

# Knowledge of Pulmonary Tuberculosis among Urban Slum and Rural Population of West Tripura District - A Comparative Study

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## ABSTRACT

### BACKGROUND

Globally, tuberculosis (TB) is one of the top 10 causes of death due to infectious diseases. TB continues to rank among world's most serious health problems despite effective diagnostic & treatment measures. The objectives of the study were to assess and compare the knowledge of tuberculosis among rural and urban slum population and identify the factors associated with their knowledge of tuberculosis.

### METHODS

A cross sectional study was conducted and multistage random sampling technique was applied for selection of the individual study subjects. Data was collected using a semi-structured and pre-tested interview schedule.

### RESULTS

200 individuals were included in the study with an overall mean age (SD) of the individuals of 36.66 ( $\pm$  13.091) years. 189 (94.5) participants had heard of tuberculosis. 36 (37.9 %) urban slum and 20 (21.3 %) rural participants said that cough is the most common symptom of pulmonary tuberculosis. 42 (52.5 % among rural population was having good knowledge (rural vs. urban; 52.5 % vs. 47.5 %) compared to urban slum population. Literacy ( $P = 0.049$ ) and family type ( $P = 0.044$ ) have played a significant role in acquiring good knowledge of tuberculosis among the participants irrespective of their place of residence.

### CONCLUSIONS

There was no significant difference in the knowledge of TB among rural and urban slum population. Literate persons were more aware compared to illiterate population irrespective of their place of living. In spite of having good awareness regarding TB, in general the knowledge level on risk factors was not satisfactory and needs further improvement. Therefore, a special drive has to be started for imparting knowledge to the community regarding risk factors as this could prevent further occurrence or progress of TB.

### KEYWORDS

Tuberculosis, Knowledge of TB, Urban Rural Difference

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## BACKGROUND

Worldwide, tuberculosis (TB) is one of the top 10 causes of death due to infectious diseases. There were cases in all countries, but overall 90 % were aged  $\geq 15$  years, 9 % were people suffering from human immunodeficiency virus (HIV) and two thirds were in eight countries: India (27 %), China (9 %), Indonesia (8 %), Philippines (6 %), Pakistan (5 %), Nigeria (4 %), Bangladesh (4 %) and South Africa (3 %). About 1.7 billion people, 23 % of the world's population, are estimated to have a latent TB infection, and are thus at risk of developing active TB disease during their lifetime.<sup>1</sup> TB continues to rank among world's most serious health problems despite effective diagnostic & treatment measures.<sup>2</sup> The main health-care intervention is to prevent new infections of *Mycobacterium tuberculosis* and their progression to TB disease. This can be done by treatment of latent TB infection and vaccination of children with the bacille Calmette–Guérin (BCG) vaccine.

The end TB strategy milestones for 2020 and 2025 can only be achieved if TB diagnosis, treatment and prevention services are provided within the context of progress towards universal health coverage (UHC), and if there is multisectoral action to address the social and economic factors that drive TB epidemics. A recent modelling study shows that eliminating extreme poverty and providing social protection could substantially reduce TB incidence.<sup>1</sup> Knowledge and awareness about any health condition or disease is important for improving quality of life and optimizing patient's health.<sup>3</sup> Adequate knowledge regarding tuberculosis is associated with positive attitude towards health care.<sup>4</sup> According to survey done in the past, there was evidence that if knowledge and awareness improves about tuberculosis it can lead to significant reduction in tuberculosis cases.<sup>5</sup> Younger age group of 15 - 16 years and older age of 60 years and above are affected by tuberculosis. A person can recognize his / her illness with signs and symptoms of tuberculosis and seek medical advice. Due to this reason tuberculosis awareness programme has been initiated in the country at rural and urban community level.<sup>6</sup>

World Tuberculosis Day is observed on 24 March of every year and is designed to build the public awareness about TB as an epidemic. In India, two TB patients are losing their life in every three minutes; nearly 3 lac school children give up study because of TB per year. Tuberculosis is a barrier to socioeconomic development.<sup>7</sup>

