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**PSYCHOLOGICAL AND EMOTIONAL EFFECTS OF ANTITUBERCULAR DRUGS  
IN PATIENTS WITH TUBERCULOSIS: PREVALENCE, RISK FACTORS, AND  
OUTPATIENT MANAGEMENT**

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**Abstract.** Antitubercular therapy (ATT) is essential for the treatment of tuberculosis (TB); however, prolonged pharmacotherapy can induce psychological and emotional disturbances, affecting adherence, quality of life, and treatment outcomes. This study aimed to evaluate the prevalence, severity, and risk factors of mental-emotional disorders associated with antitubercular drugs in TB patients and to assess the effectiveness of outpatient psychological interventions. A total of 180 TB patients undergoing first-line or second-line ATT were evaluated using the Hospital Anxiety and Depression Scale (HADS), Patient Health Questionnaire (PHQ-9), and clinical interviews. The results revealed that 92 patients (51.1%) exhibited moderate-to-severe emotional disturbances, including anxiety (42%) and depression (38%). MDR-TB, prolonged therapy duration, history of previous mental health disorders, and low social support were significant risk factors ( $p < 0.01$ ). Outpatient psychological interventions, including counseling, stress management, and patient education, significantly improved emotional well-being and treatment adherence over a 12-week follow-up. These findings emphasize the importance of integrating mental health assessment and psychosocial support into TB treatment protocols to optimize clinical outcomes.

**Keywords:** Tuberculosis; Antitubercular drugs; Mental health; Anxiety; Depression; Emotional disturbances; MDR-TB; Outpatient care; Psychosocial support; Treatment adherence

**Introduction.** Tuberculosis remains a major global health challenge, with an estimated 10.6 million new cases reported in 2022. While the physical manifestations and complications of TB are well documented, increasing evidence suggests that the psychological and emotional effects of both the disease and its treatment are significant yet underappreciated. Antitubercular drugs, while essential for eradicating *Mycobacterium tuberculosis*, have been associated with neuropsychiatric side effects, particularly when used over extended periods or in combination regimens for multidrug-resistant TB (MDR-TB).

First-line drugs, including isoniazid, rifampicin, ethambutol, and pyrazinamide, have been linked to mood disturbances, irritability, and mild cognitive effects. Second-line drugs, such as cycloserine, fluoroquinolones, and aminoglycosides, present a higher risk of anxiety, depression, and psychotic symptoms. These drug-induced effects often co-occur with the psychological burden of chronic illness, prolonged isolation, and social stigma, creating a compounded risk for mental-emotional disorders.

Mental-emotional disturbances can negatively impact treatment adherence, delay recovery, and increase the risk of relapse, ultimately influencing TB control efforts at the population level. Despite this, routine mental health assessment is rarely incorporated into outpatient TB care. The present study aims to investigate the prevalence, severity, and risk factors of psychological and emotional disorders associated with antitubercular drugs and to evaluate the effectiveness of structured outpatient psychological support in mitigating these effects.

#### Materials and Methods.

**Study Design and Participants:** A prospective observational study was conducted in outpatient TB clinics from January to December 2025. A total of 180 adult TB patients, aged 18–70 years, undergoing first-line or second-line ATT were enrolled. Exclusion criteria included pre-existing severe psychiatric disorders, cognitive impairment, pregnancy, or comorbidities preventing participation.

#### Clinical Assessment:

Detailed medical history, including TB type, drug regimen, duration of therapy, and prior mental health disorders

Sociodemographic data: age, gender, education, occupation, social support

- Physical examination

#### Psychological Assessment:

- Hospital Anxiety and Depression Scale (HADS) for anxiety and depression severity
- Patient Health Questionnaire (PHQ-9) for depressive symptoms
- Structured clinical interviews assessing emotional well-being, sleep quality, and stress

#### Interventions:

Patients with moderate-to-severe mental-emotional disturbances received:

- Outpatient counseling and cognitive-behavioral therapy
- Stress management and relaxation techniques
- Patient education about potential drug side effects
- Social support facilitation

**Statistical Analysis:** SPSS v26 used. Continuous variables: mean  $\pm$  SD; categorical: n (%). Comparisons: t-test, chi-square test. Logistic regression identified risk factors for mental-emotional disturbances. Significance:  $p < 0.05$ ; odds ratio (OR) with 95% confidence interval (CI) calculated.

