IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

GENDER DIFFERENCES IN ANXIETY, DEPRESSION AND PERCEIVED STIGMA AMONG TUBERCULOSIS PATIENTS

Saumya Brajesh Singh (Student)

Dr. Shivali Pandey (Assistant Professor)

Amity Institute of Behavioural and Applied Sciences

Amity University, Lucknow Campus

Uttar Pradesh, India

Abstract

Tuberculosis is among the most prevalent infectious diseases globally and continues to impose a substantial psychological burden on those affected. Beyond its physical consequences, TB is frequently associated with elevated levels of anxiety, depression, stress, and social stigma - factors that can significantly undermine treatment adherence and quality of life. While gender has been identified as a potential determinant of psychological outcomes in clinical populations, its role among tuberculosis patients in the Indian context remains insufficiently examined.

A quantitative cross-sectional comparative design was employed to assess gender differences in psychological distress and perceived stigma among tuberculosis patients. A total of 65 participants (32 male, 33 female) were recruited from hospital settings across Uttar Pradesh. The DASS-21 and the internalized stigma subscale of the Van Rie Tuberculosis Stigma Scale were administered.

The findings indicate that female tuberculosis patients reported significantly higher levels of depression and internalized stigma compared to male patients, both with medium effect sizes. While anxiety and stress scores were directionally higher in females, these differences did not reach statistical significance. Perceived stigma was significantly and positively correlated with all three DASS-21 subscales across both gender groups. These results partially support the hypothesis and underscore the need for gender-sensitive psychological screening and support within TB care programmes in India.

KEYWORDS: Tuberculosis, gender differences, depression, anxiety, stress, perceived stigma, DASS-21, Van Rie Stigma Scale, psychological distress, cross-sectional study, India

INTRODUCTION

Tuberculosis remains one of the most persistent infectious diseases in human history. Caused by a bacterial pathogen, it primarily targets the respiratory system and travels from person to person through airborne droplets released during coughing, sneezing, or spitting. The condition responds well to antibiotic treatment, yet when left unmanaged, it carries a significant risk of death. The disease takes hold when the bacteria begin actively multiplying within the body, gradually affecting vital organs, most commonly the lungs, though the kidneys, spine, and brain are not immune. What makes TB particularly difficult to contain is the slow, quiet nature of its early symptoms. For many months, an infected person may feel only mildly unwell, all the while unknowingly passing the bacteria to those around them. When symptoms do become apparent, they typically include a persistent cough (occasionally producing blood), chest discomfort, unexplained fatigue, noticeable weight loss, recurring fevers, and drenching night sweats. Some individuals carry the bacteria without ever showing symptoms, yet remain capable of infecting others. Despite being both preventable and treatable, TB has infected roughly a quarter of the world's population at some point.

On a global scale, no other single infectious agent claims more lives annually, and TB consistently ranks among the top ten causes of death worldwide. In 2024 alone, it has affected millions of men, women and children. The disease shows no geographic or demographic boundaries, though its heaviest toll falls on working-age adults in lower-income nations. More than four-fifths of all TB cases and fatalities occur in low- and middle-income countries. The WHO South-East Asia Region bore the largest share of new cases at 34%, followed by the Western Pacific at 27% and Africa at 25%. Thirty high-burden countries together accounted for roughly 87% of new cases globally, with India, Indonesia, the Philippines, China, Pakistan, Nigeria, the Democratic Republic of Congo, and Bangladesh together representing nearly two-thirds of the worldwide total (World Health Organization, 2025).
TB infection — sometimes distinguished from active disease — refers to a state in which a person harbours live Mycobacterium tuberculosis bacteria without necessarily showing outward signs of illness. Contemporary research treats this not as a fixed condition but as a fluid, dynamic process shaped by the ongoing relationship between the pathogen and the host's immune defences (Agbota et al., 2023). India's position within this landscape is particularly significant: the country accounts for approximately 28% of the global TB burden and holds the highest rate of TB infection worldwide. Statistically, somewhere between five and ten percent of infected individuals eventually progress to active disease. Because diagnosis is so frequently delayed, a single active case can silently infect multiple people before treatment begins, continuously replenishing the pool of those carrying the infection (Chauhan et al., 2023).

Beyond its physical toll, TB inflicts a considerable burden on the mental and emotional wellbeing of those it affects. Patients commonly contend with stress, anxiety, depression, social stigma, and in some cases, substance use - all of which erode quality of life and can slow or complicate physical recovery. This relationship runs in both directions: pre-existing psychological distress has been shown to worsen the trajectory of TB itself. The highly contagious nature of the disease amplifies social fears and community-level stigma, which in turn deepens the mental health challenges patients face. These struggles tend to be most acute in the early stages of diagnosis and treatment, when fear of spreading the disease to loved ones, the prospect of a lengthy treatment regimen, concerns about side effects, and the possibility of repeated hospitalization all converge to heighten anxiety. Research has confirmed that TB and its treatment can meaningfully diminish a patient's psychosocial functioning and overall quality of life - making early identification and ongoing monitoring of anxiety an important clinical priority.

When anxiety disorders coexist with TB, the consequences extend beyond personal suffering. Untreated anxiety can undermine a patient's ability to stick with their treatment plan, raising the risk of incomplete courses and, ultimately, drug-resistant TB. Understanding just how widespread anxiety is among TB

patients is therefore a necessary step toward building meaningful clinical guidelines. Without timely diagnosis and care for these mental health conditions, achieving full remission becomes considerably harder. In this context, anxiety is understood broadly, encompassing diagnosed anxiety disorders, positive results on validated psychological screening tools, or both where applicable. The intersection of TB and mental health has received growing scholarly attention in recent decades. TB, along with depression and anxiety, ranks among the leading contributors to years lived with disability globally. A recent systematic review found depression rates among TB patients reaching as high as 45%, far exceeding the rates seen in the general population. Despite this, the prevalence of anxiety specifically, along with its relationship to stress and quality of life in TB patients, has yet to be examined with comparable rigor (Sutar et al., 2024).

Alongside anxiety, depression has emerged as a significant but inconsistently studied companion to tuberculosis, with prevalence estimates varying widely across settings and populations. Stigma, too, remains a defining yet underexamined dimension of the TB experience — particularly in India, where social and cultural pressures compound the psychological burden of the illness in ways that biomedical frameworks alone cannot capture. The intersection of these variables with gender adds a further layer of complexity that existing research has yet to address with adequate rigor. The present study therefore examines anxiety, depression, stress, and perceived stigma among tuberculosis patients through a gendered lens, with the aim of contributing evidence that can meaningfully inform more holistic and gender-sensitive approaches to TB care.

