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Research Article

A Unique Survey on Tuberculosis in Urban Slums of Mysore City, Karnataka, India

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ABSTRACT:

Background: Tuberculosis remains a major public health problem in India. The objective of this study was to assess the knowledge, attitude and practices with respect to knowledge of TB among the selected urban slums' population between the age group of 18 – 65 years in Mysore city, Karnataka, South India.
Design: Community based cross-sectional survey in 10 randomly selected slums and 500 systematically selected individuals. Study was carried out from January to February 2015 using the WHO (KAP) survey tool.
Results: Overall knowledge about TB was low (percent mean 45.7), with no difference between gender. Knowledge about TB increased with increasing educational level. Majority of the respondents obtained knowledge regarding TB from their family, friends and teachers (percent mean 77.6), whereas print media (percent mean 10.6) was least. Respondents gaining information through health professionals had a significantly higher knowledge on treatment of TB (percent mean 30.7, p=0.011).Digital media had a positive impact on the attitude and practices regarding TB.
Conclusion: Though most persons were aware about TB, the awareness regarding diagnosis and treatment was poor. This may affect treatment seeking behaviour among persons dwelling in slums. Frequent and continuous Information Education and Communication along with Social Behaviour Change Communication activities with the help of civil societies help to improve awareness regarding all aspects of TB.

Key Words: Tuberculosis, Urban slums, KAP assessment.

Introduction

Tuberculosis (TB) remains a major public health problem in India. The World Health Organization (WHO) 2015 reports that 9.6 million people were identified as new TB cases globally, more than half (58%) of which were from South East Asia and Western specific regions[1]. India alone contributes to 23 percent of the disease burden. The mortality, and incidence of TB in India was 17, and 167 per lakh population respectively[1].

In India, the Revised National Tuberculosis Control Program (RNTCP) was launched in 1997 to control the escalating burden[2]. Under the National Health Mission, the programme was given impetus to achieve MDG-6 [3]. Since TB is a prevalent social disease, communities' knowledge, attitude and practice has an impact on TB Control programme[4]. Previous studies suggest that TB diagnosis and treatment depends on an individual's level of knowledge about TB and also their level of education plays a vital role[5-7]. However, there is a paucity of literature assessing Knowledge, Attitude and Practice (KAP) of individuals especially in urban slums of India.

To our knowledge there are no studies that report KAP towards TB in urban slums. It is essential to know what people have understood about TB, how they feel about TB, and their practices towards TB to enable us to improve treatment and diagnosis. This study was therefore, carried out to assess the knowledge, attitude and practice of tuberculosis among selected urban slums' population in Mysore city, Karnataka, South India.

Materials and methods

Study design and setting

A community based cross sectional study was designed. Study was conducted in urban slums of Mysore city, Karnataka, South India. Mysore city consists of 65 wards, has a population of 8,87,446 (Census 2011) and had 63 recognized slums[8,9].

Study sample and selection of household

The sample size was obtained using the WHO's 'Calculating the sample size for surveys for the prevalence of TB 2005' [10]. To arrive at a sample size using standard normal variate (1.96), the anticipated prevalence of knowledge about TB among people living in urban slums was assumed to be 0.31 [6]. We obtained a sample size of 329 at an absolute error of precision of 0.05. To increase the generalizability of the study, this was multiplied by a design effect of 1.5 to arrive at a sample size of 494, rounded to 500.

A multistage sampling technique was used to select the sample. The primary unit of sampling was the slums; of the 63

slums, 10 were randomly selected, and population in each slum was selected using Population Proportion to size (PPS) (i.e., Samples in each slum= 500*Total number of households in each slum area / Total number of houses), later in each slum; households were selected systematically. Only one eldest most person between the age group of 18-65 years was selected during the time of interview. In the absence of an eligible respondent in the selected households or if house was locked; the next household was selected.

