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Original article

Knowledge on Tuberculosis in a Growing Industrialized Area in Bangladesh

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ABSTRACT

Tuberculosis (TB) is one of the major public health problems in Bangladesh. Bangladesh Government provides some components of diagnosis and treatment free of charge for controlling of TB. Since sustaining TB control at current levels and making further progress to achieve global targets require money. It is a big challenge for this country. The aim of this study was to determine the lack of general knowledge on TB which was measured by a composite index and its association with different socio-economic and demographic factors among manufacturing workers in Rajshahi district, Bangladesh. A cross-sectional study was performed among 1,225 manufacturing workers from 75 different industries in Rajshahi district, Bangladesh. Knowledge on TB was the outcome of interest in this study, which was assessed through 08 different questions. This study revealed that 28.8% respondents had a poor knowledge on TB. Logistic regression model demonstrated that poor knowledge regarding TB was especially found among workers who were doing the job in silk industries, young adults, and female, educated, non-smokers, living in poor family and living without their partners (separated). Workers who had been suffering from the non-communicable disease were more likely to have a good TB knowledge compared with their counterpart. This study found that there is a huge gap in TB knowledge among manufacturing workers in Rajshahi district. It was noted that some modifiable factors were associated with TB knowledge. These factors can be considered to increase TB knowledge among manufacturing workers in Bangladesh.

Key words: Tuberculosis, Industrialized workers, Composite index, Logistic regression model.

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INTRODUCTION

Tuberculosis (TB) one of the major public health problems in controlling the TB burden is the poor awareness and knowledge of the population on TB (Shargie et al., 2007). Low level of knowledge on TB can lead to complications and worse health outcomes increasing the transmission and delaying health-seeking behavior, lack of adherence, resulting in multi-drug resistance, treatment failure, and disease complication and death (WHO, 2015). The industrial sector bears a heavy load of TB burden. In Bangladesh, workers in a variety of industries are particularly susceptible to TB due to their exposure to multiple risk factors such as their living conditions, working environment, and their migrant lifestyles. In many workplaces, employees operate in closed spaces and unprotected environments, which carry a high risk of the disease spreading from those having active TB to other employees working in close proximity. Studies already found that TB was found to be common among the industrial workers in Bangladesh (WHO, 2015).

Until now, several studies from low-and-middle-income countries have been performed to assess the knowledge on TB and shown an association between poor knowledge, attitudes and practices regarding TB among general population (Huang et al., 2012; Diallo et al., 2009), among pre-university students (Reddy et al., 2014; Orrett et al., 2001), high and secondary school students (Naidoo et al., 2013; Tanimowo et al., 1999). Moreover, methodological issues related to the measurement of knowledge of TB have not been adequately addressed in previous studies. The complexity of measuring knowledge lies in its multidimensional aspects. Most studies in this area have mainly focused on one or two indicators to measure knowledge of TB.

There are, few studies had been conducted to assess knowledge on TB. A study conducted in some selected areas in northern Bangladesh found that knowledge, attitude and practice towards leprosy and TB was low among the general population (Croft et al., 1999). Recently a study was conducted to assess the knowledge about the prevention and control of TB among the labors working in different industries in six city corporations; Dhaka, Chittagong, Rangpur, Barisal, Khulna and Sylhet in Bangladesh (Islam et al., 2015).

However, industrials labors were selected from industries which were located under urban and rural TB program operational areas. Since these industries were located under TB program operational areas, therefore, it is possible that workers from these industries were more conscious about TB. Therefore, it does not reflect the actual scenario of knowledge regarding TB on manufacturing workers. Moreover, that study did not consider the industries from Rajshahi, which is the second largest divisional district of Bangladesh.

The aim of this study was to investigate the knowledge on TB among manufacturing workers in Rajshahi district, Bangladesh.

MATERIALS AND METHODS

Study population and sample size determination:

In Rajshahi district, Bangladesh the sample population included workers working in different manufacturing in Rajshahi district, Bangladesh. There are various kinds of manufacturing in Rajshahi district and workers come from the different parts of this country. Rajshahi is a growing industrialized area in Bangladesh.

The target population is (3, 19,876 workers), the following formula technique was used for determining sample size. First stage selected 155, industries in Rajshahi district, Bangladesh, whereas in second stage 75 industries selected randomly. In the third stage each industries selected 17 sample for data collection from 75 industries. In this study estimated sample was 1275, but 50 respondents did not agree to provide data. Finally, this study was successfully collected data from 1225 participants.