RATIONALE OF THE STUDY

In India, tuberculosis is still a major public health issue and is typically treated as a biological illness. However, mounting data indicates that the illness is also linked to significant psychological distress, including stress, anxiety, and depressive symptoms. In addition to these psychological difficulties, people with tuberculosis often face social stigma, which can be internalized and have a detrimental effect on one's emotional health and self-perception. Treatment compliance, recovery results, and general quality of life may all be impacted by these psychosocial factors. Because social roles, cultural norms, and structural disparities can affect how men and women view illness and deal with its aftereffects, gender may also have an impact on the experience of tuberculosis. Gender differences in psychological distress and perceived stigma among tuberculosis patients in the Indian clinical context have not been thoroughly studied, despite the significance of these factors. In order to contribute to a more thorough and psychologically informed approach to tuberculosis care, the current study aims to investigate gender as a determinant of anxiety, depression, stress, and internalized stigma among tuberculosis patients.

OBJECTIVES OF THE STUDY

1. To understand the gender differences in depression experienced by Tuberculosis patients.
2. To understand the gender differences in anxiety and stress experienced by Tuberculosis patients.
3. To understand the gender differences in perceived stigma experienced by Tuberculosis patients.

HYPOTHESIS

1. **H_1:** Female tuberculosis patients will score significantly higher than male tuberculosis patients on the anxiety, depression, and stress subscales of the DASS-21 and the internalized stigma subscale of the Van Rie Tuberculosis Stigma Scale.

2. **H_0:** There is no statistically significant difference between male and female tuberculosis patients on the anxiety, depression, and stress subscales of the DASS-21 and the internalized stigma subscale of the Van Rie Tuberculosis Stigma Scale.

1. RESEARCH PAPERS ON ANXIETY AND DEPRESSION IN PATIENTS WITH TUBERCULOSIS

Solanki et al. (2023): A cross-sectional study was conducted across multiple institutes in Ahmedabad district to examine the prevalence of anxiety and depression among tuberculosis patients and their association with various sociodemographic and clinical variables. The findings indicated that roughly one-third of patients experienced anxiety while slightly more than one-third experienced depression, with the prevalence of depression exceeding that of anxiety. Notably, anxiety showed a statistically significant association with gender, suggesting that male and female patients may differ in their vulnerability to anxiety symptoms during the course of TB treatment. Depression, however, was not significantly linked with gender, pointing to a more complex and possibly multifactorial pattern. While the study offers useful prevalence data within an Indian urban context, the cross-sectional design limits any conclusions about the direction of these associations over time.

Salodia, Sethi & Khokhar (2019): A cross-sectional study was carried out at a DOTS centre in a rural area of Delhi to assess the prevalence of depression among tuberculosis patients and identify its associated factors. The study found that nearly one in four TB patients met criteria for depression, reinforcing the view that psychological distress is a common but under addressed feature of TB illness in India. Factors such as long treatment duration, social stigmatization, and limited family support were identified as contributing to the development of depressive symptoms. Interestingly, the study did not find a statistically significant association between depression and gender, which stands in contrast to findings from studies conducted in other settings. This makes the study particularly relevant as a point of comparison, and underscores the need for further gender-sensitive research within Indian clinical populations to clarify whether and how gender shapes depression in TB patients.

Srinivasan et al. (2021*):* A descriptive study conducted at a tertiary care teaching hospital in North India (KGMU, Lucknow) examined the prevalence of depression and anxiety specifically among drug-resistant tuberculosis patients attending a DOTS clinic. The findings revealed a substantially high burden of both conditions, with depression present in a majority of MDR-TB patients and anxiety levels also markedly elevated. Duration of illness and level of literacy were identified as the strongest predictors of both depression and anxiety in this population. The study highlights that drug-resistant TB, by virtue of its prolonged and demanding treatment regimen, places patients at a considerably higher psychological risk than drug-sensitive TB. Given that this study was conducted in the same geographic region as the present research, its findings serve as a clinically relevant reference point for understanding the mental health challenges faced by TB patients in North India.

Rajeev & Satyanarayana (2022)**:** A hospital-based study was carried out to examine the levels of stress, depression, and coping among tuberculosis patients. The findings indicated that a substantial proportion of patients reported moderate levels of depression, and several clinical-social factors were found to be statistically significant in relation to perceived stress scores. Among these, gender emerged as a meaningful variable, alongside factors such as perceived TB stigma, family support, HIV comorbidity,

and diabetes status. The co-occurrence of stigma and stress in the same study is particularly noteworthy, as it suggests that the psychological burden of TB cannot be understood without also accounting for the social environment in which patients experience their illness. The study contributes to a growing body of Indian evidence indicating that TB management must move beyond a purely biomedical framework to incorporate mental health and social support as central components of care.

Samal et al. (2025) conducted a systematic review aimed at gauging how frequently depression appears among TB patients in India and at identifying the variables most strongly linked to depressive episodes. Their meta-analytic findings confirmed that depression occurs at rates substantially above those seen in the general Indian population. Among the contributing factors, financial hardship, advanced disease severity, weak social networks, and the presence of comorbid conditions all emerged as significant predictors of psychological distress. The authors call for mental health screening to be woven into routine TB care, arguing that psychological and clinical needs must be addressed together for interventions to be truly effective.

Sutar et al. (2024) undertook a systematic review and meta-analysis to map the extent of anxiety, stress, and quality-of-life impairment in people living with TB. Pooling data across multiple studies, the authors established that psychological suffering is widespread in this group, with anxiety levels considerably exceeding population norms. Quality of life was found to deteriorate across several domains — most visibly in physical health, emotional wellbeing, and social participation. The authors note that gender-based differences in these outcomes remain poorly understood, pointing to this as a meaningful gap requiring dedicated future investigation.

Panibatla et al. (2024) carried out a systematic review and meta-analysis with the specific aim of quantifying the overall rates of depression and anxiety in TB-diagnosed populations. Their results confirmed that psychological symptoms occur more often in TB patients than in the broader population. The review further highlights the downstream consequences of leaving these conditions unaddressed — including poor medication adherence, deteriorating quality of life, and unfavorable treatment outcomes. The authors acknowledge, however, that wide variation in study designs and sample characteristics across included works makes it difficult to draw universally applicable conclusions.

Kumar et al. (2016) conducted a hospital-based cross-sectional study exploring the prevalence of depression and anxiety in TB patients. Their data revealed that a meaningful proportion of participants reported moderate to severe psychological distress, reinforcing the view that mental health difficulties are far from rare in this population. The authors suggest that emotional disruption likely has an adverse effect on treatment adherence and recovery, and they advocate for broadening TB management beyond biomedical care to include routine psychological assessment and support. That said, the cross-sectional study design prevents any firm conclusions about causality, and the single-site sample may limit how broadly the findings can be applied.

Amreen et al. (2016) used a cross-sectional design to investigate the frequency of depression and anxiety among TB patients undergoing treatment. Their results were striking — depression was present in 56% of participants and anxiety in 65%, indicating that psychological burden is a near-routine experience for this group. The study's main limitation lies in its limited engagement with demographic variables; in particular, gender-based differences were not explored in sufficient depth to allow meaningful subgroup comparisons.

