : 07-11-2017

Date of online Publication : 07-01-2018

Date of Acceptance : 01-01-2018

Date of Print Publication : 31-03-2018

\*Author for correspondence: Dr. Rekha Sonavane, E-mail: drrekha.sonavane@gmail.com

### Abstract

**Background:** Malnutrition is a major health and nutrition problem in India. It may lead to permanent impairment of physical and mental growth of those who survive. Globally, 16% of under five children were underweight, 26% were stunted and 8% were wasted.<sup>2</sup> According to NFHS 4 Karnataka 35.2% were Underweight, 36.2% were stunted and 26.1% were wasted. **Objectives:** 1) To estimate the prevalence of Malnutrition among anganwadi children. 2) To assess the association between determinants with malnutrition. **Methodology:** An observational cross sectional study was conducted for a period of 6 months among anganwadies of Nagavi PHC area. Anthropometric measurements of the children attending the anganwadi were taken according to the WHO standards. Classification of samples was done based on Gome's classification. Stunting and wasting was calculated using Waterlow classification. By the vernacular language of the informant a written consent was obtained and survey was conducted by using a semi structured questionnaire. Data was tabulated in Microsoft excel sheet and analysed by using epi info 7 software. **Results:** In the present study prevalence of underweight (weight for age), stunting (height for age) and wasting (weight for height) were found to be 40.54%, 36.49% and 30.41% respectively. Factors like children with age 48-71 months, child with low birth weight, lack of exclusive breast feeding, breast feeding duration less than 18 months and poor sanitation shows increased risk for malnutrition. **Conclusion:** From the study we conclude that there is a high prevalence of malnutrition among the anganwadi children aged 48-71 months. Various factors like age of children, child with low birth weight, lack of exclusive breast feeding, breast feeding duration less than 18 months and poor sanitation shows increased risk for malnutrition. Therefore present study recommends education & behaviour change communication (BCC) strategy are to be conducted regularly about nutrition in vulnerable populations to reduce the prevalence of malnutrition.

**Key-words:** Anganwadi, PHC, Malnutrition, Exclusive breast feeding.

### INTRODUCTION

Children's Health; Tomorrows Wealth is a World Health Day Theme in 1984. Health of the child alters when the nutritional status of the child becomes poor. This poor nutritional status of the child leads to development of infectious diseases and finally malnutrition. Malnutrition is defined by WHO as a weight – for –age below the median minus two standard deviations of the NCHS reference population.<sup>1</sup>

Globally, 16% of under five children were underweight, 26% were stunted and 8% were wasted.<sup>2</sup> According to NFHS 4 India Factsheet 35.7% were

underweight, 38.4% were stunted and 21.0% were wasted.<sup>3</sup> According to NFHS 4 Karnataka 35.2% were Underweight, 36.2% were stunted and 26.1% were wasted.<sup>3</sup>

Malnutrition is a major health and nutrition problem in India. It may lead to permanent impairment of physical and mental growth of those who survive. Causes for malnutrition involves physical, socio-cultural and familial factors like poverty, low birth weight babies, infection, gender discrimination, adolescent pregnancy, repeated pregnancy, inadequate birth spacing, lack of exclusive breast feeding, artificial feeding, food taboos and broken family.<sup>4</sup>

Government of India started the Integrated Child Development Services (ICDS) Scheme in 1975 to reduce the malnutrition problem in children. This scheme incorporates interventions such as food supplementation, immunization, health care and referral services for children as well as pregnant and lactating mothers.<sup>5</sup>

Despite of the expansion of ICDS Scheme to cover most of the children in the country, progress in reducing child malnutrition has been slow. Thus the present study was planned to find out prevalence and determinants of malnutrition among anganwadi children of Nagavi, Gadag.

## OBJECTIVES

1. To estimate the prevalence of Malnutrition among anganwadi children of Nagavi PHC area
2. To assess the association between determinants with malnutrition.

## METHODOLOGY

An observational cross sectional study was conducted for a period of 6 months from 1<sup>st</sup> January 2017 to 30<sup>th</sup> June 2017 among anganwadis of Nagavi PHC. Nagavi PHC area has 3 sub centres, each sub centre has 4 to 5 anganwadi and total 15 anganwadis are present under Nagavi PHC area. By convenient sampling technique randomly we have taken one sub centre under which 4 anganwadis are present. All anganwadis of that sub centre were visited and consent of the anganwadi teachers was taken before drawing data collection. Children who were absent at the day of visit were excluded from the study.

A semi structured questionnaire was used for the data collection. Anthropometric measurements like Height, Weight and Mid upper arm circumference of the children attending the anganwadi were taken according to the WHO standards.<sup>6</sup> Classification of samples was done based on Gome's classification. Stunting and wasting was calculated using Waterlow classification. Taking help of the anganwadi teacher and the children, respective houses were visited. By the vernacular language of the informant a written consent was obtained from the mother and survey was conducted by using a semi structured questionnaire.

## STATISTICAL ANALYSIS

Data was tabulated in Microsoft excel sheet and analysed by using epi info 7 software. Frequency of anthropometric measurements and variables was obtained. Association was drawn between the variables and malnutrition by using chi square test. Ethical clearance was obtained from the ethical committee of Gadag Institute of Medical Sciences, Gadag.

## RESULTS

The present study was conducted among anganwadi children of Nagavi PHC area. Total study subjects comprised of 148. Out of 148 children 35(23.65%) children belongs to the age group 24-47 months and 113(76.35%) children belongs to 48-71 months. In our study 52.03% of children were girls and 47.97% of children were boys. Socio-demographic details of the study subjects was explained in Table 1.

**Table 1. Socio-demographic details of study subjects.**

Variables		Frequency	Percentage
Age	24-47 months	35	23.65
	48-71 months	113	76.35
Sex	Boys	71	47.97
	Girls	77	52.03
Education of Father	Illiterate	88	59.46
	Literate	60	40.54
Education of Mother	Illiterate	117	79.05
	Literate	31	20.95
Socio economic status	Class 2-Class3	13	8.78
	Class4- Class5	135	91.2

### Prevalence of Malnutrition

In the present study prevalence of underweight (weight for age), stunting (height for age) and wasting (weight for height) were found to be 40.54%, 36.49% and 30.41% respectively. (Table 2)

**Table 2. Prevalence of Malnutrition.**

Type of Malnutrition	Frequency	Percentage
Underweight(weight for age)	60	40.54
Stunting(Height for age)	54	36.49
Wasting(weight for height)	45	30.41

According to mid upper arm circumferences, 37.16% of the children with mild malnutrition and 6.76% of the children with moderate malnutrition were seen.

### Association between various factors with underweight.

In the present study prevalence of underweight was more (45.13%) in 48-71 months age group children compared to 24-47 months age group children (25.71%) This shows that there is a association between underweight and age of the children. This association was statistically significant at  $p < 0.05$ . Prevalence of underweight was more in children with birth weight  $< 2.5$ kg, lack of exclusive breast feeding, breast feeding duration  $< 18$  months and absence of toilet facility and these shows statistically significant association with underweight at  $p < 0.05$ . (Table 3)

**Table 3. Association between various determinants and malnutrition.**

Determinants	Normal N(%)	Underweight N(%)	Total N(%)	Chi-square value	P value
<b>Age</b>	24-47 months	26(74.29)	9(25.71)	4.1803	0.04
	48-71 months	62(54.87)	51(45.13)		
<b>Birth weight</b>	<2.5kg	35(46.05)	41(53.95)	11.6489	0.0006
	≥2.5kg	53(73.61)	19(26.39)		
<b>Exclusive breast feeding</b>	yes	75(66.37)	38(33.63)	9.471	0.002
	no	13(37.14)	22(62.86)		
<b>Breast feeding duration</b>	<18 months	22(44.90)	27(55.10)	6.4435	0.011
	≥18 months	66(66.67)	33(33.33)		
<b>Toilet facility</b>	Present	20(76.92)	6(23.08)	3.9906	0.045
	Absent	68(55.74)	54(44.26)		

In our study prevalence of Underweight was more among girls, child with preterm delivery, on set of breast feeding more than 30 minutes, birth order >3 and presence of Indoor air pollution in house, but these factors not showed any statistically significant association with underweight.

### DISCUSSION

In the present study prevalence of underweight, stunting and wasting was found to be 40.54%, 36.49% and 30.41% respectively. High prevalence of malnutrition was seen in the studies done by ShailendraMeena 49%<sup>7</sup> and Mohammad Imran 47.3%.<sup>8</sup> Low prevalence of malnutrition was seen in the studies done by Vanita G Pinto Silva<sup>9</sup> where prevalence of underweight, wasting, and stunting in their study was found that 33.4%, 24%, and 31.5%, respectively. Study done by Elham Kavosi<sup>10</sup> showed prevalence of underweight, stunting, and wasting was 9.66, 9.53 and 8.19% respectively. The reason for high prevalence of malnutrition in our study may be due to low literacy status of the parents and low socio economic status study population.

In the present study Prevalence of malnutrition was high in the age group 48-71 months age group compared to 24-47 months age group children. Similarly study done by Mahammad Imran<sup>8</sup> showed lower prevalence of underweight in children with the age group 24 – 36 months compared to 36-48 months and 48-60 months age group children. High prevalence of underweight in 48-71 months age group children may be due to majority of the anganwadi children are belongs to this age group and these are the children who are vulnerable for many communicable infections.

In our study prevalence of underweight was more in children with birth weight less than 2.5kg compared to children with the birth weight equals or more than 2.5kg. Similarly study done by Mohan Anantrao Patil<sup>11</sup> showed that common cause for underweight in the

children is due to low birth weight(83%) compared to other causes.

In the present study underweight was more in the children with the lack of exclusive breast feeding compared to children with the exclusive breast feeding. Similarly study done by HS Aprameya<sup>12</sup> showed malnutrition is more in children with lack of exclusive breast feeding.

In this study mothers who discontinued breast feeding within 18 months have undernourished children compared to >/18 months breast fed children. Similarly study done by BaitunNahar showed discontinued breastfeeding shows increased prevalence of under nutrition.<sup>13</sup>

### CONCLUSION AND RECOMMENDATIONS

From the study we conclude that there is a high prevalence of malnutrition among the anganwadi children aged 48-71 months. Various factors like age of under five children, child with low birth weight, lack of exclusive breast feeding, breast feeding duration less than 18 months and poor sanitation shows increased risk for malnutrition.

An integrated approach like improving the literacy level of community, effective implementation of family planning services and health education on child feeding and rearing practices and personal hygiene should be made by the policy makers to reduce the malnutrition. Campaigns like information, education & communication (IEC) & behaviour change communication (BCC) strategy are to be conducted regularly about nutrition in vulnerable populations.

### ACKNOWLEDGMENT:

Authors are thankful to health inspectors Mr.Mallayya K and Mr Basavraj B for helping us during data collection. We sincerely thank to Anganwadi

teachers and parents for their cooperation and help during the study.

## REFERENCES

- 1) Park K. Preventive and social medicine. 24th ed. Jabalpur: M/s BanarsidasBhanot; 2017;676-78.
- 2) UNICEF-WHO-The World Bank joint child malnutrition estimates. Levels and trends in child malnutrition. New York: United Nations Children's Fund; 2012:1-14
- 3) International Institute for Population Sciences.National Family Health Survey-4. Mumbai.Ministry of Health and Family Welfare. 2015-2016:1-6.
- 4) Ghai OP. Essential paediatrics. 6<sup>th</sup> ed. Delhi: Dr O.P.Ghai;2006:101-107.
- 5) Subramanian M, SubrahmanyamG.Determinants of protein energy malnutrition among rural preschool children. Journal of Evolution of Medical and Dental Sciences 2013; 2(47):9157-62.
- 6) World Health Organisation. Measuring Change in Nutritional Status. Technical Report Series No 854. Geneva: World Health Organisation; 1983:1-100.
- 7) Meena S, Kaushal R, Saxena DM. Nutritional Status of children Un-der Five year of Age in Anganwadi Centres in Kolar area of Madhya Pradesh. Ntl J of Community Med 2015; 6(2):114-119.
- 8) Imran M, Sarwari KN and Jaleeli KA. A study on prevalence and determinants of protein energy malnutrition among 2 – 6 year anganwadi children in rural Bangalore.International Journal of Basic and Applied Medical Sciences. 2012; 2 (3):109-115.
- 9) Silva VG, Silva SG. Nutritional Status of Anganwadi Children under the Integrated Child Development Services Scheme in a Rural Area in Goa. Int J Sci Stud 2015;3(7):217-221.
- 10) Kavosi E, Rostami ZH, Kavosi Z, Nasihatkon A, Moghadami M, Heidari M. Prevalence and determinants of under-nutrition among children under six: a cross-sectional survey in Fars province, Iran. Int J Health Policy Manag. 2014;3(2):71–76.
- 11) Patil MA. Study of etiological determinants of under nutrition in undernourished children from Anganwadi. Int J ContempPediatr 2015;2:440-4.
- 12) Aprameya HS, Kamath SP, Kini PK, Baliga BS, Shenoy UV, Jain A, et al. Socioepidemiological determinants of severe acute malnutrition and effectiveness of nutritional rehabilitation center in its management. Int J Health Allied Sci 2015;4:148- 53.
- 13) NaharB, AhmedT, BrownKH, Hossain MI. Risk factors associated with severe underweight among young children reporting to a diarrhoea treatment facility in Bangladesh. Journal of Health Population and Nutrition.2010;28(5):476-483.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:**RajashreeKotabal, PralhadDasar, RekhaSonavane. Study On Prevalence And Determinants Of Malnutrition Among Anganwadi Children Of Nagavi Primary Health Centre Area, Gadag. Nat J Res Community Med 2018;7(1):32-35.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)



**Assessment of Sleep quality Index among Working and Non-working Women using Pittsburgh scale.**Sathvik Rai N<sup>1</sup>, Mayur S Sherkhane<sup>2\*</sup>**1 Postgraduate student, Department of Community Medicine & 2 Professor and Head of the Department, Department of Community Medicine, SDM College of Medical Sciences and Hospital, Dharwad, Karnataka.**

Date of Submission : 27-11-2017

Date of online Publication : 07-01-2018

Date of Acceptance : 03-01-2018

Date of Print Publication : 31-03-2018

**\*Author for correspondence:** Dr. Mayur S Sherkhane, Professor and Head of the Department, Department of Community Medicine, SDM College of Medical Sciences and Hospital, Sattur, Dharwad- 580009, Karnataka. E-mail: [drmayurss@gmail.com](mailto:drmayurss@gmail.com)

**Abstract**

**Introduction:** Sleep disturbance is a complex health problem causing significant negative effect on mental and physical health, leading to stress particularly among women because of their increased socio-familial roles. Sleep related disorders (SRDs) though frequent, are under-reported and their implications are often neglected. The disease burden and risk factors of poor sleep quality among women needs to be verified using a validated form of measurement in urban India. **Objectives:** To determine the quality of sleep among working and non-working women and to study the factors affecting it. **Materials and Methods:** A community based cross-sectional study conducted among urban women, both working and non-working aged 18 years and above. Data were collected by house-to-house survey using predesigned and pretested proforma and Pittsburgh Sleep Quality Index questionnaire (PSQI). Descriptive statistics and Chi-square test were used for analysis. **Results:** Majority, 38.5% women were in the age-group of 30-39 years, with 33.5% belonging to Class II socio-economic status, 87.5% were married, 36.5% had completed high school education. 60% women were sedentary workers, with 93% working between 4-8 hours. Poor sleep quality was seen in 71% working women as compared to 18% non-working women [ $p < 0.001$ , OR=11.15 (95% CI= 6.95 to 17.89)], with majority 97.75% of them having mild sleep disturbance. **Conclusions:** Prevalence of sleep-related problems was found to be higher among working women than non-working women. Socio-demographic factors like education, marital status, socio-economic status and working pattern had an impact on the sleep quality of both working and non-working women.

**Key-words:** PSQI, sleep, Urban, Working Women**INTRODUCTION**

Sleep is a vital element throughout the life of all mammals and its quality must be preserved,<sup>[1]</sup> as sleep is an essential part of the physiological process contributing to good health and well-being of the individual. Sleep disorder is a common and complicated health problem which contributes positively to health and welfare and these disorders are one of the major causes for morbidity, mortality as well as leading to decreased functional capacity and Quality of life (QOL).<sup>[2,3]</sup> Many populations from low income countries and developing countries are undergoing a rapid demographic and epidemiological transition leading to high burden of infectious diseases and emerging burden of Non-Communicable Diseases (NCDs). Thus this transition has led to an unrecognised public health issue related to sleep disorders in many developing countries leading to global 'sleeplessness epidemic' affecting 150 million people. Levels of sleep problems in Asia and Africa are approaching those seen in developed nations with 16.6%

population reporting insomnia and other severe sleep related disturbances. In India low levels of severe sleep problems are reported with 6.5% of women and 4.3% of men getting affected.<sup>[4]</sup>

Sleep quality represents a complex phenomenon that is difficult to define and measure objectively. It includes quantitative aspects of sleep such as duration, latency and more subjective aspects such as depth or restfulness of sleep.<sup>[5,6,7,8]</sup> Sleep disturbances affect day time functioning and general well-being of individuals, whereas well-being is associated with positive emotions, recall of more positive incidents, optimism and lower feelings of anxiety or depression. It is also reported and documented that good sleep quality is associated with well-being,<sup>[9,10]</sup> leading to increased efficiency and lesser morbidity.

In recent years the role and status of Indian women have been gradually changing as they are coming out of their traditional and stereotyped images, which is because of increasing female education and more liberty towards their

rights and privileges. Women in India today have more opportunities to pursue their higher education and more women have started taking up the jobs outside their homes which has led to their increased socio-familial roles. Indian women are bound with cultural norms and values, so they have to make adjustments with the family members.<sup>[11]</sup> which has led to stress and strain among working women in turn affecting their sleep.

Several work characteristics such as higher job demands, physical effort at work and night shift have been linked to increased sleep disturbance among women employees. Today with increasing female labour force participation, especially married women with children have exacerbated the complications for balancing work-life with household and childcare responsibilities, thus indirectly women are engaging in a greater share of domestic and child care responsibilities compared to men in both developed and developing countries. Lack of ability to balance work and home responsibilities may cause work-family conflict and has shown to affect health and health-related behaviours including sleep disturbances and its related complaints.<sup>[12]</sup>

Sleep-related disorders (SRDs) though frequent, are under-reported and their implications are often neglected.<sup>[13]</sup> These findings suggest a need for research on determining the factors related to poor sleep quality among women. Very few community-based studies have been conducted in India to understand this problem. Hence the present study was undertaken to assess the quality of sleep and factors affecting it among working and non-working women using Pittsburgh Sleep Quality Index (PSQI).

## MATERIALS AND METHODS

### Study design and setting:

This study was a community based, cross-sectional study, which was carried out for a period of 6 months, from June 2016 to November 2016. The study was conducted among working women and non-working women, in the field practice area of Urban Health Training Centre attached to a tertiary care hospital.

### Sampling method:

The overall (working and nonworking women) sample size calculated was 400, using the formula  $4pq/L^2$ , where p is the prevalence (50%), q = 1-p (50%) and L the permissible error, taken as 10%, the sample size worked out to be 400 at 5% alpha error. The total population of urban field practice area is 30,000. Considering average family size of five, there were 6000 families in the study area. To achieve the sample size calculated, every 10th family was considered and only one woman was considered from each family, as she was considered to be representative of the selected family.<sup>[14]</sup>

### Sampling procedure:

A house-to-house survey was carried out by the investigators, by doing systematic random sampling (every 10<sup>th</sup> house was considered), with the help of medico-social workers and anganwadi workers. The anganwadi workers helped in locating the house while the medico-social

workers aided in establishing a rapport with the study participants. Individual houses were selected separately for working and non-working women. Only one woman was considered from each house as she was considered representative of that family, and no other woman from the same family was considered to avoid duplication and bias.

### Inclusion and exclusion criteria:

Women aged 18 years and above, residing in the study area for more than 1 year, who consented to participate on a voluntary basis, were included in the study. Women not complying with the inclusion criteria were excluded.

### Certain definitions considered in our present study for study participants are mentioned below:

- **Working women:** Women who were paid wages for the work done by them.
- **Non-working women:** Women confined to their house, with no wages being paid for their services.

### Data collection:

Data was collected by interviewing all 400 women participants (200 working and 200 non-working) by conducting house-to-house survey using a pre-designed, pre-tested proforma and Pittsburgh Sleep Quality Index (PSQI) questionnaire.<sup>[5]</sup> Tested proforma included questions on the socio-demographic profile, their monthly income and their work status. The PSQI was used to assess quality of sleep during the past month and contained 19 self-rated questions from which seven component scores were calculated.<sup>[7,15,16]</sup> The component scores consist of subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Component scores were summed into a global score with higher scores representing worse sleep quality. The component scores range from 0 to 3 and global scores range from 0 to 21.<sup>[8,17]</sup> A global score of less than 5 was considered as normal and any score equal to or greater than 5 was indicative of poor sleep quality.<sup>[1,18]</sup>

Further, as per the need and requirement of our study, detailed assessment was done by grading the PSQI global score indicating disturbed sleep into mild (5-10), moderate (11-15) and severe (16-21). The PSQI questionnaire used for the study purpose was translated to vernacular language and validated by the investigators. After completion of this, based upon the assessment of proforma, health education regarding the importance of sleep and ill-effects associated with inadequate sleep was imparted to all the study participants. Education regarding lifestyle behaviour was also given to all the family members.

