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Research Article

CHALLENGES OF MENTAL HEALTH ISSUES IN PREGNANT WOMEN WITH COMORBID TUBERCULOSIS: A BIBLIOMETRIC ANALYSIS

Jumartin Gerung[1], Fitri Rachmillah Fadmi[2], Wisnu Catur Bayu Pati[3],Wa Ode Nova Noviyanti[4]

[1,2,3,4] *Mandala Waluya University, Kendari, Indonesia*

Corresponding Author:
Jumartin Gerung
Email :jumartin.gerung@gmail.com, Phone : +62 85255852718

ABSTRACT

Background: Patients with tuberculosis (TB) often face stigma within their communities. Additionally, TB is frequently accompanied by comorbid conditions that contribute to psychological stress, as patients must cope with a dual burden. Pregnant women with comorbid TB are particularly vulnerable to developing mental health problems.
Methods: Searching PubMed, Google Schoolar, dan Scopus from 2018 to 2023. Using Publish or Perish, a number of journals were collected and visualized using VOS viewer.
Results: Various comorbid conditions have been identified in TB patients such a HIV, DM, etc. Similarly, mental health issues have been observed in pregnant women with comorbid TB. Including anxiety disorders, depression, stress, and other related mental health conditions.
Conclusion: The double burden of disease on TB patients makes them feel depressed. The stigma that exists in the community makes patients isolated. Community support is needed in the midst of patients who experience a lot of psychological pressure. Therefore, efforts to prevent and treat mental health disorders in comorbid TB patients require cooperation between health workers, families and people closest to the patient.

Keywords: *Pregnant Women, TB, Comorbid TB, Mental Health*

INTRODUCTION

Tuberculosis (TB) is a contagious disease caused by the bacterium Mycobacterium tuberculosis. It remains one of the top 10 causes of death globally and is the leading cause of death from a single infectious agent (1). Worldwide, it is estimated that approximately 10.6 million people (range: 9.8–11.3 million) are affected by TB. The disease is responsible for about 1.4 million deaths (range: 1.3–1.5 million) among individuals not infected with HIV, and an additional 187,000 deaths (range: 158,000–218,000) among those co-infected with HIV. Regionally, the highest burden of TB cases is found in Southeast Asia (45.6%), followed by Africa (23.3%) and the Western Pacific (17.8%). In contrast, the Eastern Mediterranean (8.1%), the Americas (2.9%), and Europe (2.2%) report the lowest proportions of TB cases. Notably, ten countries contribute to approximately two-thirds of the global TB burden: India (27.9%), Indonesia (9.2%), China (7.4%), the Philippines (7.0%), Pakistan (5.8%), Nigeria (4.4%), Bangladesh (3.6%), the Democratic Republic of Congo (2.9%), South Africa (2.9%), and Myanmar (1.8%)) (2).

The prognosis of tuberculosis (TB) is significantly influenced by the presence of comorbid conditions, particularly diabetes mellitus. Comorbidities are among the key contributors to the emergence of drug resistance in TB patients. On the patient level, conditions such as diabetes mellitus (DM) can impair drug absorption, which in turn affects treatment efficacy. Individuals with TB who also suffer from comorbidities—such as TB-HIV co-infection or diabetes mellitus—are at greater risk of developing multidrug-resistant TB (MDR-TB). An autopsy review of TB-related deaths in London revealed that 35 out of 46 cases involved additional illnesses, the most frequent of which included hepatitis C, HIV infection, cancer, cardiovascular disease, and other chronic conditions. Comorbidities such as diabetes mellitus (DM), malnutrition, and smoking are associated with poor TB treatment outcomes smoking (3). Moreover, the presence of comorbid diseases can complicate TB treatment. Research indicates that one of the underlying causes of drug resistance in TB patients is impaired drug absorption due to comorbid conditions like diabetes mellitus. (4).