Rukhsana Rubeen et al. (2014) investigated the connections between anxiety, depression, and quality of life in a TB patient sample. A considerable share of participants met thresholds for clinically significant anxiety and depressive symptoms. Importantly, the study found that greater psychological distress was associated with worse quality of life — especially across psychological and social dimensions — and that patients carrying heavier emotional burdens also reported lower life satisfaction and reduced

capacity for daily functioning. As with several other studies in this area, demographic factors such as gender received limited analytical attention, leaving open questions about how outcomes may differ across population subgroups.

1. RESEARCH PAPERS ON GENDER DIFFERENCES IN ANXIETY AND DEPRESSION

Farhane-Medina et al. (2022) carried out a systematic review examining the factors that drive sex and gender-based disparities in anxiety rates and comorbid conditions. Their findings consistently showed that women experience anxiety disorders at higher rates than men and are more prone to concurrent conditions such as depression. The contributors to this gap were found to be multifaceted — encompassing hormonal fluctuations, heightened reactivity to stress, greater exposure to adverse life experiences, and the weight of socially prescribed gender roles. A central argument of the review is that no single explanation is sufficient; rather, these disparities emerge from the layered interplay between biological susceptibility and sociocultural context. The authors urge both researchers and clinicians to incorporate gender-sensitive frameworks into their work to more effectively address these entrenched patterns.

Piccinelli (2000) undertook a critical appraisal of the literature on gender and depression, drawing together evidence on prevalence rates, risk factors, and underlying explanations. Across cultures and age groups, women were found to receive depression diagnoses more frequently than men — a pattern that proved remarkably consistent. Yet the author is careful to argue against purely biological interpretations of this gap. Hormonal factors, socially defined roles, cumulative stress exposure, and divergent help-seeking behaviours are all presented as relevant contributors. The review also raises a pointed observation: depression among men may be systematically underdiagnosed, given that men often express distress through different behavioural channels. The overarching conclusion is that gender differences in depression are shaped by a complex convergence of biological, psychological, and sociocultural forces rather than any one determinant.

Dorte M. Ditlevsen (2015) and colleagues explored why anxiety disorders appear more frequently in women than in men, while resisting the temptation to reduce this difference to biology alone. Hormonal variation and differences in how stress-response systems function may raise women's baseline vulnerability, but social conditioning, culturally enforced gender roles, and accumulated life stressors contribute with equal significance. The authors also draw attention to differences in how distress is expressed: women tend toward internalizing responses such as worry and fear, while men more commonly channel distress outwardly or differently. Coping strategies also diverge along gender lines — women more often draw on emotion focused approaches, whereas men more frequently rely on avoidance. Taken together, the authors frame anxiety as a product of biological and sociocultural factors working in concert rather than in isolation.

McLean et al. (2011) examined gender-based differences in anxiety disorders across several dimensions, including how common they are, how they progress over time, how often they co-occur with other conditions, and what overall burden they place on those affected. Women showed significantly higher lifetime prevalence across most anxiety disorder categories, along with earlier age of onset, more pronounced symptom severity, and greater likelihood of comorbid depression. While the general course of illness did not diverge dramatically between genders, women carried a heavier overall burden — largely due to more chronic presentations and greater interference with daily functioning. The authors attribute these disparities to a combination of biological predisposition and gender-linked psychosocial pressures, and they call for assessment and treatment approaches that are explicitly responsive to gender.

Armstrong (2002) investigated how anxiety manifests differently across genders within a non-clinical population, paying particular attention to symptom levels, anxiety-related thought patterns, and sensitivity to bodily sensations associated with anxiety. Women in the sample reported higher overall anxiety and were more likely to perceive physical sensations as signals of threat, a cognitive tendency that may amplify vulnerability over time. The study's key contribution lies in demonstrating that these differences are not confined to clinical settings; even among individuals without diagnosed disorders, women display greater anxiety sensitivity. This points to the role of cognitive patterns — particularly the tendency to catastrophize internal physical cues, as a meaningful driver of gender disparities in anxiety, independent of formal diagnosis.

2. RESEARCH PAPERS ON STIGMA AND PERCEIVED STIGMA AROUND TUBERCULOSIS

Murugan et al. (2025): A narrative review was conducted to systematically examine the types of stigmas experienced by persons with tuberculosis and their household members in India, with a focused analysis on gender differences and potential interventions. The review found that TB-related stigma consistently produces adverse effects on emotional well-being, interpersonal relationships, and treatment adherence across the Indian context. A particularly important finding was that women bear a disproportionately higher burden of TB-related stigma compared to men, with consequences that extend beyond the individual to affect family dynamics and social standing. The review also noted that stigma functions as a direct barrier to treatment-seeking, making it not merely a psychosocial concern but a public health issue with measurable consequences for TB control. Given the comprehensive and India-specific scope of this review, its findings offer strong contextual support for the present study's focus on gender as a determinant of perceived stigma among TB patients.

Pradhan et al. (2022) explored the intertwined dynamics of stigma, depression, drug resistance, and treatment adherence in patients diagnosed with pulmonary tuberculosis. The study assessed three distinct but related constructs, internalized stigma, meaning the negative beliefs patients hold about themselves because of their illness; perceived stigma, referring to their awareness of how society views them; and depressive symptomatology. A notable pattern emerged: patients dealing with drug-resistant TB reported markedly elevated levels of both stigma and depression relative to those whose TB responded to standard drug regimens. Beyond simply documenting these differences, the study went further to show that internalized stigma and depression each functioned as mediating pathways between drug resistance status and patients' ability to maintain consistent treatment. This finding reframes TB management as something far broader than a purely biomedical challenge - it underscores that how patients feel about themselves and how they believe others perceive them are just as consequential to recovery as the clinical characteristics of the disease itself.

Nofalia (2020) investigated the nature and lived consequences of stigma as experienced by individuals with tuberculosis, drawing on evidence pooled across 15 published articles. The picture that emerged was largely consistent: stigma directed at TB patients was reported as high across most of the communities studied. People within these communities expressed discomfort being around individuals with TB, withdrew from social interaction with them, and were hesitant to share meals or allow their children to play alongside those affected. Rather than remaining a passive social attitude, this stigma had tangible behavioural consequences - patients became more socially withdrawn, and this withdrawal in turn made it harder for healthcare workers to maintain contact with them during the course of treatment. Nofalia concludes that stigma-reduction efforts must engage both patients and health personnel simultaneously, and that interventions need to operate at the level of the individual as well as the wider community to bring about meaningful change.

Jaramillo (1999) investigated the roots and social predictors of TB-related stigma, with a particular focus on understanding how prejudiced attitudes toward people with TB develop and persist. The study found a strong connection between misinformation and stigma: individuals who held inaccurate beliefs about how TB spreads, or who associated the disease with moral failing or social deviance, were significantly more likely to endorse discriminatory views. This finding is important because it repositions stigma not as a simple emotional reaction but as a socially constructed phenomenon, shaped by knowledge gaps and cultural narratives. Given that stigma contributes to social exclusion, delays in seeking care, and considerable emotional suffering, the author argues that identifying what drives stigmatizing attitudes is an essential prerequisite for designing public health campaigns capable of dismantling them at their source.

