Knowledge, attitudes, and perceptions toward Tuberculosis in Bangladesh: a cross-sectional mixed methods study

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Knowledge, attitude and perception (KAP) towards tuberculosis in Bangladesh:

A cross-sectional mixed-methods study

A. K. Lutful Kabir
A. S. Shamsur Rouf
Hafiz T. A. Khan

Abstract:

In Bangladesh, Tuberculosis (TB) is a key public health concern. In this study we assessed knowledge, attitudes, and perceptions (KAP) towards TB among the general population. A cross-sectional mixed-methods study was conducted between March and August 2014, where a total of 400 adults were interviewed at Dhaka city in Bangladesh. The overall knowledge of TB was very limited despite 99.5% of the study respondents having heard of TB. About 99.0% stated correctly that cough was one of the major signs and symptoms of TB. About 39.0% mentioned that through airborne disease someone could get TB. With regard to curability of TB, 362 people replied that TB can be cured. About 77.0% informed that TB could be cured by taking medicines such as antibiotics or others. Sixty five percent of respondents knew someone who had have TB. The mean summary score for TB knowledge was 40 out of 100 (SD 0.5). Regression analysis shows that people with tertiary level of education were connected with higher TB knowledge and people having no income were related with lower TB knowledge. A lack of awareness was associated to delay in seeking treatment because people did not recognize the symptoms of tuberculosis. To improve knowledge of TB among people having no income or even lower income group more emphasis should be given and also more awareness is required to develop the individual's perception amongst their neighbors in the study area. The alertness campaigns for TB knowledge should be a major concern countrywide in Bangladesh.

Keywords: Tuberculosis, KAP, Mixed method, Bangladesh.

Introduction

Tuberculosis (TB) is a common public health issue in most developing countries including Bangladesh. In 2010, there were 8.8 million incident cases of TB worldwide (WHO, 2011). Since TB is the most common opportunistic infection in HIV/AIDS infection, there is a risk of reappearance of tuberculosis due to the increase in number of later (Christopher & Bosede, 2011). Among other infectious diseases, TB is the principal cause of death where it was stated that there were 1.1 million of deaths in 2010 among HIV negative people and an additional 0.35 million of deaths occurred due to HIV related TB (WHO, 2011). The overall TV burden mainly deceits in some South East Asian countries. Out of them only in India, Indonesia, Bangladesh, Thailand and Myanmar, the prevalence of TB occurs more than 50%. Among the high burden countries Bangladesh ranks six position with an incident rate of 225 per 100,000 thousand populations per year and a mortality rate (exclusive of HIV) of 43 per 100,000 thousand populations per year (WHO, 2011). Millennium development goal (MDG) 6 entails to stop and begin to repeal the TB incidence by 2015. It also fixed the target to reduce prevalence of and death due to TB by 50% as compared to that of a baseline of 1990 by 2015 (WHO, 2006). To control TB, many strategies were taken. Out of them the direct observed treatment short course (DOTS) was popular that was started in 1995 as the main strategy which includes diagnosis through bacteriology and standardized short-course chemotherapy with full patient support (WHO, 1993). DOTS strategy in national TB control program (NTP) in this country was approved during fourth population & health plan (1992–1998) and in 1998 it was integrated into essential service package under the health and populations sector program (Government of Bangladesh, 2009). Primarily these services were based in TB clinics and TB hospitals only. Under the DOTS strategy, the services were extended steadily to primary health care facilities engaging public-private partnership. The community health workers for Government and NGO are occupied in rural community level for case detection and awareness building activities. Later in 2002, DOTS was expanded to Dhaka city corporation area. The entire country has been covered by DOTS service by 2006 (Government of Bangladesh, 2009). The DOTS strategy relies very much on passive case finding for TB treatment. Its success depends on the patient's health awareness, ability to distinguish early signs and symptoms, and accessibility to health services for immediate self-reporting (Karim et al., 2011). It is important that basic knowledge about the disease and the availability of treatment is clear among community to prevent any undue delay in availing the service. The TB prevailing

perceptions in the community affect the health seeking behavior of people for their symptoms. While care seeking behavior of chest symptomatic has been discovered in different studies, there is dearth of information on community perceptions of TB (Ganapathy et al., 2008). The present study assessed knowledge, attitudes, and perceptions (KAP) about TB among the general population in Bangladesh.