Pregnant women can also experience TB as a comorbid condition, which may negatively impact their psychological well-being. Tuberculosis comorbidity during pregnancy presents a multifaceted challenge, significantly disrupting the intricate physiological and immunological balance essential for a healthy maternal experience and fetal development. Pregnancy induces notable adaptations in the maternal immune system, fostering tolerance towards the fetus while concurrently heightening susceptibility to certain infections, including tuberculosis. This vulnerability arises from hormonal shifts and mechanical adaptations that can compromise respiratory function, thus increasing the risk of contracting respiratory pathogens (5). The convergence of these pregnancy-related changes with the presence of active tuberculosis can further exacerbate the risks, potentially leading to adverse maternal and fetal outcomes (6).The complexities of managing tuberculosis in pregnant women are further compounded by the potential for vertical transmission of the bacteria to the fetus, which can result in congenital tuberculosis or latent infection that manifests later in life. Additionally, the use of anti-tuberculosis medications poses concerns regarding potential teratogenic

effects, necessitating careful consideration of treatment regimens to balance maternal health with fetal safety. Furthermore, delayed diagnosis and treatment of tuberculosis in pregnant women, often due to overlapping symptoms with common pregnancy discomforts, can lead to advanced disease stages characterized by increased infectivity and heightened risk of complications. The physiological changes inherent to pregnancy, such as increased cardiac output, altered respiratory mechanics, and hormonal fluctuations, can create an environment conducive to the progression and dissemination of tuberculosis (Emeruwa et al., 2021).

The bidirectional relationship between tuberculosis and mental health is well-documented. TB patients frequently report significant psychosocial distress and exhibit higher rates of mental health disorders, such as depression and anxiety, compared to the general population (7).

This study aims to achieve the following objectives:

1. Identify comorbidities associated with tuberculosis (TB) in patients and to examine the relationship between these comorbidities and mental health issues.
2. Analyze the types of mental health problems experienced by pregnant women with TB comorbidities based on existing research.

METHODS

Search Strategy and Data Resource

The selection of potential keywords and phrases was based on key concepts identified through a preliminary review of the literature. This initial list was further refined by incorporating synonyms, related terms, acronyms, and variations in spelling or phrasing to ensure comprehensive search coverage. The following search string was used to retrieve relevant documents from the database. The query was structured into three components, combined using the Boolean operators "OR" and "AND." Some of the keywords included: "TB," "Comorbid TB," "Pregnant Women," "Mental Health," "Psychological Distress," "Mental Disorder," "Mental Disease," "Mental Illness," "Depressive Disorder," "Anxiety Disorder," "Psychological Disorder." The literature search was conducted using the Scopus, PubMed, and Google Scholar databases, applying predefined inclusion criteria. The data screening process adhered to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses

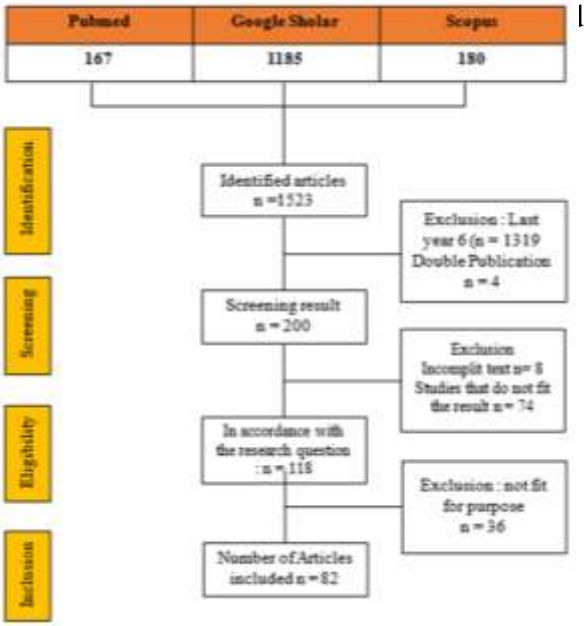

Figure 1. PRISMA Diagram

RESULTS

TB and Comorbidity

The results of journal searches through data mining using and analysis from these

journals showed that there were 36 items with 8 comorbidity clusters discussed in the various journals we obtained. The TB comorbidity clusters include diabetes, hbac1, hiv, hypertension, obesity, depression, disease progression, co-infection, MDR-TB, hyperglycemia, type 2 diabetes, infectious disease, lung cancer, covid-19, hepatotoxicity, pulmonary tuberculosis, and mental health. Visualization can be seen in the following figure:

