Sputum Positive Tuberculosis Patients Attending OPD of Chest Diseases Hospital, Rajshahi and Associated Factors

Maksuda Khatun

Nursing Instructor, Rajshahi Nursing College, Rajshahi, Bangladesh
Email: maksudaaiuca@gmail.com, Mobile: +8801765716122

Abstract

This cross sectional descriptive study was conducted among the patients attending outpatient department of chest diseases hospital. Rajshahi with a view to explore the proportion of sputum positive tuberculosis and the relationship with socio-demographic characteristics of the respondents. A total of 350 respondents were interviewed and their sputum test result was recorded from hospital reports. The respondents were selected purposively. Data were collected from the respondents by face to face interview according to a partially structured questionnaire. The mean age of the respondents was 41.49 (SD ± 17.12) years. Majority of the respondents (38.3%) had secondary or higher secondary education and a large no. of them (25.1%) was farmer followed by day laborer (21.4%) and house wives (20.3%). The average monthly income of the family was taka 7711.43 (SD ±2588.19). The average weight of the respondents was (43.01±5.69kg and maximum of them (77.1%) had weight in the range of 35 to 49 kg. Similarly mean BMI of the respondents was 17.03±2.34 and maximum of them (75.1%) had BMI <18.5, which was considered as mal nutrition. Majority of the respondents (75.14%) belonged to joint family. Among the respondents, the prevalence (relative percentage) of sputum positive tuberculosis was 15.14% and that of suspected pulmonary tuberculosis was found significantly associated with type of family ($p<0.05$) but not associated with sex ($p>0.05$),type of housing ($p>0.05$), monthly family income ($p>0.05$) and educational status ($P>0.05$). This study provided some important information which might help the concerned people to take appropriate measures and might be the basis for further in depth study on this issue.

Key words: Tuberculosis, Sputum, OPD, Associated Factors

I. Introduction:

Sputum Acid Fast Bacilli (AFB) positive pulmonary tuberculosis is the infectious form of tuberculosis and mainly responsible for transmitting the diseases. An untreated patient is likely to infect another 10-15 cases each year. Transmission is through droplet nuclei, which are airborne from the index cases. Susceptibility of developing tubercular infection depends upon bacillary load, close contact with the patient and duration of anti tubercular treatment.

On starting effective anti tubercular treatment, bacillary load decreases rapidly, which correlates with reduced infectivity. In spite of various serological markers, sputum AFB remains the important measure for the treatment response. Delay in sputum, AFB smear conversion at 2-3 months is one of the predictors of treatment failure and relapse.

Bangladesh ranks sixth among countries with the highest burden TB in the world, with 300000 new cases and 70000 deaths each year, according to the World Health Organization (WHO). Most affected are the poor and uneducated people.

The government of Bangladesh has expanded care across the country, wit 1050 DOTS centers at the sub-district level where TB treatment is free.

Bangladesh has achieved the Millennium Development Goal for 70% case detection and an 85% cure rate.

The following people are at higher risk for TB: Elderly, Infants, people with weakened immune systems, for example due to AIDS, Chemotherapy, Diabetes, or certain medications.

In the United States, there are approximately 10 cases of TB per 100000 people. However, rates vary dramatically by area of residence and socioeconomic status.

A study was done to determine the prevalence of smear-positive tuberculosis (TB) in a rural area in Bangladesh at Matlab. A TB surveillance system was established among 106000 people in rural Bangladesh at Matlab. Trained

field workers interviewed all person aged [gt-or-equal] 15years to detect suspected cases of TB (cough>21days) and sputum specimens of suspected cases were examined for acid-fast bacilli (AFB). Of 59395 persons interviewed. The prevalence of chronic cough and sputum positively were significantly higher among males compared to females ($p<0.001$). The high burden of TB among rural population warrants appropriate measures to control TB in Bangladesh.

