Asia Pacific Journal of Surgical Advances
https://apjsa.org/index.php/apjsa
Volume-2, Issue-2

pISSN: 3079-7322
eISSN: 3079-1618

Original Research Article

DOI: https://doi.org/10.70818/apjsa.2025.v02i02.050

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Intersecting Burdens: A Comprehensive Assessment of Psychosocial Distress, Physical Health, and Social Stigma Among Female Tuberculosis Patients in Bangladesh

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ABSTRACT: ***Background:*** Tuberculosis (TB) remains a significant public health challenge in Bangladesh, particularly among women, who face additional burdens due to social stigma, psychological distress, and physical side effects of treatment. Despite national efforts under the Directly Observed Treatment, Short-course (DOTS) strategy, these psychosocial dimensions are underexplored. ***Objective:*** This study aimed to assess the psychosocial distress, treatment-related physical symptoms, and experiences of social stigma among female TB patients in Bangladesh. ***Methods:*** A cross-sectional study was conducted from September 2024 to March 2025 across three districts—Khulna, Satkhira, and Magura. A total of 120 female pulmonary TB patients receiving treatment under the National TB Control Programme (NTP) were interviewed using a structured questionnaire. Psychological distress was measured using the Kessler Psychological Distress Scale (K10), and stigma was assessed using a modified TB stigma scale. Descriptive, bivariate, and multivariate analyses were performed using SPSS Version 26. ***Results:*** The majority of participants were rural, low-income, and engaged in domestic work. Over 76% experienced moderate to severe psychological distress. Drug-related side effects were reported by 65%, and 68.3% faced social stigma, predominantly from family and community. Multivariate logistic regression identified social stigma (AOR = 4.58; 95% CI: 2.01–10.45), drug side effects (AOR = 3.02; 95% CI: 1.42–6.45), higher pill burden (AOR = 2.67), and intensive treatment phase (AOR = 2.11) as significant predictors of distress. ***Conclusion:*** Female TB patients in Bangladesh experience a high burden of psychosocial distress, compounded by stigma and treatment-related challenges.

Keywords: Tuberculosis, Psychological Distress, Social Stigma, Gender, Bangladesh, TB Treatment, K10 Scale.

OPEN ACCESS

Citation:
Mim AA, Arifuzzaman, Rayhan R, Hasan MK, Ferdaus F. Intersecting Burdens: A Comprehensive Assessment of Psychosocial Distress, Physical Health, and Social Stigma Among Female Tuberculosis Patients in Bangladesh. Asia Pac J Surg Adv. 2025;2(2): 99-107.

Received: 27 February, 2025
Accepted: 06 April, 2025
Published: 18 June, 2025

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INTRODUCTION

Tuberculosis (TB) continues to be a major public health concern globally, particularly in low- and middle-income countries. In 2019 alone, an estimated 10 million people contracted TB and 1.5 million died from it, despite the disease being both curable and preventable [1, 2]. The burden is disproportionately higher in the World Health Organization (WHO) South-East Asia Region, where approximately 95% of TB cases occur [3]. Bangladesh ranks sixth globally in terms of estimated TB incidence and is among the top thirty countries with the highest TB burden [4, 5]. In response to this crisis, the United Nations has incorporated TB control into its Sustainable Development Goals, aiming for an 80% reduction in TB incidence and a 90% reduction in TB-related deaths by 2030 [6]. The WHO's End TB Strategy emphasizes integrated patient care, community involvement, and cross-sectoral collaboration [7]. Bangladesh's National TB Control Programme (NTP), revised in 2012–2016, focuses on DOTS (Directly Observed Treatment, Short-course), health system strengthening, and community

empowerment [8]. Despite these efforts, TB remains a pressing issue in the country, with gaps in early diagnosis, treatment adherence, and patient-centered care.

