ORIGINAL ARTICLE

Depression and Anxiety Among Pulmonary Tuberculosis: A Cross-Section Study

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ABSTRACT

Background: Tuberculosis (TB) is a chronic infectious disease that affects both physical and psychological well-being. Depression and anxiety are frequently overlooked among TB patients, despite their significant impact on treatment adherence and overall health outcomes. Early identification of psychological distress in TB patients is essential to ensure comprehensive patient care, so this study was done to evaluate depression and anxiety among pulmonary TB patients attending a tertiary care hospital.

Methods: This cross-sectional study was conducted over one year at the DOTS Centre of a tertiary care hospital in Bareilly, Uttar Pradesh. A total of 385 adult pulmonary TB patients were selected by using purposive sampling. A structured proforma and DASS-21 scale was used to collect data and psychological symptoms. Data were analyzed using SPSS v23.0.

Results: The mean age of participants was 41.08 ± 18.37 years, with most belonging to rural areas and nuclear families. Psychological symptoms included feeling scared without reason (28.65%), feeling life meaningless (9.64%), and feeling close to panic (10.16%). Significant associations were observed between area of residence, occupation, religion, family type, and psychological outcomes.

Conclusion: Depression and anxiety were common among pulmonary TB patients, influenced by sociodemographic factors and stigma. The findings highlight the need for mental-health screening and psychosocial support within TB care services.

KEYWORDS: Tuberculosis, Depression, Anxiety, DASS-21, Mental health, Pilot study, Stigma

INTRODUCTION

Tuberculosis (TB) remains one of the world's most significant infectious diseases, ranking among the top ten causes of death globally and the leading cause of mortality from a single infectious agent, surpassing HIV/AIDS.[1] According to the World Health Organization (WHO), approximately 10.6 million people developed TB in 2022, with India alone contributing nearly 28% of the global burden.[2] Despite major advances in diagnosis and treatment, TB continues to impose substantial physical, social, and psychological challenges on affected individuals, particularly those with pulmonary involvement.

Beyond its biological impact, TB has profound consequences for mental health. Psychological disorders such as depression, anxiety, and stress are increasingly recognized as major comorbidities among TB patients, influencing both quality of life and clinical outcomes.[3] The chronic nature of the disease, prolonged treatment duration, social stigma, physical debilitation, and fear of transmission contribute to significant emotional distress.[4] Studies have shown that the prevalence of depression among TB patients ranges from 30% to 70%, while anxiety affects nearly one-third of cases, underscoring the magnitude of mental health impairment associated with the disease.[5,6] Unmanaged psychological morbidity not only diminishes daily functioning but also adversely affects treatment adherence, potentially leading to treatment failure, relapse, or drug resistance.[7]

The bidirectional relationship between TB and mental health further complicates disease management. Depression and anxiety can weaken immune responses, potentially influencing susceptibility to infection and delaying recovery.[8] In addition, stress-related neuroendocrine changes may exacerbate systemic inflammation, impacting

disease progression.[9] Conversely, TB-related inflammation and prolonged systemic symptoms may trigger or worsen psychological distress. This complex interplay highlights the importance of integrating mental health screening into TB control programs as part of a holistic patient-care approach.

In low- and middle-income countries (LMICs), including India, the burden of mental health disorders in TB patients is often underestimated due to limited awareness, stigma, and inadequate psychosocial support services.[10] TB-associated stigma remains pervasive and can manifest as social isolation, fear of discrimination, concealment of diagnosis, and reluctance to seek care.[11] Such psychosocial stressors may intensify feelings of hopelessness, anxiety, and reduced self-worth. Studies from various regions in India have reported that stigma significantly affects treatment adherence and psychosocial well-being, creating additional barriers to TB elimination efforts.[12]

Sociodemographic factors such as age, gender, religion, socioeconomic status, occupation, and family structure also influence psychological responses among TB patients. Research has shown that individuals from marginalized communities, economically deprived households, and rural areas are more vulnerable to psychological distress due to limited access to healthcare resources and reduced social support.[13,14] Moreover, cultural beliefs and misconceptions surrounding TB may heighten emotional suffering and delay timely disclosure of illness.[15]

Despite the growing recognition of these challenges, there is a paucity of region-specific data addressing the psychological burden of TB in northern India. The present pilot study aims to assess the prevalence of depression, anxiety, and stress among pulmonary tuberculosis patients attending a tertiary care hospital in Bareilly, Uttar Pradesh, and to explore their association with key sociodemographic and clinical variables. Understanding these patterns is essential for developing targeted interventions that incorporate mental health care into TB management, ultimately improving treatment outcomes and patients' overall well-being.