3. RESEARCH PAPERS ON GENDER DIFFERENCES IN PERCEIVED STIGMA

Sakyi et al. (2024) brought into focus the degree to which gender mediates the connection between TB stigma and mental health among tuberculosis patients in Botswana. Their starting premise was that stigma surrounding infectious illness is known to worsen psychological outcomes, and that this process may not unfold identically for men and women. The research team deployed structured questionnaires to capture both HIV- and TB associated stigma, along with markers of depression and anxiety, before running gender stratified analyses to tease apart how these variables related differently across the two groups. What the data revealed was that stigma, regardless of type, carried real psychological consequences for both men and women, yet the way those consequences manifested was distinctly gendered. The association between TB stigma and depressive symptoms, in particular, was far more pronounced among female patients. The broader implication the authors draw is that gender-blind approaches to studying or treating TB-related psychological distress are likely to miss something important, that gender must sit at the center, not the margins, of this inquiry.

Kumari Indira et al. (2023) took a less common route by directing their investigation toward people living without TB, asking how community members in central Kerala perceived and expressed stigma toward those with the disease, and whether men and women in the community did so differently. Hospital visitors completed structured questionnaires and reacted to short written scenarios, vignettes, portraying a person diagnosed with TB. Interestingly, the overall stigma scores across the community sample were not particularly high, yet women in the group consistently registered stronger stigmatizing attitudes than men. The effect was sharpest when the vignette described a female TB patient, hinting that gendered stigma is animated not only by the observer's own gender but by the gender of the person being judged. An equally telling finding was that how much participants knew about TB had little bearing on how stigmatizing they were, suggesting that information campaigns alone would be insufficient, and that the real work of reducing stigma lies in addressing the sociocultural beliefs underneath it.

Thomas et al. (2021) examined how TB stigma continues to undermine disease management efforts throughout India, tracing the roots of this problem and sketching out potential ways forward. In the authors' view, stigma in this context is sustained by a constellation of factors: inflated anxieties about catching TB, public misunderstanding of transmission routes, and deeply seated cultural narratives that frame the disease as a source of social shame. The gendered dimension of this stigma received particular attention, women with TB were found to bear a distinctly heavier social cost, with their diagnosis frequently casting doubt on their marriageability, unsettling their position within the household, and weakening their standing in the eyes of the community. The authors argue that these are not peripheral effects but rather built-in features of how TB stigma functions within Indian society, making gender awareness an indispensable part of any credible response.

Mukerji (2016) focused specifically on how TB stigma shapes the daily realities of women in Kolkata, India, capturing its many manifestations across personal, familial, and community domains. Women in the study consistently described stigma as something that penetrated multiple layers of their lives simultaneously, their relationships at home, their standing among neighbours, and their sense of self were all affected. Revealing a TB diagnosis frequently brought with it a cascade of anxieties: that family honour would be compromised, that marriage prospects would be damaged, that others would pull away. Participants spoke of shame, a wounded sense of identity, and emotional suffering that persisted throughout their illness. What Mukerji draws out from these accounts is that gender norms do not merely colour the stigma experience, they are the very mechanism through which stigma is produced and intensified for women. Responses to this problem, the author contends, must therefore be crafted with these structural gendered realities at their core.

Atre et al. (2011) adopted a perspective that is relatively rare in this field by centering the voices of community members rather than patients, gathering data from 160 adults without active TB in rural Maharashtra to understand how stigma is perceived and anticipated at the community level. The results surfaced a set of striking and gendered assumptions. When it came to women, TB was frequently understood as something that runs in families — a hereditary mark rather than a chance infection. For men, the more pressing concern was how a diagnosis might affect their chances of marriage. Both groups were widely expected to conceal their illness, motivated by the fear of being shut out socially, facing complications in their marital lives, or enduring unkind treatment from those around them. Men and women alike were seen as shouldering a psychological weight tied to their inability to meet social expectations — though the particular shape of that burden differed by gender, reflecting the different roles each was expected to occupy. Because these community attitudes form the invisible architecture within which patients decide whether to disclose their illness or pursue care, they carry real consequences for health-seeking behaviour and treatment engagement.

Somma et al. (2008) cast a wide comparative net, examining how TB stigma is constructed and experienced across four distinct national settings, Bangladesh, India, Malawi, and Colombia, with an eye toward understanding how gender and cultural context shape its expression. Their findings challenged any notion that stigma is a singular or universal experience, showing instead that it is deeply context-dependent, coloured by local belief systems, gendered norms, and prevailing social hierarchies. Across most of the sites studied, women's social position left them especially exposed, a TB diagnosis could threaten their marriages, sever community ties, and bring reputational harm to their families in ways that went well beyond the disease itself. Men navigated a different but equally real set of pressures, with stigma often crystallizing around their identity as providers and their fear of becoming economically incapacitated. The study's comparative design makes visible what single-site studies often cannot: that while the experience of TB stigma is always gendered, precisely how gender matters depend on the social world a person inhabits.

Taken together, the existing body of literature establishes a clear and consistent pattern: tuberculosis is not merely a biomedical condition but one that carries a substantial psychological and social burden. Studies conducted across varied clinical settings, including several within India, confirm that anxiety, depression, and stress are markedly more prevalent among TB patients than in the general population, and that these psychological difficulties are closely intertwined with treatment adherence, quality of life, and overall recovery outcomes. The evidence also points to stigma as a defining feature of the TB experience in India, one that operates at individual, familial, and community levels and compounds the distress already associated with the illness itself.

What is less resolved in the existing literature is the role of gender in shaping these experiences. While several international studies indicate that women tend to report higher levels of anxiety and depression across clinical populations, findings from Indian TB-specific research on this question remain inconsistent. Some studies have found a significant association between gender and anxiety, while others report no meaningful difference in depression across gender groups, suggesting that the relationship is more nuanced than a straightforward female disadvantage. Similarly, with respect to stigma, there is growing qualitative and community-level evidence that women with TB face more severe social consequences, including concerns about marriage, family reputation, and social exclusion, yet quantitative studies examining internalized stigma by gender among Indian TB patients remain scarce.

This gap is significant. If gender does shape the psychological and social experience of tuberculosis in meaningful ways, then treatment approaches that do not account for this dimension may be systematically failing a section of patients. The present study addresses this gap directly by examining gender as a determinant of anxiety, depression, stress, and perceived stigma among tuberculosis patients in an Indian clinical setting, using validated psychological tools to allow for rigorous, comparable measurement. In doing so, it aims to contribute empirical evidence that can inform more gender-sensitive, psychologically informed approaches to tuberculosis care in India.

RESEARCH DESIGN

This study employed a quantitative cross-sectional comparative design. A cross-sectional approach was selected because the study aimed to assess psychological variables at a single point in time across a defined sample, rather than to track changes longitudinally. The comparative element of the design allowed for systematic examination of differences between male and female tuberculosis patients on the variables of interest. This design is well suited to the research objectives, which seek to determine whether gender functions as a meaningful differentiator of anxiety, depression, stress, and perceived stigma within a clinical TB population.

