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Concerns about the knowledge, attitude and perception (KAP) towards tuberculosis in Khulna city: Conceptualization of cross-sectional mixed methods studies

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Abstract

Tuberculosis (TB) is a major public health concern in Bangladesh. In this study, we assessed knowledge, attitudes, and perceptions (KAP) towards TB among the general people in Bangladesh. A cross sectional mixed methods study was conducted between March and August 2017, where a total of four hundred adults were interviewed at Khulna city using a semi-structured questionnaire. Male and female distribution were 45.25% and 54.75%, respectively. In response to another question, 31.75% respondents said that one might get TB from being near a patient. The most common form of transmission mentioned was through saliva, usually by sharing cups or drinking glass (45.5%). 20.75% said that someone could get TB from smoking and/or drinking, 37.5% mentioned that TB was hereditary which came from generation to generation in a family, where 8.75% mentioned other ways of getting TB (for example from uncooked food, from working in factories, through sexual intercourse and from hard work). Multiple linear regression analysis of age, education, sex, marital status, level of education, religion, income level and occupation of the respondents were analyzed in the model. From multivariate regression analysis, it was observed that people with tertiary level of education were associated with higher TB knowledge and people having no income were associated with lower TB knowledge. Focus group participants discussed the knowledge about TB, different types of TB, their sign and symptoms and their mode of transmission etc. All the respondents reported a general lack of knowledge about TB amongst their neighbors. A lack of awareness was associated to delay in seeking treatment because people did not recognize the symptoms of tuberculosis. Hence, emphasis should be given to improve knowledge of TB among people having no income or even low income group and more attention also needs to be given to improve the perception of individuals amongst their neighbors in the present study area. The alertness campaigns for TB knowledge should be a major concern nationwide.

Keywords: Knowledge, attitude, perception, towards tuberculosis, cross-sectional mixed

Introduction

Tuberculosis (TB) is a common public health concern in many of the developing countries including Bangladesh. Globally there were 8.8 million incident cases of TB in 2010 [1]. With the increasing number of HIV infection and AIDS cases there is a threat of resurgence of TB since this is the most common opportunistic infection in them [2]. TB is the leading cause of death among all infectious diseases and WHO reported that in 2010 there were 1.1 million deaths among HIV negative people and an additional 0.35 million deaths from HIV associated tuberculosis [1]. The global burden of TB mainly lies in the 22 high burden countries and about 50% of prevalence occurs in 5 countries of South East Asia, namely, India, Indonesia, Bangladesh, and Thailand, Myanmar. Bangladesh rank sixth among the high burden countries 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 [1]. Millennium development goal 6 implies to halt and begin to reverse the incidence of TB by 2015 and fixed the target (MDG 6 Target 6.C) to reduce prevalence of and death due to TB by 50% compared with a baseline of 1990 by 2015 [3]. The direct observed treatment short course (DOTS) was launched in 1995 as the main strategy in the control of tuberculosis [4]. The strategy includes diagnosis through bacteriology and standardized short-course chemotherapy with full patient support [4]. Bangladesh adopted DOTS strategy in national TB control program (NTP) during fourth population & health plan 1992–1998) and integrated into essential service package

under the health and populations sector program (HPSP) in 1998 [5]. Although initially TB services were based in TB clinics and TB hospitals, under the DOTS strategy the services were expanded gradually to primary level of health facility incorporating GO-NGO partnership. Government and NGO community health workers are involved in village level for case detection and awareness building activities. In 2002, DOTS was expanded to khulna metropolitan city. By 2006 entire country has been covered by DOTS service [5]. The DOTS strategy relies greatly on passive case finding for TB treatment and its success depends on the patient's health awareness, ability to recognize early sign symptoms, and accessibility to health services for immediate self reporting [6]. 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 perceptions of TB prevailing in the community influence the health seeking behavior of people for their symptoms. While care seeking behavior of chest symptomatic has been explored in different studies, there is dearth of information on community perceptions of TB [7]. The current study assessed knowledge, attitudes, and perceptions (KAP) about TB among the general population in Bangladesh.

Methods

Study area and population

This was a cross-sectional sequential mixed methods study where the population had been selected by a random sample of the general people of Khulna city in Bangladesh. This study combined quantitative and qualitative methods, leading to a mixed method approach [8]. For the selection of the study participants there were some inclusion criteria: the ability to speak Bengali (the local language) and/or English, being over 18 years of age or older 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 conducted. Focus group participants were sampled from three of the six constituencies (chosen because of availability of meeting facilities). Participants were selected from different areas especially that were not sampled in the study survey.

