

Assessment of Bangladeshi mothers' knowledge and awareness on childhood tuberculosis: A cross sectional study

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Abstract: Tuberculosis (TB) is a shocking problem for the least developed and low income country like Bangladesh caused by *M. tuberculosis*, *M. bovis*, *M. africanum*, and *M. microti* infection with ID₅₀ 1-10. Bangladesh holding the 6th position among the 22 countries with highest TB burden and the incidence per 100,000 people was 220 in 2008. Even there is no estimation on the prevalence of childhood TB and is severely under-diagnosed. A descriptive type of cross sectional study was conducted to assess the mothers' knowledge and awareness of TB and Childhood TB during September, 2013 to February, 2014 with the sample size 106. The study population was those, who came to outpatient department of the Bangladesh Government Homeopathic Medical College Hospital with age limit of between 18-35 years for treatment and had at least one child below five years. Among the respondents frustratingly 84% had no idea about childhood TB and they not even concerned about it where some of them said "*Babies are the gift of Allah (God) and He has the responsibility to save the baby*". The analysis showed respondents' with <25 years had more knowledge than >25 years age group ($\chi^2=1.91$; P-value-0.167). 55.3% Respondents had no idea about where to diagnose TB and the respondents with high literacy rate had significantly more knowledge about TB and Childhood TB than illiterate ($\chi^2=4.050$; P-value-0.04). Analysis also showed housewives had relatively poor knowledge about TB and childhood TB ($\chi^2=0.019$; P-value-0.891) and having income >9,000 taka/month had significantly more knowledge about TB and Childhood TB ($\chi^2=27.786$; P-value-0.001). The study findings suggested that the strategy of TB control should be more effective and target oriented than the other countries and should make a health intervention policy for Bangladesh to manage the infectious diseases.

Keywords: Tuberculosis Infection, Mycobacterium Tuberculosis, Childhood Tuberculosis, Bangladesh

1. Introduction

Albeit Tuberculosis (TB) is not emerging in the developed world but still it is a shocking problem for the least developed and low income country like Bangladesh.

The distribution of TB is not uniform across the globe; about 80% of the population in many Asian and African countries test positive in tuberculin tests, while only 5-10% of the U.S. population test positive [1] and among them more than 50% of the cases in 2002 born in foreign country

and residing in the United States [2]. *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium africanum*, and *Mycobacterium microti* are the source of infection with infectious dose (ID₅₀) 1-10 bacilli [3] which can spread through air [4]. Besides, these germs can survive up to 8 months in sputum in cool, dark locations, 45 days on clothing, 90-120 days on dust, 45 days on manure and 105 days on paper [3]. The country rank of Bangladesh is sixth among the 22 countries with highest TB burden in the world [5] where the proportion of adults' infection with TB causing agents is 50% [6] and estimated TB prevalence is 225 per 100,000 populations per annum in 2010 [6]. Approximately more than a quarter of world's preventable death is caused by TB [7] and accounting 1.2–1.5 million deaths worldwide in 2010 [8] where the rate of death in Bangladesh is about 70,000 per annum [5]. Even globally TB is the second leading cause of death from an infectious disease (after HIV, which caused an estimated 1.8 million deaths in 2008) [8]. In 2010 there were an estimated 13.7 million chronic active cases, and in 2010 there were 8.8 million new cases, and 1.5 million deaths, mostly in developing countries [8, 9]. These data indicated the gradual increase of the scenario but the incidence of tuberculosis per 100,000 people in Bangladesh was last reported 220 in 2008 [10] and the incidence of tuberculosis per 100,000 people in Bangladesh was 223 in 2007 [11]. These results signified that there is no remarkable change took place in Bangladesh. Moreover, there is no estimate on the prevalence of childhood TB, it is believed that childhood TB is severely under-diagnosed [5]. In 1993 World Health Organization (WHO) declared TB as a global emergency and recommended as standard strategy for control of the disease that is known as the Directly Observed Treatment Short Course (DOTS) [8]. Bangladesh adopted this strategy with National Tuberculosis Control Programme (NTP) in 1993 and had expanded at all upazillas in collaboration with the partner NGOs by June 1998 and expanded in the following years to almost all areas of the country reaching 100% coverage in 2006 [12]. The overall goals of TB control are to reduce morbidity, mortality and thus decrease transmission of infection and to prevent development of drug resistance where the multi-drug-resistant tuberculosis (MDR-TB) is 7216 including extremely drug resistant tuberculosis (XDR-TB) and 400,000 per annum globally [13]. There are still some major gaps in our epidemiological data on transmission dynamic of TB where the fact that TB is endemic and highly prevalent in Bangladesh. TB is still believed to be a disease that disproportionately affects the poor and marginalized [14]. Though the infection is caused by infectious bacteria with infectious dose but there are some