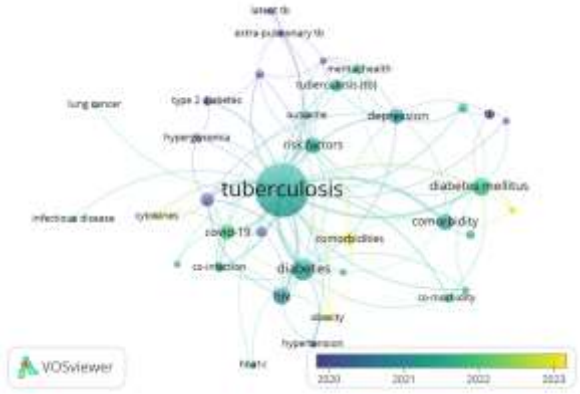

Figure 2. Comorbidities of TB Patients

TB and Mental Health Issue in Pregnant Women

A review of the literature reveals that mental health research related to comorbid tuberculosis (TB) remains relatively limited. Although some studies have begun to explore the connection between TB and mental health, they primarily aim to highlight the issue rather than offer comprehensive solutions. This gap is understandable, considering the dual burden faced by patients—they must not only focus on recovering from TB but also manage coexisting conditions. Both TB and its comorbidities can exert a profound impact on mental well-being.

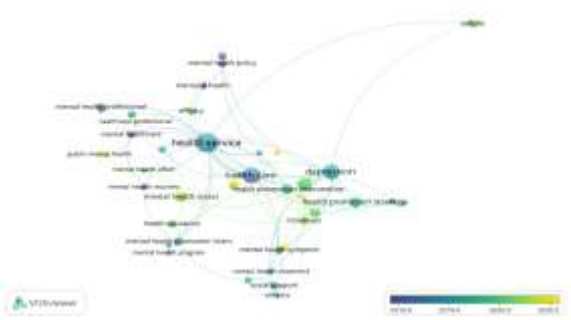

Figure 3. Mental Health Problem in Comorbid TB Patients

The analysis of several journals shows that the trend of research on mental health is more focused on people with TB. From Figure 3 below, we can see that the journal extraction results show a visualization of the dominant research trend between mental health and TB patients. Comorbidities are not included when researching TB and mental health such as anxiety, mental disorders, depression, stigma or other common mental disorders.

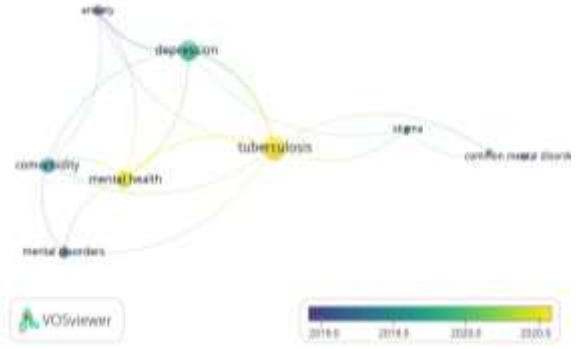

Figure 4. Research Trends Mental Health of Comorbid TB Patients

DISCUSION

TB and Comorbidity

As a chronic infectious disease, TB weakens immune surveillance, increasing susceptibility to other conditions such as noncommunicable diseases (NCDs), including cancer, diabetes, and cardiovascular and respiratory diseases.

Together, these conditions account for two-thirds of global mortality. Research also suggests a higher prevalence of mental health issues among individuals diagnosed with TB. The relationship between TB and chronic physical conditions may be bidirectional. Several health conditions, such as diabetes and chronic lung diseases—including chronic obstructive pulmonary disease (COPD) and silicosis—have been identified as significant risk factors for TB (8).

The co-occurrence of two or more chronic diseases in an individual, known as multimorbidity, is an increasing concern in global health systems, particularly in low- and middle-income countries (LMICs), where economic constraints affect healthcare planning. Evidence suggests that multimorbidity affects one in four adults in LMICs, and its prevalence is rising due to increased life expectancy. The determinants of multimorbidity include socioeconomic factors (e.g., unemployment, deprivation, financial constraints), limited access to healthcare, and health risk behaviors (e.g., physical inactivity, poor diet) (8). Addressing these determinants is essential to improving health outcomes for individuals with TB and other chronic conditions.

