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ORIGINAL ARTICLE

Prevalence and Determinants of Depression among Multi Drug Resistant (MDR) TB Cases Cross-Sectional Observational Study

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ABSTRACT

Background: The prolonged treatment duration and socio-economic hardships are major factors that lead to the high prevalence of depression among MDR-TB patients in Pakistan.

Objectives: It is aimed to establish the prevalence of depression and to identify its determinants in patients with MDR-TB in Pakistan.

Methods: A cross-sectional observational study was done at several tertiary care centers and specialized TB treatment facilities in Pakistan. Consecutively, one hundred adult patients bacteriologically confirmed MDR-TB were recruited. Structured interviews and reviews of medical records were used to collect data on socio-demographic, clinical, and psychosocial variables. The Patient Health Questionnaire 9 (PHQ-9) was used to assess depression, and a score of ≥10 was considered clinically significant depression. Factors independently associated with depression were identified by performing statistical analyses, including bivariate tests and multivariable logistic regression.

Results: Fifty percent of the study population suffered from depression, which was equally distributed between both genders, i.e., 60% male and 40% female. Using multivariable analysis we found that low socio-economic status (aOR: 2.1, 95% CI: 1.3–3.4, p = 0.002), inadequate social support (aOR: 1.8, 95% CI: 1.1–2.9, p = 0.015), high perceived stigma (aOR: 2.5, 95% CI: 1.5–4.1, p < 0.001), and a treatment duration of more than six months (aOR: 1.7, 95)

Conclusion: The study showed that depression was very common in MDR-TB patients in Pakistan, essentially due to socio-economic challenges, lack of social support, stigma, and long duration of treatment. Our findings highlight the necessity for integrated care models that include mental health services in TB treatment programs to achieve better outcomes and quality of life for patients.

Keywords: MDR-TB, Depression, Cross-Sectional Study, Socio-economic Status, Social Support, Stigma, Integrated Care

INTRODUCTION

Although TB remains a formidable public health challenge worldwide, in Pakistan, TB still has a significant impact on the lives of individuals and the national health resources and is among the high burden countries. These challenges are compounded by the emergence and spread of multidrug-resistant TB (MDR-TB) over the past few years, which has introduced an obstacle to standard treatment regimens and further burdened an already overburdened health system[1]. Pakistan's MDR-TB struggle is a manifestation of a larger crisis of socio-economic disparity, lack of access to quality healthcare, and systemic weaknesses rendering disease management and control challenging[2].

Alarmingly high recent estimates suggest that the prevalence of MDR-TB in Pakistan is high, and there are substantial regional variations that seem to reflect disparities in healthcare infrastructure and public health policy implementation. The prolonged treatment courses and severe side effects associated with MDR TB, and treatment failures and relapses further exacerbate this epidemiological trend. Increasing attention has been paid to the psychological burden brought on patients undergoing MDR-TB treatment[3].

Chronic infectious diseases with MDR-TB are comorbid with depression, which has become a major factor that affects both treatment adherence and clinical outcomes. The psychological impact of a long and uncertain treatment process, especially when the stigma of social and economic hardship is so prevalent in Pakistan, is particularly acute[4]. Despite the clinical and public health importance of depression in the context of MDR-TB, very little such research has been conducted within the country. This vulnerable population is further complicated by the lack of integrated mental health services[5].

This study aimed to fill this gap by evaluating the prevalence and determinants of depression amongst MDR-TB patients in Pakistan. This study systematically examines socio-demographic, clinical, and psychosocial factors to provide robust evidence to inform the development of integrated treatment approaches[6]. They are essential for improving the mental health and treatment outcomes of patients with MDR-TB, which is important to achieve the broader objective of TB control and elimination in Pakistan[7].

MARTIALS AND METHODS

Study Design and Setting: It was a cross-sectional observational study conducted over a given period of 12 months from June 2021 to June 2022 at multiple tertiary care centers and specialized treatment facilities for tuberculosis (TB) in Pakistan. High patient volumes of the selected sites and their representativeness of the national MDR TB treatment program were used for the sites selection. The study was conducted according to a rigorous and systematic approach using the internationally standard research.

Participants: One hundred adult patients (aged 18 years and above) with bacteriologically confirmed multidrug resistant tuberculosis (MDR-TB) consecutively recruited from the participating centers were studied. Patients with a history of major psychiatric disorder (excluding depression), patients who have cognitive impairment that would prevent informed consent, or patients who are too severely ill to complete the study questionnaire were excluded. Selection bias was minimized, and the study population was representative of the wider community of MDR-TB patients in Pakistan with this approach.

Data Collection and Variables: Structured interviews and a complete review of medical records were done to gather data. The interviews were administered in local languages by trained healthcare professionals to promote clear communication. Socio-demographic (age, gender, education level, employment status, and socio-economic factors), clinical (duration of TB symptoms, treatment history, and co-morbid conditions), and psychosocial factors (levels of social support, perceived stigma, and other stressors of a chronic illness) were gathered.

Assessment Tools: The Patient Health Questionnaire-9 (PHQ-9), a validated and culturally adapted screening instrument for

depressive symptoms, was used to assess depressive symptoms. Clinically significant depressive symptoms were indicated by a score of 10 or above on the PHQ-9. Furthermore, social support and Stigma were standardized scales evaluated to encompass the psychosocial aspects that are likely to influence the patients.

Ethical Considerations: The study protocol had been approved by the Institutional Review Board (IRB) and was performed according to ethical guidelines. All participants gave informed written consent before enrollment. Data were de-identified with care to maintain confidentiality and anonymity, and participants who required further support were referred for psychiatric evaluation and counseling.

