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**Prevalence and Associated Factors of Depression & Anxiety Among
Drug-Sensitive TB Patients at Urban BRAC DOTS TB Program in Dhaka City with
a Focus on Facilitators and Barriers of Integrating Mental Health Services –
A Mixed-Methods Convergent Study**

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Abstract

Introduction: Tuberculosis (TB) remains a major public health concern in Bangladesh, with significant challenges in addressing the psychological well-being of patients. Depression among TB patients is often underdiagnosed and untreated, despite its impact on treatment adherence and outcomes. This study aimed to assess the prevalence and associated factors of depression among drug-sensitive TB patients and explore their experiences with mental health challenges, as well as the facilitators and barriers to integrating mental health services into TB programs at BRAC DOTS centers in Dhaka, Bangladesh.

Method: This mixed-methods convergent study utilized quantitative and qualitative approaches to investigate mental health challenges among drug-sensitive TB patients and identify facilitators and barriers to integrating mental health services. Quantitative data were collected through structured surveys at the Kamrangirchar BRAC DOTS-TB center, analyzed using descriptive statistics and multivariable logistic regression. Qualitative data were gathered via in-depth and key informant interviews with patients and healthcare providers and analyzed using thematic inductive analysis.

Findings: The study found that 50.4% of drug-sensitive TB patients experienced mild to severe depression, and a similar proportion had mild to severe anxiety. Depression was significantly associated with female gender (OR = 3.1, $p = 0.023$), short sleep duration (OR = 4.2, $p = 0.003$), and anxiety (OR = 8.39, $p < 0.001$). Anxiety was linked to financial deficits (OR = 4.63, $p = 0.001$), comorbidities (OR = 2.81, $p = 0.037$), and dissatisfaction with sleep (OR = 3.25, $p = 0.011$). Patients reported stigma, lack of social support, and a need for urgent psychosocial interventions. Both patients and providers emphasized that integrating mental health services into TB care could improve treatment adherence, reduce relapses, and enhance outcomes, though challenges such as stigma, resource constraints, and systemic barriers were noted.

Conclusion: This study emphasizes the high level of depression and anxiety among DSTB patients and stresses the need for improving mental health services for DSTB patients addressing the barriers and leveraging the factors could improve patient outcomes and augment TB management in Bangladesh.

1.Introduction

Background

Tuberculosis (TB) is a health problem in Bangladesh and the country is in the list of 30 high burden country for TB (Bangladesh NTP, 2022b) . Nonetheless Tuberculosis despite the advancement registered by the National TB Control Program still poses a social health issue affecting a broad spectrum of the community (Bangladesh NTP, 2022a). Some of the elements include high population density, high levels of poverty, malnutrition, and low health facilities access . TB related discrimination also contributes to the problem of increased infection rates because patients are not willing to come out early enough for diagnosis and their adherence to the recommended treatments is compromised (World Health Organization, 2023). It gets worse with the MDR-TB that is on the rise requiring not only an all-round treatment regime but also rigorous one.

The BRAC TB program, especially the Drug-Sensitive TB (DSTB) initiative in Dhaka city, is a cornerstone of the national TB response (May, 2011). This program provides comprehensive diagnostic, treatment, and support services to patients through a network of urban BRAC DOTS centers (BRAC, 2024). These centers, strategically located in Dhaka, play a crucial role in ensuring accessible care, emphasizing patient education, and promoting adherence to treatment regimens (BRAC, 2024). By doing so, they aim to reduce TB transmission and improve health outcomes in urban populations (BRAC, 2024).

The purpose of this research is to investigate the correlation between TB and mental health and the depression/ anxiety rate among the patients of the urban BRAC DOTS centres. This research aims to establish an understanding of how often depression and anxiety occur and the effect on medication taking. anxiety among patients attending urban BRAC DOTS centers. This research investigates the prevalence of depression and anxiety and its impact on treatment adherence. Conversely, the study aims at trying to bring out the opportunities of linking mental health services to existing TB treatment frameworks. Thus our current goals are not only to physical and psychological requirements of TB patients in order to increase treatment success rate but also to ensure our part in the global vision of Bangladesh to eradicate TB.

Problem the Research Focuses On

This research come in attempt to address the high prevalence of depression and anxiety among TB patients and outcome of their treatments. They compromise on their adherence to treatment consequently worsening the disease, and increasing their chances of spreading the disease and high relapse and Treatment Failure Ratios. At the moment, BRAC DOTS centers in Bangladesh focus mainly with clinical treatment of TB without attention to patients' psychological status. Filling this gap is important in enhancing the overall impact of TB control programs. This study aims to explore the prevalence of depression and anxiety and associated factors among drug-sensitive TB patients, and to assess the feasibility of integrating mental health services into TB treatment at BRAC DOTS centers.

Gaps in the Literature

Given the high prevalence of TB in Bangladesh, there is very scanty evidence about the presence of TB and its association with mental health among Bangladeshi citizens especially. Though there are works that aimed on the description of the level of depression & anxiety in TB patients, they do not reveal the problem in context of Bangladesh. While some studies have highlighted the prevalence of depression & anxiety among DS-TB patients, they often overlook the specific challenges faced in Bangladesh (COMDIS-HSD, n.d.). Also, the papers analyzed had no information on the impact of depression on TB treatment compliance and outcomes in the target group. To the authors' knowledge, there have been no studies that have specifically aimed at assessing the practical applicability of a mental health and drug-sensitive tuberculosis service integration model – whether at the facility or individual level.

According to the Bangladeshi national TB guideline, mental health service for both TB patient & their families should be integrated (Bangladesh NTP, 2022a). In the meantime, these basic mental health services are unavailable in the BRAC DOTS TB centers at the current time. This implementation research will try to address these gaps by generating knowledge about the potential and facility of providing mental health services in existing DS-TB service delivery system of BRAC DOTS centers. It will define enablers and barriers of Mental Health services integration to create a care model to enhance services provision. Such models are essential for enhancing patient's quality and supporting WHO's Global End TB Strategy and patient-centered care and prevention initiatives.

Justification

Depression & anxiety is highly noted in drug-sensitive TB patients, impacts patient compliance and results in potential transmission and adverse outcome including relapse. However, to date there is no integrated mental health services for these needs in BRAC DOTS centers in Dhaka City even though this problem has been recognized. This gap in care disrupts comprehensive TB care, depression & anxiety being a frequent patient complication that worsens the disease and treatment complications.

The aim of this study is to assess the prevalence of depression & anxiety among DS-TB patients at BRAC DOTS centers and explore its association with various factors. Additionally, the study will explore patients' experiences with mental health problems, facilitators and potential barriers of integrating mental health services into TB care from both patient and healthcare provider perspectives. By addressing both physical and psychological health, the study will provide critical evidence on the feasibility of integrating mental health care into TB treatment programs.

Given the National TB Control Program's emphasis on the integration of mental health services for both TB patients and their families, this research will inform the development of comprehensive care models. These models could enhance treatment outcomes, align with the WHO's Global End TB Strategy, and improve patient adherence, ensuring that both TB and depression & anxiety are treated together for better overall outcomes.

Conceptual Framework

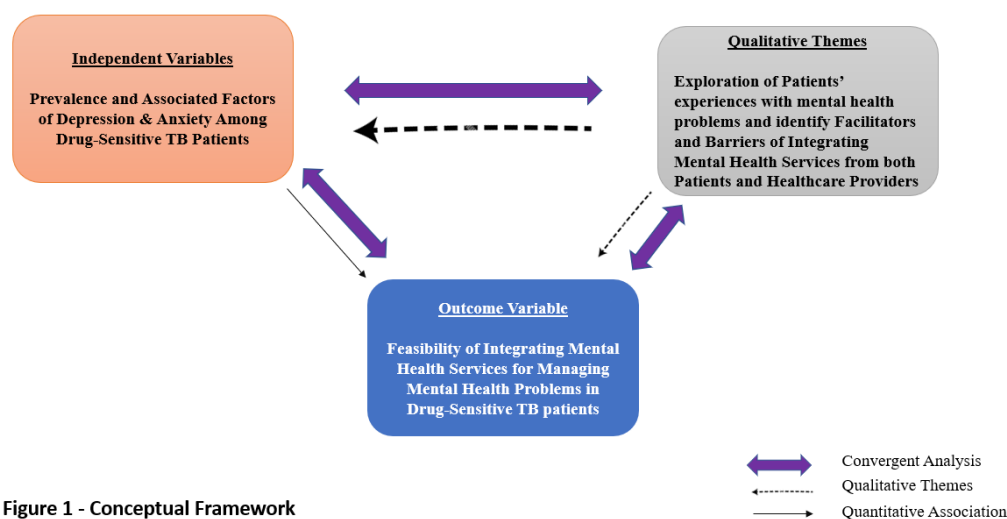


Figure 1 - Conceptual Framework

This study uses a triangulation approach in a convergent mixed-methods design, where quantitative and qualitative data are collected and analyzed separately but interpreted together to enhance understanding of the research problem. (Figure – 1)

Independent Variables: Associated factors and the prevalence of depression & anxiety among drug-sensitive TB patients serve as the quantitative components. These are measured to assess how they are associated with depression & anxiety in TB patients.

Qualitative Themes: Patients' experiences with mental health problems, Facilitators and Barriers of integrating mental health services from both DS-TB patients and Healthcare providers perspectives are explored through qualitative methods. These themes provide insight into the potential challenges and enablers for integrating mental health services into TB care.

Outcome Variable (Dependent Variable): The main outcome or dependent variable of this study is the feasibility of mental health service integration for managing mental health problems among DS- TB patients. This outcome will be informed by both quantitative associations and qualitative perspectives.

Research Questions

- What are the prevalence and associated factors of depression and anxiety among drug-sensitive TB patients at the selected urban BRAC DOTS center in Dhaka City?
- How do patients experience mental health problems, and what are the facilitators and barriers of integrating mental health services into TB treatment programs from the perspectives of both patients and providers?

General Objectives

To assess the prevalence and associated factors of depression & anxiety and to explore patients' experiences with mental health problems, as well as the facilitators and barriers of integrating mental health services into TB treatment programs at selected urban BRAC DOTS TB center in Dhaka city.

Specific objectives

- a. To assess the prevalence of depression & anxiety among drug-sensitive TB patients at selected BRAC DOTS TB center in Dhaka city.

- b. To assess the association between various factors with depression & anxiety among drug-sensitive TB patients at selected urban BRAC DOTS center in Dhaka city.
- c. To explore patients' experiences with mental health problems during TB treatment from both patients' and providers' perspectives.
- d. To explore facilitators & barriers of integrating mental health services into TB treatment program from both patients' and providers' perspectives.

2.Methodology Section

2.1 DOTS Implementation for Drug-Sensitive TB Patients at Urban BRAC DOTS Centers

The BRAC DOTS TB program adopts a community-based approach to managing DS-TB patients in urban areas. Community Health Workers (CHWs) actively identify presumptive TB cases through household visits and case-finding, with referrals from public hospital outpatient services to BRAC DOTS centers for evaluation and sputum testing.

Confirmed TB cases follow a two-phase treatment regimen: 1) Intensive Phase: Two months of Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol. And 2) Continuation Phase: Four months of Rifampicin and Isoniazid. Treatment adherence is supported by CHWs and Shasthya Shebikas, with family or community members assisting monitoring efforts. Field Organizers oversee center operations, track patient progress, and support CHWs, while Medical Officers confirm diagnoses, initiate treatments, and manage complications. Senior managers ensure alignment with national TB goals and resource allocation. There are 37 BRAC DOTS centers in Dhaka City, which plays a pivotal role in addressing the city's high TB burden by providing accessible, effective care and contributing to TB elimination efforts.

2.2. Study Design and Setting

This research was conducted at the Kamrangirchar Center, one of 37 urban BRAC DOTS TB centers in Dhaka City Cooperation. This Kamrangirchar center was purposively selected due to its high patient registration load and geographic accessibility, ensuring the collection of rich and representative data. This study employs a concurrent mixed-method approach. Quantitative and qualitative data were collected simultaneously, analyzed independently, and then triangulated to provide a comprehensive understanding of the research objectives. This convergent model enhances the study's robustness by integrating diverse perspectives and methodologies. The integration of data occurred at the interpretation phase.