MATERIALS AND METHODS

Study Design and Setting

This one year cross-sectional study was conducted in the catchment area of the Directly Observed Treatment, Short-course (DOTS), Rohilkhand Medical College and Hospital (RMCH), Bareilly, Uttar Pradesh after obtaining the Institute Ethics Committee of RMCH. The institution functions as a tertiary care referral center catering to a predominantly rural population. The study participants were all tuberculosis patients of 18 years and above registered under DOTS Centre and give consent to part in study. Pulmonary TB diagnosis was confirmed based on the guidelines of the National Tuberculosis Elimination Programme(NTEP), using sputum microscopy, GeneXpert, radiological findings, and clinical evaluation. The calculated sample size was 385 after taking prevalence of 37.5%. Purposive sampling was done and data was collected by using Depression Anxiety Stress Scale–21 items (DAS 21) scale. This scale is a validated self-report tool designed to measure symptoms of depression, anxiety, and stress over the preceding week.[16] It includes 21 items, with seven items each for the three subscales. Each item is rated on a 4-point Likert scale (0–3). Scores for each subscale were summed and multiplied by two before being categorized into normal, mild, moderate, severe, or extremely severe levels, following the scoring guidelines by Lovibond and Lovibond.[17] Data were entered and analyzed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (mean, standard deviation, frequencies, percentages) were used to summarize data.

RESULTS

It was found that the majority of participants (23.4%) belonged to the 19–30 years age group, indicating that a significant proportion of respondents were young adults. This was followed by 41–50 years (17.7%) and 51–60 years (15.8%) and majority patients were male 232 (60.26%), while female patients were 153 (39.74%). The study also showed that predominant portion of the study population, 323 (83.90%), resided in rural areas, whereas only 62 (16.10%) were from urban settings. The largest group of TB patients were employed housewives (92; 23.90%), farmers (78; 20.26%), students (75; 19.48%), and self-employed individuals (41; 10.65%). Other occupations included laborers (8.83%), salaried workers (7.01%), while the percentage of unemployed individuals were 5.45% (Table 1). It is also seen that out of 385 TB 201 (52.21%) reported a positive history of contact with a TB patient, while 182 (47.27%) mentioned no contact history to TB patient (Table 2). The relatively high proportion of patients with a known contact history reflects the importance of household transmission in TB spread, especially in densely populated or poorly ventilated environments. In majority of the participants, 304 (78.96%), disclosed their TB diagnosis to their family members, while 81 patients (21.04%) chose not to share this information, while 54 participants (14.03%) reported being treated differently by their family members after being diagnosed with TB. In contrast, the majority, 331 participants (85.97%), did not report any discrimination due to their disease (Table 3). Moderate levels of anxiety (83.6%) and depression (91.9%) were found in study group while only small proportions of participants fall into normal, mild, or severe/extremely severe categories for either condition (Table 4).

Table 1: Socio-demographic Profile of Study Participants

Category	Variable	Frequency (n=385)	Percentage (%)
Age Group	≤18	49	12.7
	19–30	90	23.4
	31–40	57	14.8
	41–50	68	17.7
	51–60	61	15.8
	61–70	40	10.4
	>70	20	5.2
Gender	Male	232	60.26%
	Female	153	39.74%
Religion	Hindu	302	78.44%
	Muslim	81	21.04%
	Other	2	0.52%
Area	Rural	323	83.90%
	Urban	62	16.10%
Type of Family	Nuclear	276	71.69%
	Joint	109	28.31%
Occupation	Housewife	92	23.90%
	Farmer	78	20.26%
	Student	75	19.48%
	Self-employed	41	10.65%
	Laborer	34	8.83%
	Salaried	27	7.01%
	Unemployed	21	5.45%
	Retired	7	1.82%
	Others	10	2.60%

Table 2: Distribution of TB patients on the basis of Contact History

Contact history	Frequency (n= 385)	Percentage %
Present	201	52.21%
Absent	182	47.27%
Not specified	2	0.52%

Table 3: Distribution of study cases as per their family response after diagnosis of TB.