vital factors involved with the transmission and epidemic. Moreover, genomic mutation may leads to the bacteria toward anti-bacterial drugs' resistant but an inadequate or poorly administered treatment regimen allows drug resistant mutants to become the dominant strain in a patient infected with TB [15]. So, adequate knowledge and information may contribute significantly to eradicate or minimize the morbidity and mortality of TB patients in Bangladesh as well as in the world.

2. Materials and Methods

A descriptive type of cross sectional study was conducted to assess the mothers' knowledge and awareness on TB and Childhood TB during September, 2013 to February, 2014. The study population was those who came to outpatient department of the Bangladesh Government Homeopathic Medical College Hospital for treatment having age between ≥ 18 years or ≤ 35 years (Reproductive age) and had at least one child below five years. Mothers having the age ≤ 18 years or ≥ 35 years or any of the physical disorder like dumbness, blindness, or mental disorder or previous history of historian or known family history of TB were excluded from the study group. The sample size was 106.

2.1. Ethics and Consent

Written informed consent witnessed by husband or legal guardian was taken and if individual showed any interest to leave out then the person was excluded immediately. Prior to the commencement of this study, the research protocol was approved by the Research Approval Committee of Atish Dipankar University of Science and Technology (ADUST). Privacy, anonymity and confidentiality were strictly maintained under lock-key system. None other than the investigators of this research; possible study monitor; the Ethical Review Committee, and any law-enforcing agency in the event of necessity had an access to the information.

2.2. Data Collection and Analysis

Data were collected through structured questionnaire having both qualitative and quantitative portion by face to face interview. The qualitative data were managed by using two experts' opinion and analyzed with simple biostatistics. The quantitative data were managed by using SPSS version 17.0 including descriptive statistic using mean, standard deviation (SD), percentage and Chi-square test to describe the association between independent variable and dependent variable.