Quantitative survey data were gathered from drug-sensitive TB patients registered at the Kamrangirchar BRAC DOTS Center to assess the prevalence of depression & anxiety and explore associated factors. Qualitative data were collected through in-depth interviews (IDIs) with patients experiencing depression and anxiety, and key informant interviews (KIIs) with healthcare providers. These qualitative interviews aimed to identify how do patients' experience mental

Table – 1: Summary of the Methods and Respondents

Component	Methods	Respondents	Objectives
Quantitative Component	Survey	Drug-Sensitive TB patients (n=121)	To Access the Prevalence and Associated Factors of Depression and Anxiety among Drug-Sensitive TB Patients.
	In-Depth Interviews (n=3)	Drug-sensitive TB patients who have certain levels of Depression and Anxiety (n=3)	To explore the patients' experiences with mental health problems, as well as facilitators and barriers of integrating mental health services from the patient's perspective.
Qualitative Component	Key Informant Interviews (KII) (n=8)	-Shasthya Shebika (n=1) -Community Health Worker (n=1) -Field Organizer (n=1) -Medical Officer (n=1) -District Manager (n=1) -Program Staff from BRAC Main Office (n=3)	To explore the patients' experiences with mental health problems, as well as facilitators and barriers of integrating mental health services from the provider's perspective.

health problems, facilitators and barriers of integrating mental health services into TB treatment programs. (Table – 1)

2.3 Quantitative Component

The quantitative component of this study utilized an analytical cross-sectional study design to assess the prevalence of depression and anxiety among drug-sensitive TB patients and explore associated socio-demographic factors. This approach was chosen to provide a snapshot of mental health conditions within the target population.

2.3.1 Study Population and Eligibility

The study population consisted of drug-sensitive TB patients receiving treatment at the selected BRAC DOTS center in Dhaka, Bangladesh. The study includes patients who meet the following

inclusion criteria: (1) those diagnosed with drug-sensitive tuberculosis (TB) attending urban BRAC DOTS centers, (2) individuals aged 18 years or older, and (3) patients who are currently undergoing TB treatment. However, certain individuals were excluded from the study based on the following criteria: (1) patients aged below 18 years, (2) those diagnosed with drug-resistant TB, (3) individuals unable to provide informed consent due to severe illness or cognitive impairment, and (4) patients who are not fluent in the Bangla language.

2.3.2 Sample Size Determination

The sample size was determined using a prevalence formula for cross-sectional studies. Assuming a 50% prevalence of depression and anxiety among TB patients, a 95% confidence level ($Z = 1.96$), and a 10% margin of error, the calculated sample size was adjusted for a 20% non-response rate. This adjustment resulted in a final required sample size of 121 participants. The 10% margin of error was selected due to resource and time constraints. The sample size was calculated using the formula: $n = \{Z^2 \times p \times (1-p) / e^2\} \times \text{Design Effect} \times (1 / 1 - \text{Non-Response Rate})$

Participants were recruited from the Kamrangirchar BRAC DOTS Center. Field organizers contacted potential participants and informed them about the survey.

2.3.3 Sampling Technique

The Kamrangirchar BRAC DOTS center in Dhaka was purposively selected for the study due to its high patient load and convenient location. From a registry of 531 patients at the Kamrangirchar center and its Lalbagh sub-center, patients were identified and contacted by Field Organizers (FOs) using the listed phone numbers, based on predefined inclusion and exclusion criteria. To meet time constraints, FOs prioritized patients who were available and could visit the center for the survey. Patients unable to attend were skipped, and others were contacted sequentially until the required sample size was achieved. This ensured feasibility and alignment with study objectives.

During the survey, five participants were excluded after being mistakenly invited due to not meeting the inclusion criteria—they were either too ill, under 18 years old, or not yet diagnosed with TB. These exclusions maintained data quality and validity. All eligible participants provided informed consent and participated, achieving a 100% response rate.

Operational definition of outcome variables including other variable

Variable	Definition	Operationalization
Depression (Outcome Variable)	Depressive symptoms are measured based on the participant's responses to the nine items in the PHQ-9, which assess the frequency of symptoms over the past two weeks.	#The total score ranges from 0 to 27, with severity categorized as: None= 0 Score, Minimal = 1–4 Score, Mild = 5–9 Score Moderate = 10–14 Score, Moderately Severe = 15–19 Score, Severe = 20–27 Score #Further Categorized as : Depression (No) = None or Minimal Depression (Yes) = Mild to Severe
Anxiety (Outcome Variable)	Anxiety symptoms refer to feelings of excessive worry, nervousness, or restlessness, assessed using the Generalized Anxiety Disorder-7 (GAD-7) scale.	#The total score ranges from 0 to 21, with severity categorized as: Minimal: 0–4 Score. Mild: 5–9 Score, Moderate = 10–14 Score, Severe = 15–21 Score #Further Categorized as : Anxiety (No) - Minimal Anxiety (Yes) - Mild to Severe
Oslo Social Support Scale (Independent Variable)	Social support refers to the availability of practical, emotional, or informational assistance from family, friends, or the community, assessed using the Oslo Social Support Scale (OSSS-3).	Measured using a oslo social support scale. The OSSS-3 sum score can be operationalized into three broad categories of social support: a) 3 – 8 poor social support b) 9 – 11 moderate social support c) 12 – 14 strong social support.

2.3.4 Data Collection Tools and Process

In data collection for the study, validated instruments were adopted to enhance reliability and concurrency of measures. Depression was evaluated by the PHQ-9, where severity can be defined as none, minimal, mild, moderate, moderately severe, and severe. Anxiety was assessed with the GAD-7 scale that divides severity into minimal, mild, moderate and severe anxiety. Observable socio-demographic information and perceived social support were collected by a series of questions asked through a survey tool including; The Oslo Social Support Scale (OSSS-3). These are tools have been used in Bangladesh and globally for the assessment of the patients' mental health and hence, it is appropriate for the study population.

The survey data were administered face-to-face at the Kamrangirchar BRAC DOTS TB Center and the Lalbagh BRAC DOTS TB Sub-center. Data was collected by a team composed of one MPH student and two trained research assistants using the Kobo Toolbox. Data were exported daily into Microsoft Excel and securely stored on a password-protected computer as well as in a Google Drive folder. Data cleaning and processing were performed using STATA version 17.0 to ensure quality and readiness for analysis.

Ethical Consideration: Informed consent was obtained from all participants prior to participation, ensuring they understood the study's purpose, procedures, and potential risks. Participants were assured of their right to withdraw at any time without consequence. Confidentiality was maintained by anonymizing data and securely storing it. The researcher remained mindful of potential emotional distress during the survey. All the participants who scored moderate to severe levels of depression or anxiety were informed about the availability of counseling resources. They were provided with referral pamphlets, which included mental health support services such as BRAC online counselling services and also online mental health consultations with psychiatrists. (Appendix -3)

2.3.5 Data Analysis Plan

Descriptive statistics were used to calculate the prevalence of depression and anxiety among drug-sensitive TB patients and to summarize the distribution of socio-demographic characteristics and other relevant variables. For anxiety severity, the anxiety scores were categorized into two groups: "**Anxiety No**" (Minimal Anxiety) and "**Anxiety Yes**" (Mild, Moderate and Severe Anxiety). Similarly, depression scores were grouped into two categories: "**Depression No**" (No and Minimal Depression) and "**Depression Yes**" (Mild, Moderate, Moderately Severe and Severe Depression).

Bivariate analyses, including chi-square tests, were conducted to examine the associations between depression and anxiety outcomes and potential influencing factors, such as socio-demographic characteristics, social support, sleep patterns, and comorbidities. These analyses helped identify initial relationships between the outcomes and predictors. To strengthen these findings, inferential analyses in the form of logistic regression tests of the examined relationships were employed. As parallel multiple regression models, these models examined the direct relationships between depression and anxiety outcomes and multiple predictors adjusting for potential confounding factors. Multivariate analyses were performed, whereby, AORs were determined to ascertain independent predictors of depression and anxiety. All quantitative data collected were analyzed using STATA statistical software for windows (Version 17.0). The study was planned to explore the mental health burden of TB patients with the focus to recognize modifiable risk factors that predict depression and anxiety so that interventions can be designed for the affected population.

2.4 Qualitative Component

The qualitative study part of this study used face-to-face In-Depth Interviews (IDI) and Key Informant Interviews (KII) to determine the enablers and the barriers to MHN integration into TB services.

2.4.1 Study Population and Eligibility

The IDI participants were drug sensitive TB patients on treatment in the selected BRAC DOTS facility in Dhaka. The patients screened positive for moderate to severe depression and /or anxiety using the PHQ-9 and GAD-7 assessment at the time of the survey were purposively sampled and offered an interview. This study's KII participants were healthcare professionals who participated in the TB regimen successfully in the BRAC DOTS program Shasthya Shebika, Community Health Workers (CHWs), Field Organizers (FOs) Medical Officers (MOs) and managers.

Study participant inclusion criteria were clients who were diagnosed with drug-sensitive TB and were seeking treatment through the BRAC DOTS centre for IDI, and having health care providers with over six months experience in the TB programme for KII. Patients who receive second-line drugs or could not give consent, such as MDR TB patients, and other patients who could not consent were excluded from the study Patients with MDR TB or who could not give informed consent: all other patients were excluded from the study; this excluded physicians with less than six months experience or employed by the sites during the study who were not present at the work station.

2.4.2 Sample Size and Sampling Technique

About three in depth interviews (IDIs) of drug sensitive TB patients with moderate to severe depression and anxiety constituted the sample. Five key informant interviews (KIIs) with healthcare providers, such as SS, CHWs, FOs, MOs, and DMs were also conducted. Three KIIs were conducted with management staff from the BRAC office as well for the very important questions. The participants were selected using a purposive sampling technique and was restricted to those able to provide in depth information on the integration of mental health services in TB care.

2.4.3 Data Collection Tools and Process

IDIs and KIIs were conducted in Bangla by a trained research assistant. Data were collected using semi-structured interview guides tailored to two participant groups: Health care providers and TB patients. These guides explored the experiences patients had with mental health problems while on TB treatment, and the experiences patients and providers had with mental health problems, facilitators and barriers to integration of mental health services in TB programs. The interviews were done in private settings at a BRAC DOTS TB center and a BRAC TB office to protect confidentiality and comfort. We had the gathered data from Bangla to be translated into English by a research assistant and an officer from JPG.

Ethical Consideration : Qualitative interviews were also obtained with participants informed about the interview process, data usage and confidentiality measures for informed consent. The interviews were conducted in private location so that the patient could be comfortable and secure from being exposed. Reflexivity was used to minimise potential biases, discussions of both how the researcher's background and assumptions might influence how data is interpreted continuous.

2.4.5 Data Analysis Plan

The qualitative data were thematically inductively analyzed. They also included transcribing interviews, coding data with Dedoose software, as well as manually later due to time constraints and identifying and synthesizing key themes and patterns. The themes were categorized based on patients' experiences with mental health problems and the facilitators and barriers to integrating mental health services into TB treatment, as perceived by both patients and providers. Additional themes emerged during the coding process. A qualitative thematic tree analysis illustrating mental health problems, as well as the facilitators and barriers to integration, was developed (Appendix-2).

This qualitative component provided in-depth insights into the operational and experiential dimensions of mental health problems among DS-TB patients and of incorporating mental health services into TB care, highlighting the challenges and opportunities involved in such integration. All study tools were meticulously developed and pre-tested to ensure cultural appropriateness, clarity, and alignment with the study objectives. Reflexivity was maintained during analysis to ensure interpretations were grounded in participants' narratives, reducing the influence of researcher bias. This rigorous preparation facilitated robust data collection, effectively supporting both the quantitative and qualitative components of the study.

2.5 Ethical Consideration for the Study

Ethical approval was obtained from the institutional review board at James P Grant school of public health (JPGSPH). IRB protocol Approval Number is MPH – 2024 - 003. Participants were informed of research objectives and were assured of anonymity and confidentiality. A written informed consent was obtained from all participants. All interviews were audio recorded after obtaining verbal consent from the participants. De-identified data was used for analysis and preserved as per JPGSPH's institutional policy.