Data collection:

The following type of information was collected for the study: (i) socio-demographic factors and (ii) knowledge about TB. All data were collected from July 2015 to January 2016 using a semi-structured questionnaire. The questionnaires were drafted in English and then translated into Bangla, the mother language of Bangladesh. The translations were reviewed by experts and volunteers, and a pilot study was conducted to validate the questionnaire.

Outcome variables:

The dependent variable in our study is knowledge about TB, which was assessed through 08 different questions. The participant's knowledge was scored using a system adopted from previous studies (Gilpin et al., 2011). Each correct response was awarded 1 point, while incorrect or 'don't know' answers received no zero marks (Syed et al., 2016).

Independent variables:

We included theoretically pertinent socioeconomic and demographic factors as independent variables. We classified age into two groups: a younger age group (< 40 years), and an older age group (≥ 40 years). Education was classified based on the formal education system in Bangladesh: Illiterate (0 years), primary education (1–5 years), secondary and higher (6 years or more). Place of residence was categorized as rural or urban. Gender was categorized as male or female. Respondents monthly income was categorized as <10000 BDT or ≥10000 BDT. Marital status was categorized as single or separated or married and whether the respondents suffering from any kind of disease as yes or no.

Statistical analyses:

Data were cross-checked for consistency before final data entry using Microsoft Excel. One person entered the data and then cross-checked it with the principal investigator of the study. Chi-square test and Fisher's exact test (if the cell frequency less than 5) were used to find the association between two factors. Binary logistic regression was utilized in this study to find the effect of socio-economic and demographic factors on the level of knowledge about TB among manufacturing workers. We estimated the adjusted odds ratio (AOR) to assess the strength of the associations and used the 95% CI for significance testing.

The performance of each indicator was expressed using a unit-free index between 0 and 1 (which allows the different indices to be added together) in accordance with the construction method of the Human Development Index (UNDP, 2005).

Knowledge index= (Actual value-minimum value)/ (Maximum value-minimum value)

Analyses were performed using statistical package for social sciences (SPSS version 22 IBM).

RESULTS

In this study was found 28.8%, 36.6% and 34.6% subjects had poor, moderate and good knowledge on TB accordingly (Fig1).Table 1 shows the socio-economic and demographic profiles about good knowledge about TB related factors of the workers. A total of 1225 individuals were included in this study. From the total sample population, approximately 54% were below 40 years of age and 70% were male. By education, 25.5% were uneducated, 41.0% were primary educated and the remaining 33.5% had secondary or higher level of education. Approximately 71.1% workers were lived in rural areas and major portion workers 77.6 % monthly income was below 10,000 BDT. Younger respondents 19.3 % had good knowledge on TB association between level of knowledge on TB and age was significant ($p < 0.05$). Male subjective 26.2% had highest level of poor knowledge on TB association between level of knowledge on TB and gender was significant ($p < 0.01$). Martial subjects 28.6% had level of good knowledge on TB association between levels of knowledge on TB and marital was significant ($p < 0.01$). Primary level of educated subjects 18.4% had level of good knowledge on TB association between level of knowledge on TB and education was significant ($p < 0.01$). Rural living subjects 19.0% had level of good knowledge on TB association between levels of knowledge on TB and residence was significant ($p < 0.01$). Low monthly subjects 21.7% had level of good knowledge on TB association between level of knowledge on TB and monthly family income was significant ($p < 0.01$). The Chi-square test showed that age, gender, marital status, education, and type of residence, and family income were significantly associated with the level of good knowledge regarding TB among manufacturing workers in Rajshahi district, Bangladesh **(Table 1).**

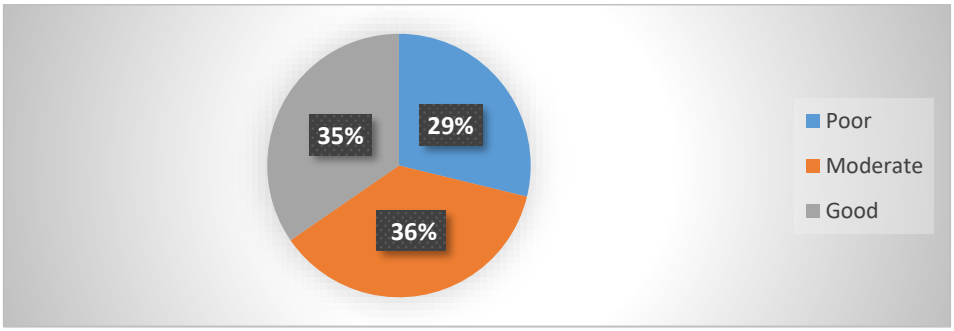

Figure1: Level of knowledge among the manufacturing workers

Table 1: Socio-economic and demographic factors of knowledge on TB among manufacturing workers