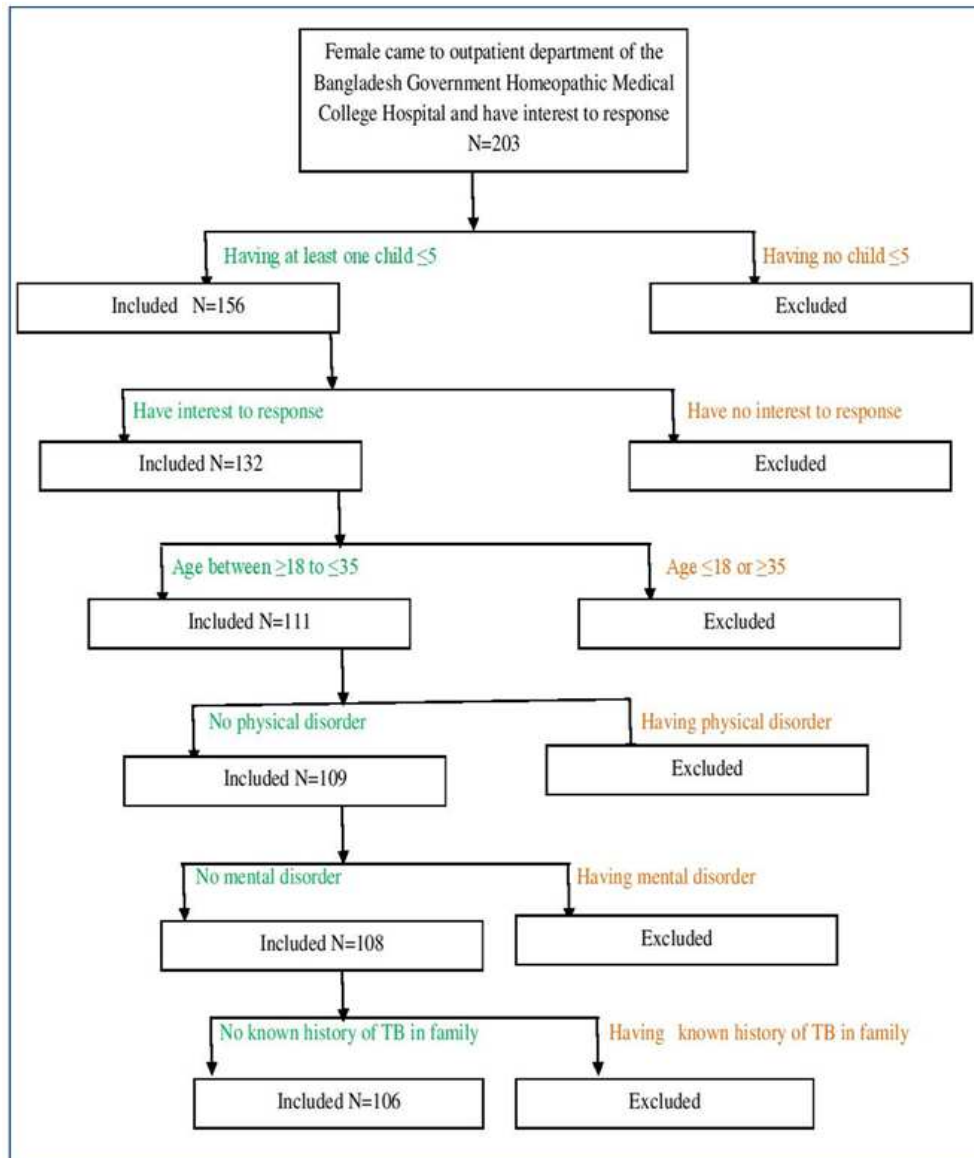
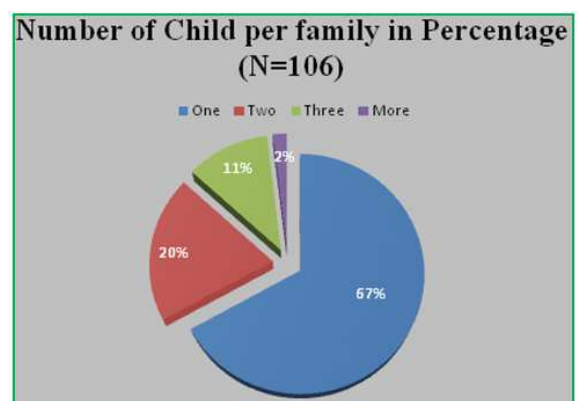


Chart 1. The inclusion and exclusion design of sampling

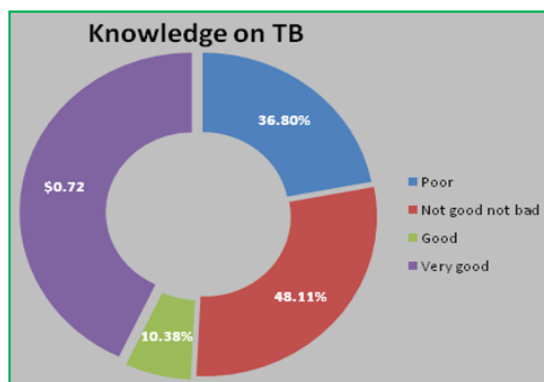
3. Results

The average age of the respondents was 28.15 ± 6.173 years (mean \pm SD) and the maximum respondents were from the age group 25 to 30 years where 85.80% were Muslim, 12.3% were from Hinduism and rest of all (1.89%) were from Christianity and Buddhism. Among the entire respondents 69.8% at least could sign where 57.5% had minimum primary education and 30.2% had no literacy. From the respondents 39.6% were involved in any commercial activities and rest of the 60.4% were housewives. Almost all the families main earning member was their husband and 29.2% were involved in non-government service, 30.2% were involved in business, 14.2 % were involved in agriculture, and only 2.8% were involved with government service and rest of all were unemployed or living foreign country as skilled or unskilled labor whereas 46.53 % had income <9,000 taka

per month. 81.13% were nuclear family and almost 100 % respondents were leaving in rental house in greater Dhaka region.