Another study was conducted to find out the incidence of Pulmonary Tuberculosis (PT) in garments workers of Dhaka city and to find out the relationship between the incidence of PT and socio-demographic factor of the respondents. The study concludes that PT among the garments workers is a more alarming health issue than among the general population of Bangladesh. Improved and regular health check-up system and directly observed treatment short course (DOTS) should be implemented in the working places particularly where clusters of workers are working together.

Indonesia ranks third in the world for TB burden. There were 245 new TB cases per 100000 persons and 110 new sputum smear-positive cases per 100000 in 2004.

As with most infectious diseases, TB is not randomly distributed; it thrives in specific groups and under specific conditions in association with identified and unidentified factors that confer vulnerability to disease including poverty.

Bangladesh has achieved the millennium Development Goal for 70% case detection and an 85% cure rate. The present study might elicit further relationship between sputum positive pulmonary tuberculosis and socio demographic characteristics of the patients.

II. Objectives:

The specific objectives of this study are

- To estimate the relative percentage of sputum positive pulmonary tuberculosis among the patients OPD of chest disease hospital at Rajshahi of Bangladesh.
- To determine the socio demographic characteristics of the patients with sputum positive pulmonary tuberculosis.
- To find out association of sputum positive pulmonary tuberculosis with some selected socio demographic characteristics.

III. Methodology:

This was a cross-sectional descriptive study. 350 patients attended outpatient department of Chest disease hospital, Rajshahi. Purposive sampling technique was followed. A partially structured questionnaire which was duly pre-tested was used to collect data from the respondents. All collected data from patients and from the guardian in case of child patients by face to face interview through a partially structured questionnaire. All efforts were made to collect data accurately. No leading questions were asked. After proper verification, data were coded and entered into the computer and analyze by using SPSS and Excel programme.

IV. Findings and Discussion:

Tuberculosis (TB) is a social disease and several socio-economic factors have significant effects on TB. The aim of this study is to assess the factors associated with the Pulmonary TB (PTB). This cross sectional descriptive study was conducted among the patients attending outpatient department of chest diseases hospital, Rajshahi with a view to explore the proportion of sputum positive tuberculosis and the relationship with socio-demographic characteristics of the respondents. A total of 350 respondents were interviewed and their sputum test result was recorded from hospital reports.

Table 1: Distribution of the respondents by their age

Age in group	Respondents	
	Frequency	Percentage
Less than 15 years	8	2.3
15-29 years	98	28.0
30-44 years	88	25.1
45-59 years	90	25.7
60 year and above	66	18.9

Total	350	100.0

Table No. 1 showed that out of 350 respondents 88(25.1%) were in the age group of 30-44 years, 98(28.0%) were in the age group of 15-29 years, 90(25.7%) were in the age group of 45-59 years and 66(18.9%) belonged to age group 60 years and above. The mean age of the respondents was 41.49±17.12 years.

Table 2: Distribution of the respondents by their educational status

Educational status	Respondents	
	Frequency	Percentage
Illiterate	60	13.1
Up to class V	120	34.3
class VI - XII	134	38.3
Graduate and above	36	10.3
Total	350	100.0

Table No. 1 showed that out of350 respondents 38.3% were in class VI-XII, up to class V 34.3% belonged to education level graduate and above and the rest 13.1% were illiterate.

Table 3: Distribution of the respondents by their occupation

Occupation	Respondents	
	Frequency	Percentage
Service	34	9.7
Farmer	88	25.1
Daily laborer	75	21.4
Business	39	11.1
House wife	71	20.3
Others	43	12.3
Total	350	100.0

From the table no. 3, It was found that out of 350 respondents (20.3) were house wife, 21.4% were daily laborer, 25.1% were farmer, 11.1% had occupation of business and the rest of them (12.3%) constituted other types of occupation.

Table 4: Distribution of the respondents by monthly income

Monthly income	Respondents	
	Frequency	Percentage
Taka 6000 or less	132	37.7
Taka 6001-20000	218	62.3
Total	350	100.0

Table 4 showed the distribution of the respondents according to their monthly family income. Majority
Of the respondents (62.3%) hand monthly family income of taka 6001-20000 and 37.7% had monthly family income of taka 6000 or less. The average monthly family income was taka 6893.31 ± 3441.56.

