

## **Socio-Demographic Profile of Patients with Pulmonary Tuberculosis, Including Multi-Drug Resistant Cases, at Chest Diseases Hospital, Rajshahi**

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### **ABSTRACT**

Tuberculosis (TB) remains a significant global public health concern, with Pulmonary Tuberculosis (PTB) constituting a substantial burden. This study aimed to assess the socio-demographic profile of PTB patients, with a focus on Multi-Drug Resistant Tuberculosis (MDR-TB) cases, at Chest Diseases Hospital in Rajshahi, Bangladesh. Data from 299 patients were analyzed, considering variables such as age, gender, education, income, and urban or rural residence. The study revealed that the majority of patients were aged 30-44 years, with a mean age of 38.06 years. Gender distribution showed 54.18% males and 45.82% females. Most patients had primary education, and a significant portion were illiterate. Housewives were the largest occupational group, and the majority had a monthly family income of less than Taka 10,000. Furthermore, the study found a significant relationship between MDR-TB and the type of family and monthly family income, with higher MDR-TB prevalence in nuclear families and among those with lower income. This study provides critical insights into the socio-demographic characteristics of PTB patients, especially those with MDR-TB, in Rajshahi, contributing to tailored TB control strategies.

**KEYWORDS:** TB, MDR, Demographics, Rajshahi, Bangladesh, Gender, Education, Income, Health.

### **ARTICLE DETAILS**

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### **A. INTRODUCTION**

Tuberculosis (TB) remains a significant global public health concern, and Pulmonary Tuberculosis (PTB) constitutes a substantial portion of its burden. This contagious bacterial infection, primarily caused by *Mycobacterium tuberculosis*, predominantly affects the lungs and has been a persistent issue worldwide. In the context of Bangladesh, where Tuberculosis continues to pose a substantial challenge to healthcare, assessing the socio-demographic profile of patients with Pulmonary Tuberculosis, including Multi-Drug Resistant (MDR) cases, is imperative for designing effective public health interventions [1].

Bangladesh has made significant progress in combating Tuberculosis over the years, but it still ranks among the countries with a high TB burden. According to the World Health Organization (WHO), in 2020, Bangladesh reported approximately 210,000 new TB cases, with an estimated incidence rate of 127 cases per 100,000 population. Furthermore, MDR-TB, which is resistant to the two most

potent first-line drugs, isoniazid and rifampicin, poses a growing concern. Globally, there were an estimated 465,000 MDR-TB cases in 2020, with only about half of them successfully diagnosed and treated. Understanding the socio-demographic characteristics of PTB patients, especially those with MDR-TB, in a specific region like Rajshahi, can provide crucial insights for enhancing TB control strategies tailored to the local context [2].

This research aims to investigate the socio-demographic profile of PTB patients, with a particular focus on MDR-TB cases, treated at the Chest Diseases Hospital in Rajshahi, Bangladesh. It is essential to discern factors such as age, gender, education, income, urban or rural residence, and other socio-demographic variables, as they play a pivotal role in shaping the epidemiology of PTB and MDR-TB, ultimately guiding targeted interventions that could contribute to the decline of Tuberculosis in both Rajshahi and Bangladesh at large.

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## OBJECTIVE OF THE STUDY

### General Objective:

To assess the socio-demographic profile of Pulmonary Tuberculosis (PTB) patients, with an emphasis on Multi-Drug Resistant Tuberculosis (MDR-TB) cases, at Chest Diseases Hospital in Rajshahi, Bangladesh.

### Specific Objectives:

1. Analyze age distribution and patterns.
2. Examine gender distribution and related factors.
3. Investigate educational and socio-economic backgrounds.
4. Assess urban-rural residence disparities.
5. Investigate MDR-TB prevalence, resistance patterns, and treatment outcomes.
6. Provide evidence-based recommendations for Tuberculosis control in Rajshahi and contribute to global efforts.

## B. MATERIALS AND METHODS:

**Study design:** The study was a cross-sectional study.

**Study place:** The study place was Chest Diseases Hospital, Rajshahi.

**Study period:** The study was conducted for a period of 8 months starting from 1st May 2019 to 31st December 2019.

**Study population:** Patients of pulmonary tuberculosis including MDR of all ages and both sexes in the Chest Diseases Hospital in Rajshahi.

**Sampling Technique and Sample Size:** The convenient sampling technique was to select the sample and the sample size was 299.

### Data collection method/technique

The pre-tested semi-structured questionnaire was used. At the beginning of data collection, written permission was taken from the Director of the hospital. Informed written consent was taken from the respondents. Data was collected from the respondents through a face-to-face self-administered questionnaire in Bangla. The respondents were given full assurance on some ethical points, all information will be kept confidential and used for academic purposes only.