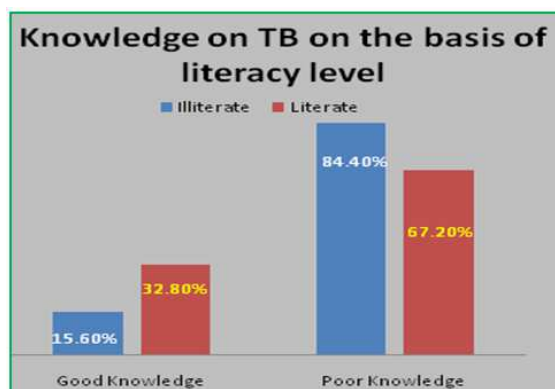


Plot 1. Number of Child per Family in Percentage (N=106)



Plot 2. Mothers' Knowledge on TB (N=106)

The number of child having age less than five years per family among the respondents is given in the *plot 1* in percentage. The knowledge of the study population on TB is showed in *Plot 2* in percentage. But frustratingly 84% respondents had no idea about childhood TB and they not even concern about it. The analysis showed that respondents' with <25 years had more knowledge than >25 years age group ($\chi^2=1.91$; P-value-0.167). Beside this, 55.3 % respondents had poor knowledge, 32.3 % had neither good nor bad knowledge whereas only 13.4 % had good and very good knowledge about treatment of TB or childhood TB. To ask the question "Where to diagnose the TB?", from the study population 55.3% respondents had no idea, 32.3% respondents were confused about where they should go and 13.4% respondents smartly gave the correct answer. Based on the literacy level of the respondents the knowledge on childhood TB is given in the *Plot 3* which showed that the respondents with high literacy rate had significantly more knowledge about TB and Childhood TB than illiterate ($\chi^2=4.050$; P-value-0.04). Among the respondents who were Housewife 25.0% had good knowledge, 75.0% had poor knowledge and respondents other than housewife 26.2% had good knowledge, 63.8% had poor knowledge about childhood TB and analysis showed housewives had relatively poor knowledge about TB and childhood TB ($\chi^2=0.019$; P-value-0.891). Analysis also showed that, having upper income (>9,000 taka per month) had significantly more knowledge about TB and childhood TB ($\chi^2=27.786$; P-value-0.001).



Plot 3. Mothers' knowledge on TB on the basis of literacy level

From the qualitative section of the questionnaire, some specific findings were evolved. Some of the respondents responded, "I haven't seen the present promotional advertisement related with TB" whereas 81.13% respondents were watched television, 26.42% were listened radio and 21.70% were read newspaper regularly. Some respondents replied that they were not willing to take vaccination for TB and they thought vaccination has no impact, accept Allah (God) and fate. A group of respondents said, "Babies are the gift of Allah (God) and He has the responsibility to save the baby". Few respondents said, "If other people find the TB infection then may be some social harassment will occur". All most all the respondents answered, "Government can play the vital role to stop TB by increasing the medical facilities" even one of the respondents said, "Government should change their policy and need to establish accountability for medical sector."

4. Discussion

The development of knowledge in specific issues always depends on education, occupation, previous family history and especially the level of standard of the community or country. So, the knowledge about TB and childhood TB also depend on these issues. The study result showed 30.2% had no literacy where the literacy rate in Bangladesh aged above 15 years is 59.82% [16]. 39.6% study population were involved in any commercial activities which is still so poor but the trend was upward than 2007 (21% in 2007) [17] and all most similar with Haque *et al.* (2014) [18]. In the study, specifically the mother working in medical related field were excluded to eliminate the group bias and to get the actual result. The presence of genotoxic substances in food may result in synergistic effects leading to cancer in humans [19] even lower estrogen level can lead to women's cardiovascular diseases [20] whereas TB is entirely different from cancer or cardiovascular diseases and is caused by the pathogenic bacterial infection which demands specific knowledge on TB to prevent the outbreak in both child and adult. But the study result is frustrating. In this study <25 aged mothers had relatively better knowledge on TB which indicates after adopting the DOTS strategy the rate of knowledge dissemination on TB management has increased in Bangladesh but it is still so poor. Frustratingly, only 16% mothers were concerned about it and still under-diagnosed [5]. Developing countries adequacy of treatment and TB contact history are the most important exposure variables [21] but still the knowledge of TB burden and its trends is imprecise in Bangladesh [22, 23]. Cough <3 weeks and low Body Mass Index (BMI) should be considered for suspecting TB cases and these issues should be addressed in the current NTP guidelines and awareness campaign which usually addresses only those with cough for at least three weeks [12] even malnutrition is also associated with TB [24-26]. Where the NTP guidelines and awareness campaign were not well