Methods

Study area and population

A cross-sectional sequential mixed methods study was done where the population had been selected by a random sample of the general people of Dhaka city in Bangladesh. This is the study of both quantitative and qualitative methods, guiding to a mixed method research (Creswell, 2003). For the selection of the participants there were some criteria for addition: the capability to speak Bengali (the local language) and/or English, having 18 years or older age and history of TB were not asked; therefore this sample neither excluded nor persistently included TB patients. The participants were selected using four levels of sampling. Out of 10 election constituencies in Dhaka, two was randomly selected. In each constituency, two wards were randomly selected (number of wards in each constituency ranged from 15 to 20). One unit was then randomly selected from each ward (total number of units in each ward ranged from 10 to 12). Fifty individuals from different households were randomly selected from each unit, by four research assistants, starting in the center of the unit and proceeding outwards in a four different directions.

Focus group discussion (FGD)

Six focus group discussions were carried out and participants were sampled from three of the six constituencies. The respondents were chosen from different areas especially which were not considered to take sample in the study survey.

Data collection

Demographic information was gathered about age, gender, employment, level of education, status of marriage and religious status. The questionnaire items covered knowledge on transmission of TB, symptoms, and treatment etc. The questionnaire was developed to ensure suitability and

comprehensiveness in the local context. The questionnaire was translated into the local language (Bengali) and the translation was verified for accuracy by four separate collaborators fluent in both languages. The survey was controlled by some trained research associates (fluent in Bengali) who took the interview of the participants. The survey tool was pilot tested in two phases. The initial tool was administered to 10 randomly selected individuals from a constituency not selected for data collection. Some small adjustments were made, and then it was administered to 10 more people to finalize the instrument. Test-retest was completed to ensure reliability of the study tool. Six focus group discussions were carried out. Focus group participants were sampled from three of the six constituencies. Respondents were selected from different areas especially which were not considered for sampling in the survey.

Ethical consideration

The research protocol was accepted by the academic council of the University of Dhaka. The ethical clearance was obtained from the Bangladesh Medical Research Council (BMRC). The permission to conduct the study and to access data was obtained from the respective authorities. Participation in this study was voluntary. Participants were informed about the details of the study. Written consent form was also filled up by the participants. The participants were instructed of the right to, without further explanation, refuse to answer any questions. Their answers were being handled confidentially. All forms were coded with numbers.

Data analysis

The survey data was entered into a Microsoft access database. Ten percent of entered surveys were thoroughly crosschecked, the remainder checked for completeness and out of range values. Open ended questions were coded thematically. Summary scores were prepared by using several questionnaire items. Certain responses that indicated incorrect and potentially detrimental information were assigned negative weights. Summary scores were then standardized on a percentage scale for comparability. Stata12 was used for data analysis. Each item of the questionnaires was summarized by using Descriptive statistics and to compare the summary scores bivariate student t-test analysis was performed where $p<0.05$ was taken as statistical significance. Focus groups discussions were summarized and then transcribed or translated. A sample of transcripts was translated by a second translator and the two English versions compared to ensure

accuracy. Transcripts were analyzed inductively using latent content analysis to identify, code, and categorize the primary patterns in the data. Themes were developed from these categories. Results were presented and discussed with key informants to the study area to confirm and validate themes. Rigour of the qualitative portion of this study was ensured through several strategies. A sub sample of transcripts was re-coded by the same researcher, and a sub-set were also coded by an independent researcher to ensure inter-rater reliability (agreement in coding tree was established) and to contribute to the trustworthiness of the study. The primary researcher traveled to the study site again in 2014 to present and discuss the results (member checking) with key informants and stakeholders. These in depth discussions with local informants contributed to the trustworthiness of the findings.

Results

Of the study respondents, 45.25% (n=181) were female and 54.75% (n=219) were male persons, mean age was 35.54 years (range 18-75 and median 34). Among them with data on education, most had primary (35.75%, n=143) and tertiary (45%, n=180) level of education. About more than 60% of the respondents were married or ever married where as less than 40% were single in their civic status. From the view point of religious aspects of the participants 87.25% (n=349) were Muslim and 9.5% (n=38) were Hindu. The income level of all the study participants were asked and most of them were found having low (42%) or no income (25.7%). Almost one third of the total participants were (29%) unskilled workers and rest of the respondents were found having different professions such as private service, government service, business, small business, students and housewife occupying 19.25%, 6.5%,6.5%, 9.75%, 6.5% and 12.75% respectively. Of them, 39 respondents had no employment. Among focus group participants focus group discussions having three men contained 30 men, and same number of women only focus groups amount a total of 30 women. The first category of participants in the focus groups were somewhat older (mean 34, median 25, range 18-60) than the women participants (mean 32, median 23, range 18-50) in this study. Demographic description by individual focus group can be found in Table-2.