Data was collected after signing a written informed consent form on voluntary basis and confidentiality was assured. The study was approved and ethical clearance was obtained from Institutional Ethics Committee. Data were analysed using SPSS software version 20.0. Descriptive statistics and Chi-square test was applied to find an association between two attributes and P<0.05 was considered as statistically significant.

## RESULTS

A total of 400 women (200 working and 200 non-working) were included in the study.

**Table 1: Socio-demographic Characteristics of the Study Participants**

Socio-demographic characteristics	Working women (n = 200)		Non-working women (n = 200)		Total (n = 400)	
	No.	%	No.	%	No.	%
<b>Age (in years)</b>						
20-29	42	21	64	32	106	26.5
30-39	86	43	68	34	154	38.5
40-49	56	28	38	19	94	23.5
50-59	14	7	28	14	42	10.5
>60	2	1	2	1	4	1
<b>Educational status</b>						
Illiterate	6	3	16	8	22	5.5
Primary	30	15	48	24	78	19.5
High school	70	35	76	38	146	36.5
Secondary	24	12	42	21	66	16.5
Graduate	50	25	18	9	68	17
Postgraduate	20	10	0	0	20	5
<b>Marital Status</b>						
Married	168	84	182	91	350	87.5
Unmarried	26	13	6	3	32	8
Widow / Divorced / Separate	6	3	12	6	18	4.5
<b>Socio economic status*</b>						
Class 1	102	51	16	8	118	29.5
Class 2	44	22	90	45	134	33.5
Class 3	34	17	50	25	84	21
Class 4	18	9	38	19	56	14
Class 5	2	1	6	3	8	2

\*As per modified B. G. Prasad classification 2015.

Table. 1 describes the socio-demographic characteristics, where maximum 43% working and 34% non-working women were in the age group of 30-39 years. A maximum of 35% working and 38% non-working women had completed high school education, 84% working and 91% non-working women were married as well as 87% of working and 65% of non-working women belonged to nuclear family. 51% of working women belonged to class I socioeconomic status, whereas a maximum 45% of non-working women belonged to class II socio economic status (SES, Modified B. G. Prasad's Classification 2015 - India).

**Table 2: Working pattern of the Study Participants**

Working pattern	Working women (n = 200)		Non-Working women (n = 200)		Total (n = 400)	
	No.	%	No.	%	No.	%
<b>Type of work</b>						
Sedentary	92	46	148	74	240	60
Moderate	96	48	52	26	148	37
Heavy	12	6	0	0	12	3
<b>Working hours</b>						
< 4 hours	6	3	0	0	6	1.5
4 – 8 hours	172	86	200	100	372	93
> 8 hours	22	11	0	0	22	5.5
<b>Night shift</b>						
No	196	98	200	100	396	99
Yes	4	2	0	0	4	1

The working pattern of the study participants is presented in Table.2. A maximum of 48% of working women were doing moderate work and 74% of non-working women were sedentary workers. Among working women, a majority 86% worked for 4-8 hours per day and only 2% did night shifts.

**Table 3: Grading and Comparison of Quality of sleep using Pittsburgh Sleep Quality Index.**

Sleep Quality	Working women (n = 200)		Non-working women (n = 200)	
	No.	%	No.	%
Disturbed	142	71	36	18
Normal	58	29	164	82
$\chi^2 = 113.736, df = 1, p = <0.001, OR=11.15 (95\% CI= 6.95 \text{ to } 17.89)$				
Grading of Disturbed sleep	Working women (n = 142)		Non-working women (n = 36)	
	No.	%	No.	%
Mild (5-10)	142	100	32	88.89
Moderate (11-15)	0	0	4	11.11
Severe (16-21)	0	0	0	0

Table.3 shows comparison of PSQI grading of quality of sleep. 71% of working and 18% non-working women had disturbed sleep and this difference was statistically significant ( $\chi^2=113.736, df=1, P=<0.001$ ) with  $OR=11.15 (95\% CI = 6.95 \text{ to } 17.89)$ . This shows that working women are eleven times more at risk of having disturbed sleep than

non-working women. The disturbed sleep was further graded and it was found that almost all working women and 88.89% of non-working women with disturbed sleep had mild sleep disturbances.

**Table 4: Association between demographic characteristics and disturbed sleep among study participants**

Socio-demographic characteristics		Disturbed sleep				Chi-square (p value)
		Working women (n = 142)		Non-working women (n = 36)		
		No.	%	No.	%	
<b>Education status</b>	Illiterate	6	4.23	6	16.7	7.07
	Literate	136	95.77	30	83.3	-0.008
<b>Marital status</b>	Married	128	90.14	36	100	3.85
	Unmarried / Others	14	9.86	0	0	-0.049
<b>Socio economic status*</b>	Class I	80	56.34	4	11.1	
	Class II	28	19.72	14	38.9	24.03
	Class III	14	9.86	6	16.7	-0.001
	Class IV + V	20	14.08	12	33.3	

\*As per modified B. G. Prasad classification 2015.

Table.4 shows the association between demographic characteristics and disturbed sleep among study participants. A majority of 95.77% of working women and 83.33% of non-working women with disturbed sleep were literates, which was statistically significant (p=0.008). A majority of study participants with disturbed sleep were married. 56.34% of working women with disturbed sleep belonged to Class I socio economic group and 38.89% of non-working women with disturbed sleep belonged to Class II socio economic group (as per modified B. G. Prasad classification 2015).

**Table 5: Association between working pattern and disturbed sleep among study participants**

Working pattern		Disturbed sleep				Chi-square (p value)
		Working women (n = 142)		Non-working women (n = 36)		
		No.	%	No.	%	
<b>Type of work</b>	Sedentary	61	42.96	26	72.2	
	Moderate	71	50	10	27.8	10.68
	Heavy	10	7.04	0	0	-0.005
	< 4 hours	6	4.23	0	0	
<b>Working hours</b>	4-8 hours	124	87.32	36	100	5.08
	>8 hours	12	8.45	0	0	-0.079
<b>Night shift</b>	Yes	2	1.41	0	0	0.51
	No	140	98.59	36	100	-0.473

Table.5 shows the association between working pattern and disturbed sleep among study participants. 50% of working women with disturbed sleep were moderate workers, whereas 72.22% of non-working women with disturbed sleep were sedentary workers. A majority of both working women (87.32%) and non-working women (100%), worked for 4-8 hours per day and only 1.14% working women with disturbed sleep were having night shift duties.

## DISCUSSION

The present study was aimed at assessing the quality of sleep among working women and non-working women and its relation to their socio-demographic factors. In our study, 71% of working women and 18% of non-working women had poor sleep quality. Overall, non-working women had better sleep quality than working women, which could be attributed to factors like education, marital status, socio-economic status and working pattern as well as their nature of work.

In our study, majority 38.5% women were in the age group of 30-39 years, 93% worked for 4-8 hours per day, 36.5% of women had completed high school education and 44.5% women had poor sleep as compared to a study done in Vadu,<sup>[4]</sup> where 84.6% had only finished primary education and only 6.5% women had poor sleep. The difference may be due to the fact that, Vadu being rural area, had lower education standards as compared to our study and the difference in sleep quality may be attributed to the fact that, the better educational standards of urban women, increases their job prospect, which in turn affects their general well-being and quality of sleep.

In another study done in South India by Samhita, et al.,<sup>[13]</sup> where the mean age was 35.14 ± 8.73 years, average daily work hours were 7.8±1.33 hours, 23.1% had secondary education and only 6.2% of study participants had poor sleep quality. A majority, 41.4% of study participants in South Indian study were rural residents as compared to our study, where all women were urban residents. This again shows that the quality of sleep indirectly depends upon the educational status and place of residence of the individual.

The present study showed that a majority 47.19% of women with disturbed sleep belonged to class I SES, which suggests that sleep quality declined with increasing income. This was in contrast to a study conducted in Germany by Anders MP, et al.,<sup>[20]</sup> and a study conducted in America by Mezick EJ, et al.,<sup>[21]</sup> where individuals with high or medium SES had a greater probability of good sleep quality than individuals from low SES. Our study finding may be attributed to the fact that, high socio economic status may be due to better educational standards, highly skilled and more demanding jobs, which in turn may increase work related stress because of no restrictions to number of working hours as per stipulated labour laws indirectly affecting quality of sleep and health.

Our study showed that a majority, 43% of working women were in the age group 30-39 years, 84% were married, 35%

were educated upto high school and 50% of working women did moderate level of physical activity as compared to a study done in Malaysia by Aazami S, et al.,<sup>[12]</sup> where a majority 37.8% were in the age group 30-39 years, all the study participants were married, 65.5% had completed graduation and 66.2% of working women did sedentary work. Our study showed that 44.5% women, had disturbed sleep which was similar to a study done in China by Luo J, et al.,<sup>[6]</sup> where 45.8% women reported poor sleep quality.

In our study, majority 87.5% women were married and among them 92.13% had disturbed sleep, which was higher when compared to that of single women. A similar picture was seen in a study conducted in Iran by Asghari A, et al.,<sup>[19]</sup> where the mean global PSQI score was independently higher among married ( $5.38 \pm 3.43$ ), as compared to single subjects and the difference was statistically significant ( $p = 0.04$ ). This may be because of increased domestic and childcare responsibilities of married women and due to high level of work-family conflict in case of married working women.

In our study, majority 95.77% working women and 83.33% non-working women with disturbed sleep were literates and this difference was statistically significant ( $p = 0.008$ ). This shows that quality of sleep depends on the educational status, with higher level of education resulting in worse sleep quality. Our study showed that among working women with disturbed sleep, 90.14% were married and 56.34% belonged to class I SES and among non-working women with disturbed sleep, all were married and 38.89% belonged to class II SES. Disturbed sleep was more among married women because of domestic responsibilities and since working women were more economically stable and independent, they could afford domestic help for their daily household activities. Therefore disturbed sleep was less prevalent among married working women as compared to married non-working women.

In present study majority, 89.99% women with disturbed sleep worked for 4-8 hours per day, which suggests that quality of sleep worsens with increase in number of working hours.

## CONCLUSION

The present study findings, suggest that the prevalence of sleep-related problems is higher among working women than non-working women and is linked with socio-demographic factors like education, marital status, socio-economic status and working pattern. Sleep related disorders are widely prevalent in India and considering its health implications and poor awareness, there is a need to sensitize and increase awareness among the women population and their counter parts. These results also emphasize the importance of screening at work place. Strategies need to be shaped in such a way so as to promote measures to improve quality of sleep and to incorporate positive psychology interventions for enhancing and maintaining well-being of working women population.

## ACKNOWLEDGEMENT

We thank all the study participants who gave voluntary consent and participated in the study.

## REFERENCES

1. Neves GSML, Noe RA, Gomes MM. Sleep quality and quality of life in patients with epilepsy in a public teaching hospital in Rio de Janeiro, Brazil. *Rev Bras Neurol* 2015;51(2):53-8.
2. Zamanian Z, Nikeghbal K, Khajehnasiri F. Influence of Sleep on Quality of Life among Hospital Nurses. *ElecPhy* 2016;8(1):1811-6.
3. Sun W, Yu Y, Yuan J, Li C, Liu T, Lin D, et al. Sleep Duration and Quality among Different Occupations - China National Study. *PLoS ONE* 2015;10(3):e0117700.
4. Stranges S, Tigbe W, Olive FXG, Thorogood M, Kandala NB. Sleep Problems: An Emerging Global Epidemic? Findings from the INDEPTH WHO-SAGE Study among more than 40,000 Older Adults from 8 Countries across Africa and Asia. *Sleep* 2012;35(8):1173-81.
5. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research. *Psy Res* 1989;28:193-213.
6. Luo J, Zhu G, Zhao Q, Guo Q, Meng H, Hong Z, et al. Prevalence and risk factors of poor sleep quality among Chinese elderly in an urban community: results from the Shanghai aging study. *PLoS One* 2013;8:e81261.
7. Mollayeva T, Thurairajah P, Burton K, Mollayeva S, Shapiro CM, Colantonio A. The Pittsburgh sleep quality index as a screening tool for sleep dysfunction in clinical and non-clinical samples: A systematic review and meta-analysis. *Sleep Med Rev* 2016;25:52-73.
8. Lo CMH, Lee PH. Prevalence and impacts of poor sleep on quality of life and associated factors of good sleepers in a sample of older Chinese adults. *Health Qual Life Out* 2012;10(1):72-9.
9. Shubha D, Titiksha C, Amitabh D, Krishna KS. Sleep Quality and its Relationship to General well-being in Ageing Adults. *Int Res J Social Sci* 2015;4(6):64-7.
10. Fredman L, Gordon SA, Heeren T, Stuver SO. Positive Affect is Associated with Fewer Sleep Problems in Older Caregivers but not Noncaregivers. *The Gerontologist* 2014;54(4):559-69.
11. Mankani RV, Yenagi GV. Comparative study of mental health of working and non-working women. *Karnataka J. Agric. Sci* 2012;25(4):510-13.
12. Aazami S, Mozafari M, Shamsuddin K, Akmal S. Work family conflict and sleep disturbance: the Malaysian working women study. *Industrial Health* 2016;54:50-7.

13. Panda S, Taly AB, Sinha S, Gururaj G, Girish N, Nagaraja D. Sleep related disorders among a healthy population in South India. *Neurology India* 2012;60(1):68-74.
14. Mahajan BK. Sampling. In: Mahajan BK, editor. *Methods in Biostatistics*. 7th ed. New Delhi, Pa: Jaypee Brothers Medical Publishers (P) Ltd; 2010. p. 84-5.
15. Manzar MD, Moiz JA, Zannat W, Spence DW, Perumal SRP, BaHammam AS, et al. Validity of the Pittsburgh Sleep Quality Index in Indian University Students. *Oman Med J* 2015;30(3):193-202.
16. Bower B, Bylsma LM, Morris BH, Rottenberg J. Poor reported sleep quality predicts low positive affect in daily life among healthy and mood-disordered persons. *J Sleep Res* 2010;19:323-32.
17. Knutson KL, Rathouz PJ, Yan LL, Liu K, Lauderdale DS. Stability of the Pittsburgh Sleep Quality Index and the Epworth Sleepiness Questionnaires Over 1 Year in Early Middle-Aged Adults: The CARDIA Study. *Sleep* 2006;29(11):1503-6.
18. Burkhalter H, Sereika SM, Engberg S, Justice AW, Steiger J, Geest SD. Structure validity of the Pittsburgh Sleep Quality Index in renal transplant recipients: A confirmatory factor analysis. *Sleep Biol Rhythms* 2010;8:274–81.
19. Asghari A, Farhadi M, Kamrava SK, Ghalehbaghi B, Nojomi M. Subjective Sleep Quality in Urban Population. *Archives of Iranian Medicine* 2012;15(2):95-8.
20. Anders MP, Breckenkamp J, Blettner M, Schlehofer B, Beckhoff GB. Association between socioeconomic factors and sleep quality in an urban population-based sample in Germany. *Eur J Pub Health* 2013;24(6):968-73.
21. Mezick EJ, Matthews KA, Hall M, Strollo PJ, Buysse DJ, Kamarck TW, et al. Influence of race and socioeconomic status on sleep. Pittsburgh sleep SCORE project. *Psychosom Med* 2008;70:410-16.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Sathvik Rai N, Mayur S Sherkhane. Assessment of Sleep quality Index among Working and Non-working Women using Pittsburgh scale. *Nat J Res Community Med* 2018;7(1):36-41.

© **Community Medicine Faculties Association**

**NJRCM:** [www.commedjournal.in](http://www.commedjournal.in)



## A Cross-Sectional Study on Bone Density in Adults from an Urban Area of South India

Priyadarshini Chidambaram<sup>1</sup>, V. V. Anantharaman<sup>2\*</sup>

<sup>1</sup> Assistant Professor, MS Ramaiah Medical College, Bengaluru, <sup>2</sup> Associate Professor, Department of Community Medicine, SRM Medical College Hospital and Research Centre, Kattankulathur

Date of Submission : 04-01-2018

Date of online Publication : 07-02-2018

Date of Acceptance : 30-01-2018

Date of Print Publication : 31-03-2018

\***Author for correspondence:** Dr. V. V. Anantharaman, Associate Professor, Department of Community Medicine, SRM Medical College Hospital and Research Centre, Kattankulathur, Chennai. E-mail: [cpdarshini@yahoo.com](mailto:cpdarshini@yahoo.com)

### Abstract

**Introduction:** Osteopenia and osteoporosis which refers to mild and severe bone density loss, together comprise Low Bone Density (LBD). Low bone density affects an estimated 200 million women globally but there are no estimates on the male population suffering from low bone density. In India, an estimated 36 million suffered from osteoporosis in 2013. The fractures that occur as a consequence burdens the individual and the public health system. **Objective:** The study aimed to estimate the prevalence of low bone density among individuals 18 years and above in an urban area of Chennai City in 2013. **Methodology:** A community based cross-sectional study was conducted among 405 individuals, 18 years and above in Nanganallur area of Chennai city. Bone density was measured using a portable quantitative ultrasound machine. **Results:** The study subjects comprised of 33.8% males and the rest were females. Osteopenia was seen among 40% (95% CI: 35.21% - 44.79%) of the population and 13.3% (95% CI: 10.01% - 16.66%) had osteoporosis. An increasing trend of low bone density was seen as age increased. Both males and females showed low bone density prevalence of 51.8% & 54.1%, respectively. **Conclusion:** The presence of LBD was high even among the younger population and was not an exclusive problem of the elderly. Measures to promote bone health and prevent loss of bone density must be instituted early among both males and females.

**Key-words:** Low bone density, osteopenia, osteoporosis

### INTRODUCTION

Bone density refers to the amount of minerals in bone tissue. These minerals are continuously resorbed and deposited in a process of bone remodeling. When the balance is disturbed, it results in low bone density. Low bone density (LBD) comprises of a spectrum in which osteopenia refers to mild bone loss and osteoporosis refers to severe bone loss based on T-score measurements. The result of low bone density is increased bone fragility and increased risk of fracture(1). Osteoporosis is considered a “silent disease” and a “silent global epidemic”. It is called a silent disease as bone density is gradually lost over time without manifesting any signs or symptoms, until a bone densitometry test reveals bone loss, or a fracture occurs with minor trauma. It is a silent epidemic as the disease has been rising in proportions without being recognized as a national and public health priority by the medical fraternity, and without awareness among the general population(2).

International Osteoporosis Foundation (IOF) estimates that worldwide, 200 million people are affected by osteoporosis. An IOF audit in India estimated that osteoporosis affected 36 million in the country in 2013(3). Though, low bone density is established as a disease of older age groups and women, in India, younger people and more men are affected

compared to the West(4). The burden of disease is shown to be 51.6% among adults of all ages to 88.8% among postmenopausal women(5,6).

The main complication of low bone density is the occurrence of fractures that affect various bones of the body especially in the elderly. The incidence of fractures is alarmingly high and is predicted to rise with increase in the elderly population. Globally, osteoporotic fractures occur one in every three seconds. Over 50 years of age, one in two women and one in five men suffer a fracture in their lifetime(7). For the people treated at a public hospital in India for a hip fracture, the direct cost borne by the patient for hospital treatment is approximately 10,000 rupees and for those treated at a private hospital, the costs maybe up to rupees 2 lakhs. The public health system pays for the remaining costs incurred by the individual towards treatment in a government setting. This is in addition to the burden of lost wages and diminished quality of life of the affected individual and also an extra burden to care for the patient by the other family members(3).

Low bone density has both modifiable and non-modifiable risk factors. Age, gender, race and family history are some of the non-modifiable risk factors and calcium deficient diet, insufficient exercise, caffeine intake, smoking, alcohol

consumption and Vitamin D deficiency are some of the modifiable risk factors (8–10). Instituting simple measures against the known modifiable risk factors can help address the burden of low bone density and its consequent fractures. This in turn will help tackle the huge socio-economic burden on the public health system and on the affected individuals even in developed countries and more so in a country like India. The high prevalence of insidious low bone density, vulnerability of the Indian population that is younger, presence of modifiable risk factors and lack of community level studies are essential reasons to study low bone density. The current study has therefore been carried out to estimate the prevalence of low bone density among adults in an urban area of Chennai, Tamil Nadu.

### METHODOLOGY

This study was a community based cross-sectional study conducted in Nanganallur, an urban area in Chennai, Tamil Nadu. The number of residents above the age of 18 years was around 42,100. The study was carried out between July 2012 and March 2013. The study population comprised of all adults, i.e., males and females aged 18 years and above in the study area. All adults, males and females of age 18 years and above at Nanganallur who were permanent residents of the area and willing to participate were included as part of the study. Those who were bed-ridden were excluded as they needed to be mobilized for having their heel bone density measured by the quantitative ultrasound machine.

Due to the lack of published literature on previous community based studies done among individuals of this age group, the sample size was calculated by doing a pilot study. Based on results from the pilot study, prevalence of low bone density was 50% in the community. Minimum sample size calculated for cluster sampling at 95% of C.I.,  $d = 7$  (allowable error, 14% of 50%) and design effect = 2, worked out to be 392.

Study subjects were picked by a two stage sampling method. The first stage employed a cluster sampling technique followed by the simple random sampling within each cluster. The sampling frame was derived from the electoral list. There were 278 clusters/streets in the area. Fifteen individuals were selected randomly from each cluster, making 27 clusters necessary to be randomly selected and the final sample size was 405 individuals. In the absence of the individual selected by simple random sampling even after 2 visits, the next person on the list was included to be part of the study.