Various kinds of stigma is associated with TB and poor knowledge in the community on various important aspects of the disease are responsible for this.<sup>8</sup> In India, Revised National Tuberculosis Control Program (RNTCP) based on the internationally recommended directly observed therapy short-course (DOTS) strategy was started as pilot project in Oct 1993, launched in 1997. RNTCP has been revised to provide "universal access to quality TB care to all patients" by 2015, which was marked by the launch of a new DOTS logo from 24th March of World TB day in 2011. The 2nd phase of TB started in 2005, and all components of new Stop TB Strategy were incorporated in the 2nd phase.<sup>9</sup> In the state of Tripura, the daily regime of TB treatment was launched from 24<sup>th</sup> October Oct 2017.<sup>10</sup> Total number of

registered TB patients for 2018 - 19 (up to July 2019) – 1393.<sup>11</sup> In Tripura, in the year 2018 - 19<sup>11</sup> the target was 800 / L / Y and achievement was 365 / L / Y. New smear positive (NSP) case detection rate target was 75 / L / Y and achievement 25 / L / Y. Total Case Detection Rate target was 217 / L / Y and achievement 53 / L / Y. New smear positive (NSP) success rate target was 90 % and achievement 90 %.<sup>11</sup> Though the facility for diagnosis and treatment are available free of cost but due to lack of knowledge towards tuberculosis in the community early diagnosis and treatment could not be initiated. Therefore, the overall success rate for treatment is not satisfactory and TB remains a public health problem. Hence, the study was taken to assess the knowledge towards tuberculosis in the community.

## Objectives

1. To assess and compare the knowledge of tuberculosis among rural and urban slum population.
2. To identify the factors associated with their knowledge of tuberculosis.

## METHODS

This is a cross sectional study was conducted in Bamutia RD Block and Ward No. 12 of Agartala Municipal Corporation during March to April 2019 among adult population residing in study area. Interview schedule was used for data collection. Person  $\geq 18$  years and one adult member from each family were included in the study. Sick person, person currently on anti-tuberculosis treatment (ATT) or treated for TB and family members of TB patients were excluded from the study.

Sample size calculation:<sup>12</sup>

$$f(\alpha, \beta) \times \{P_1(1 - P_1) + P_2(1 - P_2)\} / (P_2 - P_1)^2$$

$P_1 = 0.50$  [assumed that knowledge of cough symptoms of TB among urban population is 50.0 %]  $P_2 = 0.31$  [31.5 % Knowledge of cough symptoms of TB among rural population of Uttar Pradesh],<sup>13</sup> 80 % power, 5 % significance [ $f(\alpha, \beta) = 7.85$ ]. The calculated sample size was 90 per group  $\times 2 = 180 \sim 200$ .

There were 3 subdivisions viz. Sadar, Mohanpur and Jirania in West Tripura district. Out of which 2 (Mohanpur and Jirania) sub divisions were rural and Sadar (Agartala) was Urban. Mohanpur sub-division was randomly selected. Again, one block viz. Bhamutia block under Mohanpur sub-division was randomly selected. Further, Debendra Chandra gram panchayat under Bhamutia block was randomly selected. The lists of families were collected from register of the selected village Panchayat. In each family with persons of 18 years and above of age were identified and was prepared. The simple random sampling technique (lottery method) was applied for selection of the individual study subjects. Previously enrolled subjects again selected for this study were not eligible for inclusion in the study. House to