Data collection

Demographic information was gathered about age, gender, employment, level of education, marital status and religious status. The questionnaire items covered knowledge about TB transmission, symptoms, and treatment etc. The questionnaire was developed to ensure appropriateness and comprehensiveness of the questions 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 administered by trained research assistants (fluent in the local

language) who interviewed 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 survey tool. Six focus group discussions were conducted. Focus group participants were sampled from three of the six constituencies (chosen because of availability of meeting facilities). Participants were selected from different areas especially that were not sampled in the study survey.

Ethical consideration

The study protocol was reviewed and approved by the academic committee of the department of Pharmaceutical Technology and finally got approval from the academic council of the University of Dhaka. The ethical clearance was obtained from the BMRC. The permission to conduct the study and to access data was obtained from the NGOs authorities. Participation in this study was voluntary. Participants were given information and a detailed explanation of the study by a trained research assistant in the local language. Informed consent was provided by signature or thumbprint of the consent form. 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. The patients did not write their names on the questionnaire, but on a separate list. All documents were destroyed after the project to ensure patients' confidentiality. The patients did not receive any compensation for participating in the study. Some of the cases were asked to come to the clinic just to participate in the study. These patients were given compensation for their traveling costs to the clinic. The patients' medical treatment was not affected, regardless of whether the patient chose to take part in the study or not.

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 developed by weighting and combining multiple questionnaire items as described in Table. 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. Multistage survey design was controlled for using STATA's "survey" feat the number selected versus available sampling units at each level of sampling to account for different sample pools at each level. Descriptive statistics were used to summarize each questionnaire item. The bivariate student t-test analysis was used to compare the summary scores. Purposeful multiple linear regression was used to model the predictors of summary scores for TB knowledge, HIV knowledge, and TB/HIV co-infection knowledge. Outcome knowledge score variables were approximately normally distributed. A $p < 0.05$ was considered for statistical significance. All analyses were adjusted for the multistage survey design using survey estimation techniques in STATA (Stata Corp. Stata: Release 12 Survey Data. College station). Focus group topics were developed after most of the surveys had been completed and

preliminary data analysis using the first 200 participants had been conducted. Focus group questions aimed to add a richer understanding of key issues, and explore further topics not included in the survey that had emerged during data collection (for example topics that respondents had wanted to discuss and provide information but that were not on the survey). These topics guides were developed in partnership with the four local research assistants conducting the surveys. Six focus group discussions were conducted, three with women only and three with men only. Separating the genders was expected to help the women feel comfortable speaking freely, and designed to facilitate discussion of gender specific themes around the topics. Focus groups were co-facilitated by the principal investigator and a research assistant fluent in the local language. A second research assistant took concurrent notes in English as the discussion progressed. Research assistants were of the same gender as participants for each focus group. Focus group discussions were audio-recorded. Focus group discussions were conducted in a separate quiet area outside of rural clinics (two discussions each at two separate clinics), and in the conference room of the district health department (two discussions). Discussions lasted around half an hour to one and a half hour.

Focus groups discussions were transcribed and 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 October and November 2015 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, mean age was 35.54 years (median 34, range 18-75). 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 three men only focus group discussions contained a total of 30 men, and the same number of women only focus groups amount a total of 30 women. The male participants in the focus groups were slightly older (mean 34 years, median 25, range 18-60) than the female participants (mean 32 years, median 23, range 18-50) in this study. Demographic description by individual focus group can be found in Table-2.

Table 1: Sociodemographic characteristics of the study participants

Variables		n	(%)
Age (years)	18-25	90	22.5
	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	Daulatpur	10	35	25	18-50
2	Male	Daulatpur	10	40	30	18-50
3	Female	Khalishpur	9	34	24	18-50
4	Male	Khalishpur	10	30	23	18-50
5	Female	Sonadanga	11	28	22	18-55
6	Male	Sonadanga	10	32	25	18-60