Approval of the Institutional Ethics Committee was obtained to conduct the study. After obtaining written informed consent, a predesigned and pretested questionnaire was administered to collect socio-demographic particulars of the individuals and their family and their risk factors for low bone density. The questionnaire was translated into the local language and again back translated to English and was administered in the local language at the homes of the participants. Anthropometry and bone density were measured by asking

the participants to come to a house in the same street where the machine was placed. Height was measured using a portable stadiometer to the nearest 0.5cm and weight was measured using a portable weighing scale (Belita®) to the nearest 0.5kg validated with known weights. The heel bone densities of individuals were measured using a calibrated Quantitative Ultrasound machine (QUS) (Achilles®). The investigator was trained in the use and calibration of QUS and interpretation of the T-score. The foot of the participants was positioned such that the heel was placed exactly between the membranes and the T-score obtained from the machine was used for diagnosis of osteoporosis and osteopenia using WHO criteria (Table 1). The T score value gives the amount of bone a person has compared to a 30 year old adult of the same gender with peak bone mass.

**Table 1. WHO Definitions of bone density Based on T-score (12)**

Definition	T-Score
Normal	T-score $\geq -1$
Osteopenia	T-score between $-1$ and $-2.5$
Osteoporosis	T-score $\leq -2.5$
Severe Osteoporosis	T-score $\leq -2.5$ with fragility fracture(s)

### Statistical analysis

The data was entered into a MS excel sheet and analysis was done using SPSS v18. The quantitative parameters such as age was expressed as mean and standard deviation. Bone mineral density was expressed with T-score & classification was done as per WHO guidelines. All categorical variables were expressed as percentages. Prevalence of low bone density was estimated along with 95% CI. Association between low bone density and other categorical variables were tested for statistical significance by Chi-square/ Fisher's exact tests. To evaluate the quantitative relationship & prediction, Pearson's correlation and regression coefficients were computed. P-value of 0.05 was considered for statistical significance.

### RESULTS

The study was conducted among 405 individuals consisting of 137 males (33.8%) and 268 females (66.2%) of Nanganallur.

The mean age of the male participants was 45.2 (14.1) years and of female participants was 40.23 (12.7) years, respectively. The age varied from 18 years to 83 years. Females and males constituted 66.2% and 33.8% of the participants, respectively. The prevalence of low bone density i.e. osteopenia and osteoporosis combined was 53.3% (95% Confidence interval – 48.45% - 58.21%). Osteopenia and osteoporosis contributed 40% (95% CI 35.21% - 44.79%) and 13.3% (95% CI 10.01% - 16.66%) of this, respectively (Figure 1).

With increasing age, an increase of osteoporosis and a reduction of normal bone density was seen (Table 3). There

**Table 2: Age & sex- wise distribution of subjects based on Bone Density**

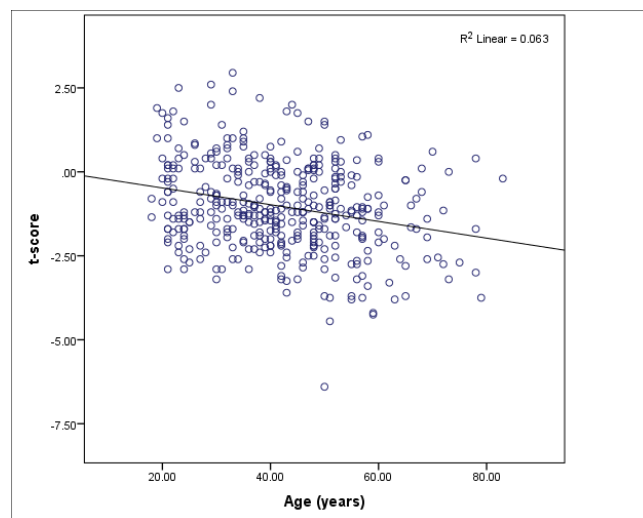
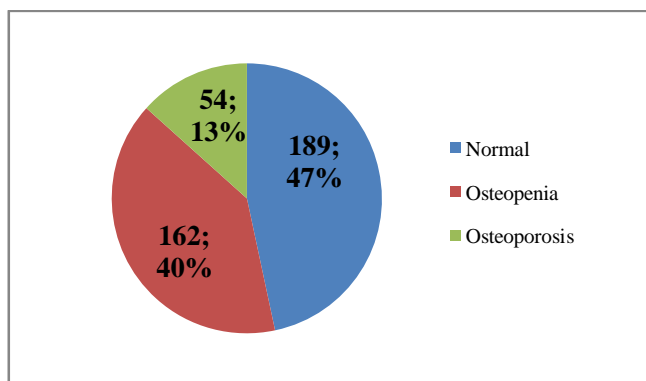
Variable	Normal Bone Density n (%)	Osteopenia n (%)	Osteoporosis n (%)	Total	P value	
Age Groups (in years)	18-29	52 (56.5)	33 (35.9)	7 (7.6)	92	<0.001
	30-44	72 (47.7)	68 (45)	11 (7.3)		
	45-59	54 (41.2)	53 (40.5)	24 (18.3)		
	≥ 60	11 (35.5)	8 (25.8)	12 (38.7)		
Sex	Males	66 (48.2)	51 (37.2)	20 (14.6)	137	0.688
	Females	123 (45.9)	111 (41.4)	34 (12.7)		
Total	189 (46.7)	162 (40)	54 (13.3)	405		

Table 3. Combined age and sex-wise distribution of subjects based on bone density

Variable	Males			Females			
	Normal Bone Density n (%)	Low Bone Density n (%)	Total	Normal Bone Density n (%)	Low Bone Density n (%)	Total	
Age Groups (in years)	18-29	17 (80.9)	4 (19.1)	21	35 (49.3)	36 (50.7)	71
	30-44	21 (39.6)	32 (60.4)	53	51 (52.0)	47 (48)	98
	45-59	20 (43.5)	26 (56.5)	46	34 (40)	51 (60)	85
	≥ 60	8 (47)	9 (53)	17	3 (21.4)	11 (78.6)	14
Total	66	71	137	123	145	268	
	Pearson chi square, P value - 0.012			Pearson chi square, P value -0.094			
	Trend chi square, P value - 0.073			Trend chi square, P value - 0.046			

was a negative correlation between age and the T score and this was seen to be statistically significant ( $r = -0.250$ ,  $p < 0.001$ ) (Figure 2). Females (54.1%) had higher prevalence of low bone density than males (51.8%). The association between sex of the individual and presence of low bone density was not statistically significant ( $p = 0.688$ ) (Table 2).

Figure 1: Prevalence of Osteopenia and Osteoporosis among all participants



When age wise prevalence of low bone density was seen among males and females separately, it was noted that there was significant difference between the groups of males ( $p = 0.012$ ) but not among the females ( $p = 0.094$ ). The linear association as seen by trend chi-square showed a significant trend of low bone density among the females ( $p = 0.046$ ) but not among the males ( $p = 0.073$ ) (Table 4).

### DISCUSSION

The current study was a community based study conducted to estimate the prevalence of low bone density, i.e.

Figure 2: Scatter Plot – Age versus T score

osteopenia and osteoporosis among the individuals aged 18 years and above in an urban area of Chennai, Tamil Nadu.

### Prevalence of Low Bone Density

The prevalence of low bone density in the study population was 53.3% with 40% of osteopenia and 13.3% of osteoporosis. A study by Babu et al in north Kerala showed the prevalence of low bone density to be 82.7% with 40.5% of osteopenia and 42.2% of osteoporosis(13). The high prevalence noted in the latter study could be due to the camp based approach that was used and the higher mean age ( $52 \pm 12.8$  years) of the participants compared to the current study ( $41.9 \pm 13.4$  years). A study conducted at Loni among the health care professionals between the ages of 21 – 61 years noted a prevalence of 31.06% of osteopenia and 28.03% of osteoporosis(14). The higher proportion of low bone density in the study by Loni could be due to the selective study of health care professionals in a hospital.

### Age and low bone density

The current study showed a decline in the bone density as age increased. There was an increase in the proportion of people with osteoporosis with increasing age and a significant association between age and low bone density was noted ( $p < 0.001$ ). The T scores also showed a significant negative correlation ( $r = -0.250$ ,  $n = 405$ ,  $p = 0.000$ ) with age (Figure 2) as seen in other studies(15,16).

Though we see an increasing gradient of low bone density with age, the risk factors that lead to low bone density are laid down at a much earlier age. There are both modifiable and non-modifiable risk factors which lead to this. Preventive measures against the modifiable risk factors must begin in early adulthood so as to enable each individual to attain optimal bone density and prevent decline in bone density at an earlier age.

### Sex and low bone density

The current study showed an increased prevalence of low bone density among the females (54.1%) compared to the males (51.8%) but the proportion of osteoporosis was more among the males (14.6%) compared to the females (12.7%) (Table 3). This could have been due to the higher mean age of the male participants than the females. No significant association was seen in the prevalence of low bone density between both the sexes ( $p = 0.688$ ). In a hospital study conducted among males with no other co-morbidities, osteoporosis and osteopenia was seen to affect 8.5% and 42%, respectively(17). In a study by Prasad, it was reported that 49% of the males 71% of the females had low bone density (14). In Pande's study 24.3% of the men and 29.9% of the women had low bone mass (18). The current study had employed QUS as a screening tool for low bone density whereas the latter had employed radiogammametry which maybe the reason for the difference seen from the current study.

The current study found consistent association between low bone density and age, however not with the sexes as reported by other studies (15,16,18,19). This showed how men were also demonstrating a high prevalence of low bone density nearly as much as women. The age group wise

analysis of low bone density among males demonstrates that a high proportion of men have lower bone density established even at an earlier age and this continues equally into older age. For women, however, there is a high proportion who never reach optimal bone density and increasing number of women in older age groups keep losing bone density. This emphasizes that prevention of risk factors for low bone density has to start at an early age even among males and equal focus should be present on both men and women without assuming that low bone density is a problem solely of females.

Following the T-score measurement in this study, if osteopenia was detected the participants were counselled about life style modifications on calcium rich diet and an active lifestyle. If osteoporosis was identified, in addition to advice on life style modifications, the participants were advised further DEXA testing which would confirm diagnosis and help start pharmacologic treatment. This would help mitigating further risk of fractures.

### CONCLUSION

The study carries huge significance, for the public health threat and huge socio economic problem that osteoporosis and its consequent fractures carry. The magnitude of low bone density seen in the population is alarming. Simple preventive measures in diet and other lifestyle may be instituted at a young age among both men and women for healthy bones at a later age and a sound backbone for the country's economy in the future.

The limitation in this study is that the QUS technique had been used, though, DEXA is the gold standard technique. However, correlation between measurements by both is as much as 80-90% (20,21). QUS has a high sensitivity of 96%, though the specificity of QUS is only 55%. The negative predictive value of QUS is as high as 90% (22). Additionally, QUS offered the advantages of cost-effectiveness in a community setting, portability, absence of radiation and served as an effective screening tool, though, it may have led to some misclassifications due to low specificity (23).

However, the use of comprehensive electoral list of the study population for selection of subjects, use of standardized instruments and methodology, training of the investigator in the use of the device and interpretation of results, and very low non-response rates contributed to control selection and measurement biases that may occur in the study. The results of this study has limited generalizability confined to the adults of the population studied but similar studies among communities could help bring out the magnitude of the disease and help institute simple measures needed to prevent onset of risk factors.

### Acknowledgement

The author is grateful to Prof. Dr. N. S. Murthy, Professor and Research Coordinator, MS Ramaiah Medical College and Ex. Emeritus Medical Scientist, ICMR for his valuable guidance in analysis and drafting of the article.

REFERENCES

1. NIH. Osteoporosis Prevention, Diagnosis, and Therapy. NIH Consensus Statement. 2000;17(1):1–45.
2. IOF Committee of Scientific Advisors. "Invest in Your Bones: Quality of Life – Why prevent the first fracture. International Osteoporosis Foundation. 2003.
3. International Osteoporosis Foundation. The Asian Audit Epidemiology , costs and burden of osteoporosis in Asia. 2009.
4. Malhotra N, Mithal A. Osteoporosis in Indians. Indian J Med Res. 2008;127(3):263–8.
5. Almeida DVR, Shetty MB, Adiga KR, Latheesh L, Nazareth EL. Prevalence of Osteoporosis in Younger Population - An Indian Perspective. Int J Recent Trends Sci Technol. 2013;8(2):119–21.
6. Thokchom S, Chhugani M. A Study to Find out the Prevalence for Osteoporosis and Osteopenia in Pre and Post Menopausal Women in India : A Cross Sectional Study. Int J Sci Res.2015;4(10):270-3.
7. International Osteoporosis Foundation. The Latin American Regional Audit Epidemiology, costs & burden of osteoporosis in 2012. 2012.
8. Korkor AB, Eastwood D, Bretzmann C. Effects of Gender , Alcohol , Smoking , and Dairy Consumption on Bone Mass in Wisconsin Adolescents. Wis Med J. 2009;108(4): 181-8.
9. Stránský M, Ryšavá L. Nutrition as Prevention and Treatment of Osteoporosis. Physiol Res [Internet]. 2009;58:7–11. Available from: [www.biomed.cas.cz/physiolres](http://www.biomed.cas.cz/physiolres)
10. Tsuang Y-H, Sun J-S, Chen L-T, Sun SC-K, Chen S-C. Direct effects of caffeine on osteoblastic cells metabolism: the possible causal effect of caffeine on the formation of osteoporosis. J Orthop Surg Res. 2006;1:7.
11. Kumar N, Gupta N, Kishore J. Kuppaswamy ' s Socioeconomic Scale : Updating Income Ranges for the Year 2012. Indian J Public Health. 2012;56(1):103–4.
12. WHO Technical Report Series 843. WHO Study Group on Assessment of Fracture Risk and its Application to Screening for Postmenopausal Osteoporosis. 1994.
13. Babu AS, Ikbal FM, Noone, Sukumari M, Joseph AN, Samuel P. Letters to Editor Osteoporosis and Osteopenia in India : A Few More Observations. 2009;63(2):76–7.
14. Prasad D V, Pathak R S, Piyush K, Aarif M M Syed, Peeyuusha D. The prevalence of osteoporosis and associated health care use. Pravara Med Rev. 2010;2(3):24–8.
15. Elizabeth J, Dayananda G, Satyavati K, PrasannaKumar. Bone Mineral Density in Healthy South Indian Men. J Pharm Bioallied Sci. 2009;22:41–3.
16. Stevenson JC, Lees B, Devenport M, Cust MP, Ganger KF. Determinants of bone density in normal women: risk factors for future osteoporosis? BMJ. 1989;298(6678):924–8.
17. Agrawal NK, Sharma B. Prevalence of osteoporosis in otherwise healthy Indian males aged 50 years and above. Arch Osteoporos. 2013;8(116).
18. Pande KC. Prevalence of low bone mass in healthy Indian population. J Indian Med Assoc. 2002;100(10) 598–600,602.
19. Pietschmann P, Rauner M, Sipos W, Kerschanschindl K. Osteoporosis: An age-related and gender-specific disease - A mini-review. Gerontology. 2009;55(1):3–12.
20. Krieg M, Barkmann R, Gonnelli S, Stewart A, Bauer DC, Rio D, et al. Quantitative Ultrasound in the Management of Osteoporosis : The 2007 ISCD Official Positions. 2008;11(1).
21. Anna Maria Vincenza Amicosante, Bernardini F, Cavallo A, Cerbo M, Jefferson T, Scalzo A Lo, et al. Agenas HTA Report – Technologies for the identification of osteoporosis. 2009.
22. Boonen S, Nijs J, Borghs H, Peeters H, Vanderschueren D, Luyten FP. Identifying postmenopausal women with osteoporosis by calcaneal ultrasound , metacarpal digital X-ray radiogrammetry and phalangeal radiographic absorptiometry : a comparative study. Osteoporos Int. 2005;16(1):93-100. doi10.1007/s00198-004-1660-z
23. Agrawal V, Gupta D. Recent Update on Osteoporosis. Int J Med Sci Public Heal. 2013;2(2):164–8.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Priyadarshini Chidambaram, V. V. Anantharaman. A Cross-Sectional Study on Bone Density in Adults from an Urban Area of South India. Nat J Res Community Med 2018;7(1):41-46.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

**A Study On Assessing The Knowledge, Attitude & Practice Among The Victims Of Animal Bites In Trichy, Tamilnadu.****Shankar.S,<sup>1</sup>, Raghuram.V<sup>2\*</sup>, M.Krishnakumar<sup>3</sup>, Elango.S<sup>4</sup>****1.Assistant Professor, Department of Community Medicine,2. Professor, Department of Community Medicine, 3. Intern, Department of Community Medicine, & Professor & HOD, Department of Community Medicine, CMCH&RC, Trichy, Tamil Nadu****Date of Submission : 03-01-2018****Date of online Publication : 07-02-2018****Date of Acceptance : 30-01-2018****Date of Print Publication : 31-03-2018****\*Author for correspondence:** Dr. Raghuram.V, Professor, Department of Community Medicine, Chennai medical college hospital and research centre (CMCH&RC), Trichy, Tamil Nadu. E-mail: raghu3873@gmail.com**Abstract**

**Background:** Rabies is highly prevalent in India contributing to 36% of world's rabies death. The main constraint for prevalence is poor knowledge among people regarding rabies. This highlights the need for creating awareness among public regarding Rabies. **Methodology:** A community based cross sectional study was carried out from June to November 2016 among 254 participants at three primary health centres at Trichy district in Tamil Nadu. All dog bite victims who are willing in the study are included. Guardian or parents are included in the place of children because children are not aware, moreover parents or guardians play a role in developing the knowledge of children. Pre-tested and semi-structured questionnaire was used for the study. The data from the questionnaires were entered and analysed in SPSS 15.0 Trial version. **Results:** The majority of the respondents (71%) had previously know about rabies, among them only 69% of victims are aware of its dangerousness. 55% of illiterate victims do not know about rabies. About 33% of victims have not received any first aid and 21 % of victims disagree with first aid; only 58% of victims have attended the health centres immediately after animal bite. About 7.5 % of victims have attended health centres after 2 weeks of animal bite & 29% of victims are not aware of vaccinating the animals. Only about 20% of victims having pets are not aware of vaccination of their animals. 26% of victims still believe that native medication will cure rabies. All the study participants were vaccinated during the study period in the health centre. **Conclusion:** The knowledge gap of rabies can be further improved by operating programmes to promote control of rabies in collaboration with different sectors of service.

**Key-words:** Animal bite, Vaccine, Rabies, Management, India.**INTRODUCTION**

Animal bite and rabies are highly endemic in India and has highest number of death burden worldwide contributing 36% of the total.<sup>1</sup> Estimates indicate that every year more than 50,000 people worldwide die from this disease and two persons die every hour due to rabies globally in spite of which ,rabies is classified as neglected tropical disease.<sup>2-4</sup> However, it is estimated that number of deaths due to rabies are 10 times more than those reported.<sup>5</sup> Rabies which is an acute fatal viral encephalitis with enzootic and epizootic disease of worldwide importance<sup>3</sup>, is caused by an RNA virus belonging to the Lyssavirus genus due to close contact with infected saliva via dogs, cats and monkeys, ranks number ten among all infectious disease worldwide and is almost 100% fatal once clinical signs develop.<sup>1,6-8</sup> But Rabies is preventable to a large extent by appropriate wound care and vaccination with modern

cell culture anti-rabies vaccine by intradermal route which is safe, efficacious, feasible and is cost effective.<sup>6,9</sup> The psychological impact of the trauma of the bite and post-exposure prophylaxis results in 0.04 million DALY's each year<sup>4</sup> for which dog is mainly responsible in India. This impact is prevented by "one health approach".<sup>10</sup> The "one health approach" is a concept that promotes partnership among multiple disciplines including human and veterinary medicine.<sup>10</sup> But in India there is very little "collaboration" between medical and veterinary services. There are two separate ministries, one for preventing rabies in humans' i.e. public health and the other for controlling rabies in animals' i.e. agriculture and animal husbandry. Also, rabies is a neglected disease both in public health and veterinary sectors.<sup>10</sup> However, from 2007 to 2011 a "National Pilot Project on Human Rabies Prevention" was implemented by Government of India in five cities, which

attempted to bring together both medical and veterinary sectors for preventing rabies in humans.<sup>10</sup> However it is, the level of knowledge among community will help the government to formulate further programme. Therefore , this KAP study will assess the knowledge, attitude and prevention of rabies among the animal bite victims to highlight the myths and concepts associated with animal bite among the community which may impair the utilisation of health service for animal bite management. It is hypothesized that knowledge about rabies translates into better practices for control and prevention.<sup>11</sup>

**Rationale of the study:** Rabies is a communicable zoonotic disease highly prevalent in India and is highly fatal. In spite of availability of preventive and first aid measures at health centres at all places, 36% of the world's rabies deaths occur in India each year.<sup>2</sup> Therefore, this study aims at highlighting the prevailing knowledge, attitude and practice of animal bites among the community, which will help to impart awareness among the population to decrease the prevalence and moving forward towards control & elimination of the disease by providing health education measures.

#### Objectives:

To study the knowledge and attitude, behaviour and practice on the animal bites

To identify the level of knowledge about First Aid measures of wound management & rabies vaccination among the victims.

To know the hospital management of animal bites.