house visit was made according to the list of identified subjects from the register. The selected subjects who did not refuse were interviewed. Data was collected using a semi-structured and pre-tested interview schedule which includes details on demography and questions about knowledge on different aspects of pulmonary tuberculosis. There were 24 knowledge related questions. The maximum of 24 score with a minimum of zero. The questionnaire was prepared in English and translated into local language while conducting interview. Each item had definitive 'yes / no' and other related response key. A scoring system was developed, whereby the total number of correct responses for the knowledge section was calculated for each respondent, and percentage was created. Each correct answer was given one mark and the total marks were calculated out of 100. Knowledge was graded as very good (> 80 %), good (60 – 80 %), average (40 - 60 %) and poor (< 40 %). Each questionnaire took approximately 12 minutes. The participants were requested to participate in the study voluntarily. Informed consent was obtained from the participants before conducting the study. The information so collected was kept confidential and anonymous. Data was checked, sorted, categorised and coded. After coding, the data was entered to the computer to make it ready for processing and analysis. Data was analysed using the Statistical Package for the Social Sciences (SPSS) 15.0 version software. Descriptive statistics such as means, standard deviations and frequencies were calculated. For inferential statistics, chi-square (X<sup>2</sup>) test was used to determine association between dependent and independent variables. P values < 0.05 were considered as statistically significant.

**RESULTS**

The selected urban slum area of Bhati Abhoy Nagar under ward no. 12 of Agartala and rural area of Damdamia under Bamutia block were visited and data was collected from the selected individuals. Overall, 200 individuals were included in the study and data so collected was analysed. The individual sample was selected based on simple random sampling technique. During data collection 7 houses were found locked, no person available over 18 years of age in 4 houses and 2 houses refused. The researcher reached 213 houses to get 200 study participants. One hundred subjects from urban slum and One hundred subjects from rural area were enrolled in the study. Among the eligible members one individual was selected from each family. The overall mean age (SD) of the individuals was 36.66 (± 13.091) years. The mean age for male and female were 40.41 (± 13.838) years and 34.41 (± 12.128) years respectively. Overall, 200 participants were enrolled, out of which one hundred equal numbers of subjects each from urban slum and rural areas were selected. Among these 200 subjects, 79 (39.5 %) were within 18 - 30 years of age among which 46 (46.0 %) were from urban slum and 33 (33.3 %) were from rural area. In 31 - 40 years age group, out of 53 (26.5 %) participants, 24 (24.0 %) were from urban slum and 29 (29.0 %) from rural area, 41 - 50 years age group 20 (20.0 %) were from urban

and rural 23 (23.0 %) and least from > 60 years age group 12 (6.0 %). 125 (62.5 %) were females and Hindu 166 (83.0 %). 107 (53.5 %) of the respondents had studied up to primary and upper primary and 48 (24.5 %) illiterate. Eight percent 16 (8.0 %) were in Govt service, 92 (46 %) were homemakers and 103 (58.9 %) among the participants within the income group of Rs. 5000 – 10,000/- per month. 117 (58.5 %) of them were having family member ≤ 4, 136 (68.0 %) nuclear family and 85 (42.5 %) of them were in below poverty line (BPL) category. (Table 1)

Variables		Urban, N (%)	Rural, N (%)	Total, N (%)
Age (Years)	18 - 30 years	46 (46.0)	33 (33.0)	79 (39.5)
	31 - 40 years	24 (24.0)	29 (29.0)	53 (26.5)
	41 - 50 years	20 (20.0)	23 (23.0)	43 (21.5)
	51 - 60 years	5 (5.0)	8 (8.0)	13 (6.5)
	> 60 years	5 (5.0)	7 (7.0)	12 (6.0)
Sex	Male	32 (32.0)	43 (43.0)	75 (37.5)
	Female	68 (68.0)	57 (57.0)	125 (62.5)
Religion	Hindu	67 (67.0)	99 (99.0)	166 (83.0)
	Muslim	33 (33.0)	1 (1.0)	34 (17.0)
	Illiterate	23 (23.0)	25 (25.0)	48 (24.0)
Literacy	Primary / upper primary	59 (59.0)	48 (48.0)	107 (53.5)
	HS and HS (+ 2)	16 (16.0)	20 (20.0)	36 (18.0)
	Graduate and above	2 (2.0)	7 (7.0)	9 (4.5)
Occupation	Govt. service	7 (7.0)	9 (9.0)	16 (8.0)
	Homemaker	47 (47.0)	45 (45.0)	92 (46.0)
	Students	4 (4.0)	1 (1.0)	5 (2.5)
	Farmer	0 (0.0)	8 (8.0)	8 (4.0)
	Business	25 (25.0)	29 (29.0)	54 (27.0)
	Retired person	1 (1.0)	1 (1.0)	2 (1.0)
	Daily labourer	16 (16.0)	7 (7.0)	23 (11.5)
Income (N = 175)	< 5000	8 (9.5)	8 (8.8)	16 (9.1)
	5000 - 10000	46 (54.8)	57 (62.6)	103 (58.9)
	10001 - 15000	15 (17.9)	15 (16.5)	30 (17.1)
	> 15000	15 (17.9)	11 (12.1)	26 (14.9)
	Missing*	16 (16.0)	9 (9.0)	25 (12.5)
Family member	≤ 4	50 (50.0)	69 (69.0)	117 (58.5)
	5 - 9	44 (44.0)	32 (32.0)	76 (38.0)
	≥ 10	6 (6.0)	1 (1.0)	7 (3.5)
Family type	Nuclear	63 (63.0)	73 (73.0)	136 (68.0)
	Joint	37 (37.0)	27 (27.0)	64 (32.0)
Whether APL / BPL	APL	45 (45.0)	70 (70.0)	115 (57.5)
	BPL	55 (55.0)	30 (30.0)	85 (42.5)

