WWJMRD 2025; 11(03): 40-46
www.wwjmrd.com
International Journal
Peer Reviewed Journal
Refereed Journal
Indexed Journal
Impact Factor SJIF 2017: 5.182 2018: 5.51, (ISI) 2020-2021: 1.361
E-ISSN: 2454-6615

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Knowledge and Awareness towards Tuberculosis Infection among new Pulmonary Tuberculosis Patients at Selected Hospitals of Chattogram City Corporation Area, Bangladesh.

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Abstract
TB is one of the top 10 leading causes of death from a single infectious agent; a total of 1.5 million people died from TB in 2018 including 251000 people with HIV infection. It is an infectious disease usually caused by Mycobacterium tuberculosis (MTB) bacteria and generally affects the lungs, but can also affect other parts of the body. The main objective of the study is determination of knowledge and awareness towards Tuberculosis (TB) infection among different TB patients of selected Hospitals, Chattogram District, Bangladesh. The sample size of the study was 250. From the findings of the study, it could be said that the respondents should know about TB more as still a big portion of the respondents did not know about TB properly. Even they did not know about the causative agent of TB and were not aware about its transmission, causative agent and diagnosis. Thus, the present study emphasizes the need for health education programmes to improve knowledge, awareness and removing misconceptions about TB.

Keywords: TB, Mycobacterium tuberculosis, Infection, Pulmonary.

Introduction
Mycobacterium tuberculosis is a pathogenic bacterium which is the causative agent for Tuberculosis (TB) disease, the most affected area is lungs. It is an airborne disease which spreads from person to person through the air. Tuberculosis patients propel the TB germ into the air by sneezing, coughing and spitting. Very small amount of these germs can infect a person. The common symptoms observed in TB patients are cough, night sweats, fever and weight loss. The symptoms may be mild for many months, these can lead to results in transmission of the bacteria to the unaffected individuals [1].

Tuberculosis can affect all ranks of society but it is closely associated with poverty due to the closer contact with the sufferers because of overcrowding at home, at work place, traveling etc. The immune system is also weakened due to their poor nutritional status, so they are at greater risk [2]. Tuberculosis may cause severe illness and also be transmitted to society. A systematic review indicated that the median duration of delay from the onset of symptoms to the begin of treatment ranged from 60 to 90 days [3]. Delayed analysis of energetic tuberculosis (TB) is an important trouble in many widespread hospitals in industrialized countries as it outcomes in greater affected person morbidity and mortality and intra institutional spread of TB. This trouble has been attributed to the relative rarity of energetic TB in these hospitals, ensuing in a scarcity of experience and expertise inside the analysis and control of TB [4-9].

The severe epidemic scenario of tuberculosis (TB) in different countries of Asia is properly documented, and the prevention and manage is a pinnacle priority for public health. TB can motive full-size social and economic disruption, motive a sequence of serious consequences [10], and impede a nation's development [11]. A report by WHO was

indicated that almost 75% of the calculated 2.9 million were either not diagnosed or diagnosed but not included to national tuberculosis programs in 12 countries including Bangladesh, India, China, South Africa, Indonesia, Nigeria, Myanmar, Pakistan, Philippines, Ethiopia, Democratic Republic of the Congo, Mozambique [12].

For an effective tuberculosis control program, early diagnosis plays an important role because delay in the diagnosis may worsen the disease with risk of death and increase the tuberculosis transmission [13]. Multidrug resistant (MDR) TB and extensively drug-resistant TB (XDR-TB) exert a substantial threat to TB control programs worldwide. However, drug resistance strains transmission from individual to individual caused by the social behavioral risk factors of the patients by themselves [14-17].

TB is one of the top 10 leading causes of death from a single infectious agent; a total of 1.5 million people died from TB in 2018 including 251000 people with HIV infection. Almost all HIV-positive patients and 45% of HIV-negative patients with TB will die without proper treatment [1]. Tuberculosis has been considered as a significant threat to public health due to the influence of the HIV virus. One of the highest reported rates of TB was estimated in South Africa (366/100000 people), this increasing rate of TB in South Africa has been imposed at least in part to the impact of HIV infections [18-20] . Many endocrine glands including hypothalamus, pituitary, thyroid and adrenal gland are also may be affected by tuberculosis. Adrenal glands are the most commonly affected endocrine organ by tuberculosis [21]. It is thought that about 80% protection against tuberculosis meningitis and military disease was treated with BCG vaccines but protection against lung tuberculosis is highly variable. [22-23]