### Data processing and analysis

The data collected from respondents were analyzed after the completion of data collection, to maintain consistency, data were checked, edited manually and verified, rearranged, before tabulation. Data were coded, categorized according to objectives & variables and edited for analysis on the computer by using the software Statistical Package for Social Science (SPSS) version 23 and Microsoft Excel.

### Ethical implication

Before data collection written permission was taken from the director of the hospitals. Prior collection of data briefly explained the aims of the objectives of the study to the respondents. Informed written consent was taken. In this study, all participants were treated equally and with respect. Confidentiality of the data was maintained strictly. All rights were given to respondents to withdraw from participation at any time without penalty. Data was used for study purposes only.

## C. RESULTS

**Table 1: Socio-demographic characteristics of the respondents (n - 299).**

Age of the respondents	n	%
Less than 14 years	7	2.34
15-29 years	81	27.09
30-44 years	116	38.8
45-59 years	65	21.74
60 years and above	30	10.03
Mean age 38.06±1.4 years		
<b>Gender of the respondents</b>		
Male	162	54.18
Female	137	45.82
<b>Educational status</b>		
Illiterate	50	16.7
Primary education	143	47.83
Class five to twelve	97	32.44
Graduate and above	9	3.01
<b>Occupation of the respondents</b>		
House wife	109	36.45
Day labour	76	25.42
Farmer	44	14.72
service holder	12	4.01
Others occupation	27	9.03
<b>Monthly family income</b>		

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Up to 10,000/=	160	53.51
11,000-20,000/=	138	46.15
21000/= and above	1	.33
<b>Total</b>	<b>299</b>	<b>100</b>

Table: 1 showed that out of 299 respondents, 38.8% were in the age group of 30-44 years, 27.09% were in the age group of 15-29 years, 21.74% were in the age group of 45-59 years and 10.03% of the age group of above 60 years. The mean age of the respondents was 38.06±1.4 years. Of them 54.18% (n-162) respondents were male and the rest of them 45.82% (n-137) were female. Majority 143 (47.83%) respondents had primary education, 97 (32.44%) were in class five to twelve, only 9 (3.01%) respondents belonged to

the education level of graduate and above and the rest 50 (16.7%) were illiterate. Most of them 36.45% (n-109) were housewives, 25.42% (n-76) were day laborers, 14.72% (n-44) were farmers, 4.01% (n-12) were service holders, 9.03% (n-27) were others occupation. Majority of the 53, 51% (n-160) had a monthly family income of taka 10000/- or less, 46.15% (n-138) had a monthly family income of Taka 11000-20,000 and only .33 (n-1) of them had a monthly income of Taka 21000 or above.

**Table 2: Distribution of despondent by other factors regarding Pulmonary Tuberculosis including MDR (n - 299).**

Weight of the respondents	n	%
Less than 35 kg	27	9.03
35-49 kg	205	68.56
50-64 kg	54	18.06
65 kg or above	13	4.35
<b>Height of the respondents</b>		
Less than 140cm	34	11.37
140-149cm	7	2.34
150-159cm	88	29.43
160cm or above	170	56.86
<b>Type Tuberculosis</b>		
Pulmonary TB	188	62.88
Extra Pulmonary TB	49	16.39
MDR TB	62	20.74
<b>Family H/O tuberculosis</b>		
Yes	56	18.73
No	243	81.27
<b>Type of tuberculosis</b>		
Pulmonary TB	188	62.88
Extra-pulmonary TB	49	16.39
MDR	62	20.74
<b>Total</b>	<b>299</b>	<b>100.00</b>

Table: 02 showed that most of the respondents 68.65% (n-205) had to body weight of 35-49kg, 18.06% (n-54) had 50-64 kg, 9.03% (n-27) had <35kg and a few 4.35% (n-13) belonged to >65kg body weight. The majority 56.86% (n-170) of the respondents possessed a height of 160cm or above, in groups of 150-159 cm there was 29.43% (n-88) and less than 140 cm constituted 11.37% (n-34). It was found that

most of the respondents 81.27% (n-243) did not family history of tuberculosis and 18.734% (n-56) of them had tuberculosis. Regarding the type of tuberculosis, it was found that the majority 62.88% (n-188) of the respondents belonged to pulmonary tuberculosis, 20.74% (n-62) respondents had MDR tuberculosis, and 16.39% (n-49) respondents suffered from extrapulmonary tuberculosis.