#### Results

##### Prevalence of Mental-Emotional Disorders:

- 92/180 patients (51.1%) exhibited moderate-to-severe psychological disturbances.
- Anxiety: 42% (76 patients)
- Depression: 38% (68 patients)
- Combined anxiety and depression: 29%

##### Risk Factors:

Risk Factor	Patients with Disorders (n=92)	Patients without Disorders (n=88)	OR (95% CI)	p-value
MDR-TB	36%	10%	5.2 (2.3–11.8)	<0.001
Therapy duration >6 months	48%	20%	3.6 (1.9–6.8)	<0.001
Previous mental disorder	22%	4%	6.8 (2.1–21.9)	0.001



Low social support	44%	19%	3.4 (1.7–6.6)	<0.001
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Laboratory and Clinical Findings:

- No direct correlation between biochemical markers and psychological symptoms, indicating drug-related neuropsychiatric effects may be independent of inflammatory activity.
- Sleep disturbances reported in 54% of affected patients.

Effectiveness of Outpatient Psychological Support:  
After 12 weeks of structured support:

- Mean HADS-Anxiety score decreased from  $12.3 \pm 3.1$  to  $7.8 \pm 2.5$  ( $p < 0.001$ )
- Mean HADS-Depression score decreased from  $11.8 \pm 3.4$  to  $7.2 \pm 2.3$  ( $p < 0.001$ )
- PHQ-9 score decreased from  $13.2 \pm 4.0$  to  $7.5 \pm 2.5$  ( $p < 0.001$ )
- Treatment adherence improved from 76% to 92%
- Patient-reported quality of life improved in 70%

Figures and Tables:

- Figure 1: Prevalence of anxiety and depression by drug type (first-line vs. second-line)
- Figure 2: Improvement in HADS and PHQ-9 scores after outpatient support
- Table 2: Risk factors associated with drug-induced psychological disturbances

**Discussion.** This study confirms that antitubercular drugs, particularly in prolonged or second-line regimens, are significantly associated with psychological and emotional disturbances. More than half of patients exhibited moderate-to-severe anxiety and depression, consistent with global reports on TB-related mental health burden. MDR-TB, prolonged therapy, prior mental health disorders, and low social support were identified as major risk factors.

Drug-induced neuropsychiatric effects can arise through multiple mechanisms, including interference with neurotransmitter metabolism, systemic metabolic alterations, and cumulative stress from treatment side effects. Cycloserine and fluoroquinolones, in particular, have been implicated in inducing anxiety, depression, and psychosis in susceptible patients. These effects, coupled with the psychosocial burden of chronic illness, create a high-risk environment for treatment non-adherence and impaired quality of life.

Structured outpatient interventions, including counseling, stress management, and patient education, proved highly effective in mitigating psychological distress. Patients receiving such interventions demonstrated significant improvements in HADS and PHQ-9 scores, higher adherence, and better overall well-being. These findings reinforce the need for routine mental health screening and psychosocial support integration into TB treatment protocols.

From a public health perspective, addressing mental-emotional disturbances in TB patients is critical. Untreated psychological disorders can prolong infectious periods, increase relapse risk, and elevate healthcare costs. Holistic care models that include mental health assessment, patient education, and support systems are essential to optimize TB control and improve patient-centered outcomes.

**Conclusion.** Antitubercular drugs, while essential for curing TB, are associated with significant psychological and emotional effects, particularly in prolonged or second-line therapy. MDR-TB, extended therapy duration, previous mental disorders, and low social support increase



vulnerability. Early identification, structured outpatient psychological interventions, and continuous monitoring improve emotional well-being, treatment adherence, and quality of life. TB management should integrate mental-emotional health assessment and psychosocial support as core components of comprehensive care.

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