



“FREQUENCY OF DEPRESSION IN NEWLY DIAGNOSED PULMONARY TUBERCULOSIS PATIENTS PRESENTING TO A TERTIARY CARE HOSPITAL”

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ABSTRACT

Background: Pulmonary tuberculosis (TB) is a significant health issue, especially in the developing world, and has been linked to a lot of psychological morbidity, especially depression, which can negatively impact the treatment outcomes and quality of life.

Objective: To find out the incidence of depression in patients with new pulmonary tuberculosis as they visit a tertiary care hospital.

Methods: The cross-sectional study was conducted at Khyber Teaching Hospital, Peshawar between December 2023 and June 2024. Non-probability consecutive sampling was used to include 267 newly diagnosed pulmonary tuberculosis patients aged 18 to 65 years. Patients who had a previous mental condition or were severely comorbid were not included. The patient had been evaluated using the PHQ-9 to measure depression. The analysis of the data was done with the help of SPSS version 25, and the results were reported in the form of frequencies and percentages.

Results: Of all the 267 patients, 111 (41.6%) had been diagnosed with depression. Females had a higher incidence of depression (47.8) than males (36.8). Patients with lower socio-economic status were more likely to be depressed (49.6%) compared to those with middle socio-economic status (32.8%). Most of the depressed patients were aged between 26 and 45 years.

Conclusion: Gender and socio-economic status. Depression is very common in patients with newly diagnosed pulmonary tuberculosis. Early psychological intervention and regular screening are necessary to enhance adherence to treatment and patient outcomes in general.

Keywords: Pulmonary tuberculosis, depression, frequency, mental health, tertiary care hospital, PHQ-9, Pakistan

INTRODUCTION

Pulmonary tuberculosis is a significant issue of global concern in terms of the general health of the population, more so in the developing world, where the occurrence is aggravated by socio-economic factors and inadequate healthcare facilities. As well as the physical symptoms of tuberculosis, the psychological effects, particularly depression, are becoming more understood and have a huge influence on patient outcomes and quality of life. Surveys were carried out in tertiary care hospitals, indicating that chronic respiratory infections, such as tuberculosis, often lead to increased cases of depression and anxiety because of long-term illness, social isolation, and stigma (1). The comorbidity of mental illnesses and infectious diseases, like tuberculosis, makes it difficult to manage the disease and underscores the importance of a more comprehensive approach to patient care (2). Psychological morbidity is a well-known and yet under-reported problem in tuberculosis patients who have been extensively studied across a variety of populations and health care environments. It has been found that a significant percentage of patients with pulmonary tuberculosis issues develop depressive symptoms throughout the period of the disease, which could be the result of biological and psychosocial factors (3).

They are the long-term character of the illness, the fear of being transmitted, the length of treatment, and the social stigma of tuberculosis that leads to emotional distress and aggravates mental health (4). The psychological impact of tuberculosis is not confined to the process of first diagnosis and may severely undermine the overall quality of life in people who have contracted the disease. There is evidence that the psychological stress experienced by patients with tuberculosis can be high and thus affect their physical recovery and compliance with treatment regimens (5). Moreover, psychiatric comorbidities, especially depression, have been linked to worse clinical outcomes, such as delayed recovery and a higher risk of defaulting on treatment, and this makes it essential in the management of tuberculosis (6). A number of local studies have investigated the prevalence of depression in patients with tuberculosis and have proposed a number of determinant factors, including socio-economic status, absence of social support, and comorbid health conditions.

As an example, a study carried out using South Asian populations has indicated a high rate of depression and anxiety in patients with tuberculosis, and this implies that the burden of the infectious disease presents significant mental health problems (7). Other research drawing attention to drug-resistant TB has also pointed to even greater psychiatric morbidity rates owing to the lengthy and complicated courses that are involved (8). Besides personal-level causes, there are also systemic and medical issues that contribute to the occurrence of depression in tuberculosis patients. Poor access to mental health care, absence of routine screening of mental health in the medical community, and poor awareness among medical professionals are some factors that lead to the underdiagnosis and under-treatment of depression among this population (9). Besides, patients receiving treatment in directly observed therapy (DOTS) facilities are subjected to logistical and social challenges, which can render them more helpless and emotionally upset (10). The depression-tuberculosis connection gets even more difficult considering the influence of this condition on adherence to treatment and the disease progression.