SETTING

Data collection was conducted at various hospital settings based in Varanasi, Jaunpur, Azamgarh and Ghazipur.

SAMPLE

A total of 65 participants were included in the study, comprising 32 male and 33 female tuberculosis patients. An equal gender distribution was maintained deliberately to ensure that group comparisons were not confounded by unequal sample sizes. Participants were recruited using convenience sampling, wherein individuals who were available at the data collection site during the period of data collection and who met the eligibility criteria were included.

INCLUSION CRITERIA

- Patients with a confirmed diagnosis of tuberculosis, either pulmonary or extra-pulmonary
- Patients aged between 18 and 60 years
- Patients currently undergoing treatment for tuberculosis, or having completed treatment
- Patients willing to provide written informed consent

- Patients possessing sufficient cognitive and linguistic capacity to comprehend and respond to the survey instruments

EXCLUSION CRITERIA

- Patients with comorbid psychiatric diagnoses predating their tuberculosis diagnosis
- Patients currently undergoing psychiatric pharmacotherapy unrelated to their TB condition
- Patients below 18 or above 60 years of age
- Patients unable or unwilling to provide informed consent

VARIABLES

- Gender: Independent variable (IV). Defined as the biological sex of the participant as reported by the individual, categorized as male and female. In this study, gender is treated as a grouping variable used to examine differences in psychological and social outcomes among tuberculosis patients.
- Anxiety: Dependent variable (DV). Operationally defined as the score obtained on the Anxiety subscale of the Depression Anxiety Stress Scale-21 (DASS-21). It refers to autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect as reported by tuberculosis patients.
- Depression: Dependent variable (DV). Operationally defined as the score obtained on the Depression subscale of the DASS-21. It encompasses feelings of low mood, hopelessness, worthlessness, lack of motivation, and anhedonia as self-reported by tuberculosis patients.
- Stress: Dependent variable (DV). Operationally defined as the score obtained on the Stress subscale of the DASS-21. It refers to persistent tension, irritability, difficulty relaxing, and overreaction to stressors as self-reported by tuberculosis patients.
- Perceived Stigma: Dependent variable (DV). Operationally defined as the score obtained on the internalized stigma subscale of the Van Rie Tuberculosis Stigma Scale. It refers to the extent to which tuberculosis patients internalize negative social attitudes, feel shame about their diagnosis, and perceive themselves as devalued by others due to their illness.

TOOLS

(a) Demographic Information Schedule

A structured demographic schedule recorded the following anonymised, non-identifying information for each participant: gender, age range (18–25, 26–35, 36–45, 46–60), marital status, educational qualification band, occupation category, approximate monthly income band, residential setting (urban/semi-urban/rural), treatment status (currently undergoing treatment/treatment completed), type of TB diagnosed (pulmonary/extra-pulmonary, where consented), and duration of treatment band. No identifying information was collected at any stage.

(b) Depression Anxiety Stress Scales — 21 Item Version (DASS-21)

The DASS-21 is a self-report instrument comprising 21 items divided equally across three subscales: depression (7 items), anxiety (7 items), and stress (7 items). Each item is rated on a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time").

Subscale scores are computed by summing the constituent items and multiplying by 2 to allow comparison with the full DASS-42 normative data. The DASS-21 has demonstrated strong internal consistency, with Cronbach's alpha values typically ranging from 0.82 to 0.93 across subscales in South Asian populations. In the present study, the instrument was administered in either Hindi or English depending on the linguistic preference and literacy level of the participant.

(c) Van Rie Tuberculosis Stigma Scale — Internalized Stigma Subscale

The internalized stigma subscale of the Van Rie Tuberculosis Stigma Scale measures the patient's self-directed stigma experiences related to their tuberculosis diagnosis. Items are rated on a Likert scale and scored according to the original protocol established by Van Rie et al. The subscale has been validated across multiple TB-endemic populations and demonstrates adequate reliability for use in the Indian subcontinent. Like the DASS-21, this instrument was administered in Hindi or English based on participant preference.

Both psychometric instruments were scored independently according to their respective original scoring protocols.

PROCEDURE

Following institutional authorisation and IEC clearance, patients meeting the inclusion criteria were contacted at the hospital settings.

Written, voluntary informed consent was obtained from each participant prior to administration. Participants were informed of their unconditional right to withdraw at any time, without reason, without penalty, and without impact on their ongoing treatment. No monetary or material inducement was offered for participation.

Upon completion of data collection, the raw data was cleaned and anonymised. The researcher received only the cleaned, anonymised dataset for the purposes of statistical analysis. At no point did the researcher have access to identifiable patient information, raw clinical records, or the participant code mapping.

ETHICAL CONSIDERATIONS

The study adheres to all applicable ethical standards for research involving human participants. Non-disclosure agreements and undertakings of confidentiality were executed by the researcher. Institutional authorisation was obtained through the Pre-Emptive Authorisation, and IEC clearance was secured prior to data collection.

No individually identifiable data was collected, recorded, or made available to the researcher at any stage. All data received by the researcher was pre-anonymised by the institution. All electronic data is stored on devices with full-disk encryption and has not been uploaded to any public cloud service or shared drive. Physical survey forms are retained by the institution. A Data Handling Log is maintained by the researcher. Upon completion of the research, all data held by the researcher shall be securely destroyed and a Certificate of Data Destruction furnished to the institution.

Participation was entirely voluntary and in no way linked to the patient's ongoing treatment or care.

STATISTICAL ANALYSIS

Data were analysed using IBM SPSS Statistics. Descriptive statistics including means, standard deviations, and frequency distributions were computed for all subscales across both gender groups and across relevant demographic variables.

The primary analysis employed independent samples t-tests to compare mean scores on each subscale — anxiety, depression, stress, and internalized stigma — between male and female participants. In the event that assumptions of normality were violated, as assessed by the Shapiro-Wilk test, the non-parametric Mann-Whitney U test was used as an alternative. The significance level was set at $p < 0.05$ for all analyses. Effect sizes (Cohen's d) were reported alongside significance values to indicate the practical magnitude of observed differences.

Exploratory analyses were conducted to examine the influence of demographic variables on the primary outcome variables, using one-way ANOVA or Kruskal-Wallis tests as appropriate. Internal consistency of all psychometric instruments was assessed using Cronbach's alpha.