### MATERIALS AND METHODS

This is a community based cross sectional study carried out from June to November 2016 at medical college field practice area (Primary Health Centres of Pullambadi Alundhalipur, Sirugambur) of Trichy district in Tamil Nadu. The study was conducted after obtaining clearance from Institutional review board of CMCHRC. Study population included all animal bite victims attending outpatient departments at PHCs who were willing to participate. In cases where the victim was a child parent/guardian were interviewed. Interviews were anonymous and data remained confidential throughout the study. Each participant was informed about the purpose of the study and informed consent was obtained from each respondent. Data was collected using pre tested and semi structured questionnaire. The questionnaire was developed based on the information gathered from literature. The questionnaire was first prepared in English and explained to the study population in Tamil. Data was collected by personal interview method. Participation in the study was voluntary and respondents were free to withdraw from the study at any time. The data from the questionnaires were entered and analysed in SPSS 15.0 Trial version. Chi

square test was used to compare proportions. A p-value of <0.05 was considered statistically significant.

### RESULTS

Total number of study subjects were 254, the gender distribution of the study population was almost equal, about 15% were children and 25% of victims had graduation (Table 1). Majority of Animal bites were due to Dogs followed by Cats and Monkeys & majority had category 2 level of Injury (Table 2).

**Table1: Socio demographic characteristics (n=254)**

Variables	Types	Number of victims	Percentage
Gender	Male	139	55
	Female	115	45
Age	Children 1–12 years	39	15
	Adolescents 13–19 years	28	11
	Adults 20 – 65 years	164	65
	Geriatric (>65 years)	23	9
Educational status	Illiterate	38	14.96
	School	152	59.84
	Graduate	64	25.2

**Table 2 .Distribution of study population according to biting animal and category of bites (n=254)**

Variables	Types	Number of victims	Percentage
Animal bite wise distribution	Dogs	232	91.3
	Cats	19	7.5
	Monkeys	3	1.2
Category of dog bite*	Category 1	72	28.3
	Category 2	162	63.8
	Category 3	20	7.9

**Table 3. Knowledge of Rabies among victims. (n =254)**

Variable		Number of victims	Percentage
Total no of people who heard about Rabies	Yes	181*	71.25
	No	73	28.75
Victims who know that rabies is preventable among n <sub>1</sub> *		165	91.16
Victims who know that rabies is dangerous among n <sub>1</sub> *		125	69.06

\* n<sub>1</sub> = 181

Among 181 victims, who were aware about rabies, 91% thought rabies was preventable and 69% had known that rabies was life threatening (Table 3). It was perceived that bite was a main mode of rabies transmission. Among the preventable methods 65% of the respondents knew about vaccination and only few 26% knew about other methods to control rabies in animals such as restraining dogs/ killing suspected animals. Respondents with higher education levels had good rabies knowledge compared to others. It was observed that there was statistically significant difference in knowledge regarding rabies among victims, which was higher with increasing levels of education (Table 4). The knowledge of vaccinating pets were higher among those who owned their pets (80%) compared to who didn't own (59%) which was statistically significant (Table 5 & 6).

**Table 4: Knowledge Of Rabies According To level of education Among The Victims (n=254)**

Educational status	Number of victims know about Rabies	Number of victims do not know about Rabies	Total
Illiterate	17	21	38
Primary school	17	25	42
Middle school	48	10	58
High school	40	12	52
Diploma	15	1	16
Graduate	38	3	41
Profession	6	1	7
Total	181	73	254

\*chi-square value-3.84

**Table 5- Knowledge regarding vaccination of pets among the bite victims(n=254)**

Variables	Number of victims have their own pets (n1 =140)	Number of victims do not have their own pets (n2 =114)	Percentage
Number of victims know to vaccinate their pets	112	67	70.4
Number of victims do not know to vaccinate their pets	28	47	29.5

It was also observed that 26% of victims had a strong belief that native medicine helps in rabies treatment. Another important observation was that 21 percent of victims disagreed with the fact that correct first aid will help in management which was statistically significant (Table 6). It is appreciable that common first aid followed was washing

the wound with soap and water (67%), followed by native medicine and traditional healers(21%), whereas 6% people preferred to do nothing as first aid (Table 7).

**Table 7. First aid followed by victims of animal bite**

First aid	Number of victims	Percentage
Wound wash with soap and water	170	67
Local application of native medicine*	53	20.9
Dressing the wound	15	5.9
Nothing	16	6.3

\*Lime juice, onion juice, ghee, neem, mango leaves, turmeric and branding the bite site. Chi square value of 7.82 is significant, table value is 252.9 at 3 degree of freedom.

**Table 8: Number of victims seeking medical advice according to the category of animal bite**

Category of bite	Utilisation of Medical Services			Total	Percent
	Immediately	Within 2 weeks	After 2 weeks		
1	41	27	4	72	28.34
2	98	51	13	162	63.77
3	10	8	2	20	7.89
Total	149	86	19	254	
Percent	58.7	33.9	7.5	508	

Following a suspect animal bite, only 58.7% of people sought the medical advice immediately 33.9% within 2 weeks, 7.5% after 2 weeks (Table 8). Majority (59%) of the Victims seek medical advice immediately followed by 34% within 2 weeks and 7% after 2 weeks (Table 8). Treatment given at the hospital, 93.3% of victims were given wound wash with antiseptics, vaccines and antibiotics were given to 100 percent of victims. Immunoglobulin was administered to 100 Percent of category 3 victims.

### DISCUSSION

Rabies remains an important public health problem in India and the bite of an infected dog is the most common means of transmission. Human rabies deaths are entirely preventable through prompt delivery of Post Exposure Prophylaxis to victims. The majority of the respondents in the study (71%) had previously know about rabies, among them only 69 percent of victims are aware of its dangerousness. More than half of the illiterate victims did not know about rabies which is a huge proportion. About 33 percent of victims did not receive any first aid and 21 percent of victims disagree with the usefulness of first aid. Only 59 percent of victims have attended the health centres immediately after animal bite. About 7 percent of victims had attended health centres after 2 weeks of animal bite. Nearly one third of victims were not aware of

**Table 6. Knowledge and attitude on vaccinating pets among victims (n=254)**

Variable	Types	No. of victims	Percentage	Significance	
Ownership of pets (n=254)	Number of victims own a pet	140	55.11	Not Significant	
	Number of victims without a pet	114	44.89		
Knowledge about vaccination of pets	Victims having pets (n=140)	Aware	112	80	Significant.
		Not aware	28	20	
	Victims without pets(n=114)	Aware	67	58.77	Not Significant.
		Not aware	47	41.23	
knowledge about Vaccination of Animals irrespective of having pets	Number of victims with awareness of vaccination of animals	179	70.47	Significant.	
	Number of victims without awareness of vaccination of animals	75	29.53		
Victims think that native medication will cure rabies	Agree	66	26	Significant.	
	Disagree	188	74		
Victims think that correct first aid will help in management	Agree	202	79	Significant.	
	Disagree	52	21		

importance of vaccinating animals. About 20 percent of victims having pets were not aware of vaccination status of their animals. Among the study subjects 26 percent of victims still believed that native medication will cure rabies. All the animal bite victims were vaccinated at the health centres during the study period. It was observed at this point that poor awareness about the fatal nature of rabies suggests that human deaths are likely to occur due to lack of knowledge in spite of good health care facilities. Ownership of pets does not seem to play any role with knowledge about rabies. But awareness of vaccination of pets among people with their own pets plays a significant role in control of rabies when compared to people without their own pets. However, it should be noted that knowledge among victims regarding vaccination plays a major role.

Studies from different parts of India have shown that Under 14 year children were the main victims- 47.9 Percent and showed male preponderance.<sup>6</sup> In contrast to this, in the present study adult population constituted 65% of bite victims.

More than four fifth of the patients presented late (>24hours) to hospital.<sup>6</sup>In the present study more

than half of the bite victims presented to the healthcare facility within 24 hours of incident. Initial wound management with soap and water was done by 30.3% of the victims.<sup>6</sup>In contrast to this majority (67%) of animal bite victims had initial wound management with soap and water in the present study.47.8% victims knew about washing the wound with soap and water.<sup>3</sup> A study has found that majority 24.3% applied local remedies.<sup>1</sup> The present study also revealed similar findings in this regard (21%). A study in Srilanka has shown that only 33% of the participants identified that rabies was 100% fatal.<sup>4</sup> A study in Philippines states that most of the pet dogs were not vaccinated their owners, the reason being that they are not aware of vaccination.<sup>7</sup> About 44.8 percent of dogs are vaccinated by their owners. In the present study majority (70.4%) of bite victims were aware about the vaccination of the pets.

World Health Organization (WHO) recommendations for post-exposure treatment divide rabies exposure into three categories: category I – and least serious – when the victim has been touching or feeding infected animals, but shows no skin lesions; category II, when the victim has received minor scratches without bleeding or has been licked by an infected animal on broken skin; and category

III, when the victim has received one or more bites, scratches or licks on broken skin or has had other contact with infected mucus. Exposure to bats, whatever the nature of the contact, falls under category III

It can be inferred from this study that people in Trichy district of TamilNadu hadadequate (50% – 80%) level of knowledge and showed favourable attitude towards seeking treatment for animal bites and practices done after animal bite was found to be adequate.

**Conclusion:** The moderate knowledge of rabies which is better than some other parts of the country can be further improved by operating programmes to promote control of rabies in collaboration with different sectors of service. The WHO suggests that prevention of human rabies is possible through mass dog vaccination, promotion of responsible dog ownership and dog population control programmes with a partnership approach. Acknowledging that rabies is a major public health challenge in India, the government proposes to make it a priority disease for control under the 12th Five Year Plan.

**Acknowledgment:** Contribution of Interns during data collection is hereby acknowledged.

#### REFERENCES:

- Sancheti P, Mangulikar S. An interventional study to assess knowledge regarding rabies in secondary school students. *Int J Community Med Public Heal* [Internet]. 2016;3(1):180–3. Available from: <http://www.scopemed.org/?jft=109&ft=109-1445153341%5Cnhttp://www.ijcmph.com/?mno=205444>
- Ross RS, Wolters B, Viazov SO, Roggendorf M. Awareness of rabies risks and knowledge about preventive measures among experienced German travel health advisors. *J Travel Med.* 2006;13(5):261–7.
- Kumar S, Trivedi R, Saxena M, Niranjana A, Kumar M. A study on knowledge of animal bite victims regarding animal bite and rabies attending tertiary care hospital of Rewa City, Madhya Pradesh. *Int J Med Sci Public Heal* [Internet]. 2016;5(5):1005. Available from: <http://www.scopemed.org/fulltextpdf.php?mno=219878>
- Jayawardene DMS, Gunawardena NS. Human Rabies: Knowledge and self-reported practices among grade ten school children in a suburban community in Sri Lanka. :26–36.
- Valekar S, Kshirsagar M, Ashturkar M, Mhaske M, Chawla P, Fernandez K. A cross-sectional study of awareness regarding dog bite and its management in rural community of Maharashtra. *Int J Community Med Public Heal* [Internet]. 2014;1(1):8. Available from: <http://www.ijcmph.com/?mno=1109>
- Chaudhuri S. Knowledge, attitude and practice about animal bite and rabies among victims attending a rural hospital in eastern India. *Glob J Med Public Heal.* 2015;4(1):1–6.
- Madrasto de Ramos ME, Bravo LC. Knowledge Attitude and Practise of the Community Regarding Animal Bite and Rabies. Vol. 8, *PIDSP Journal.* 2004. p. 24–32.
- Digafe RT, Kifelew LG, Mechesso AF. Knowledge, attitudes and practices towards rabies: questionnaire survey in rural household heads of Gondar Zuria District, Ethiopia. *BMC Res Notes* [Internet]. 2015;8(October):400. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26328612> %5Cnhttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC4566865
- Page T. National Journal of Medical and Allied Sciences. *NjmsonlineOrg* [Internet]. :1–3. Available from: <https://www.njmsonline.org/wp-content/uploads/2016/01/merged-final.pdf>
- Sudarshan M. Rural Rabies Prevention Project - A “One Health” Experiment in India: An Overview. *Int J Trop Dis Heal* [Internet]. 2014;3(2):104–13. Available from: <http://www.sciencedomain.org/abstract.php?id=208&id=19&aid=1120>
- Sambo M, Lembo T, Cleaveland S, Ferguson HM, Sikana L, Simon C, et al. Knowledge, Attitudes and Practices (KAP) about Rabies Prevention and Control: A Community Survey in Tanzania. *PLoS Negl Trop Dis.* 2014;8(12).
- WHO India's ongoing war against rabies [Internet] WHO available from <http://www.who.int/bulletin/volumes/87/12/09-021209/en/>

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Shankar.S, , Raghuram.V, M.Krishnakumar, Elango.S. A Study On Assessing The Knowledge, Attitude & Practice Among The Victims Of Animal Bites In Trichy, Tamilnadu.. *Nat J Res Community Med* 2018;7(1):47-51.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

**Influence of environmental factors on road traffic accidents: Hospital based cross sectional study at Tirupati****Bayapa Reddy N<sup>1</sup>, Shakeer Kahn P<sup>2\*</sup>, Surendra babu D<sup>2</sup>, Khadervali N<sup>1</sup>, Chandrasekhar C<sup>2</sup>, Sravana Deepthi C<sup>2</sup>****1-Associate Professor, Department of Community Medicine, Apollo institute of Medical Sciences and research, Chittoor, Andhra Pradesh. 2-Assistant Professor, Department of Community Medicine, Apollo institute of Medical Sciences and research, Chittoor, Andhra Pradesh, India****Date of Submission : 28-12-2017****Date of online Publication : 07-02-2018****Date of Acceptance : 30-01-2018****Date of Print Publication : 31-03-2018****\*Author for correspondence:** Dr P.Shakeer Kahn, Assistant Professor, Department of Community Medicine, Apollo institute of Medical Sciences and research, Murakambattu, Chittoor-517127 .Andhra Pradesh, India. Email ID- khansvmc@gmail.com**Abstract**

**Introduction:** Globalization with simultaneous motorization and population surge has led to rise in the number of road related accidents, injuries and fatalities. Vulnerable environmental conditions play a significant role in the escalating toll of Road Traffic Accidents. The objectives of this study are to know the road related factors and climatic conditions during RTA, and determine the association of environmental factors with type of injury. **Methodology:** A hospital based, cross sectional study with victims of road traffic accidents admitted in S.V.R.R. Government General Hospital, Tirupati, as study subjects was done. Study was conducted between during June 2013 to May 2014 for one year. A total of 820 victims of road traffic accidents were interviewed after taking prior consent using a predesigned questionnaire. **Results:** Most of the road traffic accidents have occurred ‘within village’ and near turnings of the road. Majority of the victims was familiar with the road where RTA happened and adequate lighting was reported in approximately half of the cases. Weather was mostly hot & dry in majority of cases. Grievous type of injury was more in case of road traffic accidents taking place at national highways. **Conclusion and recommendations:** RTAs on national highways has recorded most of the grievous injuries, hence speed limit sign boards and speed detector sensors places is needed as required on these roads. Junction points are one of the vulnerable sites of RTAs, which makes proper signaling systems and traffic police supervision at specific areas mandatory. There is a need to improve the quality of roads and establishment of surveillance mechanism for proper feedback to prevent the occurrence of RTAs.

**Key-words:** Road Traffic Accident, National Highway, Environmental factors, Grievous injury**INTRODUCTION**

Nearly 1.24 million people die every year on the roads and another 20 to 50 million sustain nonfatal injuries as a result of road traffic accidents across the world.<sup>1</sup> Road crashes deserve to be a strategic issue for any country’s public health and can lead to overall growth crisis, if not addressed properly.<sup>2</sup> Light in the scene of crash, weather condition, roadway geometrics and road surface were reported to be the important contributors to traffic crash injuries and deaths in Iran.<sup>3</sup> Residing of the family in the same area for many years and longer length of the school day were protective factors in preventing road traffic injuries.<sup>4</sup> Appropriate road engineering with prompt road signs and speed limits would be useful. There should be regular road maintenance to eliminate potholes.<sup>5</sup> Road traffic accidents

drags the least attention from health administrators and subsequent allocation of funds.<sup>6</sup> In general roads that are planned and made are of substandard level, laid down without due attention, and with minimal supervision.<sup>7</sup>

**Objectives:**

To know the road related factors during road traffic accidents in and around Tirupati

To study the climatic conditions at the time of RTA

To determine the association of environmental factors with type of injury

**METHODOLOGY**

A hospital based, cross sectional study with victims of road traffic accidents admitted in Tertiary care. Government General Hospital, Tirupati, as study subjects was done. All road traffic accident cases admitted for at least more than

24 hours were included into the study. Exclusion criteria include victims of road traffic accidents admitted for less than 24 hours, Cases treated on outpatient basis and not admitted into hospital, Victims who were immediately referred to higher centre, In case of unconscious patient & if the family members are not willing to participate, Cases not willing to participate in the study. Study was conducted at departments of Emergency, Surgery, Orthopaedic and Neurosurgery at S.V.R.R. Government General Hospital, Tirupati for a period of one year from June 2013 to May 2014 after obtaining approval from institutional ethical committee.

A pilot study was conducted for a period of one month during May 2013 by using a pre-designed Proforma and necessary corrections were made. A total of 820 cases of road traffic accidents reported to the Emergency, Surgery, Orthopaedic and Neurosurgery units of S.V.R.R. Government General Hospital at Tirupati were interviewed after taking prior consent using a predesigned questionnaire. Data was collected by the interviewer in convenient time during day time(9:00AM to 4:00PM) and regularly between 4:00PM to 8:00PM. In case if patient is not in a situation to respond, information was collected from family members, relatives, or friends. Data was entered into MS excel and analyzed using Epi-infoTM 7.1.3.10 version software and appropriate statistical tests of significance were employed like Chi-Square test for significance of difference in proportions.

**RESULTS**

The place of road traffic accident was found to be ‘within village’ in majority of cases (43.8%) followed by State high way (34.0%). The site of road traffic accident was found to be near ‘turnings of the road’ in majority of cases (57.7%) [Table 1].

**Table 1: Distribution of cases based on place of road traffic accident (N=820)**

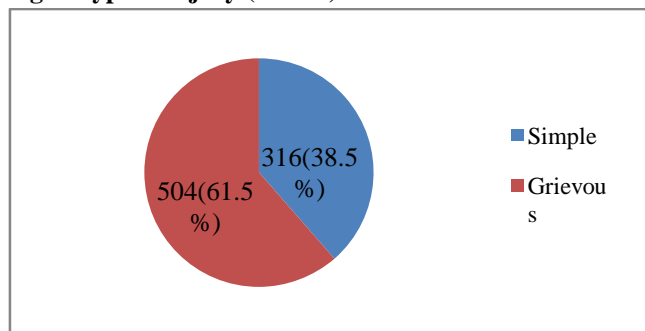
S.No	Variable	Yes	Percent.
<b>1</b>	<b>Place of accident</b>		
(a)	Within village	359	43.8
(b)	State highway	279	34
(c)	Within city	151	18.4
(d)	National Highway	31	3.8
<b>2</b>	<b>Site of accident</b>		
(a)	Turning	473	57.7
(b)	Straight road	174	21.2
(c)	Junction	173	21.2
<b>3</b>	<b>Road condition</b>		
(a)	Normal road	372	45.4
(b)	Damaged road	155	18.9
(c)	Dividers	115	14
(d)	Wet slippery road	95	11.6
(e)	Speed breakers	83	10.1
<b>4</b>	<b>Make of the road</b>		
(a)	Paved	761	92.8
(b)	Unpaved	59	7.2

Majority (83.5%) of the victims were familiar with the roads where RTA occurred and adequate lighting was reported in 47.7% cases. Overcrowding of the road at the time of accident was reported by 17.2% victims. Weather was mostly hot & dry in majority of cases (80.8%) [Table 2].

**Table 2: Distribution of various conditions at the time of accidents (N=820)**

S.No	Variable	Number of subjects	Percent.
<b>1</b>	<b>Road overcrowded</b>		
(a)	Yes	141	17.2
(b)	No	679	82.5
<b>2</b>	<b>Road familiar</b>		
(a)	Yes	685	83.5
(b)	No	135	16.5
<b>3</b>	<b>Adequate lighting</b>		
(a)	Yes	391	47.7
(b)	No	429	52.3
<b>4</b>	<b>Weather at time of accident</b>		
(a)	Hot & dry	663	80.8
(b)	Rainy	100	12.2
(c)	Cold	57	7

**Fig-1: Type of injury (N=820)**



Grievous type of injury was more in case of road traffic accidents taking place at national highways (77.4%)[Figure 1]. Further there is a statistical significant difference in proportions between the place of accident and type of injury. Majority (65.9%) of the injuries happened at junctions were of grievous in nature [Table 3]. In roads without overcrowding, it was found that majority (63.0%) of the road accidents involve grievous injury [Table 4]. Among RTAs occurred in adequate lighting, 63.4% had sustained grievous type of injury while it was 59.7% in 429 RTAs occurred in inadequate lighting.