Finding Section

1. Socio-Demographic Characteristics of Survey Participants

The socio-demographic profile of the participants reveals key insights relevant to the study. Most participants are young, with 71.08% aged between 18 and 35 years, and a mean age of 30.03 years (SD = 9.96). Female participants slightly outnumber males, comprising 55.37% of the total. Education levels indicate that 65.29% have attained at least secondary education, with an average of 7.74 years of schooling (SD = 4.54). In terms of marital status, a majority (66.94%) are married, while 30.58% are single. Financial challenges are prominent, as 42.97% reported experiencing a deficit or severe deficit in their financial situation, although 46.28% are managing to break even. The majority of participants reside in urban areas (75.21%), and most families (76.03%) consist of 4–6 members, with an average family size of 4.80 members (SD = 1.74). (Table -2)

Occupationally, half of the participants (50.41%) are employed, while 32.23% are homemakers and 14.05% are students. Only a small fraction (3.31%) are unemployed. Male-headed households are predominant, accounting for 80.99% of the total. Additionally, 52.07% of participants are involved in income-generating activities, and among them, 82.54% contribute to household expenses. These findings highlight the predominance of young, urban-dwelling participants, many of whom face financial difficulties despite being engaged in work. This socio-demographic context is crucial for understanding the broader implications of the study. (Table-2)

Table - 2 : Socio – Demographic Characteristics of Survey Participants (n=121)

Factors	Frequency (n)	Percentage (%)
Age (Years)		
18-25	49	40.5
26-35	37	30.6
36-45	27	22.3
>46	8	6.6
Mean (SD)	30.03 (9.96)	
Gender		
Male	54	44.6
Female	67	55.4
Completed Years of Education		
No Formal Education or Primary	42	34.71
Secondary or Above	79	65.3
Mean Years of Schooling (SD)	7.74 (4.54)	
Marital Status		
Single	37	30.6
Married	81	66.9
Divorced / Separated / Widow	3	2.5
Self-Reported Financial Situation		
Surplus	13	10.7
Breakeven / On Budget	56	46.3
Deficit	25	20.7
Severe Deficit	27	22.3
Residence		
Urban	91	75.2
Peri-urban	30	24.8
Number of Family Member		
0-5 Member	94	77.7
6 Members and Above	27	22.3
Mean (SD)	4.80 (1.74)	
Occupation		
Workers (Employed)	61	50.4
Homemaker	39	32.2
Student	17	14.1
Unemployed	4	3.3

The tuberculosis and other medical history of participants highlights key aspects relevant to the study. Most participants (70.25%) are in the later stages of their treatment (3–11 months), with 29.75% in the initial 0–2 months of treatment. A vast majority (93.39%) are receiving their

first TB treatment, while 6.61% have undergone treatment previously. Family history of TB is relatively uncommon, with only 10.74% reporting a family member with TB. However, a notable proportion of participants (43.8%) have coexisting medical conditions, with heart disease or hypertension (22.64%), respiratory diseases (20.75%), and diabetes mellitus (18.87%) being the most frequently reported. Other conditions include gastrointestinal diseases (8.26%), kidney diseases (3.77%), and various other unspecified ailments (41.51%). (Table -3)

Table - 3 : Tuberculosis and Other Medical History

Variable	Frequency (n)	Percentage (%)
Duration of Current Treatment Period		
Intensive Phase (0-2 months)	36	29.8
Continuation Phase (> 2 months)	85	70.3
Patient Receiving First TB Treatment		
Yes	113	93.4
No	8	6.6
Family History Of TB		
Yes	13	10.7
No	108	89.3
Patients have Other diseases		
Yes	53	43.8
No	68	56.2
If Yes, Types of Diseases		
Heart Disease / Hypertension	12	22.6
Respiratory Diseases	11	20.8
Diabetes Mellitus	10	18.9
GI Diseases	10	8.3
Kidney Diseases	2	3.8
Other	22	41.5

The analysis of sleeping habits and social support reveals key insights relevant to the study. Most participants (59.5%) report sleeping seven hours or more, with a mean sleep duration of 6.93 hours (SD = 1.68). However, nearly half of the participants (47.93%) express dissatisfaction with their sleep. Social support, as measured by the Oslo Social Support Scale (OSSS-3), indicates that a majority (54.55%) experience poor social support, while 32.23% have moderate support, and only 13.22% report strong social support. These findings highlight significant challenges in sleep

satisfaction and social support among the participants, emphasizing the need to address these factors, which may impact their overall health and treatment outcomes. (Table – 4)

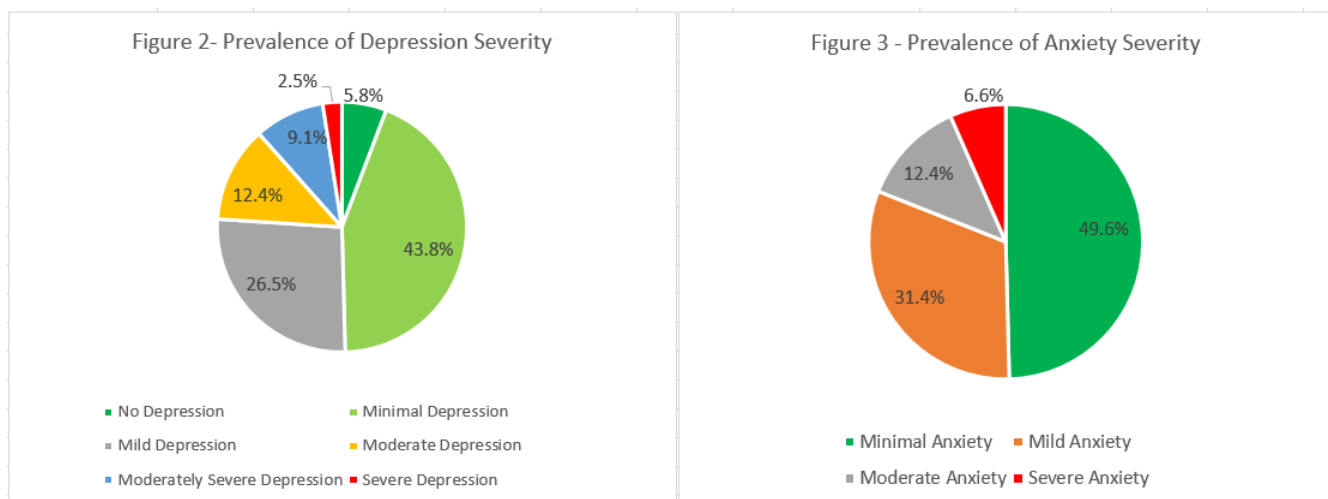
Table 4 : Sleeping Habbit and Social Support Scale

Variables	Frequency (n)	Percentage (%)
Sleep Hours		
0 - 6 Hours	49	40.5
7 Hours and Above	72	59.5
Mean Hours of Sleep (SD)	6.93 (1.68)	
Sleep Satisfaction		
Yes	63	52.07
No	58	47.93
Oslo Social Support Scale (OSSS-3)		
Poor Social Support	66	54.55
Moderate Social Support	39	32.23
Strong Social Support	16	13.22

2- Mental Health Problems in DS-TB Patients

2.1 - From Quantitative Findings

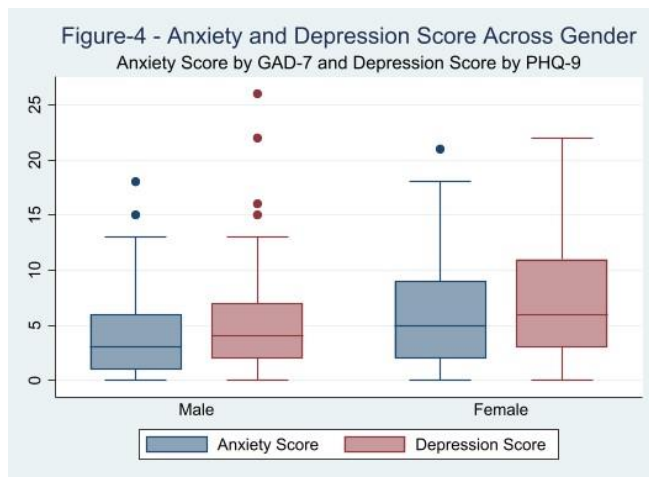
2.1.1 - Prevalence of Depression and Anxiety Among Drug-Sensitive TB Patients



Among drug-sensitive TB patients, anxiety levels showed that the majority (49.6%) experienced minimal anxiety, followed by 31.4% with mild anxiety. A smaller proportion reported moderate (12.4%) and severe anxiety (6.6%). Regarding depression, mild depression was the most common, affecting 26.5% of patients, while 12.4% reported moderate depression, 9.1%

moderately severe depression, and 2.5% severe depression. Overall, the prevalence of both anxiety and depression among drug-sensitive TB patients is notably high, with significant proportions of individuals experiencing varying degrees of severity. The overall prevalence of the mild to severe level of both anxiety and depression among drug-sensitive TB patients is similar, with 50.4% of patients reporting both anxiety and depression, while 49.6% did not report either condition. This highlights that approximately half of the patients experience some level of anxiety and depression. (Figure – 2 & 3)

2.1.2 - Anxiety and Depression Levels Across Different Gender

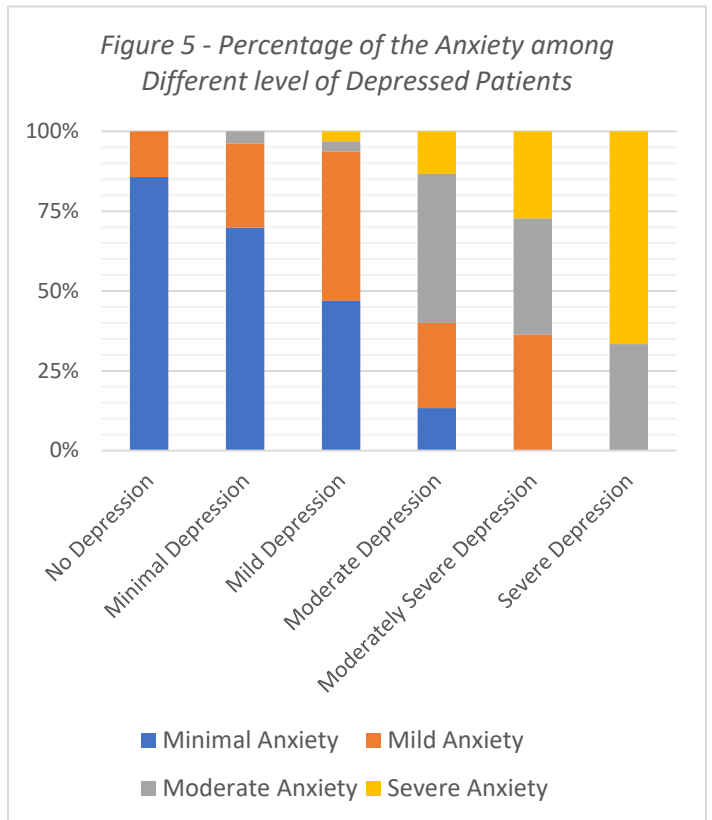


The box plot illustrates anxiety and depression score among male and female drug-sensitive TB patients, measured using the GAD-7 for anxiety (blue boxes) and PHQ-7 for depression (red boxes). Among males, anxiety scores show a relatively lower median and narrower range compared to depression scores, with several outliers observed. In contrast, female patients exhibit

higher anxiety and depression scores, with depression scores being notably higher than anxiety scores. The range of scores is broader among females; however, the presence of outliers is more pronounced among males, indicating a wider dispersion in their scores for anxiety and depression. Overall, females tend to have higher anxiety and depression levels than males. (Figure-4)

2.1.3 - Association between Depression and Anxiety Score

The stacked bar chart illustrates the relationship between anxiety levels (minimal, mild, moderate, and severe) and depression severity (ranging from no depression to severe depression). The data reveal that the proportion of individuals with minimal anxiety steadily decreases as depression severity increases, while moderate and severe anxiety levels become progressively more prevalent with higher depression severity. This pattern underscores a strong positive correlation between increasing anxiety and worsening depression severity. (Figure – 5)



Additionally, the Pearson correlation analysis showed a significant positive correlation coefficient of 0.7308 ($p < 0.001$) between anxiety and depression levels. This highlights a robust relationship, where higher anxiety levels are strongly associated with higher depression levels, confirming the trend observed in the chart. These findings emphasize the need to address both anxiety and depression in a holistic manner, especially in populations experiencing higher levels of psychological distress.

2.1.4 - Associated Factors of Depression Among Drug-Sensitive TB patients

The bivariate analysis examined the association between depression status (Yes/No) and various socio-demographic and clinical factors. Among the analyzed variables, a statistically significant association was observed for gender, hours of sleeping, and anxiety. Depression prevalence was significantly higher among females (61.2%) compared to males (37.0%) ($p = 0.008$). Similarly, individuals sleeping fewer hours (0-6 hours) had a significantly higher depression rate (65.3%) compared to those sleeping more than 7 hours (40.3%) ($p = 0.007$). Anxiety showed the strongest association, with 72.1% of individuals with anxiety experiencing depression compared to 28.3% of those without anxiety ($p < 0.001$). In summary, the analysis

identified several significant factors associated with depression, including gender, sleep patterns, and presence of anxiety. (Appendix -1)

The adjusted logistic regression findings of this study identified several significant factors associated with depression (mild to severe) among individuals. Gender was found to be a major factor, with females being significantly more likely to experience depression compared to males, as indicated by an odds ratio (OR) of 3.10 ($p = 0.023$), meaning females were about 3.1 times more likely to experience depression. Sleep duration also played a key role, with individuals who slept less than 6 hours being significantly more likely to experience depression compared to those who slept more than 7 hours, with an OR of 4.2 ($p = 0.003$). Anxiety was strongly associated with depression, with individuals experiencing anxiety nearly 8.39 times more likely to also suffer from depression, as shown by an OR of 8.39 ($p < 0.001$). Additionally, moderate social support was linked to higher odds of depression compared to poor social support, with an OR of 3.74 ($p = 0.017$), highlighting the complex relationship between social dynamics and depression. (Table – 5)

The study found that gender, sleep hours, anxiety, and moderate social support were significantly associated with depression. While other factors, including education, residence, financial situation, TB treatment category, and strong social support, showed some association, these were not statistically significant. The findings suggest the need to focus on addressing anxiety, sleep patterns, and social dynamics to improve mental health outcomes in individuals with TB.