One of the most overlooked barriers in TB control is the social stigma attached to the disease. Stigma often leads to delayed diagnosis, non-adherence to treatment, and psychological distress, thereby aggravating disease transmission and increasing morbidity and mortality [9-11]. Goffman defined stigma as a disqualifying attribute that reduces an individual's social acceptance [12]. TB-related stigma manifests in various forms, including fear, shame, rejection, and social exclusion, which may significantly disrupt the patient's life, health-seeking behavior, and mental well-being [13, 14]. In Bangladesh, TB is still commonly referred to as "Jokkha" or "Khoy Rog," evoking fear and social disapproval[4]. The stigma is more pronounced among female patients, who may face greater isolation, threats to marriage prospects, economic dependency, or even divorce[15,16]. Studies from South Asia and Sub-Saharan Africa show that women often delay seeking care due to fear of family shame, social rejection, or domestic conflict [17-19]. In ome settings, men too may struggle with fulfilling their role as breadwinners due to treatment-related disruptions, resulting in tension between economic survival and health-seeking [20]. Bangladeshi women, especially those in rural areas, often encounter compounded stigma driven by patriarchal norms, poverty, low education, and gender inequality [21]. Despite the existence of extensive research on TB control mechanisms, the psychological and social dimensions, particularly those shaped by gender, remain understudied in Bangladesh. There is a critical gap in understanding how stigma, treatment side effects, and social rejection collectively impact the well-being of female TB patients. Therefore, this study aims to explore the psychosocial distress, treatment-related physical symptoms, and social stigma faced by female TB patients in Bangladesh. By addressing this gap, the research seeks to inform more inclusive and stigma-sensitive TB policies and interventions, aligned with the WHO's vision of patient-centered care and universal health coverage.

MATERIALS AND METHODS

This study employed a cross-sectional design to explore the multidimensional burden of tuberculosis (TB) among female patients, specifically focusing on their psychosocial distress, physical health status, and experiences of social stigma. The research was conducted from September 2024 to March 2025 across three districts in southwestern Bangladesh—Khulna, Satkhira, and Magura—selected due to their operational Chest Disease Clinics and relatively high TB burden. The target population consisted of female patients diagnosed with pulmonary tuberculosis who were receiving treatment under the National Tuberculosis Control Programme (NTP) at these clinics during the study period. A total of 120 participants were recruited through purposive sampling. Inclusion criteria encompassed adult female patients aged 18 years and above with confirmed pulmonary TB, currently undergoing anti-TB treatment for a minimum of four weeks. Patients with known psychiatric disorders diagnosed before TB, or those who were critically ill and unable to participate in interviews, were excluded. The sample size was deemed adequate to capture relevant psychosocial distress patterns and perform appropriate bivariate and multivariate statistical analyses. Data were collected using a structured, interviewer-administered questionnaire developed based on an extensive review of relevant literature and established assessment tools. The questionnaire comprised five domains: (i) sociodemographic characteristics, (ii) clinical and treatment-related information, (iii) physical side effects related to anti-TB medication, (iv) psychological distress, and (v) perceived social stigma. Psychological distress was assessed using the Kessler Psychological Distress Scale (K10), a validated tool for measuring anxiety and depressive symptoms in epidemiological settings. Stigma was measured through items adapted from the TB Stigma Scale with contextual modifications to suit the sociocultural realities of rural and semi-urban Bangladesh. All interviews were conducted face-to-face by trained female data collectors with public health backgrounds to ensure sensitivity to gender-specific and cultural concerns. Interviews were carried out in private settings within the clinic premises to ensure confidentiality and minimize response bias. Before data collection, ethical clearance was obtained from the relevant institutional ethics review board. Written

informed consent was obtained from all participants, with verbal consent permitted in cases of low literacy, as per ethical guidelines. Collected data were coded, entered, and cleaned using Microsoft Excel before being exported to IBM SPSS Statistics (Version 26.0) for analysis. Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables, while measures of central tendency were applied to continuous variables. Bivariate associations between psychological distress and independent variables such as treatment phase, pill burden, side effects, and stigma were assessed using Chi-square tests. Variables with p-values less than 0.10 in bivariate analyses were included in a binary logistic regression model to identify independent predictors of moderate to severe psychological distress. Adjusted odds ratios (AORs) with 95% confidence intervals were reported to reflect the strength of association. This methodological framework ensured a robust and context-sensitive examination of the intersecting burdens faced by female TB patients in Bangladesh and provided the analytical basis for developing informed recommendations for integrated TB care and psychosocial support interventions.