**DISCUSSION**

The proportion of grievous injury was more in case of road traffic accidents occurring at national highways (77.4%) followed by within city roads (65.6%) and the differences were found to be statistically significant (P=0.01, S). National highways accounts for only 15% of the total length of roads in India but account for 33% of the

**Table 3: Type of injury according to various road related factors (N=820)**

S No	Variable	Simple injury (%)	Grievous injury (%)	Total (%)	P value
1	<b>Type of road</b>				$\chi^2=10.75;$ df=3; <b>P=0.01 S</b>
	Within village	72 (47.7)	79 (52.3)	151 (100.0)	
	State highway	141 (39.3)	218 (60.7)	359 (100.0)	
	Within city	96 (34.4)	183 (65.6)	279 (100.0)	
	National Highway	7 (22.6)	24 (77.4)	31 (100.0)	
2	<b>Site of accident</b>				$\chi^2=1.81;$ df=2; <b>P=0.40 NS</b>
	Turning	188 (39.7)	285 (60.3)	473 (100.0)	
	Straight road	69 (39.7)	105 (60.3)	174 (100.0)	
	Junction	59 (34.1)	114 (65.9)	173 (100.0)	
3	<b>Place of accident</b>				$\chi^2=16.51;$ df=4; <b>P=0.002 S</b>
	Normal road	132 (35.5)	240 (64.5)	372 (100.0)	
	Damaged road	80 (51.6)	75 (48.4)	155 (100.0)	
	Dividers	36 (31.3)	79 (68.7)	115 (100.0)	
	Wet slippery road	40 (42.1)	55 (57.9)	95 (100.0)	
	Speed breakers	28 (33.7)	55 (66.3)	83 (100.0)	
4	<b>Make of the road</b>				$\chi^2=9.78;$ df=1; <b>P=0.002 S</b>
	Paved	282 (37.1)	479 (62.9)	761 (100.0)	
	Unpaved	34 (57.6)	25 (42.4)	59 (100.0)	

If P<0.05,it is Significant(S) and if P>0.05,it is Non significant(NS)

**Table 4: Type of injury according to environmental conditions (N=820)**

S No	Variable	Simple injury (%)	Grievous injury (%)	Total (%)	P value
1	<b>Road overcrowded</b>				$\chi^2=4.11;$ df=1; <b>P=0.04 S</b>
	Yes	65 (46.1)	76 (53.9)	141 (100.0)	
	No	251 (37.0)	428 (63.0)	679 (100.0)	
2	<b>Adequate lighting</b>				$\chi^2=1.21;$ df=1; <b>P=0.27 NS</b>
	Yes	143(36.6)	248(63.4)	391(100.0)	
	No	173(40.3)	256(59.7)	429(100.0)	
3	<b>Weather</b>				$\chi^2=10.36;$ df=2; <b>P=0.006 S</b>
	Hot & dry	261(39.4)	402(60.6)	663(100.0)	
	Rainy	44(44.0)	56(56.0)	100(100.0)	
	Cold	11(19.3)	46(80.7)	57(100.0)	

fatalities. This could be due to increased proportion of passenger and freight traffic in national highways.<sup>8</sup> Regarding site of road accidents 21.2 of the RTAs occurred at junctions, where as about 49 of total accidents took

place on the junctions itself during the calendar year 2015 as against 57 during 2014.<sup>8</sup> Majority (65.9) of the injuries happened at junctions were of grievous in nature. Different types of vehicles approach at varying speeds near junctions. In addition pedestrians crossing at junctions are more vulnerable to RTAs. Speed breakers accounted for 10.1 of the total road accidents in this study while it was 2.2 as per Ministry of road transport and highways, India during 2015.<sup>8</sup> Nearly 12 of the RTAs happened during rainy season in this study while it was 60.7 in a study at Karimnagar.<sup>9</sup> Further in same study,<sup>9</sup> bright light favoured for 78.1 of accidents and this could be due to damage of roads by rains and density of traffic in day light respectively. Out of 820 victims, 68.7 and 66.3 of injuries are of grievous type, when road accidents occurred at dividers and speed breakers respectively. Further the differences in the proportions between type of injury and place of RTA was found to be statistically significant (P=0.002; S).

Make of the road was mostly paved (92.8) in this study, while in a study conducted at Rwanda, 95.6 of road conditions at crashes were paved.<sup>10</sup> Severity of injury sustained is more when the victims hit and/or fall over the hard surface of divider. Sometimes fast moving vehicles cannot be able to slow down at speed breakers as required and land into tragic RTAs. Among 92.8 of RTAs happened on paved roads, 62.9 had experienced grievous injury. Further the differences in proportions between make of road and type of injury was found to be statistically significant (P=0.002; S). As most of the roads are paved, they have a major share in road accidents. In addition harder surface of paved roads increases the severity of injury. Toll of RTAs can be reduced significantly with the active participation of civil engineers in road designing and involvement in accident investigation.<sup>7</sup>

In the present study, it was found that when the road was not overcrowded, majority (63.0) of the injuries were grievous type. Further the differences in proportions between type of injury and overcrowding was statistically significant (P=0.04 S). Most (80.7) of the victims driving in cold had suffered grievous type of injury followed by hot & dry and rainy season. There is a statistical significant difference between weather and type of injury sustained. Whereas in a study done at Karimnagar, majority of the victims had suffered major injury in rainy season<sup>9</sup> and in another study more than half of the RTAs occurred during winter season.<sup>11</sup> Bad weather conditions and defective roads were found to be some of the environmental risk factors for RTAs in North eastern India.<sup>12</sup>

**Conclusion and recommendations:**

Villages share major troll of road traffic accidents, probably due to poor maintenance and poor conditions of the roads. Further lack of road safety awareness among the residents may have a concern. Installation of speed limit sign boards at required places along with speed detector sensors for speed regulation is recommended to prevent over speeding. Most of the injuries among the RTAs occurred on the roads without overcrowding were grievous in nature,

substantiating the fact that vehicles travel fast on the roads with less traffic and may turn up into major road traffic accidents. Junction points are vulnerable sites for RTAs, hence proper signaling systems and traffic police supervision should be made mandatory at such sites. Construction of roads with acceptable standards and regular monitoring and maintenance of the roads by qualified civil engineering team will cut down the burden of RTAs. Establishment of integrated surveillance mechanisms for generating information regarding road traffic injury burden and their risk factors will help in developing guidelines to modify existing policies or for framing a new road safety policy involving various authorities.

## REFERENCES

1. Global status report on road safety 2013: supporting a decade of action. World Health Organization 2013. Available at [http://www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2013/en/](http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/). Last assessed on 25<sup>th</sup> July 2015
2. Mondal P, Kumar K, Bhangale UD, Tyagi UD. A Silent Tsunami on Indian Road: A Comprehensive Analysis of Epidemiological Aspects of Road Traffic Accidents. *British Journal of Medicine & Medical Research*. 2011;1(1):14-23.
3. Lankarani KB, Heydari ST, Aghabeigi MR, Moafian G, Hoseinzadeh A, Vossoughi M. The impact of environmental factors on traffic accidents in Iran. *J Inj Violence Res* 2014 Jul;6(2):64-71
4. Donroe J, Tincopa M, Gilman RH, Brugge D, Moore DA. Pedestrian road traffic injuries in urban Peruvian children and adolescents: case control analyses of personal and environmental risk factors. *PloS One*. 2008 Sep 10;3(9):e3166
5. Oladapo Adeoye P et al. Host, vehicular and environmental factors responsible for road traffic crashes in a nigerian city: identifiable issues for road traffic injury control. *Pan African Medical Journal*. 2014; 19:159. Available online at: <http://www.panafrican-med-journal.com/content/article/19/159/full/>
6. Rastogi D, Meena S, Sharma V, Kumar Singh G. Epidemiology of patients admitted to a major trauma centre in northern India. *Chinese Journal of Traumatology* 2014;17(2):103-7
7. Sharma SM. Road Traffic Accidents in India. *Int J Adv Integ Med Sci* 2016;1(2):57-64.
8. Road accidents in India-2015, Government of India, Ministry of Road transport and highways transport research wing, New Delhi. Available at: <http://pibphoto.nic.in/documents/rlink/2016/jun/p20166905.pdf>. Last assessed on 25th October 2016
9. Srinivasa Kumar PV , Srinivasan K. A study on environmental factors influencing road traffic accident victims in district hospital, karimnagar. *International Journal of Research in Health Sciences*. (Supplement) July –Sept 2013; 1(2):80-3
10. Patel et al. The epidemiology of road traffic injury hotspots in Kigali, Rwanda from police data. *BMC Public Health* (2016) 16:697
11. Shruthi P, Venkatesh VT, Viswakanth B, Ramesh C, Sujatha PL, Dominic IR. Analysis of Fatal Road Traffic Accidents in a Metropolitan City of South India. *J Indian Acad Forensic Med*. 2013; 35(4):317-20.
12. Joshi AK, Joshi C, Singh M, Singh V. Road traffic accidents in hilly regions of northern India: What has to be done? *World Journal of Emergency Medicine*. 2014;5(2):112-5

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Bayapa Reddy N, Shakeer Kahn P, Surendra babu D, Khadervali N, Chandrasekhar C, Sravana Deepthi C. Influence of environmental factors on road traffic accidents: Hospital based cross sectional study at Tirupati. *Nat J Res Community Med* 2018;7(1):52-55.

© **Community Medicine Faculties Association**

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)



## Study of Association between Body mass index and Blood Pressure in private school children aged 5-15 years

P.Ravi Kumar<sup>1</sup>, N.Aruna<sup>2\*</sup>, B.Sasi Kumar<sup>3</sup>

<sup>1</sup>Professor, Department of Pediatrics, S.V. Medical college Tirupati, 2PG, Department of Pediatrics, S.V. Medical college, Tirupati. <sup>3</sup> Assistant professor Department of Pediatrics, S.V. Medical college Tirupati

Date of Submission : 09-01-2018

Date of online Publication : 07-02-2018

Date of Acceptance : 30-01-2018

Date of Print Publication : 31-03-2018

\***Author for correspondence:** Dr. N.Aruna, 2PG, Department of Pediatrics, S.V. Medical college, Tirupati. E-mail: naraaruna791@gmail.com

### Abstract

**Background:** Obesity in children and adolescents is gradually becoming a major public health problem in India. In children BMI changes substantially with age, rising steeply with infancy, falling during preschool years, then rising during adolescence, and early adulthood. The prevalence of hypertension in children is 1-3%. In addition to age, gender, height, weight and body mass index are also known to influence blood pressure levels in childhood and adulthood. **Objective :** To Estimate the level of Body mass index, Blood pressure and Association between Body mass index and blood pressure among apparently healthy private school children aged 5-15 years of Tirupati. **Methods :** Cross-sectional study conducted at Tirupati urban area (School based study). **Results:** Out of 900 children included in the study, 580 (64.44%) were males and 320 (35.55%) were females. Majority of the study subjects i.e., 162 (18%) were aged 12 years, followed by 15 years (15.4%) and 14 years (14.8%) age group. Prevalence of obesity is 3.77% (34 out of 900) and overweight is 5.88% (53 out of 900). Prevalence of hypertension is 1.44% (13 out of 900) and pre-hypertension is 1.33% (12 out of 900). Out of 580 (100%) males 1.8% are obese and 1.2% are hypertensive. Out of 320 (100%) females 7.1% are obese and 1.8% are hypertensive. **Conclusion:** In the present study, prevalence of obesity is 3.77% and hypertension is 1.44% among apparently healthy school children aged 5-15 years of Tirupati. Prevalence of obesity is more in females than in males. **Key-words:** BMI, overweight, Obesity, hypertension.

### INTRODUCTION

Malnutrition, in every form, presents significant threat to human health. The world today faces a double burden of malnutrition which includes both undernutrition and obesity, especially in developing countries.<sup>1</sup> Obesity in children and adolescents is gradually becoming a major public health problem in India.<sup>2</sup> In children BMI changes substantially with age, rising steeply with infancy, falling during preschool years, then rising during adolescence, and early adulthood.<sup>3</sup>

The prevalence of hypertension in children is 1-3%.<sup>4</sup> Measurement of blood pressure is not routinely employed in our country in various health checkup programmes and studies pertaining to blood pressure of school going Indian children are still inadequate. Elevated blood pressure in children and adolescents may be an early expression of essential hypertension in adulthood.<sup>5</sup> Few studies have also shown that obese children have an increased systolic and diastolic blood pressure levels.<sup>6,7</sup> In addition to age, gender, height,

weight and body mass index are also known to influence blood pressure levels in childhood and adulthood.

Blood pressure gradually increases from very low levels at birth and reaches comparable levels to that of an adult by late adolescence. This study underlines the important role of body mass index in influencing the BP levels during childhood and adolescence. In addition to predicting adult BP, childhood BP is also known to predict other factors that are related to cardiovascular risk in later life.<sup>8</sup>

If the trend towards adult hypertension can be recognized in childhood, it may be possible to alter life style and prevent systemic hypertension as well as related complications.<sup>9</sup> Hence this study is taken up to evaluate the association between body mass index and blood pressure among apparently healthy private school aged children of Tirupati.

**Objectives:** To Estimate the level of Body mass index, Blood pressure and Association between Body mass index and blood pressure among apparently healthy private school children aged 5-15 years of Tirupati.

### MATERIALS AND METHODS

- A. Type of study** - Cross-sectional study.
- B. Study Area** - Tirupati urban area (School based study)
- C. Study period** - from September 2016 to August 2017
- D. Sample number** : It has been observed from the earlier studies that the prevalence of Overweight and obesity was 10% and the prevalence of hypertension was 1-3%. For the present study, sample size of 900 was estimated using the prevalence rate of 10% with 20% acceptable (allowable) error at 90% confidence level.

**A) Inclusion criteria:**

1. Apparently healthy private school children aged 5-15 years of Tirupati.

**B) Exclusion criteria:**

1. Children with chronic illness.
2. Children on all long term medications.
3. Children with congenital anomalies.
4. Children diagnosed to be obese and hypertensive secondary to other cause.

**Study methods:** A list of private schools in the urban area of Tirupati was obtained and from the list of schools three schools were selected using simple random sampling. Permission to undertake the study in such schools was obtained from the school principals.

A pilot study was done in a school to test the questionnaire and to have some acquaintance with the tools to be used in the study. Based on the responses, few modifications were done in the questionnaire. This pilot study was done in the school which was not selected for the study and the data obtained too was not used in the study proper.

Initially questionnaires were issued to the students. After the questionnaire was filled up, students were asked to come to the investigator with their questionnaires in hand and then their weight and height were measured and BP was recorded one by one and were noted in their respective questionnaires with the help of teachers. After collection of data from all the three schools, the questionnaires were used for analysis. For boys and girls anthropometry and BP were recorded by the investigator as per standard protocol.

**Methods adopted for statistical analysis:** Data analysis was done using MS Excel software, Epi Info 7 version software.

**Operational Definition:**

- Centre for Disease Control - BMI growth charts developed by National Centre for Health Statistics were used to categorize children using BMI percentiles
- **Obese:** Body mass index (BMI) > 2 standard deviations above the WHO growth standard median.<sup>10</sup>

**Age and gender wise distribution of study population**

Study was undertaken in "Tirupati" city, being a locality of Sri Venkateswara medical college. The present study was carried out among 900 apparently healthy school children aged 5-15 years. The proportion of males is 64.44% (580) and that of females is 35.55% (320).

**Prevalence of overweight:** Using BMI as criteria and based on CDC growth charts developed by NCHS, prevalence of overweight (BMI for age and sex between 85th and 95th percentile) was evaluated. Out of 900 (100%) study population, 53 (5.8%) apparently healthy school children are overweight. (table 1)

**Table No1: Age wise distribution of prevalence of obesity and overweight in the study population**

Age (Yrs)	Normal	Overweight	Obesity	Total
5	49(90.7%)	3(5.5%)	2(3.7%)	54(6%)
6	59(90.7%)	4(6.1%)	2(3.07%)	65(7.2%)
7	45(93.7%)	2(4.1%)	1(2.0%)	48(5.3%)
8	42(91.3%)	3(6.5%)	1(2.1%)	46(5.1%)
9	65(87.8%)	5(6.71%)	4(5.4%)	74(8.2%)
10	45(90%)	3(6%)	2(4%)	50(5.5%)
11	41(87.2%)	4(8.5%)	2(4.2%)	47(5.2%)
12	145(89.5%)	10(6.1%)	7(3.7%)	162(18%)
13	74(91.3%)	5(6.1%)	2(2.4%)	81(9%)
14	123(91.7%)	6(4.4%)	5(3.7%)	134(14.8%)
15	125(89.9%)	8(5.7%)	6(4.3%)	139(15.4%)
Total	813(90.3%)	53(5.88%)	34(3.77%)	900(100%)

**Prevalence of obesity:** Using BMI as criteria and based on CDC growth charts developed by NCHS, prevalence of obesity (BMI for age and sex above 95th percentile) was evaluated. Out of the study population of 900 (100%), 34 (3.77%) apparently healthy school children are obese. (table 2)

**Table No 2 : Gender wise distribution of prevalence of obesity and overweight in the study population**

Gender	BMI( N(%) )			Total
	Normal	Overweight	Obesity	
Male	551(95)	18(3.1)	11(1.8)	580(100)
Female	262(81.8)	35(10.9)	23(7.1)	320(100)
Total	813(90.3)	53(5.88)	34(3.77)	900(100)

**Prevalence of hypertension:** The National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents published the Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents. According to these recommendations prevalence of hypertension (average systolic or diastolic BP is > or = to 95th percentile for age, sex and height) was evaluated. Out

of 900 study population, 13 (1.44) apparently healthy school children are hypertensive.(table 3)

**Table No 3: Age wise distribution of prevalence of Hypertension and Pre-hypertension in the study population**

Age (Yrs)	Normal	Prehypertension	Hypertension	Total
5	54(100%)	0(0%)	0(0%)	54(100%)
6	65(100%)	0(0%)	0(0%)	65(100%)
7	48(100%)	0(0%)	0(0%)	48(100%)
8	45(97.8%)	0(0%)	1(2.1%)	46(100%)
9	72(97.2%)	1(1.3%)	1(1.3%)	74(100%)
10	49(98%)	0(0%)	1(2%)	50(100%)
11	45(95.7%)	1(2.1%)	1(2.1%)	47(100%)
12	154(95.0%)	4(2.4%)	4(2.4%)	162(100%)
13	78(96.2%)	2(2.4%)	1(1.23%)	81(100%)
14	130(97.0%)	2(1.49%)	2(1.49%)	134(100%)
15	135(97.1%)	2(1.43%)	2(1.43%)	139(100%)
Total	875(97.2%)	12(1.33%)	13(1.44%)	900(100%)

**Gender wise prevalence of obesity** In the present study out of 580 (100) boys, 1.8 (11) were obese whereas out of 320(100) girls, 7.1 (23) were obese. Girls were found to be more obese than boys and the difference is statistically significant.(table 3)

**Table No. 4 : Distribution of Prehypertension and hypertension in overweight and obese**

	Overweight	Obese	Total
Normal	41(77.3%)	21(61.7%)	62(71.26%)
Prehypertension	9(16.9%)	3(8.8%)	12(13.7%)
Hypertension	3(5.6%)	10(29.4%)	13(14.94%)
Total	53(100%)	34(100%)	87(100%)

**Table No 5 : Sex wise distribution of prevalence of non-obese and obese in the study population**

Sex	BMI		Total
	Non Obese	Obese	
Male	569(98.1%)	11(1.89%)	580(100%)
Female	297(92.8%)	23(7.1%)	320(100%)
Total	866(96.2%)	34(3.7%)	900(100%)

*Pvalue-0.0001* Chisquare = 14.46

**Gender wise prevalence of hypertension** In the present study out of 580 (100) boys, 1.2 (7) are hypertensive and among 320 (100) girls, 1.8 (6) are hypertensive. The percentage of hypertensive girls are slightly higher than boys but the difference is statistically insignificant. Statistically insignificant difference between boys and girls with respect to prevalence of hypertension. When the mean height and mean weight in different age groups were compared, it was found that boys are slightly taller and heavier than girls. .(table 4)

**Age group wise prevalence of hypertension among obese children** Out of 34 (100) obese children, 64.71 (22) belonged to 11-15 years age group whereas only 35.29 (12) belonged to 5-10 years age group. Out of 22 (100) obese children of 11-15 years age group, 27.2 (6) are hypertensive. Out of 12 (100) obese children of 5-10 years age group, 16.5 (2) are hypertensive..(table 5)

**DISCUSSION**

**Prevalence of overweight :** Studies conducted in different parts of India on school children have come out with prevalence ranging from 5.43 in Chakroborty et al <sup>7</sup>- 2011 to 22 in Sharma et al <sup>9</sup> – 2007. The prevalence of overweight in the present study (5.8) correlates with the study done by Deokeet al<sup>8</sup>(5.84) which was conducted among 565 school children aged 5-17 years.

**Prevalence of obesity :** Studies conducted in different parts of India on school children have come out with prevalence ranging from 0.35 (Deoke et al <sup>8</sup> – 2012) to 6 (Sharma et al<sup>9</sup> – 2007) . The prevalence of obesity in the present study (3.77) correlates with the study done by Premnath M et al <sup>11</sup>(3.4) which was conducted among 43,152 school children aged 5-16 years at Mysore .

**Prevalence of hypertension:** Studies have come out with prevalence of hypertension ranging from 0.41 (Gupta A.K and Ahmad A.J<sup>12</sup>) to 1.8 (Aggarwal VK et al<sup>13</sup>). The prevalence of hypertension in the present study 13(1.44) correlates with the study done by Verma M<sup>5</sup>et al (1.1) which was conducted among 2560 apparently healthy school children aged 5-15 years. Children and adolescents with upper percentiles of blood pressures are “at risk” of developing hypertension at a future date in adulthood.

**Gender wise prevalence of obesity:** Study done by Sonya Jagadesan et al <sup>16</sup>(IOTF criteria) showed higher prevalence of obesity among girls than boys. Also studies done by Mudu<sup>21</sup> in three major Indian cities reported higher prevalence of obesity among girls than boys. Contrarily a few studies have come out with lower prevalence of obesity among girls when compared to boys (Kapilet al<sup>17</sup> and Shiji K Jacob et al <sup>18</sup>)

**Gender wise prevalence of hypertension:** These findings are in favour of the argument that body weight and height are the strongest determinants of blood pressure and not the gender Verma M<sup>15</sup> et al.