TB comorbidities pose significant challenges in the treatment process. Research indicates that drug resistance in TB patients is influenced by impaired drug absorption due to comorbid conditions such as diabetes mellitus (DM) (4). Studies conducted in various countries have also identified that tuberculosis is often accompanied by psychological comorbidities, including depression, adjustment disorders, anxiety, and phobias (9). In addition to anxiety, many TB patients experience stress symptoms stemming from the prolonged treatment duration and societal stigma (10). Moreover, stress can exacerbate the risk of mental health disorders, contributing to psychological distress (11). Simultaneously, mental illness represents a substantial contributor to global morbidity and disability. The coexistence of TB and mental health disorders further complicates disease management, making it essential to address both conditions concurrently (12)

The WHO and the international movement against TB in the framework of the pulmonary disease treatment collaborative recommend screening for TB and diabetes mellitus simultaneously. The collaborative also recommends research that will lead to health policies that combine TB treatment and diabetes screening in people with active TB or DM (Bates et al., 2015). The increasing prevalence of diabetes in TB-endemic areas has created a double burden for global health (Harahap, 2021). Comorbidity of TB with non-communicable diseases and other infectious diseases is common in TB endemic areas. The double burden felt by comorbid TB patients certainly has an impact not only on physical aspects, but also psychological. From the physical aspect, the TB treatment process takes time and is a more complex process than non-comorbid TB, while from the psychological aspect, TB patients with comorbidities require psychological resilience in undergoing the dual treatment process. TB treatment that takes a long time plus the treatment of comorbidities puts patients in a non-ideal condition.

Research by Alisjahbana, et al. (2007) in Indonesia found some differences in clinical manifestations. Clinical symptoms were found more in pulmonary TB patients who also had DM and based on the Karnofsky index, the general condition was also worse (13). Other studies in Malaysia, Saudi Arabia, and Turkey found no

significant difference in symptoms, but a large Mexican study reported a worse clinical picture in TB patients with DM in terms of fever, hemoptysis, and general condition. Active tuberculosis can also worsen blood sugar levels and increase the risk of sepsis in people with diabetes. Fever, active pulmonary TB germs, and malnutrition stimulate stress hormones such as epinephrine, glucagon, cortisol, and growth hormone, which synergistically work to increase blood sugar levels to more than 200 mg/dL. Plasma levels of IL-1 and TNF also increase and stimulate anti-insulin hormones, thus worsening the infectious state (14), (15).

Studies in several countries have also found that comorbidities of tuberculosis disease include psychological problems such as depression, adjustment disorders, anxiety and phobias (9). According to Issacs (2002) the characteristics of anxiety are concern, difficulty, uncertainty or fear that occurs due to real or perceived threats. Anxiety is a subjective response to stress. TB disease is one of these sources of stress (10). Anxiety that grows stronger can affect the functional abilities of individuals and even families of sufferers. (16). If the family of the patient experiences anxiety, it will be difficult for the family to help solve the problems of the TB patient (17). In addition, the stigma that arises adds to the psychological burden for sufferers, because due to this stigma many people are reluctant to interact with sufferers.

Figure 5. The Process by Which Mental Health Issues Arise in Individuals with Comorbid Tuberculosis

TB and Mental Health Issue in Pregnant Women

Mental health is a significant public health issue that is currently receiving considerable attention (18). It is discussed in various contexts, including among individuals with tuberculosis (TB). Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis that affects multiple organs. It remains the most prevalent infectious disease and the leading cause of death worldwide. Each year, approximately 9 million people contract TB, and 1.4 million die from it. In addition to its physical effects, TB imposes a psychological burden due to stigma (19).

In the era of the Sustainable Development Goals and the ambitious End TB Strategy, it has become evident that achieving a microbiological cure alone is insufficient to control—let alone eliminate—

this public health crisis (20). TB not only compromises patients' physical well-being but also negatively impacts their psychological, economic, and social well-being. Mental illness, both as a risk factor for and a consequence of TB, is frequently overlooked in discussions on the disease.