Data collection

A pretested and semi structured interview schedule, the WHO (KAP) survey tool was used. Questionnaire was translated into local language (Kannada) and back translated into English. Written consent was obtained before the data collection. The interview was conducted by Principal investigator in local language (Kannada) and each interview took on an average 20 minutes. Information on TB symptoms, transmission, diagnosis and treatment, their attitude and practices towards TB was collected.

Each correct answer was scored one point and a wrong or do not know answer was scored zero points. Total score for knowledge, attitude and practice were 17, 4 and 3 points respectively (Table1)

Table 1: Knowledge, attitude and practice scoring for the analysis

Knowledge of community towards TB = 17 points	Attitude of community towards TB = 4 points	Practices with regard to TB = 3 points
Symptoms of TB = 7 points Cough more than 2 weeks- 1 Coughing with blood- 1 Weight loss – 1 Fever with sweat -1 Chest pain – 1 Shortness of breath -1 Ongoing fatigue – 1	Consider as a very serious or somewhat serious disease -1 Consider TB as a very serious or somewhat serious disease in their area -1 'I feel compassion and desire to help' about people with TB disease -1 'Community mostly supports and helps him or her who has TB' -1	They consult doctors/ medical workers about their illness if they had TB -1 Prefer to go to hospital if they think that they had symptoms of TB -1 They approach health facility immediately if the symptoms look like TB signs and last for two or more weeks -1
Transmission of TB = 2 points Through air -1 Can prevent using handkerchief- 1		
Other general awareness on TB = 3 points Anybody can get TB- 1 BCG vaccine helps in preventing TB- 1 Heard about RNTCP – 1		
Treatment of TB = 5 points TB can be cured -1 Treated with modern drugs-1 Treated with DOTS- 1 Minimum duration of treatment for TB is 6 months – 1 TB treatment is free in our country- 1		

Data entry and analysis

Data was entered in excel and analysed using SPSS 16.0 version. Since there were unequal numbers of items regarding symptoms, transmission, treatment and knowledge on BCG and RNTCP, the knowledge scores in each component were converted into percent means. Significance of responses regarding Knowledge of TB attitude and practice was assessed using one-sample t tests. We expected participant's knowledge on various components to be 100 percent. The influence of education on knowledge, attitude and practice was tested using one way ANOVA.

Ethics

Approval to conduct study was obtained from Institutional Ethical Committee, Nitte University, Mangalore, Karnataka.

Results

Participants' characteristics

The socio-demographic profile of the respondents is summarized in table 2, the mean age of the respondents was 39.6 ± 13.5 years and the majority of respondents were females (58%).

Table 2- Socio-demographic information of selected urban slums of Mysore city (n=500)

Characteristics	Sub variable	Mean ± SD/ N (%)
Age (years)	-	39.63 ± 13.58
Age group (in years)	< 25	85 (17)
	26 – 35	130 (26)
	36 – 45	104 (20.8)
	46 – 55	97 (19.4)
	56 – 65	84 (16.8)
Gender	Male	210 (42)
	Female	290 (58)
Education	Primary	70 (14)
	Middle	131 (26.2)
	High school	104 (20.8)
	High school +	57 (11.4)
	No formal education (not able to read and write)	138 (27.6)
House ownership	Own	357 (71.4)
	Rented	143 (28.6)
Type of housing	Kutcha	287 (57.4)
	Pucca	213 (42.6)
Over crowding		445 (89)
Cross ventilation		272 (54.4)
Monthly income		168 (33.6)
Distance from the clinic	Less than half kilometre	481 (96.2)
	Less than one kilometre	19 (3.8)

Many (26%) of the respondents were in the age group of 26 to 35 years. One fourth (27.6%) were illiterate (no formal education/ do not know to read and write) and only 33.6 percent of the respondents were employed. Fifty seven percent of the respondents were living in Kutcha house and 89 percent had overcrowding[11] in their residence and almost half of the residence had cross ventilation. Maximum respondents (mean 96.2%) were staying less than half kilometre from the nearest health clinic or hospital.