Table 5: Distribution of the respondents by body weight

weight of the Respondents	Respondents	
	Frequency	Percentage
Less than 35kg	38	10.9

35 – 49kg	270	77.1
50 – 64kg	42	12.0
Total	350	100.0

From the Table 5, it was found that most of the respondents (77.1%) belonged to body weight of 35-49kg, 12.0% were in 50-64kg and a few (10.9%) consisted of less than 35kg body weight. The mean body weight was 43.02 ± 5.69kg.

Table 6: Distribution of the respondents by height

Height of the Respondents	Respondents	
	Frequency	Percentage
150 -159 cm	85	24.3
160 –cm or above	265	75.7
Total	350	100.0

Table 6 showed that majority [170(56.9%) of the respondents were in height of 160cm or above, in group of 150-159cm there were 29.4% and less than 140cm constituted 11.4%. The mean height of the respondents was 163.58 ± 73.36cm.

Table 7: Distribution of the respondents by BMI

BMI	Respondents	
	Frequency	Percentage
Less than 18.5	365	75.1
18-27.0	87	24.9
Total	350	100.0

It was observed that majority [365(75.1)]of the respondents had BMI less than 18.5, a good number of 24.9% had BMI 18.5-27.0 (Table-7). The mean BMI of the respondents was 17.03±2.34.

Table 8: Distribution of the respondents by having family history of tuberculosis

Family history of tuberculosis	Respondents	
	Frequency	Percentage
Yes	27	7.7
No	323	92.3
Total	350	100.0

It was observed that majority (92.3) of the respondents had no family history of tuberculosis and 7.7% had tuberculosis patient in their family (table 8).

Table 9: Distribution of the respondents by sex

sex	Respondents	
	Frequency	Percentage
Male	362	75.1
Female	90	24.9
Total	350	100.0

It was observed from the above Table 9 that 76% of the respondents were male and the rest (24%) were female.

Table 10: Distribution of the respondents by religion

Religion	Respondents	
	Frequency	Percentage
Muslim	318	90.09
Hindu	23	6.61
Christen	9	3.3
Total	350	100.0

Regarding religion it was found that majority (90.9%) of the respondents belonged to Muslim, 6.61% were Hindu and the rest 3.3% were Christian (Table 10).

Table 11: Distribution of the respondents by housing condition

Housing condition	Respondents	
	Frequency	Percentage
Semi Building	222	63.43
Building	110	31.42
Wooden	18	5.15
Total	350	100.0

The above figure showed that out of 350 respondents 63.14% had semi Building 31.42% had building that is Building and the rest 5.15% had Wooden house (Table 11)

Table 12: Distribution of the respondents by family history of PTB

Family history of PTB	Respondents	
	Frequency	Percentage
Yes	323	92.29
No	27	7.71
Total	350	100.0

The table 12 showed that majority (92.29%) of the respondents has no family history of tuberculosis and only few (7.71%) had TB patient in their family.

Table 13: Distribution of the respondents by type of family

Type of family	Respondents	
	Frequency	Percentage
Joint family	263	75.14
Nuclear family	87	24.86
Total	350	100.0

Regarding family type it was found that 75.14% of the respondents came from joint family and the rest 24.86% belonged to nuclear family (Table 13).

Table 14: Distribution of the respondents by sputum positive PTB

Sputum positive PTB	Respondents	
	Frequency	Percentage
Sputum positive	53	15.14
Suspected PTB	54	15.43
Non PTB patients	243	69.43
Total	350	100.0

From the above Table 14 it was found that prevalence of sputum positive was only 15.14%, 15.43% were suspected PTB patients and 69.43% were diagnosed as non PTB patients.