Research has demonstrated that depression is closely linked with a low adherence rate to anti-tubercular treatment, with subsequent poor treatment results and high chances of reoccurrence or development of drug resistance (11). This two-way relationship is also important to note that mental health cannot be considered a secondary concern in tuberculosis care, but instead a major component of it (12). A systematic review and meta-analysis have consistently shown that depression is very common among patients with tuberculosis, with estimates being different in different regions and different study designs. These sources point out the fact that depression not only affects a significant percentage of patients but also is an influential factor in treatment outcomes and general health (13). Depression among hospitalized pulmonary tuberculosis patients has also been noted to be significant in the study of the hospital setting in Pakistan and elsewhere, highlighting the significance of considering mental health in clinical care (14). Depression affecting tuberculosis patients is also worsened by comorbid conditions.

Patients having co-morbid conditions like diabetes mellitus tend to have depressive symptoms as a result of the physical and psychological stresses that are compounded to cope with multiple chronic illnesses (15). Moreover, socio-demographic aspects including age, gender, state of education, and income have also been found to be significant predictors of depression among tuberculosis patients, indicating that a complex interplay of biological and social determinants influences vulnerability (16). Depression prevalence also depends on severity and type of tuberculosis, and researchers have found that multidrug-resistant tuberculosis patients are more likely to develop anxiety and symptoms of depression than patients with drug-sensitive forms of tuberculosis (17). This can be explained by the fact that the treatment process is more prolonged, there is an increased pill burden, and multidrug-resistant tuberculosis treatment has more side effects, which also lead to psychological distress and diminished quality of life.

Considering the high burden of depression among patients with tuberculosis and the influence it has on treatment outcomes, it is urgently necessary to determine its prevalence, especially in patients who present to tertiary care hospitals at the time of diagnosis. Early detection of depression during the diagnosis process may ease the way in which the patient can be well-intervened, be more adherent to the treatment, and eventually achieve better patient outcomes. Thus, the purpose of the proposed study is to identify the prevalence of depression among newly diagnosed patients with pulmonary tuberculosis receiving care in a tertiary care hospital and, as such, add to the accumulating information regarding the incorporation of mental health services in tuberculosis treatment.

Objective: To identify the prevalence of depression in newly diagnosed pulmonary tuberculosis patients seeking care at a tertiary care hospital and to emphasize the importance of the early identification of the issue and the need to implement psychological evaluation and combined therapeutic interventions.

MATERIALS AND METHODS

Study Design: A cross-sectional study was conducted.

Study Setting: The study was carried out at Khyber Teaching Hospital, Peshawar.

Duration of Study: December 2023 – June 2024

Sample Size:

OpenEpi was used to calculate the sample size with a predicted prevalence of 50 percent of depression, with a 95 percent confidence and a 6 percent margin of error, as the sample size of 267 patients was obtained.

Inclusion Criteria: All new cases of pulmonary tuberculosis presenting at the pulmonology department within the period of study and aged between 18 and 65 years during this period were included. The patients had a predetermined diagnosis through the use of sputum smear microscopy, GeneXpert, or radiographic results. Male and female patients were also enrolled, and only those who gave informed consent were included in the study.

Exclusion Criteria: Patients with a previous history of psychiatric disease, patients who were already receiving antidepressant treatment, and patients with extrapulmonary tuberculosis were excluded. Patients with serious comorbidities, including malignancy or end-stage organ failure, and who were incapable of answering the questionnaire because of cognitive impairment or severe illness were also excluded.

Methods

A structured questionnaire was used to collect data with the informed consent of all the subjects. Socio-demographic information such as age, gender, level of education, and socioeconomic status was taken. Clinical data, including the length of symptoms or the way it was diagnosed, were also recorded. The Patient Health Questionnaire-9 (PHQ-9) was used to evaluate depression, as it is a

reliable instrument that has been validated and used by numerous clinics to screen depression. A score of 10 or more was said to be a measure of depression. The interviews were all done in a confidential environment to facilitate confidentiality and elicit the correct response. SPSS version 25 was used to enter and analyze the data. Continuous variables like mean and standard deviation were used as descriptive statistics, and frequencies and percentages for categorical variables. Depression prevalence was calculated, tabulated, and graphically represented among newly diagnosed patients with pulmonary tuberculosis.