Source of information about TB

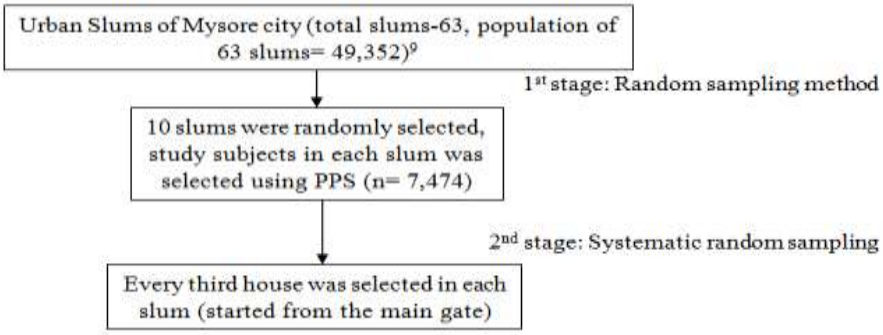

Figure1- Schema for sample selection

All respondents (n=500) had heard about TB from different sources. Sources of information regarding TB were categorized as; (i)

print media, which included newspapers, magazines, and brochures (ii) digital media included radio and television, (iii) health professionals included doctor and medical workers, and (iv) family, friends and teachers.

The sources of information on TB is summarized in figure 2, majority of the respondents obtained knowledge regarding TB from their family, friends and teachers (77.6%), whereas print media (10.6%) was the least used source of knowledge.

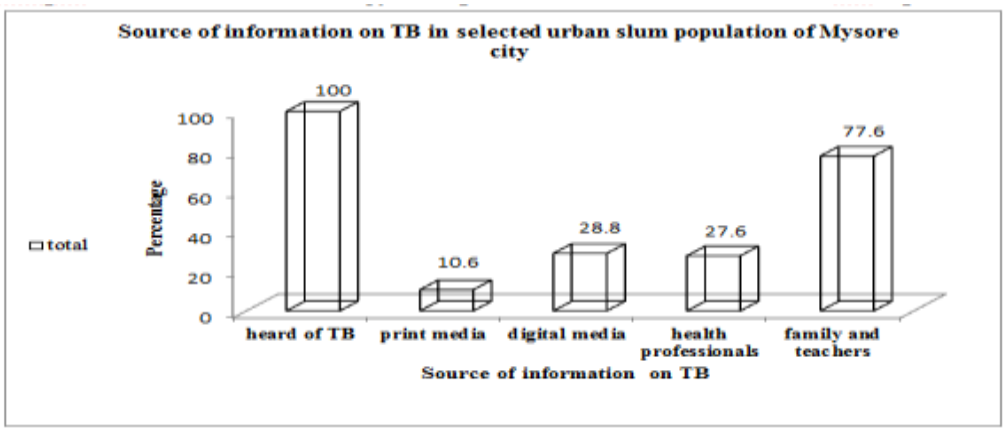

Figure 2: Sources of information on TB in selected urban slums population of Mysore city.

There were no significant differences among men and women with regard to the source of information.

Source of information on TB and knowledge about TB

The different source of information on TB and knowledge about TB is summarized in table 4, those who had source of information through print media had significantly higher knowledge on symptoms of TB (percent mean 56.6, p=0.000), treatment of TB (percent mean 32.4, p=0.000), and total knowledge on TB (percent mean 50.1, p=0.001).

Table 4: Source of information on TB in urban slums of Mysore city, 2015.