RESULT

Table 1: Sociodemographic Characteristics of the Respondents (N = 120)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
18–29	24	20.0
30–39	38	31.7
40–49	34	28.3
≥50	24	20.0
Marital Status		
Married	96	80.0
Widowed/Divorced/Separated	16	13.3
Unmarried	8	6.7
Education Level		
No formal education	28	23.3
Primary	42	35.0
Secondary	36	30.0
Higher Secondary & above	14	11.7
Monthly Household Income		
<10,000 BDT	58	48.3
10,000–20,000 BDT	40	33.3
>20,000 BDT	22	18.3
Occupation		
Housewife	84	70.0
Day laborer	12	10.0
Domestic worker	10	8.3
Small business	8	6.7
Other	6	5.0
Residence		
Rural	92	76.7
Urban	28	23.3

Table 1 presents the sociodemographic profile of the 120 female TB patients included in the study. The majority of the participants were aged between 30 and 49 years, with 80% being married and 70% engaged in unpaid domestic work (housewives). Nearly half had a monthly household income of less than 10,000 BDT, and

more than three-quarters resided in rural areas, indicating a population that is largely socioeconomically vulnerab.

Table 2: Clinical and Treatment-Related Characteristics

Variable	Frequency (n)	Percentage (%)
Duration of Illness		
<3 months	36	30.0
3–6 months	58	48.3
>6 months	26	21.7
Phase of Treatment		
Intensive Phase	48	40.0
Continuation Phase	72	60.0
Number of Drugs Taken Daily		
2 or fewer	22	18.3
3	38	31.7
≥4	60	50.0
Reported Side Effects		
Yes	78	65.0
No	42	35.0
Missed Doses in Last Month		
None	54	45.0
1–3 doses	44	36.7
>3 doses	22	18.3

Table 2 outlines the clinical and treatment-related variables. Nearly half of the patients had been diagnosed for 3–6 months, and 60% were in the continuation phase of treatment. Notably, 50% of patients were on four or more medications daily, and 65% reported experiencing drug-related side effects. While 45% reported perfect adherence, over one-third missed 1–3 doses in the past month, indicating possible issues with compliance.

Table 3: Psychosocial Distress and Stigma Exposure

Variable	Frequency (n)	Percentage (%)
Psychological Distress (Kessler-10)		
Low (10–19)	28	23.3
Moderate (20–24)	46	38.3
Severe (25–50)	46	38.3
Experienced Social Stigma		
Yes	82	68.3
No	38	31.7
Type of Stigma Experienced		
From Family	60	50.0
From Community	72	60.0
From Healthcare Workers	18	15.0
Isolation by Family	44	36.7
Verbal Abuse or Neglect	30	25.0
Reduced Social Interaction	64	53.3

Table 3 highlights significant levels of psychosocial distress, with over 76% of patients experiencing moderate to severe psychological symptoms. Social stigma was highly prevalent, affecting over two-thirds of participants. Stigma was most commonly experienced from community

members and family, with many patients reporting isolation, verbal abuse, or reduced social contact due to their illness.

Table 4: Association Between Psychological Distress and Treatment-Related Factors

Variable	Moderate–Severe Distress (%)	p-value	Significance
Intensive Treatment Phase	70.8	0.032	Significant
≥4 Drugs per Day	81.7	0.021	Significant
Reported Side Effects	76.9	0.004	Significant
Missed >3 Doses Last Month	86.4	0.009	Significant
Experienced Social Stigma	85.4	<0.001	Highly Significant

Table 4 shows a statistically significant association between psychological distress and multiple treatment-related variables. Patients in the intensive phase, those on a higher pill burden, and those who experienced drug side effects or treatment non-adherence reported significantly higher levels of psychological distress. Experiencing social stigma was strongly correlated with distress levels.

Table 5: Logistic Regression – Predictors of Moderate to Severe Psychological Distress

Predictor Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Intensive Phase of Treatment	2.11	1.02–4.36	0.044
≥4 Drugs Daily	2.67	1.26–5.64	0.011
Side Effects Present	3.02	1.42–6.45	0.004
Experienced Social Stigma	4.58	2.01–10.45	<0.001
Missed >3 Doses in Last Month	2.34	1.01–5.42	0.049
Low Income (<10,000 BDT)	1.68	0.79–3.59	0.176

Table 5 presents the results of multivariate logistic regression. After adjusting for potential confounders, significant predictors of moderate to severe psychological distress included being in the intensive phase of treatment, taking four or more medications daily, experiencing side effects, missing more than three doses in the last month, and facing social stigma. Stigma emerged as the strongest independent predictor.