Results

In this study, 267 patients with newly diagnosed pulmonary tuberculosis were selected in the Khyber Teaching Hospital, Peshawar. Table 1 shows the demographic features of the participants. The mean age of the patients was 38.612.4 years. Most patients fell within the age bracket of 26-45 years (44.2%), and after that, 33.0% within the age bracket of above 45 years, and the rest (22.8) were within the age bracket of 18-25 years. In terms of gender, 152 (56.9) were male and 115 (43.1) female.

Table 1: Demographic Characteristics of Study Participants (n = 267)

Variable	Frequency (n)	Percentage (%)
Age Group		
18–25 years	61	22.8%
26–45 years	118	44.2%
>45 years	88	33.0%
Gender		
Male	152	56.9%
Female	115	43.1%

Table 2 represents the total prevalence of depression in the participants. By PHQ-9 scoring, 111 (41.6) of 267 patients were diagnosed with depression, and 156 (58.4) possessed no symptoms of depression. This suggests that almost two-fifths of the newly diagnosed pulmonary tuberculosis patients were depressed.

Table 2: Frequency of Depression among Patients (n = 267)

Depression Status	Frequency (n)	Percentage (%)
Yes	111	41.6%
No	156	58.4%

A graphical representation of depression frequency further illustrates that a significant proportion of patients were affected by depression at the time of diagnosis.

Depression Frequency Graph

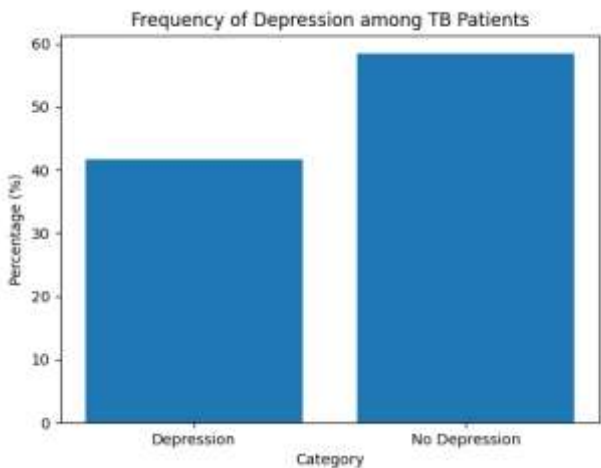


Table 3 shows the distribution of depression according to gender. Among male patients, 56 (36.8%) were found to be depressed, whereas among female patients, 55 (47.8%) exhibited depressive symptoms. This suggests a relatively higher prevalence of depression among female patients compared to males.

Table 3: Depression Distribution by Gender (n = 267)

Gender	Depression Yes (n)	Depression No (n)	Percentage (%)
Male	56	96	36.8%
Female	55	60	47.8%

Table 4 involves the correlation between depression and socio-economic status. Depression was most common among patients who had low socio-economic status, with 70 (49.6) cases, and middle socio-economic status, with 41 (32.8) cases. This indicates the effects of socio-economic determinants on the mental health of tuberculosis patients.

Table 4: Depression according to Socio-economic Status (n = 267)

Socio-economic Status	Depression Yes (n)	Depression No (n)	Percentage (%)
Low	70	71	49.6%
Middle	41	85	32.8%

Overall, the results demonstrate that depression is a common comorbidity among newly diagnosed pulmonary tuberculosis patients. It is more prevalent among females and individuals from lower socio-economic backgrounds, emphasizing the need for early psychological assessment and targeted interventions.

Discussion

The results of the current work indicate that 41.6 percent of patients with recently diagnosed pulmonary tuberculosis were depressed during the diagnosis. This brings out a significant psychological toll that comes with tuberculosis, even at an earlier stage. The results are also similar to works done on chronic respiratory diseases, in which depression and anxiety were identified as very common because the disease and other problems that accompany the condition are long-lasting (1). Additionally, psychiatric morbidity in tuberculosis patients has been consistently reported in tertiary care facilities, and this evidence highlights the importance of screening mental health early in

life (2). The prevalence rate of depression in this study is similar to the data reported in the past, which show that a large percentage of tuberculosis patients have depressive symptoms at some point in the course of their disease. Research has indicated that diagnosis of tuberculosis in itself may be an emotional stressor, causing emotional instability, fear, and uncertainty (3). Studies carried out in alternative populations have shown that depression and anxiety are prevalent among patients with tuberculosis, which are determined by biological and socio-environmental factors (4).