**Age group wise prevalence of hypertension among obese children:** Similar findings were reported by one other study conducted by ChadaSL<sup>19</sup> which showed 34 of 11-15 years age group obese children are obese which is higher than 13.1 of 5-10 years of obese children are hypertensive. These findings strongly favour the argument that anthropometric variables like height, weight and body mass index show positive correlation with systolic as well as diastolic blood pressure. Hence, obese children of 11-15 years age group who were taller and heavier showed higher prevalence of hypertension than those of 5-10 years age group

**Prevalence of obesity among hypertensive children:** The present study shows that among hypertensive children 76.9 are obese. Similar findings were reported in many other studies. Percentage of asymptomatic hypertensive children found to be obese. Close relevance was found in the study conducted by Gupta AK et al<sup>12</sup> which showed 62.5 of asymptomatic hypertensive children were obese.

**CONCLUSION:** In the present study, prevalence of obesity is 3.77 and hypertension is 1.44 among apparently healthy school children aged 5-15 years of Tirupati. Prevalence of obesity is more in females than in males and the observation is statistically significant. Prevalence of hypertension is slightly higher in females but the observation is statistically insignificant. Anthropometric variables like height, weight and body mass index showed positive correlation with systolic as well as diastolic blood pressure. Obese children are at a higher risk of "childhood onset of adult diseases". Thus, timely recognition and intervention will result in decreased adulthood morbidity and mortality.

### REFERENCES

1. B.T. PK, Bengalorkar GM, R. D, C. M, S. R. Prevalence of overweight and obesity among adolescent school going children (12-15years) in urban area, South india. IJCRR. (2012), [cited October 18, 2014]; 4(20): 99-105.
2. Mohan B, Kumar N, Aslam N, Rangbulla A, Kumbkarni S, Sood NK, et al. Prevalence of sustained hypertension and obesity in urban and rural school going children in Ludhiana. Indian Heart J.2004;56:310-4. [PubMed].
3. Pereira MA, Ludwig DS. Dietary fiber and body weight regulation. *PediatrClin N Am* 2001; 48 (4):969-980
4. Wadden TA, Crerand CE, Brock J. Behavioural Treatment of Obesity. *PsyciatrClin N Am* 2005; 28: 151-170.804-7.
5. Bhav S, Bavdekar A, Otiv M. IAP National Task force for childhood prevention of adult diseases: Childhood obesity. *Indian Paediatr*2004 June;41: 559-575.
6. Mahajan PB, Purty AJ, Singh Z, Cherian J, Natesan M, Arepally S, Senthilvel V. Study of childhood obesity among school children aged 6 to 12 years in union territory of Puducherry. *Indian J Community Med* 2011; 36:45-50.
7. Chakraborty P, Dey S, Pal R, Kar S, Zaman FA, Pal S. Obesity in Kolkata children: Magnitude in relationship to hypertension. *J Nat Sci Biol Med.* 2011; 2(1): 101-106.
8. Deoke A, Hajare S, Saoji A. Prevalence of overweight in high school students with special reference to cardiovascular efficiency. *Glob J Health Sci.* 2012 29;4(2):147-52
9. Sharma A, Sharma K, Mathur KP. Growth pattern and prevalence of obesity in affluent school children of
10. World Health Organization. World Health Organization Child Growth Standards. 2006. Accessed March 5, 2012.
11. Premanath M, Basavanagowdappa H, Shekar MA, Vikram SB, Narayanappa D. Mysore childhood obesity study. *Indian Pediatr.* 2010; 47(2):171-3
12. Gupta AK, Ahmed AJ. Childhood obesity of hypertension. *Indian Pediatr?* 1990; 27: 333-337. 78
13. Aggarwal VK, Sharan R, Srivastava AK, Kumar P, Pandey CM. Blood pressure profile in children of age 3-15 years. *Indian Pediatr* 1983, 20: 921-925.
14. Aggarwal VK, Sharan R, Srivastava AK, Kumar P, Pandey CM. Blood pressure profile in children of age 3-15 years. *Indian Pediatr* 1983, 20: 921-925.
15. Verma M, Chhatwal J, George SM. Obesity and hypertension in children. *Indian Pediatr* 1994; 31: 1065-69.
16. Sonya Jagadesan et al; Research paper on Prevalence of Overweight and Obesity Among School Children and Adolescent in Chennai URL : <http://indianpediatrics.net/july2014/544.pdf> .
17. Kapil, U., Singh., P., Pathak, P., Dwivedi, S.N. and Bhasin, S. 2002. Prevalence of obesity amongst affluent adolescent school children in Delhi. *Indian Pediatr.*, 2002, 39: 449-452.
18. Shiji K. Jacob. "Prevalence of Obesity and Overweight among School Going Children in Rural Areas of Ernakulam District, Kerala State India". *Int J Sci Stud.* 2014;2(1):16-19.
19. Chanda SL, Tandon R, Shekhawat S and Gopinath N, 1999, "An epidemiological study of blood pressure in school children (5-14 years) in Delhi, *Indian Heart Journal*, 51:178-182
20. N.K. Anand and LalitTandon: "Prevalence of Hypertension in school going children", *Indian Pediatrics*, May 1996, Volume 33, Page 377 – 381.
21. Mudur G. Asia grapples with obesity epidemics, World Health Organization. Obesity: preventing and managing the global epidemic. Geneva. *BMJ.* 2003; 326 (7388):515.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** P.Ravi Kumar, N.Aruna B.Sasi Kumar.. Study of Association between Body mass index and Blood Pressure in private school children aged 5-15 years . *Nat J Res Community Med* 2018;7(1):56-59.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

## Socio demographic profile of patients on Directly Observed Treatment Short Course Chemotherapy in Mandya Tuberculosis Unit, Karnataka

Ravikumar MS<sup>1</sup>, Manuja LM<sup>2\*</sup>, Harish BR<sup>3</sup>

1.Taluk Health Officer, Gundlupete, Department of Health and Family Welfare, Karnataka 2.Assistant Professor, Department of Community Medicine, Adichunchanagiri Institute of Medical Sciences, B G Nagar. 3. Professor and Head, Department of Community Medicine, Mandya Institute of Medical Sciences, Mandya.

Date of Submission : 09-01-2018

Date of online Publication : 07-02-2018

Date of Acceptance : 30-01-2018

Date of Print Publication : 31-03-2018

\***Author for correspondence:** Dr. Manuja LM .Assistant Professor, Department of Community Medicine, Adichunchanagiri Institute of Medical Sciences, B G Nagar. E-mail: drmanujalm@gmail.com

### Abstract

**Background:** The World Health Organization (WHO) declared Tuberculosis (TB) a global public health emergency in 1990. Tuberculosis remains a worldwide public health problem despite highly effective drugs and vaccine being available. An estimated 9.0 million people developed TB in 2013 and caused 1.5 million deaths. India has the highest burden of TB cases in the world. Emergence of MDR-TB is a threat looming large over the world. TB is a social disease with medical factors. Identifying and understanding these factors would help in achieving better outcomes among the patients and controlling the spread of TB. **Objectives:** To describe the socio-demographic profile of patients registered for DOTS at Mandya Tuberculosis Unit (TU)& To determine their HIV status. **Methodology :** This descriptive cross sectional study was conducted from 1<sup>st</sup> July 2014 – 31<sup>st</sup> December 2014. The subjects were recruited from the patients registered for DOTS in Mandya Tuberculosis Unit, Mandya. The data regarding socio-demographic details, medical history and personal history was collected from the study subjects using pretested semi-structured questionnaire and treatment cards from DOTS centres. **Results:** Among the 206 study subjects, 68% were males, 29.1% in the age group of 30-44 years, 61.7% married, 58.7% were from joint family & were illiterates and 56.3% of them belonged to low socio economic status. 55.3% were from rural area and 77.2% were living in pucca house. 53.1% were sputum positive pulmonary, 21.9% were sputum negative pulmonary and 25% were extra pulmonary cases. 20.9% of the subjects were HIV reactive. **Conclusion:** Majority of the study subjects were in the economically productive age group and were males. More than half of them were illiterates and from low socio economic status. Hence there is need to improve the socioeconomic status, educational status and living conditions to bring down the prevalence of tuberculosis.

**Key-words:** Tuberculosis, Socio demographic profile, DOTS.

### INTRODUCTION

Tuberculosis (TB) is one of the world's deadliest communicable disease. An estimated 9.0 million people developed TB in 2013 causing 1.5 million deaths and 3,60,000 among them were HIV-positive. Although TB is slowly declining each year and an estimated 37 million lives were saved between 2000 and 2013 through effective diagnosis and treatment, the death toll from the disease is still unacceptably high and efforts to combat it must be accelerated if 2030 global targets, set within the context of the Sustainable Development Goals (SDGs), are to be met.<sup>1</sup>

Of the estimated 9 million people who developed TB in 2013, more than half (56%) were in the South-East Asia and Western Pacific Regions. Further one quarter were in the African Region, which also had the highest

rates of cases and deaths relative to population. India and China alone accounted for 24% and 11% of total cases, respectively. About 60% of TB cases and deaths occur among men, but the burden of disease among women is also high. Globally, 3.5% of new and 20.5% of previously treated TB cases were estimated to have had MDR-TB in 2013.<sup>1</sup>

India is the second-most populous country in the world and one fourth of the global incident TB cases occur in India annually.<sup>2</sup> On a national scale the high burden of TB in India is illustrated by the estimate that TB accounts for 17.6% of deaths from communicable disease and for 3.5% of all causes of mortality. More than 80% of the burden of tuberculosis is due to premature death, as measured in terms of disability-adjusted life years (DALYs) lost.<sup>3</sup>

The World Health Organization (WHO) has suggested that the expected effect of improved diagnostic

and treatment services may be negated by an increase in the prevalence of risk factors for the progression of latent TB to active disease in segments of the population which may tend to increase incidence despite reductions in transmission achieved under the Stop TB strategy. Broadly described, these risk factors may be biomedical (such as HIV infection, diabetes, tobacco, malnutrition, silicosis, malignancy), environmental (indoor air pollution, ventilation) or socioeconomic (overcrowding, urbanization, migration, poverty).<sup>3</sup>

The Government of India launched the Revised National TB Control Programme (RNTCP) in 1993 and adopted the internationally recommended Directly Observed Treatment Short-course (DOTS) strategy, as the most systematic and cost-effective approach to revitalize the TB control programme in India and achieved country wide coverage under RNTCP in March 2006.<sup>4</sup> In 2006, STOP TB strategy was announced by WHO and adopted by RNTCP. Decentralized treatment is provided through a network of more than 600,000 DOTS providers, to provide treatment to the patients as near to their home as possible.

The vision of the Government of India is for a "TB-free India" with reduction of the burden of the disease until it is no longer a major public health problem. To achieve this vision, the programme has now adopted the new objective of Universal access for quality diagnosis and treatment for all TB patients in the community through the National Strategic Plan (2012-2017) under the 12th Five Year Plan of Government of India.

TB is a social disease with medical factors. Many social factors like poverty, under nutrition, poor housing, lack of education, alcohol, smoking which are interrelated contribute to the occurrence and spread of TB.<sup>4</sup> Identifying and understanding these factors would help in achieving better outcomes among the patients and controlling the spread of TB. Hence this study was undertaken to describe the socio-demographic profile of patients registered for DOTS at Mandya Tuberculosis Unit (TU) and to determine their HIV status.

## MATERIAL AND METHODS

**Study setting:** The present study was conducted in Mandya Tuberculosis Unit, Mandya district, which covers 5 Designated Microscopy Centers (DMCs).

**Study design :** Descriptive cross sectional study

**Period of Study:** (6 months )1st July 2014 – 31<sup>st</sup> December 2014

**Study Population :** Patients registered for DOTS in Mandya Tuberculosis Unit, Mandya during 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2014, starting from 1<sup>st</sup> July 2014 to 31<sup>st</sup> December 2014.

**Ethical Considerations:** Study was initiated after obtaining approval from the Institutional Ethics Committee of Mandya Institute of Medical Sciences, Mandya.

**Inclusion Criteria:** All patients registered for treatment under DOTS from 1<sup>st</sup> July 2014 to 31<sup>st</sup> December 2014 at Mandya Tuberculosis Unit, Mandya and who gave consent for the study.

**Exclusion Criteria:** Those patients who were transferred out from Mandya Tuberculosis Unit, Mandya district during any stage of the treatment were excluded from the study.

## Description of the Study Setting

Mandya District is located in the south interior part of Karnataka. Total area is 4,98,244 hectares, more than half of which is put into agricultural use. The District comprises of 7 taluks namely Mandya, Maddur, Malavalli, Srirangapattana, K R Pete, Nagamangala and Pandavapura. Total Population of district is 17,61,718 with population density of 364 persons/sq km and sex ratio of 995 females/1000 males. The literacy rate is 61.21% with male literacy rate at 70.71% and female literacy rate at 51.62%.<sup>5</sup>

The organisational structure of RNTCP at Mandya functions under the District Tuberculosis Office headed by District TB Officer (DTO). The administrative control of the District TB Office is by District Health Office under the State Health and Family Welfare Department. There are 5 Tuberculosis Units (TU) and 25 DMCs in the District. Mandya TU covers a population of 4,38,520 and includes the 5 DMCs located at MIMS Hospital, District TB Center (DTC), Maddur General Hospital, Shivally PHC and Sanjo Hospital which is a private hospital. The DMC in MIMS gets the subjects referred for sputum AFB examination mainly from the hospital outpatients & inpatients. The DMC at DTC gets referrals from 15 PHCs out of which 2 are Urban Health Centers and rest are rural. The patients suspected to have TB are referred for sputum examination to these DMCs and the microscopic examination is done as per the RNTCP guidelines. Patients found positive are categorised and either started on treatment or referred out depending on their convenience. Sputum negative cases and extrapulmonary cases are started on treatment after confirming the diagnosis as per the protocols.

## Collection of Data

After obtaining the approval from the Institutional Ethics Committee, the study proposal was submitted to the District TB Officer to obtain clearance from the District Health Society. The permission to conduct the study was given by the Society chaired by the Chief Executive Officer (CEO) of the Zillah Panchayat of Mandya District.

The patients who got registered and initiated on treatment of DOTS with in Mandya TU from 1<sup>st</sup> of July 2014 up to 31<sup>st</sup> December 2014 were taken into the study as follows. The information regarding newly registered patients were obtained from the Senior Treatment Supervisor (STS) and Senior Tuberculosis Laboratory Supervisor (STLS), Laboratory Technicians of DMCs. The patients were contacted at either the DOTS center or at their house by the investigator and explained about the study and informed consent was taken from the patient to participate in the study. Those who gave consent for the study were included in the study. Information regarding socio-demographic details, medical history and personal history of the patients were taken using a pretested semi-structured questionnaire. In case of children, the information was obtained from the parent/guardian. Information regarding

the patient's treatment which included categorisation, investigation details, DOTS provider was collected from the RNTCP treatment cards of each patient available at the DOTS centre.

**Operational Definitions**

**Socio-demographic variables**

- Age: A completed year of a person on the date of registration for treatment.
- Illiterate: A person aged more than 7 years who cannot read and write with understanding in any language.
- Primary education: Education up to 7<sup>th</sup> standard level.
- High school: Education up to 10<sup>th</sup> standard.
- Degree: One who has obtained an undergraduate or post graduate degree and above.
- Pre-school: All children up to 7 years of age.
- Socio- economic status: All individuals were classified into various socio-economic class according to Modified B. G. Prasad's classification June 2014 (All India consumer price index for the June 2014 was 255)<sup>6</sup> (Class I= ≥ 5821, class II = 2910-5820, class III = 1746-2909, class IV=873-1745 and Class V= ≤ 873)
- Nuclear family: A family of one or less than one couple along with or without their children.
- Joint family: Anything other than the nuclear family
- Unmarried: Includes all persons who have never been married
- Married: Includes persons whose current marriage has not ended through widowhood, divorce or separation (Regardless of previous marital history)
- Separated: Includes persons not legally separated or otherwise absent from their spouse because of marital discord
- Divorced: Includes persons who are legally divorced and who have not remarried
- Widowed: Includes widows and widowers who have not remarried
- Occupation: occupational groups were classified according to National Occupational Classification 2004<sup>7</sup>

**Disease Classification as per RNTCP**

- Smear-positive pulmonary TB: A patient with one or two smears being positive for AFB out of the two sputum specimens subjected for smear examination by direct microscopy is diagnosed as having smear positive pulmonary TB.
- Smear-negative pulmonary TB: A patient with symptoms suggestive of TB with two smear examinations negative for AFB, with evidence of pulmonary TB by microbiological methods (culture positive or by other approved molecular methods) or Chest X-ray is classified as having smear negative pulmonary tuberculosis.
- Extrapulmonary TB: Tuberculosis of organs other than the lungs such as pleura, lymph nodes, intestine, genitourinary tract, joint and bones, meninges of the brain etc., is called as extra-pulmonary TB. Pleural tuberculosis is classified as extra pulmonary.

**Statistical Analysis**

Data was entered into Microsoft excel sheet and analysed using SPSS (Statistical Package for Social Sciences) version 15. Descriptive statistics like percentages, mean, standard deviation and frequencies and proportions were used to describe the data.

**RESULTS**

During the 3rd and 4th quarters of 2014 in five DMCs coming under Mandya TU, 2,874 TB suspects were subjected to sputum examination for AFB. Of these, 239 were positive. Out of the diagnosed, 104 were started on

treatment within the TU and the rest were referred out to their convenient TUs for treatment. Including 34 sputum negative pulmonary and 67 extrapulmonary TB cases and one transferred- in new sputum positive case, a total of 217 patients were registered for the treatment. Among these, 206 patients consented to participate in the study.

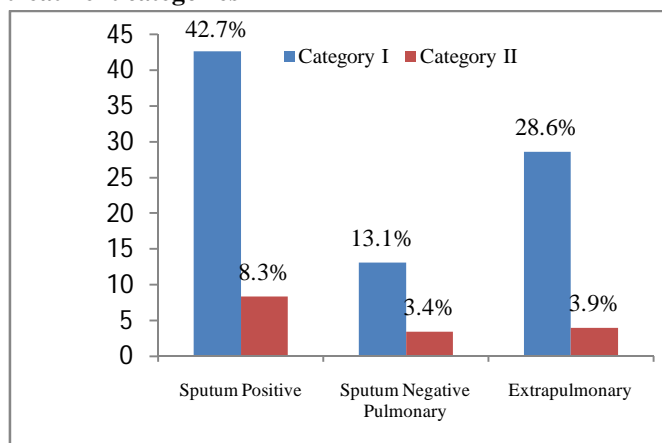
**Table 1: Distribution of study subjects among various DMCs under Mandya TU (n=206)**

DMC	No of subjects	Percentage
MIMS	77	37.4
DTC	63	30.6
Maddur	51	24.8
Shivalli	11	5.3
Sanjo		
Hospital (Pvt)	4	1.9
Total	206	100

**Table 2: Age and sex wise distribution of the study subjects (n=206)**

Age Group (in years)	Male	Female	Total (%)
0-14	9	7	16(07.8)
15-29	27	23	50(24.3)
30-44	46	14	60(29.1)
45-59	37	16	53(25.7)
60-74	17	4	21(10.2)
≥ 75	4	2	06 (02.9)
Total	140 (68%)	66 (32%)	206(100.0)

**Fig.1 Distribution of study subjects in different treatment categories**



Of the total 206 study subjects, 68% were male and 32% were female. Majority of the study subjects, 29.1% were in the age group 30-44 years, followed by the age group of 45-59 years who comprised 25.7% study subjects. Mean and Standard deviation of age of males was 40.74 ± 17.12 years and females was 34.64± 18.85 years. Majority of the study subjects were in the economically productive age group. It is observed that 61.7% study subjects were married, 18% were unmarried and 9.7% were widowed.

According to the type of the family, 58.7% of the study subjects were from joint families and 41.3 % were from nuclear families. 58.7% were illiterates and 18% were educated up to primary school and 14.1% were educated up

to high school. Only 4.9% of the study subjects were graduates.

**Table 3: Sociodemographic profile of the study subjects (n=206)**

Sociodemographic variable	Male (140)	Female (66)	Total (%)
<b>Marital Status</b>			
Unmarried	30	7	37 (18.0)
Married	87	40	127 (61.7)
Separated	2	2	04 (01.9)
Divorced	1	1	02 (01.0)
Widowed	11	9	20 (09.7)
Not Applicable*	9	7	16 (08.7)
<b>Type of Family</b>			
Nuclear	55	30	85 (41.3)
Joint	85	36	121 (58.7)
<b>Education</b>			
Illiterate	79	42	121 (58.7)
Primary	29	8	37 (18.0)
High School	22	7	29 (14.1)
Graduate	7	3	10 (04.9)
Preschool	3	6	09 (04.4)
<b>Occupation</b>			
Labourer	61	18	79 (38.3)
Farmer	35	2	37 (18.0)
Shopkeepers	10	0	10 (04.9)
Employees	7	3	10 (04.9)
Housewife	0	22	22 (10.7)
Others	17	12	29 (14.1)
Not Applicable#	10	9	19 (09.2)
<b>Socio Economic Status**</b>			
Class II	5	5	10 (4.9)
Class III	24	20	44 (21.4)
Class IV	82	34	116 (56.3)
Class V	29	7	36 (17.5)
<b>Area of residence</b>			
Urban	58	34	092 (44.7)
Rural	82	32	114 (55.3)
<b>Type of house</b>			
Kutchha	34	13	47 (22.8)
Pucca	106	53	159 (77.2)

\*This group consists of children up to age 15 years. \*\* According to modified B G Prasad classification June 2014. # This group consists of subjects up to age of 16 years, who are not working.