Table15: Relationship between sputum positive tuberculosis and sex of the respondents

Sex	positive sputum test		Negative sputum test		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	58	82.9	12	17.1	70	20.0
Female	203	72.5	77	27.5	280	80.0
Total	261	74.6	89	25.4	350	100.0

Regarding relationship between sputum positive tuberculosis and sex of the respondent it was found that among the male respondents, 82.9% were sputum positive patients and among the female respondents, 72.5% were sputum positive patients but the relationship between sputum positive tuberculosis and sex of the respondents was not found satisfactory significant ($p>0.05$) (table15).

Table 16: Relationship between sputum positive tuberculosis and type of family

Type of family	positive sputum test		Negative sputum test		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Nuclear	26	29.9	61	70.1	87	24.86

Joint	44	16.7	219	83.3	263	77.14
Total	70	20.0	280	80.0	350	100.0

Regarding relationship between sputum positive tuberculosis and type of family it was found that out of 350 respondents 77.14% came from joint family. Among them 83.3% were sputum negative and 16.7% belonged to sputum positive. It was also found that 24.86% respondents constituted nuclear family. Among them 70.1% were sputum negative and 29.9% belong to sputum positive. There was evidence of significant relationship between sputum positive tuberculosis and type of family ($p<0.05$).

Table 17: Relationship between sputum positive tuberculosis and type of housing

Type of housing	positive sputum test		Negative sputum test		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Building	27	25.5	83	85.5	110	31.4
Semi Building	39	17.6	182	82.0	221	63.1
Wooden	4	21.1	15	78.9	19	5.5
Total	70	20.0	280	80.0	350	100.0

Regarding relationship between sputum positive tuberculosis and housing condition of the respondent it was found that out of 350 respondents 63.1% resided in semi building house. Among them 82.0% were sputum negative and 17.6% belonged to sputum positive. It was also found that 31.4% respondents belonged to building house. Among them 85.5% sputum negative and 27 belonged to sputum positive. A very few number of respondents (5.5%) had wooden house. Among them 78.9% were sputum negative and 21.1% belonged to sputum positive. There was no relationship between sputum positive tuberculosis and housing condition ($p>0.05$) (Table 17).

Table 18: Relationship between sputum positive tuberculosis and monthly family income

monthly family income	positive sputum test		Negative sputum test		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Taka 6000 or less	29	22.0	103	78.0	132	37.71
Taka 6001-20000	41	18.8	177	81.2	218	62.29
Total	70	20.0	280	80.0	350	100.0

Regarding relationship between sputum positive tuberculosis and monthly family income of the respondent it was found that out of 350 respondents 62.29% had monthly family income of Taka 6001-20000. Among them 81.2% were sputum negative and 18.8% belonged to sputum positive. It was also found that 37.7% had monthly income of Taka 6000 or less. Among them 78.0% were sputum negative and 22.0% belonged to sputum positive. There was no significant relationship between sputum positive tuberculosis and monthly income ($p>0.05$) (Table 18).

Table 19: Relationship between sputum positive tuberculosis and height of the respondent

monthly family income	positive sputum test		Negative sputum test		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
150 – 159 cm	19	22.4	51	19.2	70	20.0
160cm +	51	19.2	214	80.8	265	80.0
Total	70	20.0	280	80.0	350	100.0

Regarding relationship between sputum positive tuberculosis and height of the respondent it was found that out of 350 respondents 80.0% had height of 160cm or above. Among them 80.8% were sputum negative and 19.2% belonged to sputum positive. It was also found that 20.0% respondents belonged to 150cm – 159cm. Among them 19.2% were sputum negative and 22.4% belonged to sputum positive. There was no relation between sputum positive tuberculosis and height of the respondent. The relationship was not statistically significant ($p>0.05$) (Table 19).

Table 20: Relationship between sputum positive tuberculosis and educational status

Educational status	positive sputum test		Negative sputum test		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Illiterate	14	23.3	46	76.7	60	17.14
Up to class V	27	22.5	93	77.5	120	34.29
class VI - XII	21	15.7	113	84.3	134	38.29
Graduate and above	8	22.2	28	77.8	36	10.28
Total	70	20.0	280	80.0	350	100.0

Regarding relationship between sputum positive tuberculosis and educational status of the respondent it was found that out of 350 respondents 38.29% had educational level of class VI – XII. Among them 84.3% were sputum negative and 15.7% belonged to sputum positive tuberculosis. It was also found that a good number of respondents (34.29%) had up to class V level education. Among them 77.5% were sputum negative and 22.5% belonged to sputum positive. It was also found that 17.14% respondent were illiterate. Among them 76.7% sputum negative and 23.5% belonged to sputum positive. There was no association between sputum positive and level of education of the respondents ($p>0.05$) (Table 20).