Table 1 about here

Table 2 about here

Despite 99.5% of the study participants having heard of tuberculosis (n=398), the general TB knowledge was restricted. Three hundred and ninety six respondents (99.0%) stated correctly that cough was one of major signs and symptoms of tuberculosis. Among other two typical TB symptoms, only 100 people stated weight loss, and only 80 people referred anything that might be explained as "night sweats" (other responses including fever, sweats, blur vision, skin rash and others). When the respondents were asked that how someone can get TB, 156 respondents said that it was an airborne disease. In response to another question, one hundred and twenty seven (31.75%) respondents said that one might have TB when comes in contact with a TB patient. Saliva is the most general form of transmission, usually by sharing cups or mugs or drinking glass (n=182, 45.5%). Eighty three people (20.75%) said that someone could get TB from smoking and/or drinking, 30 people (7.5%) mentioned that TB was genetic which came from generation to generation in a family, where 35 people (8.75%) referred other ways of infecting TB like uncooked food, working in industries, through sexual intercourse and from hard work). Of them 80 people (5.9%) did not have any idea about the form of TB transmission. When all the respondents were questioned about the curability of TB, three hundred and sixty two people (90.5%) replied that TB can be cured but 34 of the respondents (8.7%) answered that they did not know about it, and about 3% of them stated that TB cannot be cured. Among the respondents who knew about the curability of tuberculosis, 77.0% (n=308) informed that TB could be cured by taking medicines (administering antibiotics or others); with greater than 20% of respondents saying that TB could be cured by traditional or alternative medicines or spiritual healing. Sixty five percent of respondents (n=260) knew someone who had have TB. The mean knowledge summary score for TB was 40 out of 100 (SD 0.5 and range 20-55). Mean TB knowledge among the general people was significantly lower. The multiple linear regression analysis for age, education, sex, marital status, education level, religion, income level and occupation of respondents were analyzed in the regression model. From multivariate regression analysis, it was observed that people with tertiary level of education were associated with increased knowledge of TB and people having no income were linked with lower knowledge of TB (Table 3).

Table 3 about here

Discussion

The mean TB knowledge summary score of 40% is low and demonstrates an overall lack of knowledge about TB (Paul 2015). This study was done for the first time where TB knowledge has been assessed among the general people in Dhaka city, and this result was unexpectedly low (Islam et al., 2014). But in a cross sectional study among TB patients at selected DOTS centre of Dhaka city, men and women distribution were 55.6% and 44.4%, respectively. Of them majority was illiterate, and more than fifty percent had comprehensive family. They also live in a congested area. The most common symptom known was night fever (89.9%), and 56% of them knew that it might spread through sneezing/coughing. It was also mentioned that television was a source of getting information about TB. In some areas TB is considered to be hereditary (Mesfin et al., 2005; Edginton et al., 2002). The majority uttered a helping attitude towards the other TB patients (Kilale et al., 2008). Most of the patients were positive to get their family help, 46.6% of them referred discrimination of separate tools for food or drink (Croft & Croft, 1999; Weiss et al., 2006). About 50.5% uttered increased sadness, 39.8% had fear for loss of jobs, and 21.4% felt socially ignored (Tasim et al., 2012). Although 99% of the respondents mentioned cough as a symptom of TB, very few were able to identify weight loss or night sweats. This is similar to other studies finding that cough is the major symptom identified, with a variety of other symptoms identified occasionally (Longtin et al., 2009). This has serious implications for care seeking in extra-pulmonary TB (which is increasingly common in high HIV prevalent settings) when cough is not part of the presentation. In addition, TB is associated with a very severe set of symptoms and is distinguished from "normal cough major implications for treatment seeking behavior, and explains in part why many TB cases delay presenting to health services until a very advanced stage of disease. This study found a wide variety of understandings about TB transmission (Tolossa et al., 2014). While 39% of respondents knew TB might be transmitted through free air or being near a patient (31.75%), an overwhelming majority of respondents thought that TB was transmitted through sharing cups and utensils. This consistency of misinformation is perplexing. Similar results have been found elsewhere Bangladesh, but sharing cups does not emerge as a major way that people understand TB transmission in the sub Saharan countries (Legesse et al., 2010; Mushtaq et al., 2011; Yadav et al., 2006). It is interesting that this belief is so consistent but not