Category	Response	Frequency(n)	Percentage (%)
Disclosure of TB diagnosis to family	Yes	304	78.96%
	No	81	21.04%
Treated differently by family after diagnosis	No	331	85.97%
	Yes	54	14.03%

Table 4: Table showing impact of psychiatric illness in TB patients

	Anxiety		Depression		Stress	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Normal	36	9.4	18	4.7	0	0
Mild	4	1.0	8	2.1	0	0
Moderate	322	83.6	354	91.9	79	20.5
Severe	22	5.7	2	0.5	303	78.7
Extremely Severe	1	0.3	3	0.8	3	0.8

DISCUSSION

This study assessed the prevalence of depression, anxiety, and stress among pulmonary tuberculosis (TB) patients in a tertiary care hospital. The findings revealed a high psychological burden, consistent with global evidence showing that TB significantly affects mental health beyond its physical manifestations. Tuberculosis is increasingly recognized as a condition with strong psychosocial implications, where mental health disorders can impair adherence, worsen clinical outcomes, and prolong infectivity.[16,17,18]

The majority of patients in this study belonged to the young and middle-aged adult population, similar to previous Indian studies highlighting that the economically productive age group is disproportionately affected.[19] This demographic vulnerability has important socioeconomic implications, as active TB can lead to loss of productivity, financial strain, and reduced quality of life. The slightly higher proportion of males in the sample aligns with national epidemiological patterns, where men display greater exposure to infection-prone environments and delays in seeking timely care.[20]

A large proportion of participants resided in rural areas, reflecting earlier research demonstrating higher TB prevalence and poorer treatment outcomes in rural communities due to barriers like inadequate healthcare access, low awareness, and overcrowded living conditions.[21,22] These factors may also contribute to increased emotional distress, as rural patients often have reduced access to psychological support services.

The psychological morbidity observed in this study was substantial, with more than 80% of patients experiencing moderate depression and anxiety, and nearly 79% experiencing severe stress. Similar findings have been reported by studies from Ethiopia, India, and Cameroon, which noted depression rates ranging from 40–60% among TB populations.[23,24,25] Contributing factors may include the chronic nature of TB, medication side effects, prolonged

isolation, fear of transmission, and uncertainty regarding prognosis.

Sociodemographic factors were found to be strongly associated with psychological distress. Rural residents demonstrated higher levels of panic and stress, possibly due to limited healthcare access and traditional beliefs surrounding TB.Employment status also influenced psychological symptoms, with students and unemployed individuals expressing higher feelings of hopelessness and worthlessness, consistent with research linking economic instability to poor mental health outcomes.[26] Non-disclosure of TB diagnosis was associated with greater emotional distress. Patients who concealed their diagnosis reported higher panic and feelings of meaninglessness. This aligns with findings suggesting that concealment driven by fear of stigma increases psychological burden and decreases treatment cooperation.[27]

The high prevalence of depression, anxiety, and stress found in this study reinforces the importance of integrating mental-health screening into TB control programs. Incorporating tools like the DASS-21 into routine evaluations can help identify at-risk patients early and guide appropriate psychological interventions. Overall, the study underscores the bidirectional relationship between mental health and TB. Addressing psychological comorbidities through counselling, stigma-reduction programs, and community-based support is essential to improving TB treatment adherence and outcomes. Larger multicentric studies are recommended to validate these findings and to design tailored mental-health interventions for TB patients.[28]

CONCLUSION

Pulmonary TB not only challenges a patient's physical health but also exerts a profound toll on mental well-being, contributing to increase the levels of depression and anxiety, which often remain underdiagnosed and untreated in clinical settings. Depression and anxiety can impair a patient's treatment adherence, diminish quality of life, and potentially exacerbate disease progression. This study highlights a high burden of depression, anxiety, and stress among pulmonary tuberculosis patients with other sociodemographic factors a significant proportion of respondents were young adults, predominantly from rural areas. Disclosure of TB diagnosis was high reflecting positive family involvement, yet a notable minority faced stigma within the family and workplace or educational settings. These findings underscore the need to integrate routine mental-health screening, counselling, and stigma-reduction strategies into TB care. Addressing psychological comorbidities is essential for improving treatment adherence, patient well-being, and overall TB outcomes.