**Table 1. Sociodemographic Profile of the Participants**  
\*Missing data = The respondents did not disclose their income while conducting interview

Overall, ninety-five (94.5 %) percent of participants had heard of tuberculosis (TB), 71 (37.6 %) heard it from media and followed by relatives 53 (28.0 %) and neighbours and friends 25 (13.2 %). Nearly 38 (37.9 %) urban slum and 20 (21.3 %) rural participants said that cough is the symptoms of tuberculosis followed by cough and fever (urban vs. rural; 11.6 % vs. 18.1 %) and haemoptysis (over all 14.0 %, urban vs. rural; 11.6 % vs. 18.1 %). 173 (91.5 %) said that TB is curable, 90 (47.6 %) said that it is due to smoking and 40 (21.2 %) said it's due to germs. Almost fifty two percent (52.4 %) said that TB is not hereditary, 165 (87.3 %) said it can be transmitted from droplets through coughing and sneezing, 156 (82.5 %) said it's not due to curse from god for evil deeds and frequently affected organ is lungs 145 (76.7 %). (Table 2.1)

145 (76.7 %) among participants (urban vs. rural; 75.8 % vs. 77.7 %) knew anti tubercular drugs were supplied free of cost by the government. Most of the urban slum and rural study participants knew that financial assistance is provided from government (urban vs. rural; 46.3 % vs. 53.2 %). They also knew that diabetes is a risk factor for tuberculosis (urban slum vs. rural; 28.4 % vs. 31.9 %). Almost 81 (85.3 %) of urban slum and 80 (85.1 %) rural study subjects thought that smoking is a cause for getting tuberculosis.