Table – 5: Logistic Regression Analysis of Factors Associated with Depression (Mild to Severe) Among DS-TB Patients (n=121)

Variables	COR	(95% CI)	p-value	AOR	(95% CI)	p-value
Age Group						
18-25	1.00			1.00		
26-35	1.33	(0.57, 3.13)	0.514	1.16	(0.39, 3.47)	0.789
36-45	1.22	(0.48, 3.12)	0.682	0.71	(0.21, 2.43)	0.590
>= 46	1.13	(0.25, 5.04)	0.872	3.00	(0.48, 18.85)	0.242
Gender						
Male	1.00		0.009	1.00		0.023
Female	2.68	(1.28, 5.61)		3.10	(1.17, 8.23)	

Residence						
Urban	1.22	(0.53, 2.79)	0.636	0.84	(0.29, 2.45)	0.745
Sub-urban	1.00			1.00		
Self-Reported Financial Situation						
Breakeven / Surplus	1.00		0.166	1.00		0.876
Deficit	1.67	(0.81, 3.46)		1.08	(0.41, 2.88)	
Patient Having other disease						
Yes	1.78	(0.86, 3.69)	0.118	1.44	(0.54, 3.82)	0.461
No	1.00			1.00		
Hours of Sleeping						
0-6 Hours	2.79	(1.31, 5.93)	0.008	4.20	(1.63, 10.83)	0.003
7 Hours and Above	1.00			1.00		
Current TB Treatment Completed Months						
Intensive Phase (0-2 months)	1.84	(0.84, 4.1)	0.128	1.57	(0.58, 4.24)	0.372
Continuation Phase (> 2 months)	1.00			1.00		
Anxiety (Yes/No)						
Yes	6.55	(2.96, 14.47)	< 0.001	8.39	(3.06, 23.06)	<0.001
No	1.00			1.00		
Social Support Scale						
Poor	1.00		0.433	1.00		0.017
Moderate	1.38	(0.62, 3.05)		3.74	(1.27, 11.04)	
Strong	0.83	(0.28, 2.48)		2.48	(0.53, 11.56)	

COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval

2.1.5 - Associated Factors of Anxiety Among Drug-Sensitive TB patients

The bivariate analysis examined the association between anxiety (ranging from mild to severe) and various factors, both through bivariate and adjusted logistic regression analyses. In the bivariate analysis, gender was found to be significantly associated with anxiety, with a higher prevalence among females (59.7%) compared to males (38.9%) ($p=0.024$). Self-reported financial situation also showed a strong association, as participants reporting a financial deficit had a significantly higher prevalence of anxiety (69.2%) compared to those with a breakeven or surplus financial status (36.2%) ($p<0.001$). Similarly, dissatisfaction with sleep was associated with a

higher prevalence of anxiety (62.1%) compared to those satisfied with their sleep (39.7%) ($p=0.015$). (Appendix -1)

In the adjusted logistic regression analysis, several factors remained significantly associated with anxiety. Participants reporting a financial deficit had 4.63 times higher odds of experiencing anxiety compared to those with a breakeven or surplus financial status (OR = 4.63; 95% CI: 1.82–11.82; $p=0.001$). The presence of other diseases increased the likelihood of anxiety by 2.81 times compared to those without any comorbid conditions (OR = 2.81; 95% CI: 1.07–7.42; $p=0.037$). Additionally, dissatisfaction with sleep was associated with 3.25 times higher odds of anxiety compared to sleep satisfaction (OR = 3.25; 95% CI: 1.32–8.05; $p=0.011$). Gender, although not statistically significant, was nearly associated with anxiety, with females having 2.49 times higher odds of experiencing anxiety compared to males (OR = 2.49; 95% CI: 0.91–6.86; $p=0.077$). These findings underscore that financial difficulties, comorbid health conditions, and sleep dissatisfaction are significant predictors of anxiety, while gender shows a borderline association. (Table – 6)

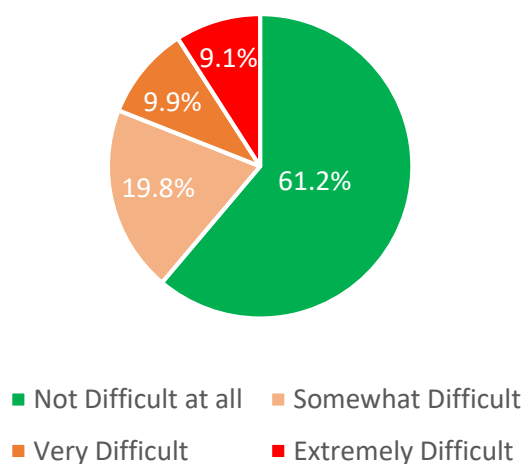
Table – 6: Logistic Regression Analysis of Factors Associated with Anxiety (Mild to Severe) Among DS-TB Patients (n=121)

Variables	COR	(95% CI)	p-value	AOR	(95% CI)	p-value
Age Group						
18-25	2.65	(0.49, 14.47)	0.259	3.72	(0.37, 37.9)	0.267
26-35	3.94	(0.70, 22.15)	0.12	3.16	(0.39, 25.37)	0.279
36-45	3.75	(0.64, 22.04)	0.144	2.86	(0.37, 22.24)	0.314
>= 46	1.00			1.00		
Gender						
Male	1.00		0.024	1.00		0.077
Female	2.33	(1.12, 4.85)		2.49	(0.91, 6.86)	
Marital Statuss						
Single	1.00		0.216	1.00		0.97
Married	1.64	(0.75, 3.59)		1.03	(0.27, 3.89)	
Divorced/Separated/Widowed	1.00			1.00		
Residence						
Urban	1.75	(0.76, 4.05)	0.191	1.79	(0.62, 5.21)	0.284
Sub-urban	1.00			1.00		
Self-Reported Financial Situation						

Breakeven / Surplus	1.00			1.00	
Deficit	3.96 (1.84, 8.52)	<0.001		4.63 (1.82, 11.82)	0.001
Patient Having other disease					
Yes	2.05 (0.99, 4.26)			2.81 (1.07, 7.42)	0.037
No	1.00	0.054		1.00	
Number of Family Members					
0 – 5	2.02 (0.84, 4.86)			2.56 (0.85, 7.66)	0.094
6 and Above	1.00	0.118		1.00	
Sleep Satisfaction					
Yes	1.00			1.00	
No	2.49 (1.20, 5.17)	0.015		3.25 (1.32, 8.05)	0.011
Current TB Treatment Completed Months					
Intensive Phase (0-2 months)	1.58 (0.72, 3.46)			1.94 (0.73, 5.16)	0.183
Continuation Phase (> 2 months)		0.258		1.00	
	1.00				
Social Support Scale					
Poor	1.76 (0.79, 3.91)	0.167		1.08 (0.39, 2.97)	0.883
Moderate	1.00			1.00	
Strong	0.78 (0.24, 2.56)	0.678		1.26 (0.27, 5.85)	0.764

COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval

Figure 6 : Percentage of Patients Experiencing Difficulties in Daily Activities



2.1.6 - Difficulties in Daily Activities Among Patients

The pie chart shows the impact of facing problems on participants' daily activities. Notably, 21 participants (17.4%) reported significant difficulties, with 12 (9.9%) finding it "Very Difficult" and 11 (9.1%) finding it "Extremely Difficult." This highlights a subset of participants experiencing severe challenges in daily life activities. (Figure – 6)

2.2 - Qualitative Findings - From Patient Perspective

The qualitative interviews with TB patients revealed significant emotional distress, characterized by pervasive fear, anxiety, depression, and hopelessness. These psychological challenges are deeply interwoven with the physical symptoms of TB, concerns about recovery, familial responsibilities, and social pressures. Patients described their mental health struggles vividly, often emphasizing the overwhelming nature of their thoughts and feelings, as well as the limited coping mechanisms available to them.

Fear and anxiety were rooted in health uncertainties and potential negative outcomes, with patients frequently worrying about their ability to recover and the long-term implications for themselves and their families. Hopelessness and depression emerged as patients struggled to find meaning or solace in their circumstances. The lack of emotional support, combined with the stigma associated with TB, further deepened these struggles. Patients often coped by crying alone, withdrawing from loved ones, or expressing a desire to escape their current lives. Patients frequently expressed fear about their health and uncertainty about their recovery. The fear of escalating illness and the potential consequences on their lives were recurring themes,

"I was extremely worried and nervous. I was scared too. Even till date I am scared. Even now I think, what if I don't come around, what if things escalate in a bad way?" (IDI - 01)

Physical symptoms such as feeling unwell or sick often triggered anxious thoughts, creating a cycle of worry and fear -

"Whenever I feel physically quite unwell and sick, that's what triggers me to think that something disastrous happened to me." (IDI - 01)

Hopelessness was a prominent theme, with some patients reporting feelings of despair and thoughts of self-harm. The burden of illness, combined with emotional isolation, intensified these feelings:

"I just feel bad about myself. I don't feel good. Sometimes I feel like dying. That's what I feel." (IDI - 03)

Coping mechanisms such as crying alone and isolating themselves from others were common among participants. These behaviors reflected their emotional struggles and a lack of external support systems:

"Sometimes I feel like wandering off somewhere because of all these problems. During those times, I work and cry alone. [Crying]" (IDI - 02)

The inability to sleep due to overwhelming tensions further exacerbated patients' distress:

"Sometimes I feel I'll go crazy because of these tensions, and I can't even sleep at night because of the same reason." (IDI - 02)

Patients' mental health struggles were compounded by the physical and social impacts of TB.

The illness often disrupted their sense of stability, leading to thoughts of abandonment or escape and patients also described persistent feelings of worthlessness and a lack of desire to engage with life:

"I thought that I'm probably going to die. I was really afraid at that time. I used to be worried all night. I wanted to leave my parents behind. I didn't want to be here." (IDI - 03)

The interplay between emotional and physical health challenges created a cycle of distress that many patients struggled to break.

2.3 – Qualitative Findings - From Healthcare Provider Perspective

These emotional struggles depression, fear, anxiety and hopelessness are a massive burden to the patients but also to their families to the healthcare providers. One challenge to coping with TB treatment, healthcare providers noted, is the stressful length of treatment, the uncertainty about treatment outcome, and the stigma of having the disease.

'The mental health impact on TB patients is multifold, with depression being one of the most commonly occurring condition,' the providers noted. Constant uncertainty of recovery, potential for relapse, coupled with long duration of treatment (six months) results in great mental burden for patients. This brings a burden that creates anxiety, depression and feelings of hopelessness; but it comes with stigma attached as a contagious disease.

Many TB patients go into a mental breakdown if they don't receive the correct emotional support from healthcare providers, they pointed out. On the psychological strain of the illness They stressed should be the integration of mental health care into TB treatment programs. Below are the following transcripts of healthcare providers, talking about symptoms of fear, anxiety, depression and hopelessness among TB patients:

"Yes, I think depression is most common among them." (KII - 02)

This statement reflects the general consensus among healthcare providers that depression is a frequent and significant issue for TB patients.

"In my opinion, it's a burden on them. They have to continue the medication for 6 months. That itself is a mental pressure for them, not only for the patients but also for their family." (KII - 02)

This comment highlights how the long duration of TB treatment not only affects the patients but also imposes psychological stress on their families, amplifying the mental burden.

"..... I've seen depression more in them. Because, there are a lot of relapse cases. It's really depressing for them and they get upset. They think that I have to take medicines for another 6 months now." (KII - 02)

Providers observed that relapse cases were particularly disheartening for patients, contributing to increased feelings of frustration and hopelessness.

"As I said, they take medicines for 6 months yet a question remains if they're going to be cured properly or not. If it's going to relapse or not, all this mental pressure creates depression in the patient. They're depressed mostly, because this disease is contagious and others can be infected by them." (KII - 02)

The uncertainty about recovery, combined with the fear of relapse and the stigma of contagion, leads to heightened anxiety and depressive symptoms among patients. While patients may not always experience loneliness, depression remains a prevalent and significant emotional challenge.