1. SAMPLE CHARACTERISTICS

Variable	**Category**	**N**	**%**
Gender	Male	32	49.2%
	Female	33	50.8%
Age Range	18-25	17	26.2%
	26-35	27	41.5%
	36-45	21	32.3%
	45-60	0	0
Marital Status	Married	38	58.5%
	Single	18	27.7%
	Divorced	7	10.8%
	Widowed	2	3.1%
Education	Below 10th	5	7.7%
	10^{th}-12th	24	36.9%
	Graduate	25	38.5%
	Post-Graduate	11	16.9%

Variable	Category	N	%
Occupation	Employed	23	35.4%
	Student	17	26.2%
	Homemaker	17	26.2%
	Unemployed	5	7.7%
	Self-Employed	3	4.6%
Income (₹/month)	Below ₹15,000	11	16.9%
	₹15,000–₹30,000	23	35.4%
	₹30,000–₹60,000	13	20.0%
	₹60,000–₹1,20,000	12	18.5%
	Above ₹1,20,000	6	9.2%
Residential Setting	Urban	21	32.3%
	Semi-Urban	27	41.5%
	Rural	17	26.2%
TB Type	Pulmonary	56	86.2%
	Extra-Pulmonary	9	13.8%

Table 1. Demographic characteristics of the sample (N = 65)

2. DESCRIPTIVE STATISTICS AND INTERNAL CONSISTENCY

Variable	Group	N	Mean	SD	Median	Min	Max	Range
Depression	Full Sample	65	13.60	10.19	10.00	0	36	36
	Male	32	10.31	9.67	8.00	0	30	30
	Female	33	16.79	9.78	16.00	0	36	36
Anxiety	Full Sample	65	10.92	9.56	8.00	0	34	34

Variable	Group	N	Mean	SD	Median	Min	Max	Range
	Male	32	9.94	9.39	6.00	0	32	32
	Female	33	11.88	9.77	10.00	0	34	34
Stress	Full Sample	65	14.00	10.20	12.00	0	40	40
	Male	32	11.94	10.00	9.00	0	34	34
	Female	33	16.00	10.14	14.00	2	40	38
Stigma	Full Sample	65	11.60	6.60	11.00	0	27	27
	Male	32	9.66	6.41	9.00	0	24	24
	Female	33	13.48	6.32	14.00	3	27	24

Table 2. Descriptive statistics for DASS-21 subscales and Van Rie Stigma Scale by gender

3. INTERNAL CONSISTENCY (CRONBACH'S ALPHA)

Scale	No. of Items	Cronbach's α	Interpretation
DASS-21 Depression	7	.821	Good
DASS-21 Anxiety	7	.809	Good
DASS-21 Stress	7	.803	Good
Van Rie Stigma Scale	12	.790	Acceptable

Table 3. Internal consistency coefficients for psychometric instruments (N = 65)

4. GENDER COMPARISONS ON OUTCOME VARIABLES

Variable	Male M (SD)	Female M (SD)	t (df=63)	p	U	p (MW)	Cohen's d	Effect
Depression	10.31 (9.67)	16.79 (9.78)	-2.683	.009*	323.5	.007*	.666	Medium

Variable	Male M (SD)	Female M (SD)	t (df=63)	p	U	p (MW)	Cohen's d	Effect
Anxiety	9.94 (9.39)	11.88 (9.77)	-0.816	.417	469.0	.441	.203	Small
Stress	11.94 (10.00)	16.00 (10.14)	-1.626	.109	406.0	.110	.403	Small
Stigma	9.66 (6.41)	13.48 (6.32)	-2.425	.018*	349.5	.019*	.602	Medium

*Table 4. Gender comparisons on DASS-21 subscales and Stigma (N = 65). * p < .05. MW = Mann-Whitney U.*

5. PEARSON CORRELATIONS: STIGMA AND DASS-21 SUBSCALES

Comparison	Full Sample (N=65)		Male (n=32)		Female (n=33)	
	r	p	r	p	r	p
Stigma × Depression	.523	< .001*	.501	.003*	.448	.009*
Stigma × Anxiety	.463	< .001*	.442	.011*	.469	.006*
Stigma × Stress	.444	< .001*	.403	.022*	.420	.015*

*Table 5. Pearson correlations between stigma and DASS-21 subscales (full sample and by gender). * p < .05.*

6. EXPLORATORY DESCRIPTIVE ANALYSES

Age Range	Gender	n	Depression M	Anxiety M	Stress M	Stigma M
18–25	Male	9	8.7	5.3	8.7	9.9
	Female	8	19.5	11.8	13.8	13.8
26–35	Male	13	7.1	10.0	12.5	9.5
	Female	14	13.1	10.3	13.3	11.6
36–45	Male	10	16.0	14.0	14.2	9.6
	Female	11	19.5	14.0	21.1	15.6

Table 6. Mean scores by age range and gender (exploratory; small cell sizes).

OVERVIEW

The present study examined gender differences in anxiety, depression, stress, and perceived stigma among tuberculosis patients recruited from multiple hospital settings across Uttar Pradesh. A total of 65 participants (32 male, 33 female) completed the DASS-21 and the internalized stigma subscale of the Van Rie Tuberculosis Stigma Scale. The central hypothesis of the study — that female tuberculosis patients would score significantly higher than male patients across all four outcome variables — was partially supported. Statistically significant gender differences emerged for depression and perceived stigma, both with medium effect sizes, while anxiety and stress showed consistent directional trends favouring higher scores in females but did not reach statistical significance. The findings are discussed below in relation to existing literature, with attention to the psychosocial and cultural context of tuberculosis in North India.

GENDER DIFFERENCES IN DEPRESSION

The most clearly supported finding of the study was that female tuberculosis patients reported significantly higher depression scores than male patients (Mann-Whitney $U = 323.5$, $p = .007$, $d = .666$). This is consistent with the broader pattern documented in the literature. Piccinelli (2000) noted that women are consistently diagnosed with depression more frequently than men across cultures and age groups, attributing this not to biology alone but to an interaction of hormonal, social, and role-based factors. In the specific context of tuberculosis, this pattern has been documented in Indian samples as well. Solanki et al. (2023), in their Ahmedabad-based study, found depression to be prevalent among TB patients and associated with several sociodemographic variables, though notably they did not find a significant gender association for depression specifically. The present study, by contrast, does find this association, which may reflect differences in sample composition, geographic context, or the particular vulnerability of female TB patients in a semi-urban and rural North Indian setting.

Rajeev and Satyanarayana (2022) similarly found gender to be a significant factor in perceived stress among TB patients in a hospital-based Indian study, and Salodia et al. (2019), working from a DOTS

centre in rural Delhi, highlighted that stigmatisation and limited family support contributed to depression in TB patients. The present findings extend this line of evidence by demonstrating that gender itself, independent of other factors, is associated with elevated depressive symptomatology in a North Indian TB sample.

GENDER DIFFERENCES IN ANXIETY AND STRESS

Unlike depression, anxiety and stress did not yield statistically significant gender differences in the present study (anxiety: $U = 469.0$, $p = .441$; stress: $U = 406.0$, $p = .110$). This is perhaps the most theoretically interesting finding and deserves careful consideration rather than dismissal.

It is worth noting that the directional pattern was consistent - female participants reported higher mean scores on both anxiety (Female $M = 11.88$ vs. Male $M = 9.94$) and stress (Female $M = 16.00$ vs. Male $M = 11.94$). The effect size for stress was small to medium ($d = .403$), suggesting a trend that the sample size of the present study may have been insufficiently powered to detect as statistically significant. With a larger sample, this difference might well have reached significance.