described elsewhere. Whether this belief stems from health care worker messages, or just from confusing TB with other diseases, it is not essentially dangerous. Appropriate hygiene (Longtin et al., 2009) and not sharing cups or mugs and utensils is a good preventative health care practice in general, so although it is stemming from misconceptions about TB, focusing on this aspect of TB knowledge may detract from more critical and useful messages around chronic untreated cough as a source of TB risk. Also important is the understanding that TB is an untreatable genetic disease. It was mentioned by 3% of survey respondents, and the theme emerged in each focus group discussion. This should be targeted since conceptualizing TB as a hereditary disease has the likely to negatively influence decision to look for care, and also will increase stigma towards families of TB patients. Understandings of TB prevention vary widely, including not sharing cups, avoiding public places, not smoking and drinking, and complicated measures to dispose of sputum. While these preventative procedures do have some epidemiological support, the WHO's TB control strategy holds effective treatment of infectious cases as the main pillar of prevention, and as such community ideas about prevention are not of top priority. One of the most significant findings is that 8.7% of participants did not know that TB might be cured. Focus group participants assured that many people believe that TB cannot be cured or that certain types of TB cannot be cured (for example TB that is inherited). This has serious inference; if people do not think that their sickness may be treated they do not search for care. This finding differs in the sense from other studies that people commonly understood that TB was treatable, at least in HIV negative patients. To recognize knowledge level about TB transmission among ever-married female aged 15 to 49 years in Bangladesh, a study was conducted. The same views were found in other studies conducted in India and Bangladesh (Ganapathy et al., 2008; Somma et al., 2008; Atre et al., 2009) and it was observed that most respondents were of the observation that TB may have adverse effects on the chances of getting married in women, but less so in men. Knowledge about TB transmission was correctly reported by approximately 7.0% of females, and it was significantly connected with education, region and access to electronic and print media using multinomial logistic regression. The probability of correct knowledge was 3.5 times (OR 3.5, 95%CI 2.5-4.9) greater among women with more or equal to 11 years of education than among women with no or primary level of education. A significantly higher OR for accurate knowledge of TB transmission (OR 1.5, 95%CI 1.2-1.9) was found among females who watched television almost daily compared to women who watched less than once a week.

Multiple regression models for TB knowledge found that tertiary level of education predicted higher knowledge of TB. It is a real outcome, and almost similar to be expected. As other studies exploring community knowledge around TB have been entirely qualitative, it is difficult to compare these finding. However, one survey in Ethiopia (Bati et al., 2013) found that literacy expected better knowledge around cause of TB, transmission, and also prevention . It is also critical to note that we found predictors of TB that are very different from the predictors of HIV and TB/HIV co-infection knowledge. These findings can be explained in part by a major focus on TB in the study area during the 1980s and early 1990s. These programs focused on TB education in rural areas, and as like, persons who were aged enough during that time to absorb that information were positively reflected. Since the start of the HIV epidemic, the Bangladesh government has focused resources and political commitment towards combating HIV (Macfarlane & Newell, 2012). While this has been successful, (reducing the HIV prevalence), TB programming has been neglected. TB education efforts have declined, and with this lack of focus it is not surprising that TB knowledge amongst youth is low. Another study in Dhaka city found that primary health care services (which would include TB education) had deteriorated following the roll-out of ART. This also may help to explain lower TB knowledge amongst the people where ART services were offered. It may also be that there have been small programmatic interventions targeting rural residents out of a perceived lack of knowledge in that demographic.