Characteristics N (%)	**Knowledge regarding TB**			
	Poor, N (%)	**Moderate, N (%)**	**Good, N (%)**	**p-value**
Age in years:				0.032
<40 years, 665(54.3)	172(14.04)	257(21.0)	236(19.3)	
≥40 years, 560(45.7)	181(14.8)	191(15.6)	188(15.3)	
Gender:				0.001
Male, 857 (70.0)	321(26.2)	324(26.5)	212(17.2)	
Female, 368 (30.0)	32(2.6)	124(10.1)	212(17.4)	
Marital status:				0.001
Single, 131 (10.7)	37(3.0)	71(5.3)	23(1.9)	
Married, 1021 (83.3)	300(24.5)	371(30.3)	350(28.6)	
Separated, 73 (6.0)	10(0.8)	12(1.0)	51(4.2)	
Educational status:				0.001
Illiterate, 313 (25.5)	122(10.0)	126(10.3)	65(5.3)	
Primary, 502 (41.0)	97(7.9)	179(14.6)	226(18.4)	
Secondary & higher, 410 (33.5)	124(10.1)	153(12.5)	133(10.9)	
Residence:				0.001
Rural, 871(71.1)	319(26.0)	319(26.1)	233(19.0)	
Urban, 354 (28.9)	34(2.8)	129(10.5)	191(15.6)	
Monthly family income in BDT:				0.001
<10,000, 951 (77.6)	312(25.5)	373(30.4)	266(21.7)	
≥10,000, 274 (22.4)	41(3.3)	75(6.1)	158(12.9)	

DISCUSSION

In this study was assessed TB knowledge at different manufacturing workers in Rajshahi district. The poor knowledge was consistent with another study conducted in Bangladesh (Agho et al., 2014). The poor knowledge about TB among the manufacturing workers indicates that the TB control program needs to consider screening, advocacy, communication, and social mobilization to these most risk groups. Our study found that younger respondents (< 40 years) had a good TB knowledge as compared to the older respondents (≥ 40 years). Our results were consistent with previous other studies (Esmael et al., 2013; Naini et al., 2012). The possible explanation is that most of the younger respondents in our study had secondary and higher level of education. An additional analysis was run to support this hypothesis and found that the proportion of secondary and higher level of education was higher among the younger respondents as compared with the older (≥ 40 years) respondents. Most of the time male subjects were always busy for industries and family welfare so, their knowledge on TB is very poor similar results were found in Dhaka city in Bangladesh (Tasnim et al., 2012). Married industrialized workers were better knowledge on TB similar results founds in West Bangle India. They found that study showed that both lack of knowledge and misconceptions regarding TB were widespread among the TB patients. For example, majority of the subjects never heard the disease TB. A considerable number of the participants had misconceptions about the cause and mode of spread of TB (Pramanik D and Ghosh J R, 2015). Primary level of educate, rural and low monthly family income manufacturing workers had level of good knowledge on TB. This study assumption was that most of primary lever and rural subject were watching BTV it was Bangladesh government media that frequent broad cast TB related advertisement it (Rana et al., 2015)

The main strength of this study is that it is the first to analyze the knowledge of TB among the manufacturing workers in Bangladesh. The standardized questionnaire format was carefully developed to ascertain accurate information from the participants, the interviewers were trained, and the fieldwork was monitored by the principal investigator of this project. The data contained information on potential confounding factors, with a low proportion of missing information. The study can be generalized to other types of manufacturing workers in

Bangladesh because manufacturing workers from all sectors have similar level of characteristics in Bangladesh.

Limitations of this study First, the cross-sectional observational design did not allow us to establish any definitive temporal associations for identifying between knowledge of TB and various socio-economic, demographic and health behavior related characteristics. Further longitudinal research is needed to fully tease apart this complex relationship and understand the underlying mechanisms. Second, this study used the only quantitative survey to elicit workers' knowledge regarding TB. For development of culture-sensitive communication strategies, qualitative studies are necessary. However, these approaches couldn't be done due to time and resource constraints. We should consider this point in our future studies. Finally, the idea of knowledge, which has several definitions; so, it is difficult to measure, especially using the questionnaire.