However, a purely methodological explanation may not be the whole story. It is also plausible that anxiety, as a response to the immediate threat of illness, contagion, and treatment uncertainty, is experienced comparably by men and women with tuberculosis. Unlike depression, which is more closely tied to social role disruption, relational loss, and internalised negative self-evaluation, experiences that are shaped significantly by gender, anxiety may be a more universal response to the objective circumstances of having a serious infectious disease. Dorte M. Detlevsen (2015) noted that while women generally show higher rates of anxiety disorders, biological and situational triggers can narrow this gap in clinical contexts where both sexes face equivalent objective stressors. Tuberculosis, with its long treatment duration, fear of contagion, and uncertainty of outcome, may constitute precisely such a context.

This interpretation is tentative and the present study cannot resolve it conclusively. What it does suggest is that the gender gap in psychological distress among TB patients is not uniform across all dimensions — it is more pronounced for depression and stigma than for anxiety and stress, a nuance that has implications for how psychological screening in TB care settings should be approached.

GENDER DIFFERENCES IN PERCEIVED STIGMA

The second significant finding was that female participants reported meaningfully higher internalized stigma scores than male participants ($t(63) = -2.425$, $p = .018$, $d = .602$). This is consistent with a substantial body of Indian and international literature on the gendered nature of TB stigma.

Mukerji (2016), in a Kolkata-based study of female TB patients, documented that women diagnosed with TB face multiple layers of stigma — not just from the broader community but within the family itself — linked to concerns about marriage prospects, family reputation, and perceived failure in domestic roles. Thomas and Stephen (2021) explicitly noted that in India, women may experience more severe social consequences from a TB diagnosis than men, including threats to marital stability and social standing. Somma et al. (2008), studying stigma across Bangladesh, India, Malawi, and Colombia, found that women were more socially vulnerable to TB stigma across multiple cultural settings, particularly in relation to marital consequences and family exclusion.

The present sample draws from urban, semi-urban, and rural settings across Uttar Pradesh, and this geographic diversity is relevant to understanding the stigma finding. In semi-urban and rural communities in North India, social visibility is high — a TB diagnosis is unlikely to remain private, and

the consequences of disclosure, particularly for women, can include reduced marriage prospects, social withdrawal, and damage to family reputation. The fact that semi-urban female participants reported the highest mean stigma scores compared to urban and rural women is consistent with this interpretation — semi-urban settings may combine the social embeddedness of rural communities with the awareness of social mobility concerns more typical of urban ones, creating a particular vulnerability to stigma for women. This pattern is exploratory and descriptive, but it aligns with what Atre et al. (2011) found in rural Maharashtra, where community perceptions of TB were deeply gendered and women faced conditional social support contingent on fulfilling their domestic roles.

The narrative review by Murugan et al. (2025), focused specifically on TB stigma in India with attention to gender differences, concluded that women bear a disproportionately higher burden of TB-related stigma, with consequences extending to mental health, treatment adherence, and social participation. The present study's quantitative finding of a significant gender difference in internalized stigma, with a medium effect size, provides empirical support for this conclusion in a North Indian clinical sample.

RELATIONSHIP BETWEEN STIGMA AND PSYCHOLOGICAL DISTRESS

A secondary but important finding was that perceived stigma was significantly and positively correlated with all three DASS-21 subscales in both gender groups. In the full sample, the strongest association was between stigma and depression ($r = .523$, $p < .001$), followed by anxiety ($r = .463$, $p < .001$) and stress ($r = .444$, $p < .001$). These correlations were consistent in direction and magnitude across male and female subsamples, suggesting that the relationship between stigma and psychological distress is not gender-specific but rather a general feature of the TB experience in this population.

This finding is consistent with Pradhan et al. (2022), who found that both internalized and perceived stigma mediated the relationship between TB severity and treatment adherence, and with Samal et al. (2025), whose systematic review identified perceived stigma as one of the strongest predictors of depression among Indian TB patients. The present correlation data extends this by demonstrating that stigma relates not just to depression but equally to anxiety and stress, pointing to its broad psychological impact.

One subtle gender difference in the correlation pattern is worth noting. Among female participants, anxiety showed a slightly stronger correlation with stigma ($r = .469$) than depression ($r = .448$), whereas among male participants the pattern was reversed (depression $r = .501$ vs. anxiety $r = .442$). This may suggest that for women, stigma is associated more with apprehension and anticipatory fear, consistent with the anticipated stigma dimension described by Murugan et al. (2025), where women may live in a state of ongoing anxiety about disclosure and its consequences, while for men, stigma may be more closely linked to a sense of worthlessness and loss of productive identity. These are speculative interpretations given the modest sample size, but they point to directions worth exploring in future research.

LIMITATIONS

Several limitations of the present study should be acknowledged. First, the sample size of 65, while adequate for detecting medium to large effects, may have been insufficient to detect smaller gender differences, particularly on the anxiety and stress subscales where directional trends were present but non-significant. Future research with larger samples would allow for more definitive conclusions about these variables.

Second, the cross-sectional design of the study limits causal interpretation. While the present findings demonstrate significant gender differences at a single point in time, they cannot establish whether gender

causes differential psychological outcomes or whether the observed differences reflect the influence of other variables that co-vary with gender, such as social support, occupational role, or marital status.

Third, the sample included both patients currently undergoing treatment and those who had completed treatment. These two groups may differ meaningfully in their levels of distress and stigma — active patients may experience higher anxiety due to ongoing illness, while cured patients may continue to experience stigma even after recovery. Future studies would benefit from examining these groups separately.

Fourth, the convenience sampling method limits the generalisability of findings beyond the specific hospital settings from which participants were recruited.

IMPLICATIONS

The findings of this study carry practical implications for TB care in India. The significant gender differences observed for depression and stigma suggest that psychological screening within TB treatment programmes should be sensitive to gender as a risk factor. Female patients in particular may benefit from targeted psychosocial support addressing both depressive symptoms and the internalised shame associated with their diagnosis. Integrating brief mental health screening tools such as the DASS-21 into routine TB care visits, as recommended by Samal et al. (2025) and advocated within the framework of India's National TB Elimination Programme, would allow for early identification of patients at psychological risk.

At the community level, stigma reduction efforts that specifically address the gendered dimensions of TB, including the social consequences for women's marital and familial standing, are needed. Awareness campaigns that reach semi-urban and rural communities in North India, where social visibility is high and gender norms are closely tied to social identity, may be particularly impactful.

Conclusion

The present study set out to examine whether gender functions as a meaningful differentiator of anxiety, depression, stress, and perceived stigma among tuberculosis patients in Uttar Pradesh, and the findings suggest that it does, though not uniformly across all psychological dimensions. Female patients in this sample reported significantly higher levels of depression and internalized stigma compared to their male counterparts, with effect sizes in the medium range for both variables. While anxiety and stress followed the same directional pattern, with females scoring higher on both, these differences did not reach statistical significance, which may reflect either the constraints of a modest sample size or the possibility that certain dimensions of psychological distress in the context of a serious infectious illness are experienced with comparable intensity across genders.