"....because a TB patient is usually mentally broken after knowing about his disease. It was compared to death before. He's really disappointed at this point. Now, if he doesn't get any mental health treatment. If we don't support the patient mentally and if we don't provide him with some necessary advice and love then he's going to have a serious mental breakdown." (KII - 02)

From the healthcare provider's perspective, the psychological impact of TB on patients is profound, with fear, anxiety, depression, and hopelessness commonly observed. Depression is the most common psychological symptom observed among drug-sensitive TB patients, as they often struggle with the prolonged treatment, fear of relapse, and the stigma associated with the disease.

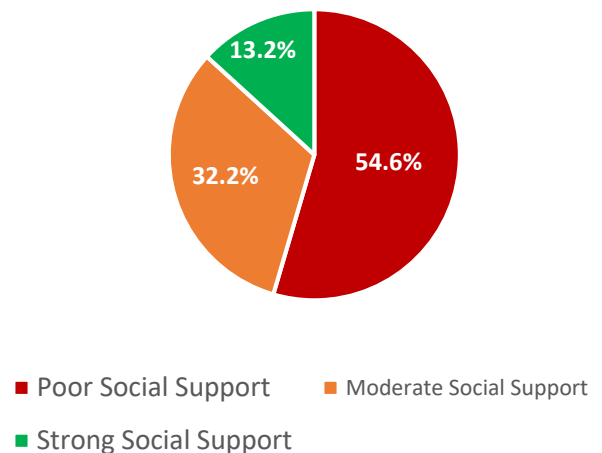
3. Facilitators of Integrating Mental Health Services

3.1 – Patients Urgently Need a Psychosocial Support

3.1.1 - Quantitative Findings – Oslo Social Support Scale

In Figure-7, the pie chart illustrates the distribution of social support among drug-sensitive TB patients based on the Oslo Social Support Scale-3 (OSSS-3). More than half of the patients (66/121, 54.6%) fall under the poor social support category, indicating insufficient assistance from their social networks. Nearly one-third (39/121, 32.2%) of the patients report moderate social support, suggesting a moderate level of help and interaction. Only a small fraction of the patients has strong social support, reflecting robust and reliable networks. This emphasizes the need to strengthen social support systems to improve treatment adherence and overall well-being among TB patients. (Figure - 7)

Figure 7 - Social Support Score Among Drug-Sensitive TB patients



3.1.2 – Qualitative Findings - From Patient Perspective

Patients frequently express feelings of profound isolation and a lack of emotional support, which exacerbates their mental health struggles while battling tuberculosis (TB). Many reports having no one to confide in or rely on during their treatment journey. One patient shared,

"No, I don't have anyone to talk to. I never found a person with whom I can share my thoughts. I don't have anyone to back me up, I have to support myself." (IDI - 02)

This self-reliance often stems from fear of judgment or ridicule, as one patient explained,

"People laugh when I try to talk, so there's no point in sharing with them. I adjust on my own. [Crying]" (IDI – 02)

This isolation extends even to immediate family, with some patients unable to seek solace from parents or siblings. A poignant reflection came from a patient longing for familial love and care, stating,

"If only my family could love me and support me, I'll be cured." (IDI – 03)

The absence of a robust social support network leads to feelings of helplessness and emotional withdrawal, further aggravating their mental distress.

3.1.3 – Qualitative Findings - From Healthcare Provider Perspective

Healthcare providers highlight similar patterns of social neglect and familial rejection in their interactions with TB patients. They recount instances where patients endure significant stigma and mistreatment from their families. One provider shared a harrowing account of a woman whose husband physically abused her and sabotaged her treatment, stating,

"Her husband couldn't stand her..... He kicks her out of the house, beats her up, and even throws away her medicines." (KII-01)

Providers note that families often isolate TB patients due to fear of the disease, with remarks such as,

"You have a disease, stay away from us." (KII-03)

This social ostracism extends to spouses, who sometimes abandon patients entirely, leaving them to cope alone. One provider reflected on how this lack of familial interaction mentally devastates patients:

"Their families isolate them..... Their family members stop interacting with them. On top of that their spouse abandons them. Even they keep their distance. This actually breaks the patients mentally." (KII - 03)

Moreover, societal stigma plays a critical role, as TB patients and their families are often disrespected within their communities. A provider recalled a mother-in-law's cruel remarks about her daughter-in-law, attributing her illness to personal failings:

"A TB patient is regarded as a societal con entity in the communities. It is their superstitious beliefs a mother-in-law bad-mouthing her own daughter-in-law by saying things that her daughter-in-law is only getting punished because of her sins." (KII – 04)

These accounts underscore the pervasive lack of compassion and understanding surrounding TB, further emphasizing the urgent need for social support interventions.

3.2 - Patient-Identified Needs for Mental Health Services

3.2.1 - From Patient Perspective

Patients said they needed mental health support along with their TB physical treatment. But they stressed how it's also been emotionally and psychologically challenging, and need to address that part of the treatment process to enhance their overall health. One patient suggested the need for initiatives to help TB patients manage their emotions and anger, recognizing the mental toll of the illness and treatment:

"I think you should take an initiative if you think generally TB patients face mental health issues with physical sickness after starting their TB medication to help the patients control their emotions and anger." (IDI - 01)

The patient also underscored the urgency of timely mental health interventions, warning of the potential consequences if emotional struggles are left unaddressed:

"People develop massive mental problems from these small issues. Things can get very dangerous if not consulted on time." (IDI – 01)

Repeated themes were around the desire for easy access to mental health services. Some patients offered hope that there will be additional treatments, or resources to help them cope with their psychological burdens. The patient remarked,

"It would be good if you actually have some additional treatment for your patients through which all of them could get some help. This is my opinion. Rest is up to you." (IDI-01)

Common challenges of patients were social and emotional isolation. One participant explained:

"I never found a person with whom I can share my thoughts." (IDI - 02)

For some, simply having the opportunity to talk about their feelings was seen as therapeutic:

"I want to talk. I feel good as long as I talk." (IDI - 03)

Patients stressed the key importance for mental health care as well as TB treatment, reporting emotional suffering, social isolation and the therapeutic virtue of open conversation. The psychological burden of TB, they said, must be addressed with timely interventions and access to services to reduce its overall effect on well being.

3.2.2 - From Healthcare Provider Perspective

The health care providers concurred with the patients and societies on the need to improve care on mental health support as crucial in TB. They also often cited the patient's psychological state, especially showing a concern for having regular mental health care. One provider suggested that incorporating mental support into TB care would greatly benefit patients:

"....if there was anything to provide them with mental support, it would be better for them." (KII - 01)

This was seen with a focus on the probability of patients developing severe mental conditions that would deteriorate if they aren't provided for. A provider highlighted the risks of neglecting mental health care:

"Now, if he doesn't get any mental health treatment—if we don't support the patient mentally and if we don't provide him with some necessary advice and love—then he's going to have a serious mental breakdown." (KII – 02)

The devastating impact of a lack of mental support was a common observation. One healthcare worker noted,

"If they don't get mental support from their surroundings, they actually do become mentally devastated and broken." (KII – 04)

Healthcare providers often observe TB patients experiencing heightened anxiety, which can manifest as frequent episodes of panic and distress. This emotional state drives some patients to seek reassurance from their providers even during unconventional hours. One provider shared,

"Some of the patients even call me at 10 PM in the night. They constantly panic and ask me if they will actually get cured or not. They do expect mental support from us." (KII – 04)

Lastly, the importance of mental support was emphasized as an integral part of the healing process. A provider summarized this sentiment, stating,

"Mental support is very important. I personally think that half of the cure is mediated through mental support." (KII-04)

Healthcare providers strongly emphasized the necessity of integrating mental health support into TB care, recognizing the emotional vulnerability of TB patients and the risks of neglecting their mental health. They highlighted that structured mental health services and consistent emotional support could significantly aid in patients' recovery and overall well-being.

3.3 - Willingness to Participate / Integrate Mental Health Services

3.3.1 - From Patients' Perspective

This was complemented with patients' readiness to be involved in receiving mental health services added to TB treatment. Some of them were glad because for at least they got a place where they can talk and feel the support and that was a relief for most people they felt relieved and at peace. One patient reflected on the value of such interactions, stating,

"I feel relieved now after talking to you. I feel that whatever you are saying is for my own good. I am getting consultation and suggestions." (IDI - 01)

For participants, the chance to discuss problems and feel that someone listens was valuable. They appraised these interactions as an opportunity of social support during a difficult cancer treatment process. A patient shared,

"Of course, I'll use them. I'll come here to talk. I'll be at peace. I'll feel something good that I'll have a place to talk. I'm able to share my problems and I'll feel good....." (IDI – 02)

This sentiment was echoed by another participant, who showed a clear commitment to utilizing mental health services:

"Yes, of course. I'll come and talk." (IDI - 03)

These responses reaffirm patients' willingness to innovate with mental health integration and attune to its capacity to enhance mental well being for TB patients.

3.3.2 - From Healthcare Providers' Perspective

Healthcare providers strongly endorsed the integration of mental health services into TB care, highlighting its necessity for improving patient outcomes. Providers recognized the emotional challenges faced by TB patients, particularly when family support is lacking. One provider emphasized the positive impact of mental support, stating,

".... Sometimes the patients don't get any kind of mental support from their family. The support we provide them with gives them hope and courage. They feel they're not alone." (KII – 01)

Providers acknowledged the intrinsic connection between mental health and TB treatment success. They noted that addressing mental health is critical to achieving comprehensive care. As one provider explained,

"We are not able to work on mental health up to the mark. But it's definitely necessary. Because there's a close relation between mental health and TB." (KII – 02)

Another provider stressed that without mental health support, the overall cure for TB patients would remain incomplete:

"We definitely need to integrate mental health care. Without focusing on mental health, I'm not going to be successful in the overall cure of a TB patient." (KII – 02)

Providers also highlighted their commitment to patient counseling and motivation, recognizing its role in program success:

"We ensure to provide adequate counseling to our patients. The more we support our patients with motivation, the more our program gets successful." (KII – 05)

The need for integration was summarized by a higher level-staff provider who stated,

"I think it definitely needs to be integrated." (KII – 08)

These perspectives from both patients and healthcare providers highlight a shared understanding of the importance of mental health services and their willingness to support its integration into TB care programs.

3.4 – Positive Outcome Expected

3.4.1 - From Patient Perspective

Although the patients interviewed in this study had not received formal mental health services, they perceived significant emotional benefits even from participating in the in-depth interviews (IDIs). Many patients expressed that the experience of sharing their thoughts and feelings during the interviews resembled a form of counseling, providing them with a sense of relief, emotional connection, and hope for the future. One patient reflected on the importance of verbalizing emotions, stating,

"Words matter a lot, and I understand how much someone's words can help a person. It feels great after expressing." (IDI – 01)

This statement highlights how simply being listened to can create a profound sense of comfort and validation for individuals struggling with the dual burden of TB and mental health challenges. Another patient described the experience of participating in the interview as a deeply satisfying and almost spiritual experience, saying,

"..... and I'll feel good. I'm feeling that Allah has granted me a place to talk to, and I'm feeling good about it. Whatever I'm talking about, I'm feeling good and I'm at peace." (IDI - 02)

This sense of gratitude and peace underscores the transformative potential of creating a space for TB patients to share their emotional struggles, even in the absence of formal counseling services. The interviews also instilled a renewed sense of optimism in some patients. One shared,

"I'm thinking that maybe the future holds better. Maybe my life is starting over from here, that's what I'm feeling. I'm feeling a lot better." (IDI - 02)

This expression of hope and a fresh start suggests that being heard and acknowledged during the interview process helped them envision a more positive outlook on their lives. The in-depth

interviews, while not intended as counseling sessions, were perceived by patients as a source of emotional relief and support. This reinforces the importance of integrating mental health services into TB programs, as even a small opportunity to be heard can have a significant positive impact on patients' mental and emotional well-being.