Source of information on TB	Knowledge on TB (N=500)	Percentage score (±SD)	T	P
Print media	Symptoms of TB	56.6 (19.6)	3.854	.000*
	Transmission of TB	91.5 (25.4)	.397	.692
	Treatment of TB	32.4 (17.1)	2.390	.017*
	Knowledge BCG, RNTCP, & who can get TB	37.1 (16.8)	.117	.907
	Total knowledge on TB	50.1 (13.7)	3.194	.001*
Digital media	Symptoms of TB	48.8 (16.7)	.034	.973
	Transmission of TB	93.7 (20.3)	.647	.518
	Treatment of TB	30.0 (15.8)	1.888	.060
	Knowledge BCG, RNTCP, & who can get TB	38.6 (17.0)	1.620	.106
	Total knowledge on TB	46.7 (11.0)	1.323	.185
Health professionals	Symptoms of TB	50.4 (15.9)	1.431	.153
	Transmission of TB	93.4 (20.7)	.465	.642
	Treatment of TB	30.7 (16.2)	2.563	.011*
	Knowledge BCG, RNTCP, & who can get TB	37.6 (17.4)	.714	.476
	Total knowledge on TB	47.4 (11.2)	2.161	.031*
Family, friends and teachers	Symptoms of TB	50.0 (15.5)	3.404	.001*
	Transmission of TB	94.0 (21.3)	2.464	.014*
	Treatment of TB	28.6 (14.0)	1.518	.130
	Knowledge BCG, RNTCP, & who can get TB	36.6 (15.5)	.613	.540
	Total knowledge on TB	46.5 (10.3)	3.130	.002*

However, Digital media was not statistically significant with regard to knowledge on TB. Information through health professionals had significantly higher knowledge on treatment of TB (percent mean 30.7, p=0.011). Lastly, information through family and teachers had significantly higher knowledge on symptoms of TB (percent mean 50, p=0.001), transmission of TB

(percent mean 94.0, p=0.014), and total knowledge on TB (percent mean 46.5, p=0.002).

Knowledge Attitude and Practice on TB

Table 3 summarized the result of KAP on TB, knowledge of TB among slum dwellers was found to be low (percent mean 45.7).

Table 3: Knowledge, Attitude and Practice towards TB in urban slums of Mysore city, 2015.

Knowledge, attitude and practice about TB (N=500)	Percentage score	SD	Confidence Interval	
			Lower	Upper
Knowledge on symptoms of TB	48.7	15.8	47.3	50.1
Knowledge on transmission of TB	92.7	23.0	90.6	94.7
Knowledge on treatment of TB	28.1	13.8	26.9	29.3
General knowledge on TB	36.8	15.7	35.4	38.2
Total knowledge on TB	45.7	10.6	44.8	46.7
Attitude towards TB				
Consider TB as a very serious or somewhat serious disease	58.8	0.4	0.5	0.6
Consider TB as a very serious or somewhat serious disease in their area	47.6	0.5	0.4	0.5
'I feel compassion and desire to help' about people with TB disease	36.2	0.4	0.3	0.4
'Community mostly supports and helps him or her who has TB	24.0	0.4	0.2	0.2
Total attitude towards TB	41.6	28.5	39.1	44.1
Practice towards TB				
They consult doctors/ medical workers about their illness if they had TB	97.8	0.1	0.9	0.9
Prefer to go to hospital if they think that they had symptoms of TB	99.4	0.0	0.9	1.0
They approach health facility immediately if the symptoms look like TB signs and last for two or more weeks	59.8	0.4	0.5	0.6
Practice towards TB	85.6	17.9	84.0	87.2

Knowledge regarding transmission of TB was high (percent mean 92.7), whereas knowledge regarding symptoms (percent mean 48.7), treatment of TB (percent mean 28.1) was low. Knowledge on who can get TB, BCG injection and RNTCP program was also low (percent mean 36.8, p=0.000). The overall positive attitude towards TB was low (percent mean 41.6). Only one sixth (percent mean 59.8) of the people said, they approach health facility immediately if the symptoms look like TB signs last for two or more weeks.

The result of knowledge on TB with respect to socio-demographic variables is summarized in table 5; there were no significant differences in knowledge regarding TB between men and women.