This cross sectional study provided some important basic information about proportion of sputum positive tuberculosis patients and its relationship with the socio-economic status of the patients.

V. Conclusion:

The present study was a cross sectional type of descriptive study which was carried out to explore sputum positive tuberculosis and associated factor including socio demographic characteristics of the patients attending chest diseases hospital, Rajshahi. A total of 350 respondents were interviewed and their sputum test result was recorded from hospital reports. We observed there is no relation between sputum positive tuberculosis and sex, monthly income and height of the respondent. From the information we gathered, we come to a conclusion that the existence situation of the sputum positive pulmonary patients is still alarming. But the situation can be improved by providing health education programme especially regarding respiratory etiquette in the outpatient departments of chest diseases hospital, Rajshahi who come for diagnosis and treatment. The government of Bangladesh can invite NGOs in this sector to gear up the programme.

VI. Recommendations:

The following recommendations might be made on the basis of the study findings:

- People should be educated about the nature of the disease and importance of completion of full course treatment of tuberculosis.
- Awareness which would enable them to make the right choice with regard to adopting healthy behavior and life style should be encouraged.
- Educational campaign concerning DOTS regimen must reach the entire population irrespective of education and socio-economic status.
- Political commitment to sustain TB control activities.
- Strengthening cooperation and collaboration between the governmental and non –governmental organizations involved in control of tuberculosis.

Acknowledgement

I would like to express my indebtedness heartfelt gratitude, sincere appreciation and profound regards to my honorable teacher Dr. Md. Jawadul Hoque for his sincere co-operation. I convey my special thanks for his hard job. I wish to express my sincere thanks Dr. Monowar Ahmad Tarafder, Dr. Md. Anayet Ullah, Dr. A T M Fakhrul Islam, Dr. A K M Obaydullah. I must be grateful to my colleagues and friends who helped me directly or indirectly at different stages of my research work and report preparation. I would like to express deep regards and thanks to my parents for their prayerful concern, support and patience during the completion of this research work. Finally, I am highly grateful to my beloved husband Sayed Abdul Mannan and son Tuzo, Tibro, Tonmoy for their encouragement and sacrifice to complete the research work successfully.

References:

[1] Telzak EE, Fazal BA, Pollard CL, Turett GS, Justman JE, Blum S, Factors influencing time to sputum conversion among patients with smear-positive pulmonary tuberculosis. Clin Infect Dis. 1998; 26:775-776.

[2] Gunnels JJ, bates JH, Swindoll H. Infectivity of sputum-positive tuberculoses patients on chemotherapy. Am. Rev. Respir. Dis. 1974; 109: 323-330.

[3] Michison DA. Clinical development of anti tuberculosis drug. J Antimicrob Chemother. 2006; 58: 494-495.

[4] Ratnam SS, Rao KB, Arulkumaran S. Obstertric and gynaecology for postgraduate. Orient longman publication;1993

[5] Alam AY, Qureshi AA, Adil MM, Ali H. Comparative Study Of Knowledge, Attitude And Practices Among Antenatal Care Facilities Utilizing And Non-Utilizing Women. Journal Of Pak Med Assoc.2005;55(2):53-6.

[6] Ekabua J E, Ekabua K J et al. Awareness Of Birth Preparedness And Complication Readiness. ISRN Obstetrics and Gynaecology. 2011:1-6

[7] Moran AC, Sangli G, Dineen R. et al. Birthpreparedness for maternal health. Journal of Health Population and Nutrition. 2006;24(4):489-97

[8] Kajali, Samuel. The perceptions and practices of birth preparedness among antenatal mothers in Naguru and Kawempe health centers .Makerere University. 2009; [online].