According to the National classification of occupations 2004, India, labourers come under Division 8, farmers come under Division 6, shopkeepers come under Division 5, employees come under Division 4, housewives & others who are not employed are treated as unclassified. Of the study subjects 38.3% were labourers, 18% were

farmers and 14.1% were persons included in others as they did not specify being engaged in any occupation.

**Table 4: Distribution of study subjects in Category II according to the type of case**

Type	Sputum positive Pulmonary (%)	Sputum negative Pulmonary (%)	Extrapulmonary (%)	Total (%)
Relapse	11(33.3)	06(18.8)	04 (12.5)	21 (65.6)
Treatment after default	05 (15.7)	0	0	05 (15.6)
Others	01(3.1)	01 (3.1)	04 (12.5)	06 (18.8)
Total	17 (53.1)	07 (21.9)	08 (25.0)	32(100)

**Table 5: Distribution of the study subjects according to HIV Status in category I and II**

HIV Status	Category I (%)	Category II (%)	Total (%)
Reactive	32 (18.4)	11 (34.4)	43 (20.9)
Non-reactive	142 (81.6)	21 (65.6)	163 (79.1)
Total			

**Table 6: Distribution of the study subjects according to HIV Status in different categories of new cases**

HIV Status	Category I (New Cases)			Total
	Sputum positive Pulmonary (%)	Sputum negative Pulmonary (%)	Extrapulmonary (%)	
Reactive	12 (37.5)	06 (18.7)	14 (43.8)	32 (100.0)
Non-reactive	76 (53.5)	21 (14.8)	45 (31.7)	142 (100.0)
Total	88	27	59	174

Majority 56.3% of the study subjects belong to socio-economic status class IV, followed by class III 21.4% and 17.5% from class V. Study subjects belonging to class II were 4.9%. None of the study subjects were from class I and 55.3% were from rural area and 44.7% were from urban area. Majority of study population 77.2% were living in pucca houses and 22.8% lived in kutchha houses.

20.9% study subjects were HIV reactive. The proportion of reactive subjects was more, 34.4% in category II compared to 18.4% in category I. Of the newly diagnosed TB patients who were HIV reactive 14 (43.8%) had extrapulmonary TB, 12(37.5%) were sputum positive TB and 6 (18.7%) were sputum negative pulmonary TB cases.

**DISCUSSION**

Out of 206 study subjects studied, 68.0% were male and 32.0% were females. Of the study subjects, 24.3% were in the age group of 15-29yrs, 29.1% were in the age group of 13-44yrs and 25.7% were in the age group of 45-59 years. Majority of the study subjects were distributed in the economically productive age group. There were 16 (9.2% of new cases) children who were aged up to 14

years. The Global TB Report 2014 has stated that the highest burden of TB is observed among people aged 35-54 years old who are the most economically productive age group which is similar to our study findings.<sup>1</sup> There were 9.2% (of new cases) children who were aged up to 14 years. The Annual Status Report, TB India 2014 states that 5 % of the new cases are in the pediatric age group of 0-14 years.<sup>2</sup>

In a study conducted by Chaya Mittal & Gupta S C in Agra city, majority of the study subjects 65.8% were in 16-45 years age group.<sup>8</sup> In a study conducted by Olarewaju et al in South Western Nigeria, the total mean age for male patients was  $43 \pm 19$  years and that of the female group it was  $40 \pm 17$  years and the total mean age group is  $42.0 \pm 19$  years.<sup>9</sup> In our study the mean and Standard deviation of age of males was  $40.74 \pm 17.12$  years and females was  $34.64 \pm 18.85$ .

With regard to the marital status, 61.7% were married, 18% were unmarried, 9.7% were widowed. 41.3% belonged to nuclear family and 58.7% were from joint families. similar findings were seen in a study done by T S Bam et al where 40 (67.8%) were married and 14 (23.7%) were single.<sup>10</sup>

This may be due to the fact that people who were married may visit health care centre early compared to those who were unmarried.

More than half of the study subjects (58.7% ) were illiterates. Illiteracy is one of the major social factor for tuberculosis. In a study by P G Gopi et al conducted in a rural tuberculosis unit of South India, 40% of the study subjects were illiterates and 60% were literates.<sup>11</sup> In a study conducted by P Mishra et al in Nepal the illiterates were 42.5%.<sup>12</sup>

Out of 206 study subjects 38.3% were labourers, 18% were farmers and 14.1% were unemployed. In a study conducted by Kulkarni P Y et al in Mumbai on Non-adherence of new pulmonary TB patients of the study subjects, 38.1% were unemployed and 62.1% were employed.<sup>13</sup> In our study majority were either manual labourers or farmers as the district is mainly dependent on agricultural income.

In present study, 56.3% subjects belonged to socio-economic status class IV and 21.4% class III. None of the study subjects were from class I. In a study conducted by P Mishra et al, 62.5% of the study subjects belonged to lower SES and 32.5% belonged to medium SES and 5% belonged to higher SES.<sup>12</sup> In a study done in Mumbai by Suparna Bagchi et al, 52.6% belonged to SES class IV & V, 16.7% belonged to class III and 30.7% belonged to SES class II respectively.<sup>14</sup> It shows that lower socio economic status people are more affected comparatively due to the poverty and poor housing conditions.

In our study 55.3% were from rural area & 44.7% from urban area. Most (77.2%) of study population were living in pucca houses. In a study conducted by M Uplekar et al in Maharashtra on TB patients 57.8% of the study subjects were from rural area and 42.2 % were from urban area.<sup>15</sup>

## Treatment Categories

More than three fourth (84.4%) of the 206 study subjects were registered for category I treatment and 15.6% were registered for category II treatment. Of the category I, 42.7% were new sputum positive cases, 13.1% were sputum negative pulmonary cases and 28.6% were extra pulmonary TB cases. Among the category II, 8.3% were sputum positive, 3.4% were sputum negative pulmonary cases and 3.9% were extra pulmonary cases. According to a study by Shikha Jain et al in Ahmedabad city, 88.9 % belonged to category I and 11.1% were category II or re treatment cases which is similar to our findings.<sup>16</sup> A study by Dilip D. Motghare et al in Goa, 66.5% of patients had pulmonary tuberculosis, 31.9% had extrapulmonary TB while 1.6% had combination of pulmonary and extra-pulmonary TB. As far as type of Tuberculosis cases was concerned 75.8% were new cases, 13.2% were relapse cases, 5.5% were treatment after default, and 2.2% were failure cases.<sup>17</sup>

## Study subjects in Category II according to the type of cases

Among the study subjects who were classified as (retreatment) category II, 65.6% were due to relapse, out of which 33.3% were sputum positive. All the study subjects who were started on retreatment following default during the previous treatment were sputum positive. In a study conducted by Solomon Sisay et al in Gambala region of Ethiopia, among the retreatment cases 6.4% were due to relapse, 5.3% were due to default and 0.9% were due to failure.<sup>18</sup>

## Study subjects according to HIV Status in category I and II

Out of 206 study subjects, 20.9% study subjects were HIV reactive. The proportion of reactive subjects was more, 34.4% in category II compared to 18.4% in category I. According to Global TB report 2014, 13% of the people who developed TB were HIV positive.<sup>1</sup> According to annual status report of TB India 2014, in 2013 among the TB patients registered 63% were tested for HIV and 5% were found to be HIV positive.<sup>2</sup>

In their study on treatment outcome of Tuberculosis Patients at Gambella Hospital, Southwest Ethiopia Getahun Asebel et al found that 24.22% were HIV positive.<sup>19</sup> It reveals that TB is more common among those who are infected with HIV. Suresh Shastri et al in their retrospective study in Karnataka found that nearly three-quarters 73.2%, of all co-infected patients had pulmonary TB. Of these, 46% were sputum positive for acid fast bacilli. A majority of the patients (87%) were new TB infections while 9.6% were those who had either defaulted treatment, received incomplete treatment, or those who had relapsed.<sup>20</sup>

**Conclusion** Majority of the study subjects were in the economically productive age group and were males. More than half of them were illiterates, were from rural area and from low socio economic status. Hence there is need to improve the socioeconomic status, educational status and

living conditions to bring down the prevalence of tuberculosis in the country.

### Acknowledgement

We are thankful to our faculty members for their guidance and support and health workers of DOTS centre, Mandya for their help & support.

### REFERENCES

- World Health Organization. Global TB Report 2014. Geneva: WHO; 2014
- TB India 2014. RNTCP Annual Status report: Reach the unreached. Central TB Division, Directorate of General Health Services, MOHFW, Nirmal Bhavan, New Delhi. 2014
- TB India 2012. RNTCP Annual Status report, Central TB Division, Directorate General Health Services, MOHFW, Nirmal Bhavan, New Delhi. 2012
- Park K. Textbook of Preventive and Social Medicine. 23<sup>rd</sup> ed. Banarsidas Bhanot publishers; 2014:427-31.
- Census 2011. Statistics of Mandya available at <http://www.census2011.co.in/census/city/449-mandya.html> accessed on 14<sup>th</sup> March 2015
- Dulada SR, Arlappa N. An updated Prasad's socioeconomic status classification for 2013. International journal of research and development of health 2013;1:2-4.
- Government of India. National Classification of Occupations-2004. Available at URL (<http://www.nsdindia.org/pdf/nco2004-code-structure.pdf>) accessed on 23<sup>rd</sup> July 2015
- Chaya M Mittal, SC Gupta. Noncompliance to DOTS: How it can be decreased, Indian Journal of Community Medicine, 36 (1), January 2011, 27-30
- Olarewaju S, Olanrewaju O, Folorunso E, Babatunde A, Temitayo OA, Abdulsalam S et al. Tuberculosis Research and Treatment Outcome of Tuberculosis Patients Registered at DOTS Centre in Ogbomoso, Southwestern Nigeria: A 4-Year Retrospective Study. Tuberculosis Research and Treatment 2014; 2014:1-5.
- Bam TS, Gunneberg C, Chamroonsawasdi K, Bam DS, Aalberg O, Kasland O et al. Factors affecting patient adherence to DOTS in urban Kathmandu, Nepal. Int J Tuberc Lung Dis 2006; 10(3):270-76.
- Gopi PG, Vasantha M, Muniyandi M, Chandrasekharan V, Balasubramaniam R. Risk factor for Non adherence to directly observed treatment (DOTs) in a rural tuberculosis unit, South India. Indian J Tuberc. 2007; 54(3):66-70.
- Mishra P, Hansen EH, Sabroe S, Kafle KK. Socio-economic status and adherence to tuberculosis treatment: a case-control study in a district of Nepal. Int J Tuberc Lung Dis 2005; 9(10):1134-39.
- Kulkarni PY, Akarte SV, Mankeshwar RM, Bhawalkar JS, Banerjee A, Kulkarni AD. Non-adherence of New Pulmonary Tuberculosis patients to Anti-Tuberculosis treatment. Annals of Medical and Health Sciences Research, 3 (1), Jan-Mar 2013: 67-74
- Suparna B, Gurish A, Nalini S. Determinants of poor adherence to anti tuberculosis treatment in Mumbai, India. Int J Prev Med 2010; 1(4):223-32.
- Uplekar M, Juvekar S, Morankar S, Rangan S, Nunn P. Tuberculosis patients and practitioners in private clinics in India. Int J Tuberc Lung Dis 1998;2(4):324-29.
- Shikha Jain et al. Defaulter rate and Associated factors among the TB patients treated under DOTS in Ahmedabad city. Indian Journal of Preventive & Social Medicine. Vol 43, No 2, 2012 159-164
- Motghare DD, Sardesai GM, Vaz FS, Kulkarni MS. Study of treatment outcomes in tuberculosis patients on DOTS therapy at five centres in Goa. Int J Community Med Public Health 2014; 1:48-51.
- Solomon S, Belete M, Woldaregay E, Desalegn W. Directly Observed Treatment Shortcourse (DOTS) for tuberculosis control program in Gambella Regional State, Ethiopia: ten years experience. BMC Research Notes 2014;7(44):1-8.
- Asebe G, Dissasa H, Teklu T, Gebreegizeabhe G, Tafese K, et al. (2015) Treatment outcome of Tuberculosis Patients at Gambella Hospital, Southwest Ethiopia: Three-year Retrospective Study. J Infect Dis Ther 3:211. doi: 10.4172/2332-0877.1000211.
- Suresh S, Balaji N, Anita S, Bharat R, Ayesha DC. TB treatment outcomes among TB-HIV co-infections in Karnataka, India: how do these compare with non-HIV tuberculosis outcomes in the province? BMC Public Health 2013;13:838.

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Ravikumar MS, Manuja LM, Harish BR. Socio demographic profile of patients on Directly Observed Treatment Short Course Chemotherapy in Mandya Tuberculosis Unit, Karnataka. Nat J Res Community Med 2018;7(1):60-65.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

## Comparison Of Outcomes Of Teenage And Non-Teenage Pregnancies At A Rural Maternity Hospital In Ramnagara District, Karnataka – A record Review

Naveen Ramesh<sup>1</sup>, Cency Baburajan<sup>2\*</sup>, Avita Rose Johnson<sup>3</sup>

1 – Associate Professor, Department of Community Health, St. John's Medical College, Bangalore, 2 – Postgraduate student, Department of Community Health, St. John's Medical College, Bangalore, 3 – Assistant Professor, Department of Community Health, St. John's Medical College, Bangalore

Date of Submission : 12-01-2018

Date of online Publication : 15-02-2018

Date of Acceptance : 30-01-2018

Date of Print Publication : 31-03-2018

\***Author for correspondence:** Dr. Cency Baburajan, Post graduate student, Department of Community Health, St. John's Medical College, Bangalore, Email Id: [cencyvyola@gmail.com](mailto:cencyvyola@gmail.com)

### Abstract

**Introduction:** Pregnancy that occurs in the ages of 13-19 years is considered as teenage pregnancy. Pregnancy and child birth related complication are the second biggest causes of death among this age group. India ranks first among countries with the highest number of teenage pregnancies, most of who are from rural areas. **Objectives:** To assess the socio-demographic profile and the outcomes of teenage pregnancies and to compare the outcomes of teenage pregnancies with non-teen pregnancies in a rural area. **Methodology:** This study was a retrospective record review, conducted in a rural maternity hospital in Ramnagara district of South Karnataka. Hospital records for the past one year were reviewed for outcomes of deliveries. A proportion of 1:2 (one teen: two non-teen pregnancies) was maintained while collecting the data after obtaining permission from the hospital authorities. Data was entered in MS Excel and analyzed using standard statistical packages. **Results:** Among the 45 teenage and 92 non teenage pregnancies, 55.5% and 60.9% had completed school education and mean age of marriage was 17.8 years and 20 years respectively. Among teenage and non-teenage pregnancies respectively, 4.4% and 17.4% had anemia, 97.8% and 94.6% were term deliveries, 82.2% and 87% had normal delivery, 8.9% and 4.3% had postpartum hemorrhage and 13.3% and 25% had low birth weight babies. Teen and non-teen pregnancies were not significantly associated with any of the socio-demographic factors or other factors like anaemia, type of delivery, term of delivery, birth weight of the baby, complications in mother and baby. **Conclusion:** Teen mothers had a higher proportion of PPH as compared to non-teens, but there was no statistically significant difference in the outcomes of teen and non-teen pregnancies. This could be attributed to the fact that all the teen pregnancies in the present study were above the age of 18 years.

**Key-words:** Teenage, pregnancy, rural, record review.

### Introduction

The World Health Organization defines adolescence as the age group of 10-19 years. Pregnancies that occur during these ages are referred to as adolescent pregnancies. India accounts for about 20% of the world's adolescent girl population according to 2010 data, making it one among the top ten countries in the world with the greatest number of adolescent girls<sup>1</sup>. According to UNICEF, worldwide 14 million children are born to teenage women<sup>2</sup>. In India, teenage pregnancy constitutes 8-14% of total pregnancies. Complications of pregnancy and childbirth in teenagers are the leading cause of mortality among women in India. Hence teenage pregnancy is a serious problem in developing countries like India<sup>3</sup>. Adolescent girls face higher risks during pregnancy and motherhood like maternal anemia, preterm birth, complications of caesarean section and maternal death. Teen pregnancy

leads to violations of right to education, employment and poor reproductive health. There are also complications for the newborn like low birth weight, prematurity and high rates of perinatal and neonatal mortality. Emphasis on maternal and child health has been given by the Indian government with the introduction of programs and government schemes like including RMNCH+A. While there is reduction in the maternal and infant mortality rates in the country<sup>4</sup>, the sheer numbers of teenage pregnancies remain high. However, the increasing education levels and increasing prosperity in rural areas around cities, a need was felt to document and compare the outcomes teenage and non-teenage pregnancies in this setting. **Objectives:** To compare and contrast the maternal and fetal outcomes of teenage and non-teenage pregnancies in a rural maternity hospital in South Karnataka.

## Methods

The in-patient records maintained at a private rural maternity hospital located in Ramnagara district in South Karnataka were reviewed retrospectively for the last one year for outcomes of deliveries conducted in that hospital. For the purpose of this study, pregnant women upto 19 years of age were considered as teenage and those above 19 years were considered as non-teenage pregnancies. It was decided to review records over a one year period, and therefore a sample size was not calculated, instead all the teen pregnancies in that period were included in the study. A proportion of 1:2 (one teen: two non-teen pregnancies) was maintained while reviewing the records after obtaining permission from the hospital authorities. Information collected from records included socio-demographic and obstetric details, HIV/HBsAg/VDRL status, hemoglobin level and outcomes in terms of pregnancy outcomes (abortion/live birth/still birth), term (full term/ pre term/post term), type of delivery (normal/caesarean/ vacuum delivery), birth weight of the baby, congenital anomalies, intra natal complications, post natal complications and complications in the baby. Data was entered in MS Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 16. Descriptive statistics such as mean and standard deviation were computed for quantitative variables. Various outcomes among teenage and non-teenage pregnancies were compared using Chi-square/Fisher's exact test and Odd's ratio as appropriate. A probability level  $p < 0.05$  was considered for statistical significance.

## Results

A total of 137 in-patient delivery records were analyzed which included 45 teenage and 92 non-teen pregnancies. The mean age of the teenage mothers was  $18.96 \pm 0.21$  (18-19) years and mean age of the non-teenage mothers was  $22.9 \pm 2.83$  (20-30) years. Socio-demographic profile of the teenage and non-teen pregnant women is given in Table 1.

**Table 1: Socio-demographic variables among teenage and non-teenage pregnancies**

Variable	Category	Teenage pregnancy (n=45)	Non-teen pregnancy (n=92)	p value
Highest education	Upto 10 <sup>th</sup> standard	25(55.6%)	56(60.9%)	0.552 <sup>a</sup>
	PUC and above	20(44.4%)	36(39.1%)	
Occupation	Home maker	45 (100%)	89(96.7%)	0.551 <sup>b</sup>
	Gainfully employed	0	3 (3.3%)	
Marital status	Married	45 (100%)	92 (100%)	
	Unmarried	0	0	-
Age at marriage	<18 years	6 (13.3%)	3 (3.3%)	0.059 <sup>b</sup>
	$\geq 18$ years	39(86.7%)	89(96.7%)	

a = Chi-square test, b= Fisher's exact test

**Table 2: Obstetric variables among teenage and non-teenage pregnancies**

Variable	Category	Teenage pregnancy (n=45)	Non-teen pregnancy (n=92)
Gravida	Primigravida	44 (97.8%)	48(52.2%)
	Multigravida	1 (2.2%)	44(47.8%)
History of abortion	Yes	1 (2.2%)	10 (10.9%)
	No	44 (97.8%)	82 (89.1%)
Hemoglobin status	< 11g/dl	2 (4.4%)	16 (17.4%)
	$\geq 11$ g/dl	43 (95.6%)	76 (82.6%)

**Table 3: Pregnancy outcomes of teenage and non-teenage pregnancies**

Variable	Category	Teenage pregnancy (n=45)	Non-teenage pregnancy (n=92)	Odd's ratio (95% CI)
Term of delivery	Full term	44(97.8%)	87(94.6%)	-
	Preterm/post term	1 (2.2%)	5 (5.4%)	0.39 (0.04-3.48)
Pregnancy Outcome	Live birth	45 (100%)	91(98.9%)	-
	Still birth	0	1 (1.1%)	0.98 (0.97-1.01)
Type of delivery	Normal delivery	37(82.2%)	80 (80.7%)	-
	Caesarean section	5 (11.1%)	9 (9.8%)	0.833 (0.26-2.66)
	Forceps delivery	3 (6.7%)	3 (3.3%)	0.46 (0.89-2.4)
Birth weight of the baby	<2500 grams	6 (13.3%)	16 (17.4%)	0.46 (0.17-1.23)
	$\geq 2500$ grams	39 (86.7%)	76 (82.6%)	-

All the teenage and non-teenage mothers were married. There was no significant difference in education, occupation and age at marriage between teenage and non-teenage pregnancies. The details obtained from teen and non-teen pregnancy records were described in Table 2. Blood tests including HIV/AIDS, HBsAg were found to be negative and VDRL was found to be non-reactive for all the pregnant mothers. The pregnancy outcomes of both groups were recorded and analyzed. The details are depicted in table 3.