Table 5: Knowledge on TB with respect to demographic variables

Knowledge about TB			N	Percentage score	SD	t/ F	P
Knowledge on TB	Male		210	46.7	11.2	1.739	.083
	Female		290	45.0	10.2		
Knowledge on TB	Primary		70	45.9	8.5	7.939	.000*
	Middle		131	45.4	8.5		
	High school		104	46.4	10.6		
	High school +		57	52.0	14.9		
	Illiterate		138	42.8	10.3		
	Total		500	45.7	10.6		
Knowledge on TB	House owner	Own	357	46.5	10.1	2.678	0.008*
		Rented	143	43.7	11.7		
Knowledge on TB	Type of house	Kutcha	287	46.3	10.6	1.424	0.155
		Pucca	213	44.9	10.7		
Knowledge on TB	Overcrowding- yes		445	45.1	10.0	-3.502	0.001*
Knowledge on TB	Cross ventilation- yes		272	45.9	10.6	0.509	0.611
Knowledge on TB	Have monthly income		168	46.3	11.6	0.867	0.387

As the educational levels increased, knowledge also increased (p=0.000) linearly and significantly as revealed by one way ANOVA. Respondents with education more than high school level have a comparatively higher knowledge (percent mean 52) than who do not have formal education (percent mean 42.8).

The attitude and practices towards TB with respect to source of information on TB summarized in table 6, those who had source of information on TB from various sources did not show any significance with respect to their attitude towards TB.

Table 6: Attitude and practice towards TB based on source of information on TB

Attitude and practice towards TB	Source of information on TB	Sub variable	Percentage score(±SD)	T	P
Attitude towards TB	Print media	Yes	1.79 (1.11)	.853	.394
		No	1.65 (1.14)		
	Digital media	Yes	1.77 (1.14)	1.395	.164
		No	1.62 (1.13)		
	Health professional	Yes	1.79 (1.10)	1.589	.113
		No	1.61 (1.15)		
	Family, friends and teachers	Yes	1.67 (1.11)	.216	.829
		No	1.64 (1.23)		
Practice towards TB	Print media	Yes	2.58 (0.49)	.213	.831
		No	2.56 (0.54)		
	Digital media	Yes	2.67 (0.47)	2.756	.006*
		No	2.52 (0.55)		
	Health professional	Yes	2.58 (0.52)	.435	.664
		No	2.56 (0.54)		
	Family, friends and teachers	Yes	2.56 (0.53)	-.609	.543
		No	2.59 (0.56)		

Regarding practice towards TB (table 6); sources of information on TB through digital media showed influence at practices towards TB (p=0.006), when compared to the print media (p=0.831), health professionals (p=0.664) and through family and teachers (p=0.543).

Discussion

We found that all respondents in our study had heard about TB. Overall knowledge and attitude towards TB was less than half, but only one sixth of them said, they approach a health facility immediately if the symptoms look like TB and last for two or more weeks. Gender showed no significant difference, however, as education level increased knowledge on TB also increased. Print media showed significant change in knowledge on TB than digital media; knowledge on treatment for TB through health professionals was higher among community. Digital media showed significant effect on practices towards TB.

In spite of intensive awareness on TB our study revealed that family, friends and teachers were the major source of information towards TB in comparison to others. The similar result also found evident in a study conducted in Jodhpur, Rajasthan[12], where the major source of information on TB was identified as neighbours (50.5%), next followed by friends (42.6%), and family members (37.2%). However, another study conducted by Tolossa et al in Ethiopia using WHO KAP survey tool showed that the highest source of information on TB was media (radio) which was 63.2 percent[7]. Sources of information on TB varies from place to place, hence this kind of geographical variances on information on TB acts as a warning sign which was directly attributing to the discrepancy in the TB disease burden. This was also viewed in other studies [13-15]. This study revealed that, most of the respondents had a prior knowledge on TB by personal experience and with close friends, family members, who have affected by TB disease and also teachers educated them in schools and colleges regarding TB.