3.4.2 - From Healthcare Provider Perspective

Healthcare providers highlighted several challenges they face with TB patients, emphasizing how integrating mental health care into treatment could yield significant benefits. Providers observed that some patients, when experiencing heightened anxiety or depression, tend to avoid confronting their problems. This avoidance behavior manifests in various ways, such as changing their address to evade follow-ups or providing false information about their adherence to medication. As one provider explained,

“They don’t feel good, so they show this kind of behavior sometimes. They don’t like taking medicines and stop taking it after some time. They even changed their address so that we can’t reach them.” (KII – 01)

Despite this, forgetting to take medication is not a primary concern. As another healthcare provider noted,

“Chances of them forgetting to take their medicines is very low. The main problem is their insincerity. Nothing else.” (KII – 04)

Instead, the challenge lies in patients not fully understanding the importance of completing their treatment, which leads to non-compliance and treatment interruptions. This behavior, in turn, contributes to relapse cases and patients failing to complete their treatment within the predefined duration. They also highlighted the importance of mental health care in preventing the recurrence and relapse cases of TB, explaining,

“We are curing the patients, but the problem is it’s relapsing again. So, if we bring mental health care and the medication program together, then preventing relapse is possible.” (KII – 02)

The integration of mental health services into TB treatment was seen as a promising solution to address these issues. Providers believe that aligning mental health care with TB medication could prevent relapses and improve treatment outcomes. One healthcare provider emphasized,

“If we integrate mental health care in TB treatment, it will increase our efficiency or efficacy. If I say in our medical term, it will be much more effective if we can align mental health with this successfully. The rate shall be good too.” (KII – 02)

Overall, providers strongly believe that integrating mental health support could significantly improve treatment compliance, increase cure rates, and enhance the overall success of the TB program. One higher-level staff member concluded,

“First thing will be more treatment compliance. So, the success rate shall go up. As our main indicator is treatment compliance, and” (KII – 08)

Healthcare providers emphasized the potential for significant positive outcomes by integrating mental health care into TB treatment. They noted that many patients struggle with emotional challenges, leading to behaviors such as treatment non-compliance, providing false information, or even relocating to evade follow-ups. While medication adherence was not seen as the primary issue, a lack of understanding about the importance of completing treatment often resulted in interruptions and relapses. Providers believe that aligning mental health services with TB care could address these challenges, improve treatment compliance, reduce relapse rates, and enhance the overall effectiveness of the TB program, ultimately leading to better patient outcomes.

4. Barriers of Integrating Mental Health Services

4.1 - Knowledge and Awareness Gaps in Mental Health

From Patient Perspective

Patients revealed a significant lack of knowledge and awareness about mental health, which serves as a critical barrier to integrating mental health services into TB care. Many patients struggled to recognize or articulate their psychological distress, often attributing their symptoms to physical health issues or external stressors such as financial pressures.

One patient expressed confusion about their recent emotional and physical changes, stating,

“However, I am still unaware about why I have been feeling so strange lately. Is it because I am weak, or if I am worrying a lot I don’t know.” (IDI - 01)

This reflects a lack of understanding about the interconnectedness of mental and physical health, leaving patients unable to identify potential psychological contributors to their distress. Another patient described their symptoms exclusively in terms of physical health challenges, saying,

“Actually, my body does not respond like before. I feel extremely weak nowadays. I feel very sick and weak. I have never felt this weak ever before. I become tired after working a bit or walking the stairs for two floors. I can’t walk. I feel very unsteady.” (IDI - 01)

Despite experiencing emotional and behavioral changes, the patient seemed unaware of the potential mental health dimensions of their condition. Despite experiencing significant mental

distress—characterized by frequent crying and moderate to severe depression, as indicated in the quantitative findings and acknowledging feelings of immense pressure, the patient denied having any mental health problems. This response likely reflects a fear of being stigmatized as mentally ill. Financial and physical stressors appeared to overshadow and obscure the recognition of her mental health challenges. The patient stated,

“No, I don’t have those kinds of mental problems. I just have problems related to my physical health and money. I’m under a lot of pressure because of these two things. I don’t have any other problems apart from these. I can’t eat or sleep properly because of these.” (IDI-02)

This response illustrates how immediate, tangible challenges often overshadow and suppress acknowledgment of underlying psychological struggles. A lack of opportunities for open communication also emerged as a barrier. One patient shared,

“I have been suffering from this for 15 days now, but I could only express it today because you talked to me. If you didn’t tell me, I wouldn’t even consider sharing.” (IDI – 01)

This indicates that patients may not only lack awareness of their mental health but also require structured opportunities and prompts to acknowledge and articulate their concerns. And so, patients demonstrated substantial gaps in knowledge and awareness about mental health, often misinterpreting or overlooking their psychological symptoms. Addressing these gaps through education and open communication can play a vital role in facilitating the integration of mental health services into TB care.

2.1.2 - From Healthcare Provider Perspective

Healthcare providers identified a critical gap in knowledge and awareness about mental health, both among themselves and within the broader system, as a significant barrier to integrating mental health services into TB care. Providers consistently emphasized the need for targeted training to equip them with the skills necessary to address the psychological needs of TB patients effectively. Several providers highlighted their lack of skills in identifying and addressing the mental health needs of patients. One stated,

“Sometimes we can’t figure out the mental needs of the patients. We’re not skilled enough for that. Nor can we make them understand properly the way they need it. So, if we could get proper training that would’ve benefited both us and patients.” (KII-01)

This statement underscores how inadequate training hampers their ability to communicate effectively and meet patients' psychological needs. The absence of specialized mental health knowledge was also noted as a challenge. As one provider admitted,

“We can’t exactly get what is wrong with the patient. We don’t have that skill.” (KII-01)

Another elaborated,

“We have to know which psychological part is going to align with the patient. Which mental part of a specific patient do I need to focus on, I have to know that.” (KII-01)

These insights reveal a lack of confidence in diagnosing or addressing mental health issues, further emphasizing the need for professional development in this area. Providers also stressed the importance of structured training programs to enhance their ability to provide mental health support. One noted,

“About their training, the better training you’ll arrange for them, the better they will do the counseling. It definitely needs some training because if I don’t have enough training, I wouldn’t know which thing to target on patients’ emotions.” (KII - 02)

Another echoed this sentiment, stating,

“First of all, they need training, that’s the main thing they need.”(KII - 08)

These remarks indicate that both field-level health workers and higher-level staff recognize the necessity of comprehensive mental health training to improve patient outcomes.

The lack of psychological expertise was acknowledged as a systemic issue. A provider remarked,

“We are not psychologists. We have to know which psychological part is going to align with the patient.....” (KII - 02)

highlighting the limitations of their current roles and the need for enhanced capacity-building to address the psychological dimensions of TB care. Providers also noted that training must include strategies for actively listening to patients and understanding their mental health needs. One emphasized,

“We have to make them understand that they need to listen to the patients and know what their mental need is. Also, we have to make them understand its importance.” (KII - 06)

The healthcare providers recognized significant knowledge and awareness gaps in mental health care, attributing these challenges to a lack of training and expertise. Addressing these gaps through comprehensive training programs is essential for enabling providers to effectively integrate mental health services into TB care and improve the overall quality of patient support.

4.2 - Societal Misunderstanding Including Stigma of Mental Health

From Patient Perspective

Patients expressed mixed perceptions regarding societal attitudes and stigma associated with mental health. While some participants appeared to downplay societal influence, prioritizing their personal well-being, others seemed more focused on immediate practical challenges like physical health and financial stress, which they identified as their primary concerns.

Several patients indicated that societal opinions held little significance when it came to addressing their mental health. One participant remarked,

“What others think is not a big factor. Own well-being and peacefulness is what is important here.” (IDI – 01)

The salient feature of this perspective is a concentration on personal subjective mental and emotional health at the expense of being judged by society. Similarly, another patient stated,

“All of these would eventually help a person mentally. It doesn’t really matter what others are thinking.” (IDI - 01)

The societal stigma and the misunderstanding around mental issues is another patient’s message. The patient says that having to fear ridicule they cannot share how they feel.

“There’s a lot of people but I can’t share with them. People laugh when I try to talk so there’s no point in sharing with them.” (IDI - 02)

This shows the lack of societal attitudes on which we (those who are in need of support) are encouraged to open up this discussion. But there were some patients, who denied everything that has to do with mental health struggle completely – that is, they centred their challenges entirely around the physical health issues and financial load. Some patients were more willing to place focus on personal well-being above societal stigma, while others prioritized tangible stressors such as health, and finances and thereby couldn't acknowledge their need for mental health. These insights help underscore the intersection of social attitude, personal priorities and real-world factors, and call for stigma raising efforts and better alignment between TB and mental health services.

From Healthcare Provider Perspective

Societal misconceptions and stigma about the mental health regionally contribute to problems introducing mental health care to TB treatment. Yet they noted that the general public’s lack of awareness and understanding on TB makes it not easily recognised and supported as needed by

TB patients with mental health issues. Another provider observed that societal consciousness about TB patients' mental health needs was so low as to involve both relapse cases. They explained,

“There’s also a lack of consciousness in society. It’s for the mental health of TB patients, even for the patients with relapse cases. I think there’s a need for social awareness. We have to work on spreading social awareness.” (KII - 02)

This underscores the importance of community-level initiatives to educate people about the mental health challenges faced by TB patients. Another provider observed that people are often too preoccupied with their own lives to notice or acknowledge others' emotional struggles. They noted,

“Actually most of the people don’t understand that. They’re too busy with their own life to even notice others’ depression. They don’t even notice when an always smiling person is quiet.” (KII - 03)

This statement illustrates the invisibility of mental health issues in societal interactions, leading to a lack of empathy and support for those in need. Providers also stressed the role of deep-seated societal beliefs and superstitions in perpetuating mental health stigma. One stated,

“But if I want the patients to receive mental support from the society too, then that can only be possible if people remove all of their superstitious thoughts and disbeliefs from their minds. Acceptance is very important.” (KII - 04)

This highlights the critical need for dismantling stigma and fostering an environment of acceptance to create a supportive framework for TB patients' mental health. Societal misunderstanding and stigma remain significant obstacles to integrating mental health services into TB care. Providers called for increased social awareness, education, and cultural change to promote acceptance and understanding of mental health challenges, thereby enabling better support for TB patients.

4.3 - Operational Barriers

From Patient Perspective

Patients identified various operational barriers that could hinder the integration of mental health services into TB care. These barriers include time constraints, communication challenges, and gender or cultural dynamics, which collectively impact the feasibility of implementing effective mental health interventions.

Time Constraints emerged as a significant operational hurdle for many patients. Balancing work and household responsibilities with treatment schedules posed challenges. One participant

expressed concerns about the fixed hours of mental health services conflicting with their daily obligations:

“Some people might not manage the time for that amidst their job or household work. Some people might be working outside who have a packed schedule. You also would have a designated time slot for your consultation hours. Suppose I myself am working at a job and I can’t manage time in between. This could be a potential reason.”
(IDI - 01)

This highlights the need for flexible service hours to accommodate patients with diverse schedules. Communication challenges also emerged as a recurring theme, as some patients acknowledged their own difficulty in expressing their emotions and concerns. One patient candidly explained,

“I think our way of communication stops you. If we don’t communicate clearly with you and not express our feelings, then there is no way you could help us. No matter how much you try, we need to cooperate with you. We need to be true to ourselves and to you too.” **(IDI - 01)**

This underscores the critical role of trust and openness in fostering effective communication between patients and mental health providers. Additionally, patients described a perceived emotional and physical distance between them and healthcare professionals. One participant remarked,

“Nowadays, the doctors seal themselves with a glass box before their patients with a fear that they would get affected by their patients. Can you imagine the distance that they create? I was honestly scared today to come outside and talk to you.” **(IDI – 01)**

This statement reflects the apprehension and mistrust that some patients feel towards healthcare providers, which can act as a barrier to seeking mental health support.

Gender and Cultural Barriers further complicated the integration of mental health services. Many participants emphasized their preference for mental health providers of the same gender. One explained,

“Girls will always be more comfortable with girls, rather than guys. If the man is understanding and considerate enough, if I see that he is reciprocating towards me and listening to me carefully, then there would be no issue. I would talk to him the way I talked to you.” **(IDI - 01)**

Another patient highlighted the cultural norms restricting cross-gender communication:

“And I can't talk to a guy, it's not right. Women can only talk to women. You can't possibly talk to a guy like that. Because they might have other ideas. They might not get what I'm trying to say and may think otherwise.” (IDI - 02)

These insights reveal the importance of gender sensitivity and cultural competence in mental health service delivery.

The operational barriers such as time constraints, communication challenges, and gender or cultural dynamics significantly impact patients' ability to access and benefit from mental health services. Addressing these barriers through flexible service schedules, improved communication strategies, and gender-sensitive approaches is crucial to ensure the effective integration of mental health care into TB treatment programs.

From Healthcare Provider Perspective

Healthcare providers highlighted several operational barriers that complicate the integration of mental health services into TB treatment. A recurring theme was the difficulty in ensuring continued patient engagement, particularly among working patients who face time and economic constraints.

Time-related challenges emerged as a significant factor affecting patients' ability to access mental health services. One provider noted,

“I think there's an issue with time. A lot of patients are busy because of their job.” (KII – 02)

This reflects the reality that many TB patients, particularly those engaged in full-time work or daily labor, struggle to find time for additional healthcare appointments. The issue is further exacerbated for patients employed in labor-intensive industries or those with long working hours. One healthcare provider explained,

“There are some patients who go to factories in the morning and come late at night. So, meeting them becomes impossible for us.” (KII – 03)

For these individuals, balancing work responsibilities and mental health support is a significant barrier. Economic considerations also play a key role in disengagement. Providers shared instances where daily wage earners prioritized their income over attending healthcare meetings or mental health sessions. As one healthcare provider explained,

“In that case, if we call a meeting they decline. They tell us that they have to be at work. This will be a problem for both the mental health care provider and receiver.”