Poor living standards and psychological stress are known adverse effects of tuberculosis. There is evidence that long-term treatment, physical weakness, and isolation of the patient tend to cause emotional distress, which leads to the development of depression (5). Besides, psychiatric comorbidities have been reported to adversely affect the quality of life and overall functioning of the patients, and it is therefore important to consider mental health in addition to physical health (6). Depression turned out to be more common among women patients than among men in the given study. This observation falls in line with the evidence in the region that has noted more prevalence of depression and anxiety in female patients with tuberculosis, potentially because of an increased social stigma, caregiving burden, and access to health care facilities (7). Moreover, research dedicated to drug-resistant tuberculosis has also given prominence to the assumption that psychological load can be more significant among females because of the long period of treatment and the stress that it causes (8). In this study, socio-economic status has become a significant predictor of depression, whereby low socio-economic status patients have shown a great prevalence of depressive symptoms. The observation is in line with past studies that have shown that poverty, unemployment, and social support deficiency are some of the leading causes of mental health challenges in tuberculosis patients (9). In addition, patients under the care of health facilities must deal with logistical and economic difficulties, and such difficulties can also increase a sense of helplessness and depression (10). Another important issue that has been presented in the literature is the connection between depression and treatment outcomes. Research has established that depression is closely related to low adherence levels to anti-tubercular treatment that can lead to treatment failure, relapse, or emergence of drug-resistant tuberculosis (11). In-depth reviews and meta-analyses have also reinforced the fact that depression is not only common among patients with tuberculosis but is also influential in shaping the outcome of treatment and its long-term effects (12). Moreover, extensive studies have revealed that depression is among the prevalent psychiatric disorders in tuberculosis patients in the world. These studies reiterate that mental illnesses need to be included in the management plans of tuberculosis in countries with a high burden (13). Similar results were also reported by research in Pakistan, according to which a significant percentage of patients admitted to hospitals with tuberculosis were diagnosed with depression, which leads to the topicality of this problem in the country (14). The conditions that are comorbid also make tuberculosis patients more susceptible to depression. As an example, patients who experience comorbid conditions, such as diabetes mellitus, have been identified to experience more depressive symptoms owing to the physical and psychological strain of living with several chronic diseases (15). Also, it has been found that certain socio-demographic and clinical factors, such as age, education level, and severity of the disease, are the key predictors of depression in patients with tuberculosis (16).

Depression is also affected by the nature of tuberculosis, as well as its severity. The rates of depression among patients with multidrug-resistant tuberculosis are more prevalent than drug-sensitive types of the illness, which is mainly explained by the extended duration of treatment, increased intake of drugs, and more significant adverse effects (17). This represents the necessity of specific psychological approaches towards high-risk groups of patients. All in all, the results of this research align with the available literature and emphasize the need to incorporate mental health services into tuberculosis care. The timely diagnosis and treatment of the initial patients of depression can raise treatment adherence, improve the quality of life, and result in better clinical outcomes. That is why regular depression screening should be introduced in tertiary care to provide patient-centred and comprehensive management of tuberculosis.

Conclusion

The current research concludes that depression is very common among patients with newly diagnosed pulmonary tuberculosis, with almost two-fifths of patients having it when they are diagnosed. This underscores the fact that psychological distress not only starts late in the disease course but also at an earlier stage. The results also show that depression is associated more with female patients and those who are in the lower socio-economic strata, which means that biological and social aspects also play a role in making people vulnerable to mental health. Depression that occurs alongside tuberculosis may adversely affect the process of treatment adherence, recovery, and quality of life. Thus, mental health is an issue that should be considered in order to manage tuberculosis successfully. Simple and validated tools of routine depression screening should be included in the regular clinical practice, especially in tertiary care hospitals. Early diagnosis and intervention can enhance patient outcomes and contribute to a more holistic approach to tuberculosis treatment.