Conclusion

Overall, TB knowledge was low among the general population which is indicative of the neglect that TB programs have faced in recent years. One of the significant predictors of higher TB knowledge among them was the level of education, which suggests that previously functional TB educational programs in Bangladesh have been effective. We found several gaps and misconceptions among the population which have the potential to negatively influence TB care. The first, and likely the most important, is that many people still consider that TB is not curable. Some believe that TB cannot be cured if it is “inherited” from their family members. Regardless of the specific details of the misconception, the belief that TB is incurable will certainly have serious effects on case finding and also health seeking behavior. If people do not believe that they may be treated, they will not ask health services. This should be a major concern in case of future TB awareness campaigns. Second, general understandings of TB symptoms are very limited. Most

people know that cough is a symptom of TB, but very few people recognize night sweats or weight loss and fever as the symptoms of tuberculosis. This study also found that TB is associated with a severe set of symptoms, and minor symptoms are considered to be a "normal cough" for which health services are not highly sought. The third misconception which must be addressed is that "the concept of inherited TB". While this may be stemming from a partial understanding of latent TB infection, the effects may contribute to increased stigma and are also detrimental to health seeking behavior. Finally, there are many misconceptions around TB transmission including smoking, drinking water or tea, sharing cups etc. One of the major drivers of TB stigma is the fear of infection. Directly addressing these misconceptions and informing people that TB is airborne may not be the best strategy since it could increase stigma and fear of infection. Instead the main message should be that TB patients are no longer infectious after two weeks of treatment. This message would have the dual role of reducing stigma around TB patients, and heartening patients to seek treatment early instead of remaining soundless at home.

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Declarations of competing interests

The authors have no competing interests.

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Table 1: Socio-demographic characteristics of the study participants

Variables	Category	n	(%)
Age	18-25	90	22.5
(years)	26-39	168	42.0
	40-49	78	19.5
	50+	64	16.0
Sex	Male	219	54.75
	Female	181	45.25
Level of education	Primary	143	35.75
	Secondary	26	6.5
	Tertiary	180	45.0
	Illiterate	51	12.75
Marital status	Single	142	35.5
	Married or Ever married	258	64.5
Religion	Islam	349	87.25
	Hinduism	38	9.5
	Others	13	3.25
Income level	Low (BDT 0- BDT 5000)	168	42.0
	Medium (BDT 5000- BDT 20,000)	64	16
	High (BDT 20,000 ++)	65	16.25
	No income	103	25.7
Occupation	Private Service	77	19.25
	Government Service	26	6.5
	Business	26	6.5
	Small business	39	9.75
	Unemployed	39	9.75
	Student	26	6.5
	House wife	51	12.75
	Unskilled worker	116	29.0

Table 2: Demographic description of focus group respondents

Focus group	Gender	Location	Number of respondents	Age in Years		
				Mean	Median	Range
1	Female	Dhanmondi	10	35	25	18-50
2	Male	Dhanmondi	10	40	30	18-50
3	Female	Ramna	9	34	24	18-50
4	Male	Ramna	10	30	23	18-50
5	Female	Lalbagh	11	28	22	18-55
6	Male	Lalbagh	10	32	25	18-60

Table 3: Multiple linear regression analysis of TB Knowledge Score

Variables	Coefficient (Slope)	Standard Error	t	Significance level	[95% CI]	
Gender						
Female	1.0					
Male	2.798	0.4255	6.58	0.000	1.961	3.634
Level of education						
Illiterate	1.0					
Primary	12.289	0.519	23.65	0.000	11.268	13.311
Secondary	14.896	1.170	12.72	0.000	12.594	17.199
Tertiary	22.914	0.727	31.51	0.000	21.484	24.343
Income						
High	1.0					
Low	-9.056	0.977	9.260	0.000	-10.978	-7.133
Mid	-7.186	0.535	-13.420	0.000	-8.239	-6.134
No income	-13.076	1.668	-7.840	0.000	-16.356	-9.796
Religion						
Hindu	1.0					
Muslim	2.843	0.871	3.26	0.001	1.130	4.556
Others	-2.156	1.261	-1.71	0.088	-4.635	0.322
Occupation						
Business	1.0					
Government service	6.25E-14	0.780	0.00	1.000	-1.535	1.535
House wife	5.778	1.424	4.06	0.000	2.976	8.579
Private Service	-4.889	0.661	-7.39	0.000	-6.191	-3.588
Small business	-1.079	0.589	-1.83	0.068	-2.237	0.078
Student	6.882	1.690	4.07	0.000	3.557	10.206
Unemployed	2.864	1.493	1.92	0.056	-0.071	5.799
constant	30.380	1.013	29.97	0.000	28.387	32.374