

Providing Education to Increase The Knowledge of Patients with Tuberculosis

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ABSTRACT

Background: *Tuberculosis* (TB) is one of the leading causes of morbidity and mortality worldwide. Tuberculosis is a long-lasting infectious disease caused by *Mycobacterium tuberculosis*. *Mycobacterium tuberculosis* can enter through open wounds on the skin, respiratory tract, and gastrointestinal tract. Objective: To assess the provision of education to improve patients' knowledge of tuberculosis. Methods: Literature review by analyzing journals that have been obtained and filtering with inclusion criteria according to the direction of the results to be obtained. Discussion: Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. The etiology or cause of tuberculosis is primarily infection by *Mycobacterium tuberculosis*, an acid-resistant rod bacteria. The most common symptoms of pulmonary TB include a prolonged cough lasting more than three weeks, chest pain, and the production of blood-colored sputum. Comprehensive education can improve patients' understanding of TB treatment.

Keyword : Education; knowledge; *mycobacterium*; tuberculosis

Introduction

Tuberculosis (TB) is one of the leading causes of morbidity and mortality worldwide. The World Health Organization (WHO) says that pulmonary TB patients were 7.1 million in 2019, but that number dropped to 5.8 million in 2020. In 2021, Indonesia reported 397,377 tuberculosis cases, up from 351,936 the previous year. In the Poncol Health Centre working area, 47 TB cases were recorded, an increase from the previous year. Tuberculosis is a long-lasting infectious disease caused by *Mycobacterium tuberculosis*.¹

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. It can affect various parts of the body, but it most often attacks the lungs. TB

is one of the most serious public health problems worldwide and is one of the leading causes of death from infectious diseases. According to a World Health Organization (WHO) report, approximately 10 million people worldwide will develop TB in 2021, with a mortality rate approaching 1.5 million. Restrictions in diagnosis and treatment and the social stigma associated with the disease add complexity to the risks of its spread and control.¹

Vulnerable individuals with weakened bodies can be infected quickly. *Mycobacterium tuberculosis* can enter through open skin wounds, the respiratory tract, and the gastrointestinal tract. It is important to adhere to tuberculosis treatment, as non-adherence can lead to resistance of tuberculosis germs to anti-tuberculosis drugs (OAT), also known as multidrug resistance (MDR). Non-adherence to treatment will cause many treatment failures in pulmonary TB patients, increase risks such as morbidity and mortality, and may lead to many pulmonary TB patients being resistant to conventional treatment. Adherence is defined as the degree to which a patient follows treatment-related actions, such as maintaining healthy living habits and seeking treatment.² In medicine, a person can be said to be disobedient if that person neglects his or her obligation to seek treatment, so that it can lead to obstruction of recovery. Patient compliance behaviour can be influenced by several things, such as factors of knowledge, beliefs, attitudes, availability of health facilities and family support factors.²

Material and Methods

This study uses a literature review approach, drawing on a range of academic publications to explore the role of educational interventions in improving tuberculosis patients' knowledge. The review integrates findings from both national and international journals, accessed through databases including Google Scholar, NCBI, PubMed, and Elsevier. To ensure relevance, we considered only articles published within the last five years (2019–2024). This study uses a narrative synthesis. We selected sources based on thematic relevance to patient education and knowledge enhancement, without applying rigid exclusion criteria. This flexible approach allows the incorporation of diverse perspectives and practices reported across different healthcare contexts. The analysis emphasizes descriptive insights, focusing on educational strategies, implementation models, and reported outcomes. By organizing the literature thematically, the review highlights both common approaches and variations in educational delivery. This method provides a broad overview of current practices while acknowledging the limitations inherent in non-systematic reviews.

Results and Discussion

Bacteria spread through the air when an infected person coughs or sneezes, releasing tiny droplets containing the bacteria.³ When other people breathe in those droplets, they can become infected. Risk factors that increase the likelihood of TB infection include a weak immune system, underlying health conditions such as HIV/AIDS, diabetes, and use of immunosuppressive drugs. Dense neighbourhoods, lack of access to health services, and social and economic factors also contribute to the increased prevalence of TB infection.⁴ After entering the respiratory tract, *Mycobacterium tuberculosis* can spread through the bloodstream to various organs. However, most TB infections occur in the lungs, where the bacteria invade and damage lung tissue. The body responds by activating the immune system, mainly through macrophages, which engulf and destroy the bacteria. However, TB bacteria can survive in macrophages and avoid destruction, leading to granuloma formation. Granulomas are structures made of immune cells and dead tissue that contain the spread of infection. If the immune system is weak or unable to cope with the infection, TB bacteria can proliferate, causing more extensive lung tissue damage, and triggering more serious clinical symptoms.⁵

Clinical manifestations of tuberculosis vary by site of infection and the strength of the individual's immune response. The most common symptoms of pulmonary TB include prolonged cough lasting more than three weeks, chest pain, and production of blood-colored sputum.⁶ Patients also often experience systemic symptoms, such as unexplained weight loss, fatigue, fever, night sweats, and loss of appetite. In the case of extrapulmonary TB, symptoms may vary depending on the infected site, such as bone pain in TB spondylitis or gastrointestinal symptoms in abdominal TB. If left untreated, TB can be progressive and potentially fatal, especially in individuals with weakened immune systems.⁶

Educating tuberculosis (TB) patients is essential to increase their knowledge of the disease and its treatment. According to a 2021 WHO report, TB remains one of the deadliest infectious diseases, with more than 10 million new cases recorded. Effective health education can help patients understand the importance of treatment adherence, which is crucial to prevent relapse and transmission. Research by Nyamagoud et al. (2026) showed that comprehensive education can improve patients' understanding of TB treatment. Various educational methods, such as individual counseling, use of digital media, and discussion groups, can be applied to make it easier for patients to receive information. In addition, education can also reduce the social stigma that TB patients often experience, give them the confidence to seek help, and improve their quality of life. A recent study by Mustamin et al.