Recently, the most widely used route for the vaccine is the intradermal route, this method is recommended by WHO. [24] The intradermal route delivers the dose of vaccine more precisely, is also cheaper and induces higher rates of tuberculin skin test conversion compared with the percutaneous route. [25, 26] Living in the same household, people who are close contacts to a TB case, are at greater risk of the tuberculosis infection rather than the casual contacts. The young children who are below 5 years old and the people with immunodeficiency (HIV infected) are at higher risk of TB disease within two years following infection usually. [27]

All the children who are in close contact of sputum smear-positive TB cases are recommended for screening by the World Health Organization (WHO), the International Union against Tuberculosis and Lung Diseases (IUATLD) and the National TB Control Programs (NTPs) [28]. To reduce the morbidity and mortality related to TB in children, screening and management are the potential key. [29, 30] Early initiation of prevention therapy of TB may reduce the progression and prevent the development of infection to disease. The identification of contacts of any age with suspected TB disease at the earlier stage may reduce the transmission and increase the findings rather than the patients who are in health care services. [31] The transmission may be small through the young children's contribution but they may form a pool of future adult case infection [32, 33].

Tuberculosis (TB) is a public health problem in many developing countries including Bangladesh. Globally there were 8.8 million incident cases of TB in 2010 [34]. With the rising number of HIV infection and AIDS cases there is a threat of resurgence of TB as this is the most common opportunistic infection in them [35]. 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 [34].

The global burden of TB mainly lies in the 22 high burden countries and about 50% of prevalence occurs in 5 countries of SouthEast Asia, namely, India, Indonesia, Bangladesh, and Thailand, Myanmar. Bangladesh ranks sixth among the high burden countries with an incident rate of 225 per 100,000 thousand population per year and a mortality rate (exclusive of HIV) of 43 per 100,000 thousand population per year [34]. 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 [36]. The direct observed treatment short course (DOTS) was launched in 1995 as the main strategy in the control of tuberculosis [37]. The strategy includes diagnosis through bacteriology and standardized short-course chemotherapy with full patient support [37].

Bangladesh adopted DOTS strategy in the national TB control program (NTP) during the fourth population & health plan (1992–1998) and integrated it into an essential service package under the health and populations sector program (HPSP) in 1998 [38]. 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 at the village level for case detection and awareness building activities. In 2002, DOTS was expanded to Dhaka metropolitan city. By 2006 the entire country had been covered by DOTS service [38].

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 [39]. It is important that basic knowledge about the disease and the availability of treatment is clear among the 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 [40]. The aim of this study is to determine the knowledge and awareness towards Tuberculosis (TB) infection among different TB Patients of selected Hospitals, Chattogram District, Bangladesh.

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Research Methodology

Study Design: It is a descriptive type of cross-sectional study.

Study Population: Different TB patients of selected Hospitals of Chattogram District were covered as study population.

Study Period: This study was conducted from September, 2023 till February, 2024.

Study Area: Selected Hospitals of Chattogram District

were covered as study areas.

Inclusion Criteria: Patients of selected hospitals (where TB care and management is available) with given consent who willingly joined or participate in the study living in the area.

Exclusion Criteria: Patients who felt unwilling to participate and who were unable to provide information.

Data Collection Tools: A pre-tested, structured and modified interview administered questionnaire was followed to collect data properly.

Sampling Technique: Non-randomized, non-probability and purposive sampling methods were followed.

Data Collection Technique: By following a face-to-face interview of the participants.

Data Analysis & Management Plan: All interview questionnaires were checked for its completeness, accuracy and consistency to exclude missing or incomplete data. Then data was checked, cleaned and edited again before analysis. The data was analyzed by using Statistical Package Social Science Software (SPSS). Descriptive statistics was used for the interpretation of the findings.

Sample Size: Due to financial constraint and time limitation the researchers took 250 samples according to the guide's decision.

Ethical Consideration: For conducting the study, Ethical approval was obtained from the ethical board of university. The personal identification, information of the subjects involved in the research were replaced by codes in the protected archived computer data files. The paper forms with the personal identification information were stored in a high security procedure. Data files for statistical analysis were prepared to ensure the confidentiality of any information about the study participants and did not include any personal identification.

Quality Control & Quality Assurance: Regular assistance and guidance from the supervisor was taken for conducting interviews. Data collection and analysis was performed by the researcher himself. Report were made with the respondents before data collection. Data was checked and rechecked for reliability. A semi-structured questionnaire was used. Questionnaire was explained in local languages for better understanding.

Result

Table 1: Socio Demographic Characteristics.