addressed, it is tough to find adequate amount of mothers having good knowledge on TB or childhood TB. So, proper strengthening of control activities and knowledge dissemination may contribute in prevention, early diagnosis and treatment of TB though till now total cost of diagnosis and treatment bare by Government. But, need much more specific community oriented campaign for dissemination of infoware. Literacy always increases knowledge, so the information disseminated by television, radio, news papers were easy to understand by the literate person and this study showed significant relation between education and knowledge about TB and childhood TB ($\chi^2=4.050$: P-value 0.04). Most of the Bangladeshi housewives are generally not well educated and laggard. They not even well informed about the present status of the world and also not involved with regular activities accept home management which may be a great reason behind the knowledge gap on TB and childhood TB. A foreign funded TB CARE-II project is working throughout Bangladesh to raise awareness of TB among vulnerable groups, including children, urban and rural populations, and low-income populations [5]. This type of target and community oriented programme may help to develop the scenario more effectively with higher rate of success but obviously need proper pre assessment of knowledge of the female of Bangladesh by matching with the present government policy framework.. In Bangladesh there are lots of ethnic communities who are residing in extreme rural areas and most of the cases they depend on their own complementary and alternative treatment system. Bangladesh government is still unable to reach modern treatment to all the communities, not even information about disease prevention. Locally Hajongs' use *Ocimum tenuiflorum* L. [27], Santals' use *Withania somnifera* [28], Chakmas' of Chittagong Hill Tracts use *Stereospermum chelonoides* [29], Garos' of Madhupur forest region use *Piper longum* L. [30] whereas Garos' of Netrokona region [31]. Bede [32], Rakhain [33], Tonchongya [34], Khumi [35], Pahan & Teli [36], Tripura [37] still have no report on TB treatment with their own system. So using "*Babies are the gift of Allah (God) and He has the responsibility to save the baby*" type words by the randomly selected mothers are very much rational. Only early detection of TB and childhood TB patients and providing effective treatment are required to prevent the spread of disease [38] in country like Bangladesh which even can prevent social harassment. But the first step is knowledge dissemination on TB and childhood TB to create awareness. Otherwise the treatment time, cost, infection frequency with other social and health impacts will be increased where long term anti-TB therapy can lead to patient non-adherence [39] which is also a notable information but still not in concern for all. Social harassment for TB patient and hiding TB is also common in Pakistan [40]. Presently Bangladesh has so many strategies for controlling infectious and non infectious diseases but still has no health intervention policy to increase the activities of knowledge dissemination on TB and childhood

TB. It will be very much tough to control TB and childhood TB without proper awareness. Even TB management is entirely different from other diseases due to its highly contagious property. Moreover, in the time of TB management, we should keep in mind that, it is very much dependent with antibacterial agents which may lead to resistant bacterial strains and can cause more harm to the patient. But frustratingly, still there is no specific circulation, even no one was alarmed yet about it which may be a reason behind mothers' poor knowledge on TB and childhood TB. This is a social war against infectious diseases and everyone has to perform their own part with appropriate knowledge. Dissemination of infoware with appropriate technoware, humanware and orgaware can minimize the infectious diseases. Mothers are the primary resources to fight against any sort of evil and by improving their knowledge base it is very much possible to reduce the frequency of TB and childhood TB at tolerable range.

There was a gap in sampling procedure and number of study population of this study. So, it is tough to avoid the errors from the data and interpretation even we had not set any question about HIV to correlate TB. To evade this type of error, need a wide scale of study including all the clusters and communities of Bangladesh to represent the country.

5. Conclusion

Bangladesh is a densely populated country, so the risk of TB infection is many folds higher than the lower population density country due to its highly contagious property. TB demands some special attention which may start from home. But, awareness always depends on proper knowledge dissemination that may not be well developed in Bangladesh. So, obviously the strategy of TB control and prevention should be more effective and target oriented than the other countries. It is the prime time to make a health intervention and policy for Bangladesh to manage the infectious diseases like childhood TB.

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Author Contributions

Conceived and designed the experiment: AKMF Haque, AZ Khan, IJ Mukti; Performed the field work: B Lutfunnahar, S Chakma, MAR Bhuiyan; Analyzed the data: T Islam, MN Rahman; Wrote the paper: AKMF Haque, AZ Khan, IJ Mukti. All the authors read and approved the final manuscript.

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