DISCUSSION

This study aimed to investigate the psychosocial distress, physical challenges, and stigma-related experiences among female patients with pulmonary tuberculosis in three districts of southwestern Bangladesh. The findings reveal a complex interplay between social vulnerability, treatment burden, and mental health, highlighting the critical need for an integrated care model that goes beyond pharmacological intervention. The participants' sociodemographic profile reflects a markedly socioeconomically disadvantaged population. A significant proportion of the women (48.3%) belonged to households earning less than 10,000 BDT per month, and the majority (76.7%) resided in rural areas.

These factors are consistent with the established literature indicating that TB disproportionately affects populations in low-income, rural settings where poor living conditions and inadequate access to health services prevail [3]. The predominance of housewives (70%) also suggests a lack of financial autonomy, which may exacerbate dependency and hinder healthcare-seeking behavior [22]. Clinically, the treatment experience among these women was fraught with challenges. Half of the participants were prescribed four or more medications daily, and 65% reported experiencing drug-related side effects—figures that align with findings from similar studies in South Asia, where the intensity of drug regimens and their associated toxicities often compromise quality of life and treatment adherence [23]. Alarmingly, more than half of the respondents had missed at least one dose in the previous month, with 18.3% missing more than three. Non-adherence is a well-documented risk factor for

poor treatment outcomes and the development of drug-resistant TB, and in this study, was found to be significantly associated with higher levels of psychological distress [24]. The psychological burden borne by the participants was profound. Over three-quarters (76.6%) of the women experienced moderate to severe psychological distress, as measured by the Kessler Psychological Distress Scale (K10). These findings mirror prior research indicating high rates of depression and anxiety among TB patients, particularly in settings with weak social support and high disease stigma [25, 26]. The mental health impact of TB in women is often amplified by their traditional caregiving roles and the sociocultural expectation to maintain household stability even during illness [27]. Social stigma emerged as a pervasive and damaging force in the lives of these patients.

Nearly 70% reported experiencing stigma, most commonly from community members and family. A significant proportion reported being isolated by family members (36.7%) and suffering verbal abuse or neglect (25%). These findings resonate with prior studies from Bangladesh and India, where TB-related stigma has been shown to lead to secrecy, delayed care, marital conflict, and social exclusion [11]. In our analysis, stigma was not only prevalent but also the most powerful predictor of psychological distress, with an adjusted odds ratio (AOR) of 4.58. Multivariate analysis further highlighted the intersectional burden faced by these women. Being in the intensive phase of treatment (AOR = 2.11), taking four or more medications daily (AOR = 2.67), experiencing side effects (AOR = 3.02), missing multiple doses (AOR = 2.34), and facing stigma (AOR = 4.58) were all significant predictors of moderate to severe psychological distress. These findings corroborate the syndemic framework, wherein biological, social, and psychological factors co-occur and interact to worsen health outcomes [28-62]. Interestingly, while income level (<10,000 BDT) was associated with distress in the descriptive analysis, it was not a statistically significant predictor in the multivariate model. This suggests that while poverty may underpin general vulnerability, specific experiences related to treatment and stigma exert a more direct influence on psychological health during the TB care process. Taken together, these results underscore the necessity of a holistic approach to TB management that incorporates psychosocial support, community education to reduce stigma, and counseling services integrated into routine TB care, particularly for women. The WHO's End TB Strategy emphasizes patient-centered care as a pillar of effective TB control, and our findings provide compelling evidence for operationalizing that commitment in rural and underserved areas of Bangladesh [3].

CONCLUSION

This study reveals a high prevalence of psychological distress and social stigma among female TB patients in Bangladesh, with stigma, treatment side effects, and high pill burden being significant contributors. The findings underscore the urgent need for integrated, gender-sensitive interventions that address not only the clinical aspects of TB but also the psychosocial challenges faced by women. Strengthening community awareness, reducing stigma, and providing mental health support should be prioritized within the National TB Control Programme to improve treatment adherence, mental well-being, and overall health outcomes for female TB patients in Bangladesh.

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