REFERENCES

1. Sweetland AC, Kritski A, Oquendo MA, et al. Addressing the tuberculosis–depression syndemic to end the TB epidemic. Int J Tuberc Lung Dis. 2017;21(8):852-61.
2. Duko B, Gebeyehu A, Ayano G. Prevalence and correlates of common mental disorders among patients with tuberculosis in Ethiopia: a cross-sectional study. Neuropsychiatr Dis Treat. 2015;11:1735-41.
3. Pachi A, Bratis D, Moussas G, Tselebis A. Psychiatric morbidity and other factors affecting treatment adherence in pulmonary tuberculosis patients. Tuberc Res Treat. 2013;2013:489865.
4. Kumar K, et al. J Clin Diagn Res. 2021;15(4):LC01-05.
5. World Health Organization. Global tuberculosis report 2023. Geneva: WHO; 2023.
6. Suryanarayana MH, et al. Indian J Tuberc. 2020;67(3):327-34.
7. Chadha VK, et al. Indian J Tuberc. 2012;59:233-8.
8. Kehbila J, et al. BMC Public Health. 2016;16:731.
9. Amreen, Rizvi N. Depression and anxiety among tuberculosis patients. J Depress Anxiety. 2016;5(3):1-4.
10. Rouf A, et al. J Clin Tuberc Other Mycobact Dis. 2021;24:100249.
11. Courtwright A, Turner AN. Tuberculosis and stigmatization: pathways and interventions. Public Health Rep. 2010;125(Suppl 4):34-42.
12. Somma D, Thomas BE, Karim F, et al. Gender and sociocultural determinants of TB-related stigma in Bangladesh, India, Malawi and Colombia. Int J Tuberc Lung Dis. 2008;12(7):856-66.
13. Rajeswari R, et al. J Family Med Prim Care. 2022;11:1234-40.
14. Janmeja AK, et al. Lung India. 2021;38(2):108-13.
15. Nagarajan S, et al. PLoS One. 2023;18:e0283456.
16. Ministry of Health and Family Welfare. India TB Report 2023. New Delhi: Central TB Division; 2023.
17. Duko B, Bedaso A, Ayano G. The prevalence of depression among patients with tuberculosis: a systematic review and meta-analysis. Ann Gen Psychiatry. 2020;19:30.
18. Ige OM, Lasebikan VO. Prevalence of depression in tuberculosis patients compared with non-tuberculosis family contacts visiting DOTS clinics in Ibadan, Nigeria. Afr J Med Med Sci. 2011;40(2):135-40.
19. Gonçalves FA, Faria AR, Costa AC, et al. Non-adherence to tuberculosis treatment: a systematic review. Rev Saude Publica. 2021;55:40.
20. Smith I. Mycobacterium tuberculosis pathogenesis and molecular determinants of virulence. Clin Microbiol Rev. 2003;16(3):463-96.
21. Segerstrom SC, Miller GE. Psychological stress and the human immune system: a meta-analytic study. Psychol Bull. 2004;130(4):601-30.
22. Jain A, Dixit P. Mental health problems among patients with pulmonary tuberculosis in India: a neglected domain. Indian J Tuberc. 2021;68(1):72-8.
23. Thomas BE, Shanmugam P, Malaisamy M, et al. Psychosocial correlates of health-related quality of life of tuberculosis patients in South India. Health Qual Life Outcomes. 2009;7:11.

24. Tola HH, Shojaeizadeh D, Garmaroudi G, et al. Psychological distress and its association with sociodemographic factors among TB patients in Ethiopia. BMJ Open. 2015;5(9):e009705.
25. Duko B, Gebeyehu A, Ayano G. Prevalence and correlates of common mental disorders among patients with tuberculosis in Ethiopia: a cross-sectional study. Neuropsychiatr Dis Treat. 2015;11:1735-41.
26. Somma D, Thomas BE, Karim F, et al. Gender and sociocultural determinants of TB-related stigma in Bangladesh, India, Malawi and Colombia. Int J Tuberc Lung Dis. 2008;12(7):856-66.
27. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): construct validity and normative data. Br J Clin Psychol. 2005;44:227-39.
28. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd ed. Sydney: Psychology Foundation; 1995.

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