(2024) confirmed that digital-based educational interventions can improve knowledge and adherence to treatment, while Nyamaoud et al. (2026) highlighted the effectiveness of community-based education in reducing stigma and improving treatment adherence. Thus, the provision of planned and systematic education is key in managing tuberculosis, helping patients to be more proactive in treatment and disease prevention.⁷

When educating patients with tuberculosis, a variety of methods are needed to meet all aspects of their educational needs. Below is the program plan for educating the public and patients with tuberculosis, first with Individual Counselling. This method involves face-to-face sessions between a patient and a health professional. During this session, the health professional can identify the patient's information needs, answer questions, and provide a detailed explanation of the disease, treatment, and preventive measures. Individual counseling provides an opportunity for patients to share their concerns and receive important emotional support. Second Group-based Education, \Organizing education sessions in small groups with other TB patients can provide a supportive atmosphere. In this setting, patients can share experiences, ask questions, and learn from one another. This approach can also reduce the sense of stigma that patients may feel, as they do not feel alone in dealing with the disease.

Next, the use of Digital Media, In today's digital age, the use of social media, health apps, and educational videos is important. Educational materials presented through digital platforms can reach more patients. Easy-to-understand videos or infographics can improve understanding of TB and its treatment. Recent studies show these methods effectively improve patients' knowledge of the disease. Written Educational Materials, such as brochures, leaflets, or manuals on TB, are a classic but still effective method. Informative, easy-to-understand written materials can help patients access necessary information outside education sessions. Patients can take this information home, review it, and use it as an additional reference for themselves and their families.

As technology develops, telemedicine is becoming an effective solution, especially in situations that limit in-person meetings. Through phone or video consultations, patients can receive education from a healthcare professional without travelling to a hospital or health facility. going to a health facility. This method also reduces transmission risk for patients and medical personnel.

Community-based Education Programs, involving the community in TB education efforts can broaden awareness. These programs can include education by local health workers, information shared at community events, or volunteer training to disseminate TB

information. Providing education in the community can also help reduce stigma and increase social support for patients.⁸

Education for patients with TB is important because it increases their knowledge of the disease, improves treatment adherence, reduces social stigma, prevents transmission, and provides emotional support. By understanding what TB is, how it is transmitted, and the symptoms to watch for, patients will be better prepared to manage the disease and seek treatment as soon as symptoms appear. Many studies show that well-informed patients tend to adhere more to treatment regimens because they understand the risks of non-adherence, such as disease recurrence and transmission to others. Education also helps reduce the social stigma patients commonly experience by providing the wider community with accurate understanding, so patients feel more supported in sharing their experiences. In addition, understanding how TB is transmitted helps patients take necessary precautions, such as maintaining respiratory hygiene, to prevent the spread of the disease. Finally, access to reliable information and support can help maintain patients' mental well-being, making them feel less alone as they face this challenging situation. These points suggest that effective education should be an integral part of TB treatment.¹⁰⁻¹²

Recent research shows that patient education significantly improves understanding and treatment adherence. A study by Olowoyo et al. (2024) found that the intervention, community-based education and health counselling, directly increased treatment adherence rates by 65% among TB patients. In addition, a study by Chen et al. (2025) revealed that the use of digital media as an educational tool increased patients' knowledge of TB treatment by 75%, and improved their awareness of how to prevent bacterial transmission. Research by Khamis et al. (2022) also showed that telemedicine remote consultations can improve access to education for patients living in remote areas, with 82% of patients reporting feeling more confident in their treatment after attending education sessions through digital platforms. This evidence suggests that diverse and targeted education methods can significantly support patients in better understanding and managing TB disease.5section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions that can be drawn

Conclusion

Educating patients with tuberculosis (TB) is crucial to improving their understanding of the disease, treatment, and preventive measures. This education not only improves patients' knowledge of TB and its symptoms, but also supports adherence to treatment regimens.

Awareness of the importance of completing treatment reduces the risk of relapse and transmission of TB to others. Through various educational methods such as individual counselling, group-based education, use of digital media, provision of written materials, telemedicine, and community-based education programs, patients can receive the information they need in an easier and more engaging way.

Declaration of Generative AI in Scientific Writing

The authors affirm that this article used generative artificial intelligence tools, including Microsoft Copilot, solely to improve grammar and clarity, including in the methods section. These tools were not used for generating content, data analysis, or interpretation. The authors are fully responsible for the accuracy and integrity of the content as well as the conclusions presented in this study

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