The respondents of this study had good knowledge on transmission of TB but knowledge on TB related to symptoms, treatment and knowledge on BCG vaccine, RNTCP, and who can get TB was less than half. Similarly, other studies showed that treatment for TB showed much lesser knowledge than symptoms and transmission of TB[5-7,16-18]. In this study gender does not show any significant differences, as education increased knowledge also increased. Similar studies supported our observation that literates (who had formal education) had good knowledge on TB than illiterates (no formal education)[17,19-22]. The socio economic status of respondents was measured using different categories like house ownership, type of house, whether there was overcrowding and cross ventilation in their home, and also they had monthly paid income or not? These said factors affect both directly and indirectly in one or the other way. Our study result revealed that people having their own house had better knowledge on TB, and those that were economically better compared to those living in rented houses or in tents. Knowledge on TB and overcrowding showed significant difference, which was most likely due to one to one close interaction within the household. It was also evident in our study that, maximum respondents got prior information on TB from family, friends and teachers.

Regarding source of information on TB and its influence on knowledge on TB we found that information through print media and digital media were less significant. Regarding treatment for TB, health professionals lead a major role in this. Information on symptoms and transmission of TB was mainly from family, friends and teachers. This was alarming because, though IEC messages on TB spreads through print and digital media, it seems to have no impact on vulnerable sections like slum population. As the residents of slum more prone for infection due to overcrowding, poverty, and low socio economic status, it is essential to create awareness about "early detection and free treatment" of TB disease. The Advocacy, Communication, and Social Mobilization (ACSM) activities on the concept of "free TB diagnosis and treatment" need to be strengthened to reduce pre-treatment costs, as mentioned in a study conducted by Ananthakrishna et al.[23]. People know when symptoms last for two weeks they must approach a doctor, but they fail to report the history of the symptoms and treatment taken in the past which was also required to monitor the treatment of TB under National Tuberculosis Programme in India[24]. This can also be achieved through Social and Behaviour Change Communication (SBCC) activities. Hence ACSM activities on DOTS under RNTCP programme help to reduce pre-treatment costs on TB disease[25]. Our study result showed poor knowledge on TB has a negative impact towards an individual's attitude on patients' health-seeking behaviour. This was also evident in a study conducted in Ethiopia reported that, attitude place a major role towards patients' health care seeking behaviour[7]. Moreover, digital media has greater effect towards practices related to TB which was significant due to repeated number of TV and radio ads. After five decades of implementation of National TB Control Programme, still the level of knowledge on TB is incomplete[4]. Regular Information Education and Communication (IEC) and Social Behaviour Change Communication (SBCC) activities will really help to change people's attitude and practice towards TB.

Conclusion

The selected urban slum community had basic knowledge on transmission of TB, whereas less knowledge towards symptoms and treatment. Maximum number of respondents got prior information on TB from family, friends and also teachers. It is also evident that, there was no difference between genders regarding awareness on TB. Moreover, as education level increased knowledge on TB also increased. Health professionals have an important role in creating awareness on treatment for TB. Awareness on TB has impact on treatment seeking behaviour towards TB; it also have a negative impact on attitude and practices towards TB.

Conflict of interest: Authors have declared that they have no competing interest.

Author's contributions:

A B – Conception of the research idea, study design, coordination of data collection, data entry and analysis, interpretation of the data and drafting the manuscript.

V Y – Interpretation of data and review of manuscript

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Strengths and limitations of this study

- To our knowledge there are no other studies conducted to assess knowledge on TB using WHO (KAP) survey tool in urban slum population.
- Multistage random sampling technique was used and design effect was considered while sampling to ensure the results were representative and generalizeable. One sixth (i.e., 10 out of 63 slums) of the total slums were selected. Study was not able to capture practice question on sputum disposal.

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