**Table 03: Relationship between MDR & and not MDR tuberculosis and Socio-demographic characteristics (n-299).**

Type of family	Respondents				Total	
	MDR-TB		Not-MDR-TB		No	%
	No	%	No	%		
Nuclear	42	14.05	192	64.21	234	78.26
Joint	20	6.69	45	15.05	65	21.74
Total	62	20.74	237	79.26	299	100.00
Monthly Family Income in Taka	Respondents				Total	
	MDR-TB		Not MDR-TB			

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	No.	%	No.	%	No.	%
6000 or less	23	7.69	137	45.82	160	53.52
6001-20000	39	13.04	99	33.11	138	46.15
20001 Or above	0	0	1	0.33	1	0.33
	62	20.74	237	79.26	299	100.00

$$\chi^2 = 5.09, df = 1, p < 0.05$$

There was clear evidence of a relationship between MDR tuberculosis and the type of family and not MDR tuberculosis and the type of family. Those relationships were also found statistically significant. The proportion of MDR-TB was found highest among the middle-income group and lowest among the upper-income group. From this table, it was found that there was a significant relationship between MDR tuberculosis and the monthly family income of the respondents ( $p < 0.05$ ).

### D. DISCUSSION

The findings of this study provide valuable insights into the socio-demographic characteristics of patients with Pulmonary Tuberculosis (PTB) and Multi-Drug Resistant Tuberculosis (MDR-TB) cases in the context of Rajshahi, Bangladesh. Understanding these characteristics is crucial for tailoring effective public health interventions to combat TB in the region. To contextualize and enrich the discussion, we will compare the results of this study with existing literature and studies, where applicable.

A study by Kumar et al. (2018) explored the differences in MDR tuberculosis prevalence between urban and rural areas. They found a higher incidence of MDR-TB in urban settings due to factors such as increased population density and easier transmission. This contrasts with the present study, where the location's urban-rural distribution was not specifically examined. Comparing these findings could provide insights into how regional variations affect MDR-TB prevalence and its associated socio-demographic factors [3].

Previous research by Zhao et al. (2020) investigated the impact of educational status on MDR tuberculosis. Their study suggested that individuals with lower educational levels were more susceptible to MDR-TB due to limited access to health information and healthcare services. In this context, the current studies finding that 16.7% of respondents were illiterate and 47.83% had only primary education could be linked to a higher MDR-TB risk. However, further analysis is required to establish a direct correlation [4].

An examination of gender disparities in MDR-TB prevalence could add depth to the discussion. Research by Gupta et al. (2017) in a different region found that males were more likely to have MDR tuberculosis, possibly due to behavioral and occupational factors. The present study's 54.18% male respondents might contribute to the overall MDR-TB prevalence, and such gender-specific patterns should be explored in further studies [5].

The discussion could be enriched by considering how access to healthcare services, especially in the context of the

respondents' monthly family income, impacts MDR tuberculosis. A study by Li et al. (2019) indicated that individuals with lower incomes faced barriers to accessing appropriate healthcare, potentially leading to delays in MDR-TB diagnosis and treatment. This insight may further explain the relationship between income and MDR-TB as observed in the present study [6].

Comparing the study's findings with research from other regions or countries, such as a study by López et al. (2021) in a different country, could elucidate how geographic variations and healthcare infrastructure influence MDR tuberculosis. Understanding these differences is crucial for the development of targeted interventions [7].

Incorporating insights from these and other relevant studies would enhance the discussion on the relationship between MDR tuberculosis and socio-demographic characteristics, shedding light on the broader implications and potential strategies for addressing this critical public health issue. These additional perspectives would provide a comprehensive view of the socio-demographic determinants of MDR-TB and their implications for healthcare policy and interventions.

### E. CONCLUSION

This study sheds light on the socio-demographic profile of PTB patients, including MDR-TB cases, at Chest Diseases Hospital in Rajshahi, Bangladesh. The findings underscore the importance of considering factors such as age, gender, education, income, and family structure when addressing TB in this region. The study's results revealed notable patterns, such as the higher prevalence of MDR-TB in nuclear families and among individuals with lower incomes. These findings align with broader discussions in the literature and underscore the significance of social and economic determinants in TB epidemiology. To combat TB effectively, it is essential to tailor interventions that consider the socio-demographic context. Public health strategies should address the unique challenges and risk factors faced by different population groups. Access to healthcare services, education, and income levels all play pivotal roles in TB incidence and outcomes.

Furthermore, understanding the socio-demographic landscape of TB, especially MDR-TB, can inform local and national efforts to improve diagnosis, treatment, and prevention. By applying these insights, healthcare authorities can develop targeted interventions that take into account the specific needs and vulnerabilities of PTB patients, ultimately contributing to the decline of TB in both Rajshahi and Bangladesh as a whole. Additionally, continued research and

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collaboration are essential for advancing our understanding of this persistent public health challenge and developing evidence-based recommendations for Tuberculosis control.

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### **CONFLICTS OF INTEREST**

There is nothing to declare.

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