Variables	Response	Urban, N (%)	Rural, N (%)	Total, N (%)
Heard of tuberculosis	Yes	95 (95.0)	94 (94.0)	189 (94.5)
	No	5 (5.0)	6 (6.0)	11 (5.5)
Source of information	Media	38 (40.0)	33 (35.1)	71 (37.6)
	Relatives	27 (28.4)	26 (27.7)	53 (28.0)
	Neighbors / friends	9 (9.5)	16 (17.0)	25 (13.2)
	Health personnel	8 (8.4)	11 (11.7)	19 (10.0)
	Govt. hospitals	10 (10.5)	6 (6.4)	16 (8.5)
	Private health facility	0 (0.0)	1 (1.0)	1 (0.5)
	NGO's	2 (2.1)	0 (0.0)	2 (1.0)
Signs and symptoms of TB	Cough > 2 weeks	36 (37.9)	20 (21.3)	56 (29.6)
	Cough and low grade fever	11 (11.6)	21 (22.3)	32 (16.9)
	Haemoptysis	11 (11.6)	17 (18.1)	28 (14.8)
	Fever and weight loss	12 (12.6)	12 (12.8)	24 (12.7)
	*All of the above	17 (17.9)	17 (18.1)	34 (18.0)
TB is curable	Yes	85 (89.5)	88 (93.6)	173 (91.5)
	No	10 (10.5)	6 (6.4)	16 (8.5)
Cause of TB	Germes	21 (22.1)	19 (20.2)	40 (21.2)
	Foods	11 (11.6)	4 (4.3)	15 (7.9)
	Bad air	9 (9.5)	6 (6.4)	15 (7.9)
	Bad water	0 (0.0)	1 (1.1)	1 (0.5)
	Smoking	44 (46.3)	46 (48.9)	90 (47.6)
	Sharing clothes	2 (2.1)	0 (0.0)	2 (1.1)
	Don't know	8 (8.4)	18 (19.1)	26 (13.8)
Can be transmitted from person to person	Yes	77 (81.0)	88 (93.6)	165 (87.3)
	No	13 (13.7)	4 (4.3)	17 (9.0)
	Don't know	5 (5.3)	2 (2.1)	7 (3.7)
TB is hereditary	Yes	29 (30.5)	25 (26.6)	54 (28.6)
	No	51 (53.7)	48 (51.0)	99 (52.4)
Disease spread from sneezing / coughing / sharing household items	Yes	79 (83.1)	86 (91.5)	165 (87.3)
	No	16 (16.8)	8 (8.5)	24 (12.7)
Curse from god for evil deeds	Yes	15 (15.8)	8 (8.5)	23 (12.2)
	No	75 (78.9)	81 (86.2)	156 (82.5)
	Don't know	5 (5.3)	5 (5.3)	10 (5.3)
Frequently affected organs of the body by TB	Lungs	72 (75.8)	73 (77.7)	145 (76.7)
	Joint & bones	4 (4.2)	1 (1.1)	5 (2.6)
	Intestine	3 (3.2)	1 (1.1)	4 (2.1)
	Don't know	16 (16.8)	19 (20.2)	35 (18.5)

**Table 2.1. Distribution of Participants According to Knowledge**

\*All of the above = Cough, cough & fever, haemoptysis, fever and weight loss

Variables	Response	Urban, N (%)	Rural, N (%)	Total, N (%)
Medicines are available free of cost from government health centers	Yes	72 (75.8)	73 (77.7)	145 (76.7)
	No	7 (7.4)	5 (5.3)	12 (6.3)
TB patients are given financial assistance by Government.	Yes	44 (46.3)	50 (53.2)	94 (49.7)
	No	10 (10.5)	12 (12.8)	22 (11.6)
Poor nutrition is a risk factor for TB	Yes	56 (58.9)	57 (60.6)	113 (59.8)
	No	16 (16.8)	13 (14.9)	29 (15.3)
	Don't know	23 (24.2)	24 (25.5)	47 (24.9)
Diabetes is a risk factor for TB	Yes	27 (28.4)	30 (31.9)	57 (30.1)
	No	30 (31.6)	16 (17.0)	46 (24.3)
	Don't know	38 (40.0)	48 (51.0)	86 (45.5)
HIV / AIDS is a risk factor for TB	Yes	18 (18.9)	26 (27.7)	44 (23.3)
	No	24 (25.3)	13 (13.8)	37 (19.6)
	Don't know	52 (54.7)	55 (58.5)	107 (56.6)
Poor family condition is risk factor for TB	Yes	49 (51.6)	57 (60.6)	106 (56.1)
	No	22 (23.1)	16 (17.0)	38 (20.1)
	Don't know	24 (25.3)	11 (11.7)	45 (23.8)
Smokers may have higher chance of getting TB	Yes	81 (85.3)	80 (85.1)	161 (85.2)
	No	5 (5.3)	49 (52.1)	9 (4.8)
	Don't know	9 (9.5)	10 (10.6)	19 (10.0)
TB can be prevented	Yes	72 (75.8)	78 (83.0)	150 (79.4)
	No	8 (8.4)	5 (5.3)	13 (6.9)
	Don't know	15 (15.8)	11 (11.7)	26 (13.8)
TB can be prevented by giving vaccine	Yes	39 (41.0)	47 (50.0)	86 (45.5)
	No	16 (16.8)	13 (13.8)	29 (15.3)
	Don't know	30 (31.6)	29 (30.8)	59 (31.2)
TB can be prevented by maintaining good body immunity	Yes	53 (55.8)	59 (62.8)	112 (59.3)
	No	9 (9.5)	7 (7.4)	16 (8.5)
	Don't know	23 (24.2)	22 (23.4)	45 (23.8)
TB can be prevented by improving socio-economic condition and adequate nutrition	Yes	44 (46.3)	56 (59.6)	119 (63.0)
	No	15 (15.8)	3 (3.2)	18 (9.5)
	Don't know	26 (27.4)	24 (25.5)	54 (28.6)