CONCLUSION

This study found a huge gap on knowledge of TB 28.8% about TB among the manufacturing workers. Male subjects had poor knowledge on TB among the manufacturing workers. In this study strongly recommended manufacturing workers education level should be increase and advocacy, communication and social mobilization programm could play an important role for increase knowledge on TB.

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Conflict of Interest: None to declare.

REFERENCES:

Agho KE, Hall J, Ewald B.(2014). Determinants of the Knowledge of and Attitude towards Tuberculosis in Nigeria. *J Health Popul Nutr*. 32:520-38.

BBS.(2013). *Bangladesh Bureau of Statistics*: Rajshahi district economic census.

Croft RP, Croft RA.(1999). Knowledge, attitude and practice regarding leprosy and tuberculosis in Bangladesh. *Lepr Rev*. 70:34-42.

Diallo S, Diarra B, Diop S, Toloba Y, Berthé F, Sissoko B, Gomez P.(2009). Knowledge of the Bamako general population on tuberculosis. *Mali Med*. 24:48-51.

Esmael A, Ali I, Agonafir M, Desale A, Yaregal Z, Desta K. (2013). Assessment of Patients' Knowledge, Attitude, and Practice Regarding Pulmonary Tuberculosis in Eastern Amhara Regional State, Ethiopia: Cross-Sectional Study. *Am J Trop Med Hyg*. 88: 785–788.

Gilpin C, Colombani P, Hasanova S, Sirodjiddinova U. (2011). Exploring TB-Related Knowledge, Attitude, Behaviour, and Practice among Migrant Workers in Tajikistan. *Tuberc Res Treat*. 2011:548617.

Huang Y, Zhong JM, Chen SH, Chen B, Wang XM. (2012). Investigation analysis on public awareness of tuberculosis knowledge in Zhejiang province. *Zhonghua Yu Fang Yi Xue Za Zhi*. 46:352-4.

IslamQS, IslamMA, IslamS, AhmedSM.(2015).Prevention and control of tuberculosis in Wor kplaces: how knowledgeable are the workers in Bangladesh? *BMC Public Health*. 15: 1291.

Mushtaq MU, Majrooh MA, Ahmad W, Rizwan M, Luqman MQ, Aslam MJ.(2010). Knowledge, attitudes and practices regarding tuberculosis in two districts of Punjab, Pakistan. *Int J Tuberc Lung Dis*. 14:303-10.

Naidoo S, Taylor M.(20130. Association between South African high-school learners' knowledge about tuberculosis and their intention to seek healthcare. *Global Health Action*. 6: 21699.

Naini RA, Mood BS, Meta M. (2012). Association between Tuberculosis and Smoking. *Int J High Risk Behav Addict.* 1:71-4.

Orrett FA, Shurland SM.(2001). Knowledge and awareness of tuberculosis among pre-university students in Trinidad. *J Community Health*. 26:479-85.

Pramanik D, Ghosh J R. (2015). Knowledge and awareness of tuberculosis among pulmonary tuberculosis patients in a rural area of West Bengal, India. *SAARC Journal of Tuberculosis, Lung Diseases & HIV/AIDS*. XII(2).

Reddy V, Bennadi D, Gaduputi S, Kshetrimayum N, Siluvai S, Reddy CV. (2014). Oral health related knowledge, attitude, and practice among the pre-university students of Mysore city. *J Int Soc Prev Community Dent.* 4:154-8.

Shargie EB, Lindtjorn B. (2007). Determinants of treatment adherence among smear-positive pulmonary tuberculosis patients in Southern Ethiopia. *PLoS Med.* 4:e37.

Tanimowo MO.(1999). Knowledge, attitudes and practices regarding tuberculosis among senior secondary school students. *East Afr Med J*. 76:47-50.

Tasnim S, Rahman A, and Hoque FM A. (2012). Patient's Knowledge and Attitude towards Tuberculosis in an Urban Setting. *Hindawi Publishing Corporation Pulmonary Medicine* 352850-5

Thu, Ohnmar, Win H, Nyunt MT, LwinT. (2012). Knowledge, attitudes and practice concerning tuberculosis in a growing industrialised area in Myanmar. *Int J Tuberc Lung Dis*. 16:330-5.

UNDP. (2005). *Human Development Report*: United Nation Development Programm. New York.