References

1. Sindhuja, O., Chadala, V.N., Murthy, P.S., & Chaudhury, S. (2025). Prevalence of Depression and Anxiety in Chronic Respiratory Disease Patients Attending Pulmonology Department of a Tertiary Care Hospital: A Cross-Sectional Study. *Medical Journal of Dr. DY Patil Vidyapeeth*, 18(5), 813–819.
2. Yadav, P., Gupta, A.K., Gautam, A.K., Arya, S., Kumar, A., Mishra, A.K., & Gupta, S. (2024). Assessment of psychiatric illness among pulmonary tuberculosis patients at a tertiary care center in India. *Annals of African Medicine*, 23(4), 594–599.
3. Zahid, A., Khan, S., Mandokhel, S., Ghafoor, A., & Doutani, M.U. (2025). Frequency of Depression in Pulmonary Tuberculosis Patients. *Journal of Health, Wellness and Community Research*, e254.
4. Assefa, S., Boru, B., Gebeyehu, D.A., & Terefe, B. (2023). Depression, anxiety, and their associated factors among patients with tuberculosis attending Gondar city health facilities, North West Ethiopia. *BMC Psychiatry*, 23(1), 91.
5. Febi, A.R., Manu, M.K., Mohapatra, A.K., Praharaj, S.K., & Guddattu, V. (2021). Psychological stress and health-related quality of life among tuberculosis patients: A prospective cohort study. *ERJ Open Research*, 7(3).
6. Pathak, A., Pathak, R., Jaiswal, S., & Gadad, A. (2023). Clinical correlates, psychiatric morbidity, and quality of life in patients of pulmonary tuberculosis: A cross-sectional study from a tertiary care hospital in rural North India. *Medica Innovatica*, 12(1).
7. Parajuli, S.B., Yadav, R.K., & Baral, S. (2024). Prevalence and factors associated with depression and anxiety among TB patients in Kaski District. *SAARC Journal of Tuberculosis, Lung Diseases and HIV/AIDS*, 22(1), 6–21.
8. Srinivasan, G., Chaturvedi, D., Verma, D., Pal, H., Khatoon, H., Yadav, D., Sahil, A.P., Gautam, D., & Deepak, D. (2021). Prevalence of depression and anxiety among drug-resistant tuberculosis: A study in North India. *Indian Journal of Tuberculosis*, 68(4), 457–463.
9. Okoro, L.C., Odukoya, O., Ikwuka, A.O., & Udeh, F.C. (2024). Prevalence, patterns, and peculiarities of depression among tuberculosis patients attending Directly Observed Treatment Short-course (DOTS) centers in Lagos State, Nigeria. *American Journal of Medical Science and Innovation*, 3(1), 62–72.
10. Momanyi, R.K., Kwobah, E.K., Owiti, P., Nyamogoba, H., & Atwoli, L. (2024). Psychiatric morbidity among patients on treatment for tuberculosis at a tertiary referral hospital in Western Kenya. *PLoS One*, 19(5), e0302744.
11. Rouf, A., Masoodi, M.A., Dar, M.M., Khan, S.M., & Bilquise, R. (2021). Depression among tuberculosis patients and its association with treatment outcomes in district Srinagar. *Journal of Clinical Tuberculosis and Other Mycobacterial Diseases*, 25, 100281.

12. Panibatla, V., Nagaraja, S.B., Mohan, D., Kizhakkethil, S.M., & Sangeetha, M.D. (2024). Depression and anxiety among tuberculosis patients: A systematic review and meta-analysis. *Indian Journal of Social Psychiatry*, 40(4), 326–340.
13. Samal, J., Dehury, R.K., Thomas, M.B., & Singh, H. (2025). Prevalence and predictors of depression in tuberculosis patients in India: A systematic review and meta-analysis. *Discover Mental Health*, 5(1), 104.
14. Gulzar, A., Khan, I., Muhammad, A., & Khan, M.N. (2021). Prevalence of depression in hospitalized patients of pulmonary tuberculosis. *Pakistan Armed Forces Medical Journal*, 71(1), 206.
15. Li, X., Fang, X., Zhou, L., Mao, Y. (2023). Prevalence and factors associated with depression in patients with diabetes mellitus and pulmonary tuberculosis (DM-PTB): A hospital-based cross-sectional study. *International Journal of General Medicine*, 16, 3465–3472.
16. Abdurahman, S., Yadeta, T.A., Ayana, D.A., Kure, M.A., Ahmed, J., & Mehadi, A. (2022). Magnitude of depression and associated factors among patients on tuberculosis treatment at public health facilities in Harari Regional State, Eastern Ethiopia: A multi-center cross-sectional study. *Neuropsychiatric Disease and Treatment*, 18, 1405–1415.
17. Liu, K., Zhang, Y., Qu, S., Yang, W., Guo, L., & Zhang, L. (2021). Prevalence and correlates of anxiety and depressive symptoms in patients with and without multidrug-resistant pulmonary tuberculosis in China. *Frontiers in Psychiatry*, 12, 674891.