Sl. No.	Category	Options	Frequency (F)	Percentage (%)
1	Age in years	<20-20	26	10.40%
		21-30	45	18.00%
		31-40	43	17.20%
		41-50	51	20.40%
		51-60	37	14.80%
		60+	48	19.20%
2	Gender	Male	156	62.40%
		Female	94	37.60%
3	Marital Status	Single	45	18.00%
		Married	204	81.60%
		Divorced	0	0.00%
		Widow/widower	1	0.40%
4	Educational Status	Primary	107	42.80%
		SSC	50	20.00%
		HSC	26	10.40%
		Graduate	10	4.00%
		Post graduate	2	0.80%
		Illiterate	55	22.00%
5	Occupation	Jobless	48	19.20%
		Government employee	7	2.80%
		Private employee	84	8.00%
		Business	17	6.80%
		Student	23	9.20%
		House wife	71	28.40%
6	Religion	Muslim	194	77.60%
		Hindu	49	19.60%
		Christian	0	0.00%
		Buddha	7	2.80%
7	Which area do you live in?	Hill Track	7	2.80%
		Coast	4	1.60%
		Flat Land	239	95.60%
8	Which area do you live in?	Urban	67	26.80%
		Rural	158	63.20%
		Semi-Urban	25	10.00%
9	Monthly Family Income	< 20 K	174	69.60%
		21 - 30 K	57	22.80%
		31 - 40 K	13	5.20%
		> 40 K	6	2.40%

Socio-demographic characteristics of the studied population are presented in table 1. Maximum participant's age was 41 years. The average monthly household income of the participants was <20k (69.60%). It shows that the

majority (81.60%) of the study participants were married. With regard to the educational status, 22% were illiterate, 42.80% studied up to primary level. The distribution of occupation indicated that most of the participants were housewives (28.40%), business (6.80%), private employees (8.00%) and students (9.20%). However, 19.20% of individuals were jobless. The result also revealed that most (95.60%) of the participants are residing in Flat land area.

Table 2: Knowledge of the participants towards tuberculosis.

Sl. No.	Category	Options	Frequency (F)	Percentage (%)
1	Do you know what TB is?	Yes No	151 99	60.40% 39.60%
2	If yes, say few words in general	A viral infection in lungs & selected organs A bacterial infection in lungs & selected organs A fungal infection in lungs & selected organs Not answered	4 86 3 58	2.65% 56.95% 1.99% 38.41%
3	Do you know what the causative agent of TB?	Virus Bacteria None of them Not answered	6 87 9 49	3.97% 57.62% 5.96% 32.45%
4	How long you have been suffering by TB?	1-3 Months 3-6 Months 6-9 Months	188 50 12	75.20% 20.00% 4.80%
5	Do you take healthy foods that is good for quick come round?	No Yes	23 227	9.20% 90.80%
6	What are the main symptoms of TB?	Fever Cough Bleeding Body pain Weakness Chest pain	a, b, e (153) a, c, f (72) b, e, f, (25)	61% 29% 10%
7	Is it transmitted from person to person?	Yes No Not sure	188 19 43	75.20% 7.60% 17.20%
8	What is the main source of information of TB?	Social Media TV Internet Friends Doctors / health workers NGO workers	5 23 1 5 167 68	2.00% 9.20% 0.40% 2.00% 66.80% 27.20%

The table shows that, 39.60% of the subjects never heard of TB disease before diagnosis of their disease. Those who knew (56.95%) they said that it is a bacterial infection in lungs and selected organs. With regard to the cause of TB, 57.62% participants think that its becuase of a bacteria. Maximum patients (75.20%) have been suffering from these disease for 1-3 months. When participants were asked about the symptoms of TB, 61% marked fever, cough and weakness. 75.20% agreed that TB transmisses from person to person. When they were asked about the source of information about TB, 26% individuals replied health worker, 11% replied patient, followed by friend (6%), family member (3%) and, media and neighbor 1% each as a source of information about TB.

Table 3: Awareness of participants regarding tuberculosis.

Sl. No	Catagory	Options	Frequency	Perchantage
1	Is TB curable by drugs?	Yes No Not sure	227 6 17	90.80% 2.40% 6.80%
2	Do you think, after being diagnosed, one should keep away from spreading TB?	Yes No Not sure	133 48 69	53.20% 19.20% 27.60%
3	Do you cough in public places without carefulness?	No Yes	202 48	80.80% 19.20%
4	Do you think that TB is preventable?	Yes No Not sure	174 20 56	69.60% 8.00% 22.40%
5	Do you think that you are becoming well gradually with current management & treatment?	No Yes	19 231	7.60% 92.40%
6	Are you satisfied with current management & treatment of the Hospital?	No Yes	7 243	2.80% 97.20%

Table 3 shows that with regard to the curability of TB, 90.80% said that it is curable. 53.20% think that after being diagnosed, one should keep away from spreading TB. Majority(80.80%) do not cough in public places without carefulness. 69.60% think that TB is preventable. the majority of the participants are satisfied with management and treatment hospital (97.20%) and becoming well gradually (92.20%).