Details of intra natal and post natal complications among the teenage and non-teenage mothers and congenital abnormalities in the baby were also explored. Among teenage pregnant mothers, 4(8.9%) reported to have postpartum hemorrhage while no intra natal complications and congenital anomalies among babies were reported. Among non-teenage mothers, intra natal complication 1(1.1%), congenital anomalies 2(2.2%) and 4(1.1%) postpartum hemorrhage were reported.

## Discussion

According to our record review, all the women both teenage and non-teenage had received formal education. Studies have shown that, higher level of education expected out of the younger generation than in the past drives them to obtain at least secondary school education. Parents and community are recognizing the importance of education and are discouraging early marriage and child bearing. Governments have accepted the need to improve the status and health of women and policy makers are increasingly focusing their attention on the situation of youth, especially that of girls and young women<sup>5</sup>. While all the teen pregnant women were homemakers, 3(3.3%) of the non-teenagers were gainfully employed. Teenage pregnancy hampers further employment opportunities and makes them economically dependent on their families. In a study conducted in rural Karnataka, 90.2% teenage mothers were housewives<sup>6</sup>.

In the present study, 55.6% of teenage mothers had school education up to tenth standard and 44.5% had attended PUC. But none of the teenage mothers were working at the time of pregnancy. In a study conducted in Bhopal, average age of marriage was 17.55 years and 80.95% of teenagers were uneducated. Only 2.9% of the teenage mothers were employed and they were laborers<sup>7</sup>. All were married and majority of the teenagers (86.7%) got married at the legal age of 18 years while majority of the non-teenage pregnant women, (85.1%) got married above 18 years of age. This indicates that the teenage pregnancies in our study were due to immediate pregnancy after marriage at the legal age rather than marriage before legal age.

Due to improved education and awareness levels, marriages are occurring at or after the age of 18 years, which is why the pregnancies in our study have all occurred after the age of 18 years.

The pregnancy outcomes of the two groups also did not have marked differences. Majority were full term normal deliveries for both the groups. This may be because of the effective utilization of the antenatal care services which had a positive influence on the health of the mother and child. Complications associated with pregnancy (like preterm labor, hypertensive disorders of pregnancy, Premature Rupture of Membrane, abortion and anemia) can be prevented, diagnosed and managed timely with proper antenatal visits<sup>7</sup>. In our study, 4.4% of teenage pregnant women were anaemic compared to 17.4% among non-teen pregnant women. There is evidence that teenage pregnant women can have healthier reproductive history due to special attention and greater care<sup>8</sup>. In the current study setting, services available at low-cost, early registration and ante-natal care including timely intake of iron and folic

acid by teenage women may have played a role in reducing anemia. Healthy timing and spacing between pregnancies (HTSP) is important to avoid maternal anemia<sup>9</sup>. Prevalence of anemia is higher among pregnant women with short pregnancy interval and higher parity<sup>10</sup>. Among the non-teen pregnant women in our study, 47.8% were multiparous and therefore more likely to have been anaemic. Unmet needs of post-partum spacing also results in low birth weight (LBW) babies<sup>9</sup>. This could be the reason for having higher LBW babies among non-teen pregnant women compared to teens in our study. Both teenage and non-teenage pregnant women may have had adequate institution based antenatal care equally in the present study setting probably leading to no significant difference in delivery outcomes between the age groups. Teenage and non-teenage pregnancies were not significantly associated with any of the socio-demographic factors. In this study, 8.9% of teenage women had post-partum hemorrhage while a study conducted in Ahmedabad reported only 2.1%. But this result was not statistically significant<sup>11</sup>. According to a study conducted in Varanasi, teenagers who are younger ( $\leq 17$  years) are most vulnerable to adverse obstetric and neonatal outcomes. Increased neonatal morbidity and mortality were also seen in babies delivered to those teenage mothers. In the present study, all the teenage pregnant women were 18-19 years of age. Therefore the different adverse outcomes described in other studies pertaining to teenage pregnancies were not evident<sup>12</sup>. The better education status of the teenage mothers in the present study may also be the reason for better outcomes<sup>8</sup>. In a study conducted in Karnataka on maternal and fetal outcomes of teenage pregnancy, majority of the deliveries were reported to be normal vaginal deliveries and majority were healthy babies which is similar to our study findings<sup>3</sup>. Another study conducted in a different setting also reported that the birth outcomes of early adolescent pregnancies (15 years and younger) were poorer than for pregnant women between 16-19 year of age. This also supports the present study findings were the teenage pregnancies were above the age of 18 years<sup>10</sup>.

**Limitations:** Lack of data regarding previous antenatal checkups, insufficient data regarding identification and management of any complications during antenatal period prior to admission for delivery

## Conclusion

Though not statistically significant, a higher proportion of teenage mothers presented with PPH in comparison to non-teenage mothers. All other outcomes like still birth, low birth weight, pre term delivery and complications of delivery were found to be not different between teenage and non-teenage mothers. This may be due to the fact that the teenage deliveries

in our study were all above the age of 18 years. But the findings cannot be generalized.

### Acknowledgement

The authors thank the management and staff of Snehalaya Hospital, Solur, Ramnagara district, for all their help and co-operation in this study.

### References

- Loaiza E, Liang M. Adolescent Pregnancy: a review of the evidence. Available from: <https://www.popline.org/node/578624> [Accessed 1st December 2017]
- Unicef. Young people and family planning: Teenage pregnancy. 2008 July. Available from: [https://www.unicef.org/malaysia/Teenage\\_Pregnancies\\_-\\_Overview.pdf](https://www.unicef.org/malaysia/Teenage_Pregnancies_-_Overview.pdf) [Accessed 29<sup>th</sup> November 2017]
- Ambadekar NN, Khandait DW, Zodpey SP, Kasturwar NB, Vasudeo ND. Teenage pregnancy outcome: a record based study. Indian Journal of medical sciences. 1999 Jan ;53(1):14–7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10798019> [Accessed 1st December 2017]
- Sharma AK, Chhabra P, Gupta P, Aggarwal QP, Lyngdoh T. Pregnancy in adolescents: a community based study. Indian J Prev Soc Med 2003;34(1):24-32. Available from: <http://medind.nic.in/ibl/t03/i1/iblt03i1p24o.pdf> [Accessed 30<sup>th</sup> November 2017]
- Chawanpaiboon S, Hengrasmee P. Adverse pregnancy outcomes in extremely maternal age. Open Journal of Obstetrics and Gynecology. 2013 May 22;3(04):427. Available from: [https://file.scirp.org/pdf/OJOG\\_2013060313404872.pdf](https://file.scirp.org/pdf/OJOG_2013060313404872.pdf) [Accessed 27<sup>th</sup> November 2017]
- Doddihal CR, Katti SM, Mallapur MD. Teenage pregnancy outcomes in a rural area of South India: A prospective study. International Journal of Medicine and Public Health. 2015;5(3). Available from: [http://www.ijmedph.org/sites/default/files/IntJMedPublicHealth\\_2015\\_5\\_3\\_222\\_161527.pdf](http://www.ijmedph.org/sites/default/files/IntJMedPublicHealth_2015_5_3_222_161527.pdf) [Accessed 24<sup>th</sup> November 2017]
- Jain A, Sengupta D Sengupta M. A Study of maternal mortality in a tertiary health care centre in West Bengal. Journal of Evolution of Medical and Dental Sciences. 2013 May 27;2(21):3822–8. Available from: [https://www.researchgate.net/publication/270781616\\_a\\_studyof\\_maternal\\_mortality\\_in\\_a\\_tertiary\\_health\\_care\\_centre\\_in\\_west\\_bengal](https://www.researchgate.net/publication/270781616_a_studyof_maternal_mortality_in_a_tertiary_health_care_centre_in_west_bengal) [Accessed Nov 24<sup>th</sup> 2017]
- Raatikainen K, Heiskanen N, Verkasalo PK, Heinonen S. Good outcome of teenage pregnancies in high-quality maternity care. European Journal of Public Health 2005;16(2):157–61. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/16141302> [Accessed 7th February 2018]
- United States Agency for International Development. HTSP 101 : Everything You Want to Know About Healthy Timing and Spacing of Pregnancy. 2005. Available from: [www.esdproj.org](http://www.esdproj.org) [Accessed 7<sup>th</sup> February 2018]
- Noronha JA, Bhaduri A, Bhat HV. Prevalence of anaemia among pregnant women : a community-based study in udupi district. Health and Population-Perspectives and Issues 2008;31(1):31–40. Available from: [medind.nic.in/hab/t08/i1/habt08i1p31.pdf](http://medind.nic.in/hab/t08/i1/habt08i1p31.pdf) [Accessed 7<sup>th</sup> February 2018]
- Thaker R V, Panchal M V, Vyas RC, Shah SR, Shah PT, Deliwala KJ. Study of Feto-Maternal outcome of Teenage Pregnancy at Tertiary Care Hospital. Gujrat Medical Journal. 2013 Dec:68 (2):45-8. Available from: <http://medind.nic.in/gaa/t13/i2/gaat13i2p100.pdf> [Accessed 24<sup>th</sup> November 2017]
- Kumar A, Singh T, Basu S, Pandey S, Bhargava V. Outcome of teenage pregnancy. Indian Journal of pediatrics. 2007 Oct 1;74 (10):927-31. Available from: <http://link.springer.com/10.1007/s12098-007-0171-2> [Accessed 3<sup>rd</sup> December 2017]

**Conflict of Interest:** None

**Source of funding support:** Nil

**How to cite this article:** Naveen Ramesh, Cency Baburajan, Avita Rose Johnson. Comparison Of Outcomes Of Teenage And Non-Teenage Pregnancies At A Rural Maternity Hospital In Ramnagara District, Karnataka – A record Review. Nat J Res Community Med 2018;7(1):66-69.

© Community Medicine Faculties Association

NJRCM: [www.commedjournal.in](http://www.commedjournal.in)

**SHORT ARTICLE**

DOI: 10.26727/NJRCM.2018.7.1.70-72

Year: 2018 Vol: 7 Issue: 1. Jan.-Mar. Page: 70-72

**Shape your breakfast: Breakfast skipping as a risk correlate of Obesity among school children in Chennai**Sowmiya KR<sup>1\*</sup>, Arun G<sup>2</sup>

1 Associate professor, Department of community medicine, Tagore medical college and hospital, Chennai, 2 II MBBS student, Tagore medical college and hospital, Chennai

Date of Submission : 12-01-2018

Date of online Publication : 07-02-2018

Date of Acceptance : 30-01-2018

Date of Print Publication : 31-03-2018

**\*Author for correspondence:** Dr.Sowmiya KR, M.D., Associate professor, Department of community medicine, Tagore medical college and hospital, Chennai. E-mail: [krs3012@gmail.com](mailto:krs3012@gmail.com)**Abstract**

**Introduction:** Breakfast is the first and the most important meal for us. But unfortunately we tend to take it lightly or skip it to our convenience. The younger generation often finds skipping breakfast as a method to lose their body weight unknowing the fact that it leads to deleterious effects. Hence this study was taken up to assess breakfast skipping as a risk to overweight and obesity among school children in Chennai, India. **Methods:** this cross sectional study was done among 300 school children in the age group of 15-17 years studying in a higher secondary school in Chennai. Their BMI was recorded and their awareness regarding the effects of skipping breakfast was assessed. **Results:** Among the 300 study participants, 163(54.3%) were males and 137(45.7) were females. The mean age was 15.9±0.45 years. 64.3% of the students were normal weight while 22.67% were overweight and rest 13% was obese. Overweight and obesity was more among breakfast skippers and was statistically significant (p<0.05). Only 26.6% and 32.6% of the study participants were aware of the fact that skipping breakfast will lead to obesity and hormonal imbalance respectively.

**Key-words:** diet, school children, obesity, overweight, India**INTRODUCTION:**

Breakfast is the first meal taken after rising from a night's sleep, most often eaten in the early morning before undertaking the day's work. The Old English word for dinner, *disner*, means to break a fast, and was the first meal eaten in the day until its meaning shifted in the mid-13th century. It was not until the 15th century that "breakfast" came into use in written English to describe a morning meal, which literally means to break the fasting period of the prior night; in Old English the term was *morgenmete* meaning "morning meal."

Breakfast is the first meal of the day. Breakfast contributes a huge amount of energy daily. Many people tend to skip their first meal of the day due to many variable reasons. Some people skip their breakfast intentionally and some skip their breakfast due to lack of time. Also many people are unaware of the circumstances that arise due to skipping of breakfast.

Students are the main group of population who skip their breakfast frequently. The adverse effects of skipping breakfast are too dangerous. Major adverse effect is hormonal imbalance. Many hormones (like Growth hormone, Glucagon, Thyroxine, Ghrelin) tend to increase

their secretions which lead to obesity (1), hypertension, Diabetes Type II (2), Chronic stress (3).

Hormonal Actions:

Ghrelin:

- Promotes Growth hormone
- Increase appetite and food intake by stimulating feeding centre in Hypothalamus (4) Glucagon:
- Increase blood glucose level (5)

Growth hormone:

- Increase Fatty acids utilization
- Increased Free Fatty Acids in blood which produce energy
- Reaping of higher quantity of free fatty acids from adipose tissue leads to accumulation of fat in liver which leads to Fatty Liver.

Thyroxine:

- Increased Free Fatty Acid increases Free Fatty Acids in blood which produces energy
- Increased Free Fatty Acid which leads to Fatty Liver.

Glucocorticoids:

- Enhances the breakdown of protein in extrahepatic cells (Muscle) which release Amino acid in circulation.
- From Amino acid energy is produced.

By skipping breakfast frequently, hormonal fluctuations happen which damages major vital organs like Brain, Heart, Liver and Kidney (6).

**OBJECTIVE:**

1. To find out the association between skipping breakfast and body mass index (BMI) among higher secondary school students in Chennai
2. To assess the awareness among the students about the health effects of skipping breakfast.

**METHODOLOGY**

This cross-sectional study was undertaken amongst higher secondary schooling students aged between 15 to 17 years in Chennai , during april to july 2017. By simple random sampling method one higher secondary school in Chennai was selected for the study. Students of both the sexes belonging to higher secondary class were included in the study. Students who were not available even after 3 visits were excluded.

**SAMPLE SIZE AND SAMPLING TECHNIQUE::** By simple random sampling method the students will be placed into 2 groups- those who skip breakfast and those who don't till the number 150 is reached in each of the groups with the total sample size of 300.

**VARIABLES ASSESSED:**

Breakfast skipping: We assessed breakfast skipping based on the response to a single assessment question “How many days in a week (on average) do you skip breakfast?” with response of more than 3 days on an average taken as skipping breakfast.

BMI= weight in kg/ height in meters square

The BMI was appropriated for age, gender, and height by calculating percentile ranking according to WHO adolescent anthropomorphic standards. For participants aged 15–17 years, we defined overweight as ≥85th percentile, and obesity as ≥95th percentile, as recommended by the WHO Expert Committee on Physical Status (6).

Awareness regarding health effects of skipping breakfast.

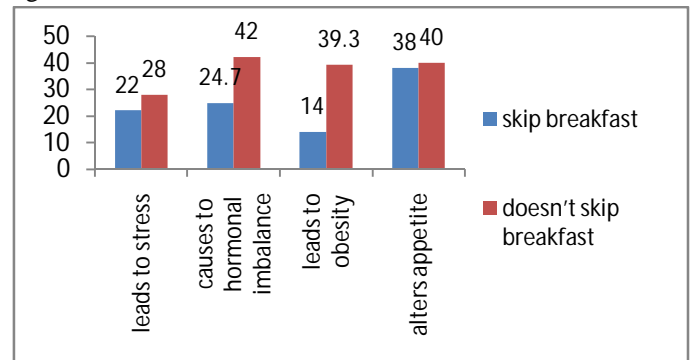
**TOOLS USED:** Pre tested structured close ended questionnaire which will assess on the following sub headings:

- General Demographic details
- Breakfast habit- takes/ skips
- Awareness regarding the health effects of skipping breakfast
- BMI

**DATA ANALYSIS::** Statistical analysis was done in IBM SPSS 21.0 version. BMI is given in mean with standard deviation. Also the range and percentiles calculated. The association between skipping breakfast and BMI will be found out by chi square test. P value of <0.05 taken as significant.

**RESULT**

Among the 300 study participants, 163(54.3%) were males and 137(45.7) were females. The mean age was 15.9±0.45. Only 26.6% and 32.6% of the study participants were aware of the fact that skipping breakfast will lead to obesity and hormonal imbalance respectively. The awareness regarding the consequence of skipping breakfast is given in figure 1.



**Figure 1: awareness regarding the effects of skipping breakfast**

Upon calculating the students BMI, it was found that 64.3% of the students were normal while 22.67% were overweighting and rest 13% was obese. Overweight and obesity was more among breast skippers and was statistically significant (p<0.05) (table 1).

**Table: 1 Breakfast pattern and its relationship to Overweight and Obesity**

Breakfast pattern	Normal (%)	Overweight (%)	Obese (%)	P value
Skip N=150	82 (54.6)	39 (26)	30(20)	0.034*
Never skip N=150	111(74)	27(18)	9(6)	

\*p<0.05

**DISCUSSION**

In this study 22.7% were overweight and 13% were obese, which is similar to the studies done in Delhi and Tamilnadu. (7,8) However, the National Nutrition Monitoring Bureau surveys done in rural areas of India in 2002 reported the prevalence of as little as 0.6%. (9) studies done abroad at Malaysia, Egypt and Pakistan shows prevalence of overweight and obesity to be on the higher side than our study results.(10-13) Prevalence of overweight individuals and obesity in the study could be because of imbalance in the diet.

Females are prone to skip breakfast than the males as seen in the present study as well as studies conducted abroad. (1,2) 36.7% of the students had skipped breakfast to lose their body weight which is similar to the study done in Hongkong. (14) Skipping breakfast is correlated with obesity (by physical measurement). Nearly 20% of the students who skip breakfast were obese. People who skip three days in a week were tend to be overweight. In

conclusion, overweight and obesity was strongly associated with skipping breakfast. Hence it is imperative to impart nutrition education to the school children regarding the importance of regular breakfast to produce a future healthy India.

### REFERENCES

- 1) Thompson-McCormick JJ, Thomas JJ, Bainivualiku A, Khan AN, Becker AE. Breakfast skipping as a risk correlate of overweight and obesity in school-going ethnic Fijian adolescent girls. *Asia Pacific journal of clinical nutrition*. 2010;19(3):372-382.
- 2) Kang YW, Park JH. Does Skipping Breakfast and Being Overweight Influence Academic Achievement Among Korean Adolescents?. *Osong Public Health Res Perspect* 2016 Aug;7(4):220- 227.
- 3) Goldstone AP , Prechtl CG , Scholtz S , et al . Ghrelin mimics fasting to enhance human hedonic, orbitofrontal cortex, and hippocampal responses to food. *Am J Clin Nutr* 2014;99:1319–30.
- 4) Maffeis C, Fornari E, Surano MG, Comencini E. *Eur J Clin Nutr* 2012;66(3):314-21
- 5) Bi H, Gan Y, Yang C, Chen Y, Tong X et al. Breakfast skipping and the risk of type 2 diabetes: A meta-analysis of observational studies. *Public Health Nutrition*. 2015;18(16), 3013-3019
- 6) WHO/BMI-for-age (5 to 19 years). WHO. 2007. Available from: [www.who.int/growthref/who2007\\_bmi\\_for\\_age/en/](http://www.who.int/growthref/who2007_bmi_for_age/en/). last accessed on 09.9.2017
- 7) Ramachandran A, Snehalatha C, Vinitha R, Thayyil M, Kumar CK, Sheeba L, et al. Prevalence of overweight in urban Indian adolescent school children. *Diabetes Res Clin Pract*. 2002;57:185–90
- 8) Chatterjee P. India sees parallel rise in malnutrition and obesity. *Lancet*. 2002; 360:1948.
- 9) National Nutrition Monitoring Bureau. Diet and nutritional status of rural population national institute of nutrition. India: Indian Council of Medical Research Hyderabad; 2002.
- 10) Boo NY, Chia GJ, Wong LC, Chew RM, Chong W, Loo RC. The prevalence of obesity among clinical students in a Malaysian medical school. *Singapore Med J*. Feb 2010;51(2):126-32.
- 11) Gopalkrishnan S, Ganeshkumar P, Prakash MV, Christopher, Amalraj V. Prevalence of overweight / obesity among the medical students, Malaysia. *Med J Malaysia* 2012 Aug;67(4):442-44.
- 12) Bakr EM, Ismail NA, Mahaba HM. Impact of lifestyle on the nutritional status of medical students at Aim Shams University. *J Egypt Public Health Assoc*. 2002;77(1-2):29-49.
- 13) Nisar N, Qadri MH, Fatima K, Perveen S. Dietary habits and lifestyle among the students of a pvt. Medical University Karachi. *J Pak Med Assoc*. 2008 Dec;58(12):687-90.
- 14) Tin SP, Ho SY, Mak KH, Wan KL, Lam TH. Breakfast skipping and change in body mass index in young children. *Int J Obes (Lond)* 2011; 35: 899–906.

**Conflict of Interest: None**

**Source of funding support: None**

**How to cite this article:** Sowmiya KR, Arun G. Shape your breakfast: Breakfast skipping as a risk correlate of Obesity among school children in Chennai. *Nat J Res Community Med* 2018;7(1):70-72.

**© Community Medicine Faculties Association**

**NJRCM: [www.commedjournal.in](http://www.commedjournal.in)**