[9] Amrin A. An Analysis of the Status of Antenatal Care in Bangladesh. Human, 2016; Vol. 5 (2): 49-57.

[10] NIPORT. Population NIo, RaT, Associates Ma, Dhaka B. Bangladesh Demographic and Health Survey 2007. National Institute of Population Research and Training, Dhaka, Bangladesh.

[11] ackling poverty in tuberculosis control. *Lancet* 2005;366: 2063. [PubMed] [Google Scholar]

[12] Dye C. Global epidemiology of tuberculosis. *Lancet* 2006;367: 938-40. [PubMed] [Google Scholar]

[13] Dormandy T. *The white death*. London: Hambledon Press, 1999.

[14] Coker R, McKee M, Atun R, Dimitrova B, Dodonova E, Kuznetsov S, et al. Risk factors for pulmonary tuberculosis in Russia: case-control study. *BMJ* 2006; 332: 85-7. [PMC free article] [PubMed] [Google Scholar]

[15] National Institute for Health and Clinical Excellence. *Tuberculosis: clinical diagnosis and management of tuberculosis, and measures for its prevention and control*. London: NICE, 2006. Available at: www.nice.org.uk/page.aspx?o=CG033.

[16] Snider DE, Roper WL. The new tuberculosis. *N Engl J Med* 1992;326: 703-5. [PubMed] [Google Scholar]

[17] Cantwell MF, Snider DE Jr, Cauthen GM, Onorato IM. Epidemiology of tuberculosis in the United States, 1985 through 1992. *JAMA* 1994; 272: 535-9. [PubMed] [Google Scholar]

[18] Raviglione MC, Snider DE, Kochi A. Global epidemiology of tuberculosis: morbidity and mortality of a world-wide epidemic. *JAMA* 1995;273: 220-6. [PubMed] [Google Scholar]

[19] Corbett EL, Watt CJ, Walker N, Maher D, Williams BG, Raviglione MC, et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Arch Intern Med* 2003;163: 1009- [PubMed] [Google Scholar]

[20] World Health Organization Stop TB Department. *Treatment of tuberculosis: guidelines for national programmes*. 3rd ed. Geneva: WHO, 2003.

[21] Pozniak AL, Miller RF, Lipman MCI, Freedman AR, Ormerod LP, Johnson MA, et al. British HIV Association treatment guidelines for TB/HIV infection: February 2005. www.bhiva.org (accessed Dec 2005).

[22] Stop TB Partnership and World Health Organization. *Global plan to stop TB 2006-2015*. Geneva: WHO, 2006. (WHO/HTM/STB 2006.35.)

[23] Hossain MD, Latif ZA, Mahtab H. Clinical and radiological presentation of pulmonary tuberculosis in diabetic and non-diabetic patients. *J Soc Heart Chest Dis.* 2004; 2: 69–72. [Google Scholar]

[24] Sagir, G., Islam, R., Rashid, M. M., Hossain, M. A., & Haque, M. A. (2018). Knowledge of Pulmonary Tuberculosis among the Patients under Anti- Tubercular Therapy. Bangladesh Journal of Infectious Diseases, 5(1), 27–31. https://doi.org/10.3329/bjid.v5i1.37713

[25] Karim F, Chowdhury AMR, Islam A, et al. Stigma, gender, and their impact on patients with tuberculosis in rural Bangladesh. Anthropol Med. 2007;14(2):139–151. [Taylor & Francis Online], [Google Scholar]

[26] National Tuberculosis Programme. National guidelines and operation manual for tuberculosis control [Internet]. 2013 [cited 2018 Feb 16]. Available from: http://www.ntp.gov.bd/ntp_dashboard/magazines_image/National%20Guide%20Lines-TB%205th%20Ed%20(1).pdf. [Google Scholar]

[27] BRAC. Jokkha niyontron kormoshuchir orientation shobhar jonnyo guideline. 2017.