The daily laborers rather head off to work than attend a meeting, because they would lose their income if they attend the meeting.” (KII – 05).

These insights highlight the financial vulnerability of many TB patients and how the opportunity cost of attending mental health services may prevent them from participating. Healthcare providers identified time constraints, and long working hours as critical challenges to maintaining patient engagement in mental health programs. Addressing these issues may require the implementation of flexible service schedules, workplace-based interventions, or financial support mechanisms to ensure that mental health care is accessible and sustainable for TB patients.

4.4 – Resource and Other Constraints

Only From Healthcare Provider Perspective

Financial Issue

Healthcare providers emphasized insufficient funding as a primary barrier to integrating mental health services into TB treatment programs. Financial constraints significantly impact the availability of necessary resources, manpower, and training required for successful implementation.

The need for adequate funding was underscored by several providers. One provider stated,

“We are trying, but I think there's a limitation of funding. Naturally, when you try to do something, you need funding, manpower, and training.” (KII – 02)

This highlights the foundational role of financial support in addressing the gaps in resources and skilled personnel essential for delivering mental health services.

Additionally, the socio-economic conditions of many TB patients compound the challenge. As a provider noted,

“A number of patients belong to lower socio-economic conditions. Also, the health system of Bangladesh is actually a burden on the people. We have to carry our own expenses.” (KII – 02)

This dual burden—on patients and the healthcare system—further complicates efforts to introduce new services like mental health care. Another healthcare providers also identified the lack of structured financial incentives as a significant obstacle and highlighted the importance of financial support, stating,

“First we need some resources, that's the first priority. Even if we don't need the resources, we would need financial support.” (KII – 06)

Similarly, another provider linked the absence of financial incentives to a lack of accountability among community health workers, explaining,

“If they (SSs) were under a certain payroll, then it would be possible for us to forcefully make them work harder and give them hard deadlines and instructions. Because they are not under a payroll, they do not put much importance on their work.” (KII – 04)

Insufficient funding stands as a critical barrier to the integration of mental health services into TB programs. Adequate financial support is necessary not only for acquiring resources and providing training but also for incentivizing community health workers to actively engage in mental health counseling. Addressing these financial constraints will be essential for the successful integration of mental health services into TB care.

Workload Issue

The shortage of staff and an imbalance in workload emerged as significant challenges to integrating mental health services into TB programs, as reported by healthcare providers. Staff working in TB programs are already burdened with heavy workloads, leaving little room to take on additional responsibilities such as mental health counseling and support.

One provider highlighted the widespread nature of this issue, stating,

“Because the doctors working on the TB programme or talk about the field organisers and every other worker of the TB programme, everyone has a huge workload.” (KII – 02)

The already demanding responsibilities of existing staff make it challenging to accommodate new tasks, such as mental health service delivery, within their current schedules. Moreover, the shortage of staff compounds this problem, as one provider explained,

“I am burdened with excessive workload. It is quite difficult for only one organizer to take over 100 patients.” (KII – 04)

This workload imbalance not only affects the quality of care provided to TB patients but also raises concerns about the feasibility of integrating mental health services without increasing the workforce. Healthcare providers emphasized that addressing these HR challenges requires strategic investments. One provider stated,

“At those times we need more funding, manpower, equipment, training, and logistics. If we could do all that, I think we can run the programme successfully.” (KII – 02)

This underscores the necessity of recruiting additional staff and providing adequate resources to manage the increased responsibilities effectively. The shortage of staff and existing workload

imbalance are critical barriers to the integration of mental health services into TB programs. To overcome these challenges, it is essential to recruit more personnel, allocate sufficient funding, and provide appropriate training and resources. Without these measures, the successful implementation of mental health services in TB care will remain difficult.

Other Suggested Policy

Healthcare providers highlighted several policy-level suggestions for integrating mental health services into TB programs, emphasizing the importance of structured approaches, inter-organizational collaboration, and forward-looking strategies.

One provider noted the value of officially incorporating mental health care services into the TB program's protocol, stating,

“About policies, it would be regarded if mental health care service was added to the TB program protocol.” (KII – 04)

Establishing mental health services as part of TB care policies would provide a clear framework for action and ensure consistency across implementation levels. Providers suggested leveraging existing mental health services offered by both BRAC and government entities. For instance, one healthcare provider explained,

“Like I said, the government has a distinct mental health-related entity. If we could engage the counselors or psychologists of that field here, as well as the TDC of BRAC or the places that we have, it would actually be good.” (KII – 06)

Integrating resources from these entities could optimize service delivery by providing specialized mental health support to TB patients without overburdening existing TB program staff. Additionally, a higher-level staff member elaborated on a referral system as a potential policy solution:

“..... if they think that they're not being able to provide the patients enough counselling, they have to refer the patients to someone who can provide them with better counselling. They have to ensure it as well as follow up the patients to know if he's okay or not.” (KII – 08)

This approach involves equipping TB program staff with basic mental health counseling skills through training and then establishing a system to refer patients requiring more specialized care to dedicated mental health facilities. Ensuring follow-up for referred patients was emphasized as critical to maintaining continuity of care. Finally, there was optimism regarding the integration of mental health services in future strategies. One healthcare provider stated,

“We have some plan in the next strategy that we're going to learn some things from these initiatives, and we're going to include some mental health programs in our next strategy of 2026-2030.” (KII - 08)

This indicates a forward-looking commitment to integrating mental health into TB care, guided by current learnings and ongoing initiatives.

Discussion

Patients' Mental Health Problems

This study highlights significant mental health challenges among drug-sensitive TB patients, emphasizing the prevalence of anxiety and depression in this population. The prevalence of mild to severe depression and anxiety among drug-sensitive TB patients was similar, with 50.4% experiencing both conditions, aligns with findings in the cited article (Ambaw et al., 2017; Dahiya et al., 2017). Depression scores were slightly higher than anxiety scores, indicating that approximately half of the patients faced mental health challenges. Female patients exhibited greater vulnerability, with higher medians and broader score ranges for both anxiety and depression compared to males aligns with findings in the cited literature, which also report higher rates of depression among female TB patients (Duko et al., 2020).

A strong positive correlation between anxiety and depression ($r = 0.7308$) highlights the interconnected nature of these conditions, a finding that is consistent with the results reported in the cited literature (Jacobson & Newman, 2017; Kalin, 2020; Stavrakaki & Vargo, 1986). Key factors associated with depression included female gender, insufficient sleep (<6 hours), and coexisting anxiety, with these factors increasing the odds of depression by 2.5, 3.6, and 7.8 times, respectively, were also consistent with findings in the cited article (Ayana et al., 2019; Duko et al., 2015). Similarly, financial insecurity, comorbidities, and dissatisfaction with sleep significantly influenced anxiety levels, with financial deficits increasing the odds by 4.59 times and this finding is also consistent with the cited article (Sutar et al., 2024).

Prolonged treatment, physical and psychological symptoms, health uncertainty and social stigma were frequently reported in patients by their reporting of emotional distress including fear, hopelessness and frustration and this finding is also similar with the cited article (Agbeko et al., 2022; Hidayat et al., 2022; USAID, 2021). Providers who corroborated these findings said there's a lot of anxiety and depression among patients; fears of relapse and stigma around TB. Patients engaged in maladaptive coping mechanisms characterized by social withdrawal or 'crying in

isolation' further came founding their emotional, as well as, physical challenges. Providers noted that these struggles were most difficult when treatment relapse occurred, highlighting the huge need for integrated mental health care in TB care.

Patients Urgently Need Psychosocial Support Systems

Patients had to overcome profound isolation and emotional vulnerability and had to rely on close family members without recurring. Stigma further compounded by isolation of the patients and of their families, which caused community rejection or familial neglect. These experiences of stigma were corroborated by providers, who recounted cases of families that mistreated or abandoned TB patients in the belief that they are stigmatized. The need of both patients and providers for psychosocial support systems was stressed. Providers emphasised the provision of compassionate environments that would reduce stigma and encourage family in and community involvement, while patients expressed a strong desire for networks that would provide emotional and practical support. Emotional suffering and treatment adherence were thought to be best addressed by these support systems.

Patient-Identified Needs for Mental Health Services

Mental health interventions to support emotional well-being and recovery were both stressed by patients and providers. Patients mentioned the importance of available and quick same services to avoid additional emotional decline and stated that open communication is a way to deal with mental problems. Providers also acknowledged the importance of providing structured mental health support, in order to improve treatment effectiveness. They emphasize the need for reassurance, and consistent emotional care to be part of holistic treatment.

Willingness to Participate/Integrate Mental Health Services

Patients were overwhelmingly eager to engage in mental health services as they saw them both as a relief for their emotional state, and a complement to physical care. They saw opportunity counseling and connection as therapeutic tools to deal with the challenges of their disease and treatment. Concerns about the importance to the treatment and outcomes of mental health care were raised by providers. They mentioned how a full recovery can be achieved through an approach which dealt with emotional needs, and highlighted that connection. Patients rated counseling and motivational support as two important components of care to both groups, as patients found these services as avenues for emotional expression and providers were in agreement to include these services on holistic care plans.

Positive Outcomes Expected

The interview process was emotionally relieving for patients who compared it to informal counseling and discussed the comfort that came from hearing one's story. Providers also pointed out that addressing emotional issues on the advising side may recognize patients' experiences, and increase resilience, as well as benefit treatment. Both groups understood that treatment compliance was related to mental health. Barrier for consistency was seen by patients as an emotional struggle, providers saw that anxiety and depression were major challenges to non-compliance and relapse. This finding is also consistent with the cited articles (Agbeko et al., 2022; Panda et al., 2024). As many programs provide TB treatment, they stressed that integration of mental health services into TB programs as a means to improve adherence, reduce treatment interruptions and ultimately increase cure rates is consistent with TB treatment aims to improve program outcomes.

Knowledge and Awareness Gaps in Mental Health

They appeared to be unaware of mental health and the majority of patients did not understand why they were unwell and attributed psychological distress to physical illness or external challenges such as financial strain. With immediate life concerns taking priority and stigma and fear of being mentally ill labeling them further preventing them from spoke out about emotional struggles, they did not build a space where people could just say I'm struggling. They also had barriers, providers cited insufficiency of training and expertise in treating the psychological needs of TB patients. Without preparation, this lack of confidence and capacity to add mental health support to TB care undermined their capacity to do this. Both groups highlighted the need for education: Patient awareness campaigns to reduce stigma about mental health issues and promote mental health recognition to providers, who get targeted training in mental health literacy and patient centered communication.

Societal Misunderstanding Including Stigma of Mental Health

Some patients reacted to stigma differently, prioritizing personal well being, while others simply pretended they didn't have mental health struggles because of fear of ridicule and judgement. I know many people who put their hardships down to physical or financial problems that society pressures you not to voice, as there is this cultural norm that it is frowned upon to discuss mental health. Providers explained how misperceptions and stigma impede vastly needed support to the socioeconomically disadvantaged and those struggling with relapses. These misperceptions lead to isolation and prevent excellent care. It has been implied, however, that for both groups the

removal of cultural belief that perpetuates stigma was essential. A view was taken that community level interventions, such as raising awareness, challenging stereotypes, promoting acceptance are important precautionary steps for the formation of an environment where TB patient can seek their mental health needs without being judged. This finding is also aligned with the cited article (American Psychiatric association, 2024; Corrigan, 2004; Henderson et al., 2014).

Operational Barriers

A view was taken that community level interventions, such as raising awareness, challenging stereotypes, promoting acceptance are important precautionary steps for the formation of an environment where TB patient can seek their mental health needs without being judged. Patients struggled to communicate emotions because they lacked trust and providers became emotional distance from the patient may make them apprehensive. In building openness and trust, it's important that communication strategies are strengthened. Further barriers to care were gender and cultural barriers, as patients desired same gender providers and cultural norms limited the crossing of gender barriers. It was essential to make these approaches gender sensitive and culturally appropriate, providers emphasized.

Resource and Other Constraints

A major obstacle to the integration of TB and mental health services was the lack of funding,' said healthcare providers who identified insufficient funding as a major impediment, because resources, staffing, training were limited.' Service delivery was further complicated by socio economic challenges faced by TB patients. Providers suggested financing, particularly structured incentives for community health workers who serve as mental health counselors. Along with staff shortages and heavy workloads, existing TB staff were already overburdened. They considered that additional personnel and resources would be necessary to discharge and manage the greater responsibilities. Critical solutions highlighted were at policy level. Formal integration of mental health care into TB protocols, enhanced utilization of existing mental health services, and a referral system for complex cases were provided provider recommendations. Continuity of care was emphasized in follow up, and hope that such measures could successfully integrate mental health services into TB programs.