**Table 2.2. Distribution of Participants According to Knowledge**

Nearly nineteen percent of urban slum and almost 26 (27.7 %) of rural people knew that HIV / acquired

immunodeficiency syndrome (AIDS) is also a risk factor of tuberculosis. 86 (45.5 %) study participants knew that tuberculosis can be prevented by giving BCG vaccine (urban vs. rural; 41.0 % vs. 50.0 %) and by maintaining good body immunity (urban vs. rural; 55.8 % vs. 62.8 %). (Table 2.2).

More than forty two percent 80 (42.3 %) were having good knowledge followed by average 62 (32.8 %), poor 30 (15.9 %) and very good 17 (8.5 %). (Table 3)

Variables	Number (N)	Percentages (%)
Knowledge categories	< 40 %	30
	40 - 60 %	62
	60 - 80 %	80
	> 80 %	17
<b>Total</b>	<b>189</b>	<b>100.0</b>

**Table 3. Distribution of Participants According to Knowledge Categories of the Participants**

Variables		Knowledge Categories, N (%)				P Value
		< 40 %	40 - 60 %	60 - 80 %	> 80 %	
Sex	Male	7 (23.3)	24 (38.7)	34 (42.5)	6 (35.3)	0.322
	Female	23 (76.7)	38 (61.3)	46 (57.5)	11 (64.7)	
Literacy	Illiterate	4 (13.3)	9 (14.5)	25 (31.6)	3 (17.6)	0.049
	Literate	26 (86.7)	53 (85.5)	54 (68.4)	14 (82.4)	
Location	Urban	21 (70.0)	29 (46.8)	38 (47.5)	7 (41.2)	0.123
	Rural	9 (30.0)	33 (53.2)	42 (52.5)	10 (58.8)	
Family type	Nuclear	16 (53.3)	41 (66.1)	62 (77.5)	9 (52.9)	0.044
	Joint	14 (46.7)	21 (33.9)	18 (22.5)	8 (47.1)	
Religion	Hindu	22 (73.3)	54 (87.1)	67 (83.8)	14 (82.4)	0.429
	Muslim	8 (26.7)	8 (12.9)	13 (16.3)	3 (17.6)	
APL / BPL	APL	14 (46.7)	33 (53.2)	51 (63.8)	8 (47.1)	0.289
	BPL	16 (53.3)	29 (46.8)	29 (36.3)	9 (52.9)	
Occupation	Employee	1 (3.3)	3 (4.8)	8 (10.1)	3 (17.6)	0.224
	Unemployed	29 (96.7)	59 (95.2)	71 (89.9)	14 (82.4)	

**Table 4. Association of Sociodemographic Profile with Knowledge of Participants**

Higher proportion (urban vs. rural; 41.2 % vs. 58.8 %) among rural respondents were having very good knowledge, good knowledge (52.5 % vs. 47.5 %) and average (53.2 % vs. 46.8 %) compared to urban slum. It was found that literacy (P = 0.049) and family type (P = 0.044) were playing a significant role in acquiring good knowledge of tuberculosis among the participants irrespective of their place of living. The other variables like sex, religion, location of family, occupation and whether above poverty line (APL) or BPL did not have any significant relation with knowledge of tuberculosis. (Table 4)