What the data makes clear is that the psychological burden of tuberculosis does not distribute itself evenly. For female patients in particular, the experience of TB appears to extend well beyond the physical symptoms of the illness into a broader terrain of emotional suffering and social consequence. The significant correlation between perceived stigma and all three DASS-21 subscales, observed consistently across both gender groups, reinforces the view that stigma is not a peripheral concern in TB care but a central one, something that actively compounds whatever psychological distress the illness itself produces.

In the Indian context, and particularly in the semi-urban and rural settings from which much of the present sample was drawn, these findings carry a specific weight. TB in North India does not occur in a

social vacuum. It is embedded in networks of family expectation, community visibility, and gendered social roles that determine how illness is disclosed, how it is received, and what consequences follow from it. For women navigating these networks while simultaneously managing a stigmatised infectious disease, the psychological toll is considerable, and the present data reflects that reality in measurable terms.

The broader implication is straightforward: tuberculosis care in India cannot remain exclusively biomedical in its orientation. A patient who completes their medication regimen but carries unaddressed depression and shame into their recovery is not fully treated. Integrating psychological screening and gender-sensitive support into routine TB care, particularly for female patients, is not an optional enhancement to existing services but a clinical necessity. The present study, modest in scale but grounded in the realities of a North Indian clinical population, contributes to the growing body of evidence making that case.

REFERENCES

- Agbota, G., Bonnet, M., & Lienhardt, C. (2023). Management of tuberculosis infection: Current situation, recent developments and operational challenges. *Pathogens, 12*(3), 362.
- Armstrong, T. (2002). Gender differences in anxiety: The role of anxiety sensitivity and its dimensions. *Personality and Individual Differences, 33*(6), 919–929.
- Amreen, & Rizvi, N. (2016). Frequency of depression and anxiety among tuberculosis patients. *Journal of Tuberculosis Research, 4*(4), 183–190.
- Atre, S., Kudale, A., Morankar, S., Gosoniu, D., & Weiss, M. G. (2011). Gender and community views of stigma and tuberculosis in rural Maharashtra, India. *Global Public Health, 6*(1), 56–71.
- Chauhan, A., Parmar, M., Dash, G. C., Solanki, H., Chauhan, S., Sharma, J., Sahoo, K. C., Mahapatra, P., Rao, R., Kumar, R., Rade, K., & Pati, S. (2023). The prevalence of tuberculosis infection in India: A systematic review and meta-analysis. *Indian Journal of Medical Research, 157*(2–3), 135–151.
- Dorte, M. (2015). Gender differences in anxiety disorders: Prevalence, course of illness, comorbidity and burden of illness. *Journal of Psychiatric Research, 56*, 89–95.
- Farhane-Medina, N. Z., Luque, B., Tabernero, C., & Castillo-Mayén, R. (2022). Factors associated with gender and sex differences in anxiety prevalence and comorbidity: A systematic review. *Science Progress, 105*(4), 1–25.
- Jaramillo, E. (1999). Tuberculosis and stigma: Predictors of prejudice against people with tuberculosis. *Journal of Health Psychology, 4*(1), 71–79.
- Kumar, K., Kumar, A., Chandra, P., & Kansal, H. M. (2016). A study of prevalence of depression and anxiety in patients suffering from tuberculosis. *Journal of Family Medicine and Primary Care, 5*(2), 150–153.
- Kumari Indira, K. S., & Mathew, N. (2023). TB related stigma and gender disparity among unaffected population in central Kerala, a survey. *Indian Journal of Tuberculosis, 70*(2), 168–175.
- McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: Prevalence, course of illness, comorbidity and burden of illness. *Journal of Psychiatric Research, 45*(8), 1027–1035.
- Mukerji, R. (2016). Manifestations of tuberculosis-related stigma among women in Kolkata, India. *Indian Journal of Tuberculosis, 63*(1), 40–44.

- Murugan, Y., Patel, N., Kumar, V., & Gandhi, R. (2025). TB stigma in India: A narrative review of types of stigma, gender differences, and potential interventions. *PLOS Global Public Health, 5*(1), e0005109.
- Nofalia, I. (2020). Stigma and its impact on tuberculosis patients: A literature review. *Indonesian Journal of Community Health Nursing, 5*(2), 48–57.
- Panibatla, V., Prabhu, M., & Bhaskara Rao, G. (2024). Prevalence of depression and anxiety among tuberculosis patients: A systematic review and meta-analysis. *Journal of Global Health, 14*, 04123.
- Piccinelli, M., & Wilkinson, G. (2000). Gender differences in depression: Critical review. *The British Journal of Psychiatry, 177*(6), 486–492.
- Pradhan, A., Bhattarai, P., & Acharya, S. (2022). Internalized and perceived stigma and depression in pulmonary tuberculosis: Do they explain the relationship between drug sensitivity status and adherence? *Frontiers in Psychiatry, 13*, 869647.
- Rajeev, H., & Satyanarayana, P. (2022). Stress, depression and coping in tuberculosis patients: A hospital-based study. *National Journal of Community Medicine, 13*(11), 762–770.
- Rubeen, R., Khan, S., & Hassan, Z. (2014). Anxiety, depression and quality of life among tuberculosis patients. *Journal of Medical Sciences, 22*(3), 120–125.
- Sakyi, E. K., Asante, K. P., & Agyeman, Y. N. (2024). Gender differences in the relationship between tuberculosis-related stigma and mental health outcomes among adults diagnosed with tuberculosis in Botswana. *International Journal of Tuberculosis and Lung Disease, 28*(4), 178–185.
- Salodia, U. P., Sethi, S., & Khokhar, A. (2019). Depression among tuberculosis patients attending a DOTS centre in a rural area of Delhi: A cross-sectional study. *Indian Journal of Public Health, 63*(1), 39–43.
- 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.
- Solanki, S. R., Dave, V. R., Shukla, R. P., Rathod, V. G., & Solanki, R. N. (2023). Assessment of anxiety and depression among tuberculosis patients of Ahmedabad, India. *Indian Journal of Tuberculosis, 71*(Suppl 2), S197–S202.
- Somma, D., Thomas, B. E., Karim, F., Kemp, J., Arias, N., Auer, C., Gosoniu, G. D., Abouihia, A., & Weiss, M. G. (2008). Gender and socio-cultural determinants of TB-related stigma in Bangladesh, India, Malawi and Colombia. *International Journal of Tuberculosis and Lung Disease, 12*(7), 856–866.
- 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.
- Sutar, R., Kamath, R., & Nimkar, S. (2024). Prevalence of anxiety, stress and quality of life among tuberculosis patients: A systematic review and meta-analysis. *BMC Infectious Diseases, 24*(1), 312.
- Thomas, B. E., & Stephen, A. (2021). Stigma related to tuberculosis in India: Barriers and ways forward. *Indian Journal of Tuberculosis, 68*(2), 258–262.
- World Health Organization. (2025). *Global tuberculosis report 2025*. WHO Press.