Despite 99.5% of the study participants having heard of tuberculosis (n=398), the overall TB knowledge was limited. Three hundred and ninety six respondents (99.0%) stated correctly that cough is one of the main signs and symptoms of

tuberculosis, but of the other two classic TB symptoms, only 100 people mentioned weight loss, and only 80 people mentioned anything that could be interpreted as “night sweats” (other responses included fever, sweats, blur vision,

skin rash and others). When the respondents were asked that how someone can get TB, 156 respondents mentioned that it was an airborne disease. In response to another question, one hundred and twenty seven (31.75%) respondents said that one might get TB from being near a TB patient. The most common form of transmission mentioned was through saliva, usually by sharing cups 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 hereditary which came from generation to generation in a family, where 35 people (8.75%) mentioned other ways of getting TB (for example, from uncooked food, from working in industries, through sexual intercourse and from hard work). Of them 80 people (5.9%) did not have any idea about the mode of transmission of TB. 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 more than 20% of the respondents saying that TB was cured by traditional drugs or spiritual healing. Sixty five percent of respondents (n=260) knew someone who had 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. Multiple linear regression analysis of age, education, sex, marital status, level of education, religion, income level and occupation of the respondents were analyzed in the regression model. From multivariate regression analysis, it was observed that people with tertiary level of education were associated with higher TB knowledge and people having no income were linked with lower TB knowledge (Table 3).

Table 3: Multivariate linear regression analysis of TB knowledge score

Source	SS	df	MS	Number of observation	400
				F(13, 386)	356.980
Model	36786.911	13	2829.762	Prob > F	0
Residual	3059.766	386	7.926	R-squared	0.923
				Adj R-squared	0.920
Total	39846.677	399	99.866	Root MSE	2.815

Discussion

The mean TB knowledge summary score of 40% is low and demonstrates an overall lack of knowledge about TB [9]. This is the first time TB knowledge has been assessed among the general people in Khulna city, and this result was unexpectedly low [10]. But in a cross sectional study among TB patients at selected DOTS centre of Khulna city it was found that male and female distribution was 55.6% and 44.4%, respectively. One quarter of them was illiterate, and more than half had extended family and live in a congested situation. Night fever was the most common symptom known (89.9%), and 56% were aware that it could spread through sneezing/coughing. Television was mentioned as a source of information about TB. In some places TB is believed to be hereditary [11, 12]. The majority expressed a helping attitude towards other TB patients [13]. Although most of them were positive about getting family support, 46.6% [14] mentioned discrimination of separate utensils for food or drink [15]. About

50.5% expressed increased sadness, 39.8% had fear of loss of job/wedges, and 21.4% felt socially neglected [16]. 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 [17]. 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 [18]. While 39% of respondents knew TB could be transmitted through air or being near a TB 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 [19, 20, 21]. 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 necessarily harmful. Proper hygiene [17] and not sharing cups and utensils is a good preventative health 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 hereditary disease. This 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 potential to negatively affect decisions to seek 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 (2012). One of the most significant findings is that 8.7% of respondents did not know that TB can be cured. Focus group participants confirmed 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 implications; if people do not believe that their illness can be treated they will not seek care. This finding is different from other studies that found that people universally understood that TB was curable, at least in HIV negative patients. To identify the level of knowledge about TB transmission among ever-married women aged 15-49 in Bangladesh, one of the highest tuberculosis (TB) burden countries, a study was conducted. These views are in line with other studies conducted in India and Bangladesh [22, 23, 24] where most participants were of the view that TB can have adverse effects on the chances of getting married in females, but less so in males. Knowledge about TB transmission was correctly reported by approximately 7.0% of women, and was

significantly associated with education, district and access to media using multinomial logistic regression. The likelihood of correct knowledge was 3.5 times (OR 3.5, 95%CI 2.5-4.9) higher among women with ≥ 11 years of education than among women with no/primary education. A significantly higher OR for correct knowledge of TB transmission (OR 1.5, 95%CI 1.2-1.9) was found among women who watched television almost every day compared to women who watched less than once a week.

As other studies exploring community knowledge around TB have been entirely qualitative, it is difficult to compare these finding. However, one survey in Ethiopia [25] found that literacy predicted better knowledge around TB cause, transmission, and 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 such, individuals who were old enough during that period to absorb that information were positively impacted. Since the start of the HIV epidemic, the Bangladesh government has focused resources and political commitment towards combating HIV [26]. 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 Khulna 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.

Table 4

knowledge score	Coefficient (Slope)	Std. Err.	T	P>t	[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
Unskilled Worker	0.00	(omitted)				
_cons	30.380	1.013	29.97	0.000	28.387	32.374

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 believe 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 can be treated, they will not seek 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 very serious set of symptoms, and minor symptoms are assumed 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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