## DISCUSSION

The present study was conducted among rural and urban slum population of selected areas of west district of Tripura and knowledge and risk factors of tuberculosis (TB) were analysed. More than fifty percent were females. The overall mean age (SD) of the individuals was 36.66 (± 13.091) years. Majority of the participants were literate and studied up to primary / upper primary level of education. Mahakalkar SMR et al. reported that the participants were aged between 21 - 62 years of age with a mean age of 42.6 (± 12.2) years.<sup>13</sup> Das P et al. reported that 60.34 % of study population was male. More than one third was illiterate.<sup>14</sup> In the present study, almost ninety five percent of participants had heard of TB and commonest source of information was media (35.5 %) and followed by relatives (26.5 %), neighbours and friends (12.5 %). Kar M et al. reported that

56.0 % heard of TB and television was the main source of information (45 %).<sup>15</sup> Das P et al. reported that majority had heard about TB.<sup>14</sup> Hassan AO et al. reported that over 80 % had heard about TB.<sup>16</sup> A study in Shillong reported that 75 % of the participants had heard about TB and most common source of knowledge about TB was television.<sup>17</sup> The level of awareness was quite high in present study. This difference might be due to wider coverage of information education communication (IEC) activities over time. Chinnakali P et al. reported that 94 % respondents had heard about TB.<sup>18</sup> Tolosa et al. reported that 94.9 % of the respondents said that they had heard about TB.<sup>19</sup> The result was almost similar with the present study.

In present study, it was observed that awareness of overall cough symptoms of TB was 29.6 % and among urban slum and rural participants were 37.9 % and 21.3 % respectively (Table 2.1). Mahakalkar SMR et al. reported that 36.9 % of urban population and 31.5 % of rural population knew that tuberculosis is associated with cough. There was a significant difference in the awareness about symptoms between rural and urban population when cough and haemoptysis were concerned.<sup>13</sup> Kar M et al. reported that 80 % were not aware of cough symptom of TB.<sup>15</sup> It was almost comparable with present study. Das P et al. reported that 62.07 % correctly answered that cough was the commonest symptom.<sup>14</sup> Chinnakali reported that 82 % were aware that cough is a symptom of TB.<sup>18</sup> Tolosa et al. reported that persistence cough (72.4 %) was the most commonly stated symptom of TB.<sup>19</sup>

In the present study, more than ninety percent said that TB is curable if treated, 47.6 % said that it is due to smoking and 21.2 % said it's due to germs. A study in Shillong reported that 65.99 % knew about mode of transmission of disease, 76.11 % knew about the symptoms, 85.44 % claimed the disease was curable with proper treatment, 52.63 % claimed that the disease is preventable and 32.39 % knew about BCG vaccine.<sup>17</sup> Mahida HD et al. reported that in relation to presenting symptoms there can be fever (84.4 %), cough > 14 days (66.2 %), weight loss (69.72 %), and haemoptysis (23.85 %).<sup>20</sup> Rao VG et al. reported that 85 % respondents had knowledge of the symptoms of tuberculosis.<sup>21</sup> Samal J et al. reported that 95 % of the respondents knew that TB is caused by bacteria. Eighty two percent knew that TB is transmissible, 63 % were aware of different modes of TB transmission, 97 % could tell about the symptoms of TB and 76 % of participants were aware about the curability of TB.<sup>22</sup> Tolosa et al. reported that eighty percent had awareness that TB can be transmitted from a patient to another person and 79.3 % know that transmission of TB can be preventable.<sup>19</sup> Rao VG et al. reported that about a quarter of the respondents were not aware of any method for preventing TB. Majority of the respondents stated that TB is a curable disease.<sup>21</sup>