Discussion

This study assessed the level of knowledge about TB and healthcare seeking behavior of TB patients. In our study, regarding knowledge about transmission of TB, our study revealed that 60.40% of the respondents have knowledge about transmission of TB. The finding of this study is comparable with the finding of a study done in South Sudan [41] which reported knowledge of transmission as 79.4%, but higher than that of study done in India [42] which reported 30.6%.

Here, 65.2% of the respondents knew that TB is caused by bacteria (67.62%) which is higher than studies from Southwest Ethiopia [43], South Sudan [1], Nigeria [44] and Indies [45] which showed lower knowledge about the cause of TB: 33.7%, 19.6%, 36%, 13.2% and 6.9% respectively. The majority of the patients, 188 (75.20%), knew that TB is a transmittable disease which is similar to another TB related article which shows participant's knowledge about TB transmission is 80.4% [46].

In this study, the respondents' knowledge about signs and symptoms of TB were 60% (fever, cough and weakness) which is comparable to the study done in Zambia [47] that reported 70% of TB patients know about signs and symptoms of TB. However, this finding is higher than the studies done in South Sudan [41] and India [42] that reported 48% and 47% of respondents respectively know about signs and symptoms of TB. The improved knowledge about signs and symptoms of respondents in this study as compared to previous studies could be because of better opportunity to access information.

Primary source of information about TB and its treatment in the present study was health workers (46%), followed by patients. However, the contribution of the media in increasing awareness was very low (10%). This was in corroboration with the study by Khan et al [48]. Contrary to that, health facilities were the least source of information while relatives and friends were the most important sources in central Tanzania [49]. With regard to the curability of TB, most of the patients had knowledge about the curability of TB. 90% said that it is curable by drugs. Similarly, a previous study in Tanzania by Kilale et al. 28 showed that all respondents in that study knew that TB was a curable disease [50].

Majority (69%) of the participants knows that TB is preventable which contradicts with another article of Pakistan where only 10% of the participants thinks that it is preventable [51]. Majority (97.20%) of the participants are satisfied with the treatment given to them and they (92.40%) think that they are gradually becoming well with current management and treatment.

Limitations of this study was that the knowledge and awareness of TB patients were assessed based on respondents' self-report, which may lead to recall bias. The other limitation of the study was that it did not assess the delay of time to seek healthcare and reasons for delay. The sample size of this study was also small because of the short duration of the study period. This can also have an impact on the significance of the variables.

Conclusion

The study was aimed to assess the knowledge and awareness towards tuberculosis infection among pulmonary tuberculosis patients. From the findings of the study, it could be said that the respondents should know about TB more as still a big portion of the respondents did not know about TB properly. Even they did not know about the causative agent of TB. Some of the respondents were not aware about TB, its transmission, causative agent, diagnosis. That portion of respondents are still in danger. There are some good findings also, as most of the respondents knew about the symptoms of TB, mode of transmission etc. Many of them believed that TB is preventable and they also said that it is not a result of great sin. Thus, the present study emphasizes the need for health education programmes to improve knowledge, awareness and removing misconceptions about TB. Because, poor knowledge of TB patients concerning their disease may be an obstacle in effective cure, prevention and control of the disease, and thus will contribute more burden of TB disease in the country.

Recommendations

- There is no alternative of training and health education regarding different serious health issues among different community people.
- Awareness of different communicable diseases is important through social, political, NGO and Govt. interventions.
- Health promotion, healthcare distribution, and emergency response play a major role in reducing spreading of diseases and epidemics.
- So regular health checkup, diagnosis, regular medication, regular health education on various issues should be recommended.
- Regular awareness programs, KAP studies, awareness-based chapters in academic course curriculum should be implemented. the tries of the honest people doing

Acknowledgments

All of the authors have equal contribution to this research. The research was done under the direct supervision of Dr. Md Jahedul Islam.

Financial Support

There was no financial support for conducting the research.

Conflicts Of Interest

There are no conflicts of interest among authors.

Ethical Approval

The ethical approval had been issued and the recommendations had been followed accordingly.

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