Strengths and Limitations

This mixed-methods study combines data from TB patients and healthcare providers, offering a nuanced understanding of the feasibility of integrating mental health services into TB care in

Bangladesh. The study combines both quantitative and qualitative data so as to take a holistic approach, generating strong insights into the barriers and facilitators for successful integration. However, this study is limited to the BRAC TB centre Kamrangirchar and its Lalbagh sub centre due to lack of time and resourcing constrain which may badly limit the finding's generalisability. Future studies with a larger geographic scope, such as stratified random sampling of urban and rural BRAC TB centers scattered across Dhaka that would be more representative would be conducted to examine the prevalence of depression and anxiety in patients suffering from DSTB taken all over Dhaka. Despite this context specific findings may not closely reflect the exploited diversity of TB treatment settings in Bangladesh and they will have to be expanded for country wide perspective.

Conclusion

The integration of mental health services into TB treatment programs is urgently needed, particularly given the high prevalence of depression and anxiety among drug-sensitive TB (DSTB) patients. These mental health challenges, combined with the burden of TB treatment, often result in silent suffering, with many patients enduring their struggles alone. Stigma and a lack of social support exacerbate this isolation, underscoring the critical need for psychosocial and mental health services within TB care. Both patients and healthcare providers recognize the direct relationship between mental health issues and TB treatment adherence. While the likelihood of patients forgetting to take medication is low, insincerity and recurring relapses remain significant challenges. Both groups emphasize the importance of integrating mental health care into TB treatment, aligning with the priorities outlined in the National TB Treatment Control Program of Bangladesh.

However, significant barriers hinder this integration. These include societal stigma, inadequate knowledge and awareness of mental health, time constraints, communication challenges, and gender and cultural sensitivities. Additionally, resource limitations such as insufficient funding, staff shortages, and a lack of policy support—present further obstacles.

Policy Implications

The integration of mental health services into the TB program should be prioritized by developing policies that incorporate mental health screening, counseling, and treatment within existing TB care frameworks. Adequate funding, staff, and training for healthcare providers are essential to ensure effective service delivery. TB healthcare workers should be trained to identify and address

mental health issues, such as depression and anxiety, and equipped with patient-centered communication skills. Reducing stigma through community awareness campaigns and promoting a supportive environment will also be key. Furthermore, policies must be gender and culturally sensitive, addressing barriers that may hinder access to mental health care for all patients. Aligning the TB program with national health strategies and establishing monitoring mechanisms will ensure the integration of mental health services is effective and sustainable.

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Appendices

Appendix–1 : Bivariate Analysis Table

Table - Bivariate Analysis of Depression, Anxiety, and their Associated Factors Among DS-TB Patients (Chi-Square Tests)

Variables	Depression (Mild to Severe)			Anxiety (Mild to Severe)		
	Yes n(%)	No n(%)	p-value	Yes n(%)	No n(%)	p-value
Age Group						
18-25	23 (46.9)	26 (53.1)	0.929	23 (46.9)	26 (53.1)	0.364
26-35	20 (54.1)	17 (45.9)		21 (56.8)	16 (43.2)	
36-45	14 (51.8)	13 (48.2)		15 (55.6)	12 (44.4)	
>= 46	4 (50.0)	4 (50.0)		2 (25.0)	6 (75.0)	
Gender						
Male	20 (37.0)	34 (63.0)	0.008	21 (38.9)	33 (61.1)	0.023
Female	41 (61.2)	26 (38.8)		40 (59.7)	27 (40.3)	
Marital Status						
Single	18 (48.7)	19 (51.3)	0.793	16 (43.2)	21 (56.8)	0.097
Married	42 (51.9)	39 (48.1)		45 (55.6)	36 (44.4)	
Divorced/Separated/ Widowed	1 (33.3)	2 (66.7)		0 (0.0)	3 (100.0)	
Education						
No Formal or Primary	19 (45.2)	23 (54.8)	0.406	23 (54.8)	19 (45.2)	0.485
Secondary or Above	42 (53.2)	37 (46.8)		38 (48.1)	41 (51.9)	
Occupation						
Workers	28 (45.9)	33 (54.1)	0.364	27 (44.3)	34 (55.7)	0.55
Unemployed	3 (75.0)	1 (25.0)		2 (50.0)	2 (50.0)	
Student	7 (41.2)	10 (58.8)		9 (52.9)	8 (47.1)	
Homemaker	23 (59.0)	16 (41.0)		23 (59.0)	16 (41.0)	
Residence						

Urban	47 (51.7)	44 (48.3)	0.636	49 (53.9)	42 (46.1)	0.188
Sub-urban	14 (46.7)	16 (53.3)		12 (40.0)	18 (60.0)	
Self-Reported Financial Situation						
Breakeven / Surplus	31 (44.9)	38 (55.1)	0.164	25 (36.2)	44 (63.8)	<0.001
Deficit	30 (57.7)	22 (42.3)		36 (69.2)	16 (30.8)	
Patient Having other disease						
Yes	31 (58.5)	22 (41.5)	0.117	32 (60.4)	21 (39.6)	0.053
No	30 (44.1)	38 (55.9)		29 (42.7)	39 (57.4)	
Number of Family Members						
0-5	49 (52.1)	45 (47.9)	0.482	51 (54.3)	43 (45.7)	0.115
>5	12 (44.4)	15 (55.6)		10 (37.0)	17 (63.0)	
Hours of Sleeping						
0 - 6 Hours	32 (65.3)	17 (34.7)	0.007	26 (53.1)	23 (46.9)	0.631
7 Hours and Above	29 (40.3)	43 (59.7)		35 (48.6)	37 (51.4)	
Sleep Satisfaction						
Yes	25 (39.7)	38 (60.3)	0.014	25 (39.7)	38 (60.3)	0.014
No	36 (62.1)	22 (37.9)		36 (62.1)	22 (37.9)	
Current TB Treatment Completed Months						
0-2 months	22 (61.1)	14 (38.9)	0.126	21 (58.3)	15 (41.7)	0.257
3-11 months	39 (45.9)	46 (54.1)		40 (47.1)	45 (52.9)	
Social Support Scale						
Poor Social Support	32 (48.5)	34 (51.5)	0.624	38 (57.6)	28 (42.4)	0.207
Moderate Social Support	22 (56.4)	17 (43.6)		17 (43.6)	22 (56.4)	
Strong Social Support	7 (43.8)	9 (56.2)		6 (37.5)	10 (62.5)	
Anxiety (Yes/No)						
Yes	44 (72.1)	17 (27.9)	< 0.001			
No	17 (28.3)	43 (71.7)				

Appendix -2 : Qualitative Thematic Tree Analysis of Mental Health and TB Care Integration Challenges

From Two Perspectives	A.priori Codes	Main Codes	Subcodes
Demand Side (From Patients' Perspective)	Facilitators of Integrating Mental Health Services	Patient Identified Needs for Mental Health Services	Mental Health Problems/ Symptoms Observed (Fear, Anxiety, Depression, Hopelessness,) among TB patients
			Impact of Financial Stress on Mental Health
			Patient-Identified Mental Health Needs
		Lack of Social Support System	Lack of Family / Social Support (including Stigma of TB)
			Need for Social Awareness about Mental Health of TB patients
		Patient Comfort and Openness	Empathetic Interaction even for Interview (like Mental Counselling)
			Willingness to Participate in Mental Health Services
		Perceived Value of Mental Health Support	Perceived Benefits of Mental Health Support
			Positive Coping Mechanisms
	Barriers of Integrating Mental Health Services	Stigma and Societal Perception	Stigma or Societal Perception (Fear of being Labeled / Societal Misunderstanding)
			Cultural and Gender Preferences in Mental Health Service Providers
		Lack of Awareness and Understanding of Mental Health	Knowledge Gaps in Mental Health
			Confidentiality Issues
		Physical Health Focus Over Mental Health	Prioritization of Physical Symptoms

			Neglect of Mental Health
Supply Side (From Health Care Providers' Perspective)	Facilitators of Integrating Mental Health Services	Understanding the Patient's Needs	Mental Health Problems/ Symptoms Observed (Fear, Anxiety, Depression, Hopelessness) among TB patients
			Lack of Social / Mental Support Observed from Both Family and Community (including Stigma About TB)
			Mental Support Expectations/Requests from Patients
		Service Delivery Enhancements	Empathy and Counseling in Mental Health Support for TB patients
			Types of Mental Health Services Suggested (Individual Counseling, Group Counseling, Peer Support)
		Programmatic Support for Mental Health Integration	Support from Providers for Mental Healthcare Integration in TB Program
			Positive Outcomes Expected (Adherence to Treatment, Improved Compliance, Better Recovery, Reduced Stigma)
	Barriers to Integrating Mental Health Services	Resource Capacity Building Constraints for Mental Health Integration	Insufficient Funding
			HR Challenges (Current Staffs) : Shortage of Staff and Workload Imbalance
			Lack of Training for Mental Health
			Lack of Specialized Mental Health Skill or Staff
		Operational Challenges	Difficulty in Ensuring Continued Patient Engagement
			Logistical and Infrastructure issues for Integrated Services
		Persistent Social Stigma and Lack of Awareness about Mental Health	Lack of awareness and Reluctance by the Patients to Accept Mental Health Services
			Societal and Cultural Barriers (including Stigma about Mental Health)

		Policy and Structural Challenges	Need for Other Policy Reforms (Inclusion of Mental Health Services)
			Other Challenges in Implementing Mental Health Services

Appendix-3 : Pamphlets for Counseling Services for Patients with Moderate to Severe Depression or Anxiety

রেফারাল পামফলেটের জন্য কনটেন্ট

আপনার কথা শোনার জন্য আমরা আছি।

আপনি যদি মানসিকভাবে বিপর্যস্ত, উদ্ভিন্ন বা একা অনুভব করেন, মনে রাখবেন আপনি একা নন।
মনের যত্ন হটলাইন ট্রি এবং গোপনীয় টেলি-কাউন্সেলিং সেবা প্রদান করে।

○ আমরা কী দিচ্ছি:

- আপনার অনুভূতি এবং চিন্তাগুলো শেয়ার করার জন্য একটি নিরাপদ ও স্বস্তিদায়ক পরিবেশ।
- প্রশিক্ষিত পেশাদারদের সহায়তা, যারা আপনার মানসিক চাপ লাঘব করতে সাহায্য করবে।
- আপনাদের সকলের জন্য সহজলভ্য।

📞 যোগাযোগ করুন যেকোনো সময়:

- হটলাইন নম্বর: ০৯৬৪৩২৬২৬২৬, **09678191911**
- সেবা সময়: দুপুর ১২টা – রাত ২টা (প্রতিদিন, ছুটির দিনসহ)।
- অ্যাপ: অ্যান্ড্রয়েড এবং আইওএস-এ **বীরাময় পেশেন্ট অ্যাপ** ডাউনলোড করুন।

আজই আপনার মানসিক স্বস্থির পথে প্রথম পদক্ষেপ নিন।

রেফারাল পামফলেটের জন্য কনটেন্ট

আপনার কথা শোনার জন্য আমরা আছি।

আপনি যদি মানসিকভাবে বিপর্যস্ত, উদ্ভিন্ন বা একা অনুভব করেন, মনে রাখবেন আপনি একা নন।
মনের যত্ন হটলাইন ট্রি এবং গোপনীয় টেলি-কাউন্সেলিং সেবা প্রদান করে।

○ আমরা কী দিচ্ছি:

- আপনার অনুভূতি এবং চিন্তাগুলো শেয়ার করার জন্য একটি নিরাপদ ও স্বস্তিদায়ক পরিবেশ।
- প্রশিক্ষিত পেশাদারদের সহায়তা, যারা আপনার মানসিক চাপ লাঘব করতে সাহায্য করবে।
- আপনাদের সকলের জন্য সহজলভ্য।

📞 যোগাযোগ করুন যেকোনো সময়:

- হটলাইন নম্বর: ০৯৬৪৩২৬২৬২৬, **09678191911**
- সেবা সময়: দুপুর ১২টা – রাত ২টা (প্রতিদিন, ছুটির দিনসহ)।
- অ্যাপ: অ্যান্ড্রয়েড এবং আইওএস-এ **বীরাময় পেশেন্ট অ্যাপ** ডাউনলোড করুন।

আজই আপনার মানসিক স্বস্থির পথে প্রথম পদক্ষেপ নিন।