The prevalence of mental health disorders among tuberculosis patients has been a growing area of research interest in recent years. Scholars have utilized various analytical approaches, such as keyword co-occurrence analysis and year-slice analysis, to identify research hotspots and examine temporal trends in this field. (12); (21). The convergence of tuberculosis and pregnancy presents a formidable challenge, significantly impacting maternal mental health and overall well-being. Pregnancy induces profound physiological and psychological transformations, rendering women more susceptible to mental health disorders, while tuberculosis, an infectious disease often associated with socioeconomic disadvantage and chronic illness, further exacerbates this vulnerability (22). Maternal mental health, defined as a state of well-being where a mother realizes her capabilities, copes with normal life stresses, works productively, and contributes to her community, is crucial for both the mother and the developing child (23). However, the comorbidity of TB introduces multifaceted stressors that can undermine this state, increasing the risk of depression, anxiety, and other mental health conditions.

The intricate interplay between TB, pregnancy, and mental health involves biological, psychological, and social determinants. Hormonal fluctuations, immune system modulation, and metabolic demands of pregnancy can heighten susceptibility to both TB infection and mental health disturbances (Kumar et al., 2022 ; Mutahi et al., 2022). The physiological stress imposed by TB, including chronic inflammation and nutritional deficiencies, can directly affect neurotransmitter function and brain activity, predisposing pregnant women to mood disorders. Psychologically, the diagnosis of TB during pregnancy can trigger feelings of fear, isolation, and uncertainty about the health of the baby and oneself (26).

According to the World Health Organization (WHO), comorbidity refers to the presence of two or more chronic health conditions in an individual simultaneously. Multimorbidity is associated with adverse health outcomes and increased healthcare costs. Tuberculosis (TB) is frequently found alongside other significant chronic conditions, such as HIV, diabetes mellitus (DM), and depression. However, in health systems with limited resources and restricted access to care, services—including those for TB—tend to focus on single diseases. This approach often overlooks the presence of multimorbidity, resulting in missed opportunities for prevention, screening, and integrated treatment of related chronic conditions (27). Moreover, there is a scarcity of research specifically examining mental health in patients with comorbid TB. Nonetheless, several studies have investigated perceptions of mental health and illness, as well as the factors influencing the use of mental health services among patients with TB and diabetes.

In the context of ambitious global health targets, such as the Sustainable Development Goals and the End TB Strategy, it is increasingly clear that microbiological treatment alone is insufficient to tackle the TB epidemic—much less to eliminate it. Mental health disorders are both risk factors for and consequences of TB, yet they often receive

little attention in TB-related discourse. Given that mental illnesses significantly contribute to global morbidity and mortality, the intersection of TB and mental health presents an added layer of complexity in disease management that must not be overlooked (28).

CONCLUSION

The dual burden of disease experienced by TB patients often leads to feelings of depression and emotional distress. Social stigma further compounds this burden, causing many patients to experience isolation and a lack of support. Yet, community and familial support are crucial for patients who are under significant psychological pressure. As such, the prevention and treatment of mental health disorders in individuals with comorbid TB require collaborative efforts among healthcare professionals, families, and close social networks.

Understanding the mental health challenges faced by patients with comorbid TB, as well as the role of their social environment, is essential for facilitating their recovery. Analyzing these factors provides a scientific basis for developing targeted interventions and models aimed at maintaining and improving the mental well-being of comorbid TB patients.

In the context of pregnant women, these issues become even more critical. Pregnant women with comorbid TB face a triple burden: managing the physical demands of pregnancy, coping with TB treatment, and dealing with mental health challenges. The physiological changes of pregnancy, combined with social expectations and possible stigma, may heighten emotional vulnerability. Moreover, concerns for fetal health, treatment adherence, and fear of transmission can lead to heightened anxiety or depressive symptoms.

Thus, a gender-sensitive and perinatal-specific approach is urgently needed in mental health interventions. Support systems must be strengthened around pregnant women with TB, ensuring access to psychosocial counseling, continuous medical care, and protection from stigma—both for their own well-being and that of their unborn children.

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