Statistical Analysis: The data were analysed using advanced statistical software such as SPSS version 26.0. The characteristics of the study population were described using descriptive statistics, and the prevalence of depression was calculated along with corresponding 95% confidence intervals. Potential factors associated with depression were found using bivariate analyses (chi square test for categorical variables, t test for continuous variables). To examine determinants of depression independent of other factors, other variables with a p-value less than 0.20 in the bivariate analysis were included in a multivariable logistic regression model. The aORs with 95% CI and a p-value of less than 0.05 were considered statistically significant.

RESULTS

There were 100 MDR-TB patients, 60 (60%) male and 40 (40%) female, who were enrolled in the study. The bivariate and multivariable analyses are summarized in the following sections, along with key findings from the descriptive analyses.

Participant Characteristics: The socio-demographic and clinical characteristics of the study participants are presented in Table 1. The mean age was 35.4 years (SD = 10.2). Other than the gender distribution (60% male, 40% female), 40% of patients did not have any formal education, and 45% were employed. The mean duration of TB symptoms was 7.8 months (SD = 3.2), and 65% of the patients had a history of previous TB treatment.

Table 1: Socio-demographic and Clinical Characteristics (N = 100)

Characteristic	Value
Age (years)	35.4 ± 10.2
Gender	Male: 60 (60%) Female: 40 (40%)
Education (no formal education)	40 (40%)
Employment (employed)	45 (45%)
Duration of TB symptoms (months)	7.8 ± 3.2
History of previous TB treatment	65 (65%)

Prevalence of Depression: The Patient Health Questionnaire 9 (PHQ 9) was used to assess the depression, and a score greater than or equal to 10 was considered to be clinically significant depressive symptoms. In total, 50 patients (50 out of 100) with MDR-TB were found to have depression. It was seen in both genders as shown in table 2.

Table 2: Prevalence of Depression

Depression Status (PHQ-9 ≥ 10)	Number (%)
Yes	50 (50%)
No	50 (50%)

Table 3: Multivariable Logistic Regression Analysis

Variable	Adjusted Odds Ratio (95% CI)	p-value
Low socio-economic status	2.1 (1.3–3.4)	0.002
Inadequate social support	1.8 (1.1–2.9)	0.015
High perceived stigma	2.5 (1.5–4.1)	<0.001
Duration of treatment >6 months	1.7 (1.0–2.8)	0.045

Multivariable Analysis of Determinants of Depression: A multivariable logistic regression analysis was performed to determine independent determinants of depression among MDR-TB patients. The adjusted odds ratios (AOR), together with their 95% confidence intervals and p values, are summarized in Table 3. It was found that depressed patients with a low socioeconomic status, low social support, high perceived stigma, and a duration of treatment greater than six months had higher odds of depression.

The descriptive analysis described a diverse group of MDR-TB patients, and male patients were as represented as female patients. Gender distribution (60% male and 40% female) shows that both genders were taken into consideration. Half of the study participants were depressed, which underscores the extent of the mental health burden in this population.

Multivariable analysis gave a deeper insight into the factors related to depression. Patients of low socio-economic status were more than twice as likely to suffer from depression than patients with high socio-economic status. Likewise, depression was significantly predicted by inadequate social support and high perceived stigma. Furthermore, a treatment duration longer than six months emerged as an important factor, which may be related to the fact that MDR-TB is a long and difficult disease to manage.

These findings highlight that socio-economic, psychosocial, and clinical factors work together to influence the mental health of MDR-TB patients. By addressing these factors through integrated care strategies, mental health outcomes and treatment success for this population could potentially be improved.

DISCUSSION

This study helps in understanding the prevalence and determinants of depression among patients with multidrug-resistant tuberculosis (MDR-TB) in Pakistan. The finding that 50 percent of patients in the study had clinically significant depressive symptoms with a sample size of 100 patients reflects the significant mental health burden in this group[8]. It is possible that the high prevalence of depression could be due to the long and difficult treatment regimen, in conjunction with socio-economic hardships, poor social support, and stigma of TB and mental illness[9, 10].

Multivariable analysis showed that low socioeconomic status, low social support, high perceived stigma, and treatment duration greater than 6 months were independently associated with a higher odd of depression[11]. These factors suggest the multifactorial nature of depression in the setting of MDR-TB and that both clinical and nonclinical aspects of patient care are required. Socioeconomic challenges and mental health are intricately intertwined and highlight the need for the integration of psychosocial support with the TB treatment programme[12, 13].

This is consistent with previous research showing psychiatric comorbidities are associated with chronic infection, notably with TB, and can impair treatment adherence and outcomes. These results are particularly important in the context of Pakistan where it is precisely mental health services that are scarce and TB and mental health services are struggling to provide care, and where there is an immediate need for comprehensive, patient-centred approaches to MDR TB care that includes mental health evaluation and intervention within the routine MDR TB framework[14, 15].

The following must be acknowledged about the study: The cross-sectional design prevents causal inferences about the relationship between the identified determinants and depression[16]. Furthermore, the sample size is large enough for the analysis but may not encompass the heterogeneity of the broader MDR-TB patient population across different regions. Future studies with larger and more diverse samples, as well as with longitudinal designs, are required to further validate these findings and to evaluate the effects of integrated mental health interventions on treatment outcomes[6, 17].

CONCLUSION

The study concludes that a great number of MDR-TB patients in Pakistan suffer from depression; half of the patients had clinically important depressive symptoms. The results indicate determinants

of depression such as low socio-economic status, inadequate social support, high perceived stigma, and prolonged treatment duration. These findings reemphasize that effective care strategies for MDR-TB patients must address both the clinical and psychosocial needs of patients. Imparting mental health services to TB treatment programs could enhance adherence, clinical outcomes, and the overall quality of life for this vulnerable population. Targeted interventions should be evaluated in future research, as well as sustainable models for comprehensive care in similar high-burden settings.

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