In the present study, almost seventy six percent of urban and seventy eight percent of rural participants said that TB medicines are available free of cost at public health facilities. Kar M et al. reported that 34.0 % were aware of TB treatment free of cost.<sup>15</sup> Samal J et al. reported that 75 % of the slum dwellers were aware that TB treatment is free of cost at public health facilities.<sup>22</sup> Mahida HD et al. reported

that only nearly fifty two percent were aware about correct duration of treatment. Almost sixty percent had knowledge regarding place of treatment for TB.<sup>20</sup>

The present study reveals that nearly fifty percent said that TB is not hereditary; more than eighty percent said it can be transmitted from coughing and sneezing. Mahida HD et al. reported that nearly fifty-eight percent of participants believed that TB can be transmitted through sneezing / coughing.<sup>20</sup> Mahakalkar SMR et al. reported that 36.2 % of urban population and 27.6 % of rural population thought that it was transmitted by close contact, 21.5 % of urban population and 13 % of rural population had idea that it could be transmitted by droplets in air.<sup>13</sup> Sherkhane R et al. reported that almost ninety percent were aware that TB is transmitted by coughing.<sup>23</sup>

The risk factors mentioned by the participants were poor nutrition, diabetes, HIV / AIDS, poor family condition and smokers. Three quarter of the participants said TB can be prevented by giving vaccine, improving body immunity and improving socio-economic condition and adequate nutrition. (Table 2.2) Singh MM et al. reported that factors favouring TB were overcrowding (56.4 %) and poor diet (45.4 %). Only about two percent knew about preventive role of BCG. Extensive health education directing towards attitudinal change by community involvement is needed to create awareness and remove myths about TB in such colonies.<sup>24</sup>

In present study, more than forty six percent urban slum and nearly fifty percent rural participants said that smoking is the cause for TB. Sherkhane R et al. reported that nearly eighty seven percent of them opined that smokers are at maximum risk of developing the disease. Nearly seventy eight percent opined that TB can be prevented by following coughing etiquettes.<sup>23</sup>

In the present study, more than forty two percent were having good knowledge followed by average, poor and very good. Higher proportion among rural respondents was having good knowledge compared to urban slum. (Table 4) Hassan AO et al. reported that there has been a significant improvement in correct knowledge of the cause of TB from baseline (19 %) in 2008 to 26.5 % in 2012 ( $P < 0.001$ ).

In present study it is observed that literacy and family type are having significant role in acquiring good knowledge of tuberculosis among the participants. (Table 5) Alkulaib FK et al. reported that people with higher education degree have better knowledge than others. More than nineteen percent of participants have good knowledge.<sup>25</sup> Samal J et al. reported that slum dwellers have relatively poor knowledge about the modes of TB transmission and its preventability showing that proper health education approaches must be implemented to bring down this knowledge gap.<sup>22</sup> Chinnakali P et al. reported that literacy was significantly related to knowledge of cough symptoms ( $P = 0.03$ ).<sup>18</sup> Konda SG et al. reported that a poor knowledge score was significantly associated with young age group ( $P = 0.037$ ), low education ( $P < 0.001$ ) and low income ( $P = 0.027$ ). A low attitude and practice score was significantly associated with low education ( $P = 0.002$ ), low income ( $P = 0.008$ ) and nuclear family ( $P = 0.008$ ).<sup>26</sup>

## CONCLUSIONS

There was no significant difference in knowledge of TB among rural and urban slum population. Literate persons were more aware compared to illiterate population irrespective of their place of living. In spite of having good awareness regarding TB in general, the knowledge level on risk factors was not satisfactory and needs further improvement. Therefore, a special drive has to be started for imparting knowledge to the community regarding risk factors as this could prevent further occurrence or progress of TB. Moreover, knowledge about organs affected was not satisfactory. Therefore, for achieving successful result, it was necessary to educate people about the importance of good nutrition and to recognise early complications, once it is diagnosed.

### Limitations

The study was conducted in a selected localised population. It cannot be generalised due to small sample size.

### Recommendations

This study needs to cover wider study area covering all districts including both urban and rural population. Further study is recommended involving more subjects.

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