



## Literature Review: Factors Influencing Medication Adherence in Pulmonary TB Patients

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### Abstract

The health problem that is a global challenge today is tuberculosis. This is due to the high incidence of infection, low coverage of treatment adherence and widespread drug resistance rates. Tuberculosis (TB) is the leading cause of death due to infectious diseases in the world, and Indonesia is the second largest contributor of TB cases after India. Medication adherence issues are the main obstacle in TB elimination. This study aimed to examine the factors that affect treatment adherence in TB patients and assess the effectiveness of interventions designed to improve adherence. The method used in this study is a literature review. The sources for making literature reviews were taken from Google Scholar, ProQuest and PubMed since the last 5 years (2019-2024), a total of 15 articles were found and filtered into 8 articles that met the inclusion requirements, namely medication compliance. The results of the study are intended to make an important contribution to designing more targeted intervention strategies to improve treatment adherence, especially in areas with high prevalence of tuberculosis. This study confirms that the success of tuberculosis control and therapy is greatly influenced by continuous monitoring, patient education, and adequate support.

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## Introduction

Tuberculosis (TB) is a preventable and treatable disease. However, in 2022, Tuberculosis became the second leading cause of death from infectious diseases worldwide after COVID-19, and was the cause of almost twice as many deaths as deaths from HIV/AIDS. More than 10 million people suffer from Tuberculosis every year. The number of deaths due to TB (among HIV-negative patients) globally in 2022 was 1.1 million, down from 1.2 million last year. (1)(2)

In 2022, there were 7.5 million new cases of Tuberculosis diagnosed in the world. India is the country with the highest cases of Tuberculosis in the world. Meanwhile, the WHO places Southeast Asia as the region with the highest cases of tuberculosis globally. The figure reached 46% with the most cases found in Indonesia (10%) and the Philippines (7%). (1)

In 2023, the total number of Tuberculosis cases in Indonesia found was 821,200 cases, quite an increase when compared to all Tuberculosis cases found in the previous year, which was 677,464 cases. Meanwhile, the coverage of the detection rate of tuberculosis cases in 2023 is 77.5%, an increase from the previous year which was 74.7%. However, this figure still has not reached the target of the Ministry of Health's 2023 Strategic Plan, which is 90%. (2)

Central Java Province accounts for 10.2% of Tuberculosis cases out of a national total of 694,808 cases. Meanwhile, in Semarang City itself, Pulmonary TB cases in 2024 as of May will reach 1546 patients. This number is spread across 38 health centers in Semarang City. This number includes cases of Pulmonary TB and Extra-Pulmonary TB, as well as cases of pediatric TB and adult TB. The number of cases tends to increase from the previous year. (3)(4)

Medication adherence is medication that is appropriate to the dosage or medical instructions in tuberculosis patients which is very important, because stopping taking medication will cause resistant bacteria and treatment to be long, the length of treatment will be more likely to make TB patients not comply with taking medication. There is a sense of boredom in TB patients because they have to take medication for a long and long time, sometimes it stops in TB patients because they do not understand the medication taken at the specified time It is said that patients who obedient to take medication are those

who are able to complete treatment regularly without any interruption of taking medication for 6 months to 9 months. Compliance is the patient's behavior to follow a medical request or can be defined as an individual's willingness to follow recommended health practices.(5)(6)(7)

Generally, people with pulmonary tuberculosis (TB) experience stress problems that manifest both physically and behaviorally. Stress that is not handled properly can result in irritability, anxiety and negative thinking, hopelessness, and helplessness. This condition can cause patients with Pulmonary Tuberculosis (TB) to regularly take medication and even stop taking medication, so that later it will affect the quality of life. Tuberculosis patients who do not comply with the dosage rules that have been set by health workers will result in drug resistance or rifampicin resistance, tuberculosis patients who are said to be obedient to taking medication can complete treatment for 6 months or until the end of treatment. Treatment of pulmonary tuberculosis requires a combination of several drugs and takes six to eight months. However, there are still patients in the treatment phase who stop taking their medication while the treatment is still ongoing, resulting in treatment failure. Factors that affect medication adherence in patients with pulmonary tuberculosis (TB) predisposing factors include information knowledge that has been combined with understanding and potential to act, beliefs, beliefs, values, and attitudes. Enabling factors include the availability of health facilities or facilities and the reinfactoring factor, which is family support, a process that occurs throughout life, and the attitude of health workers who have a higher education background have a good attitude.(8)

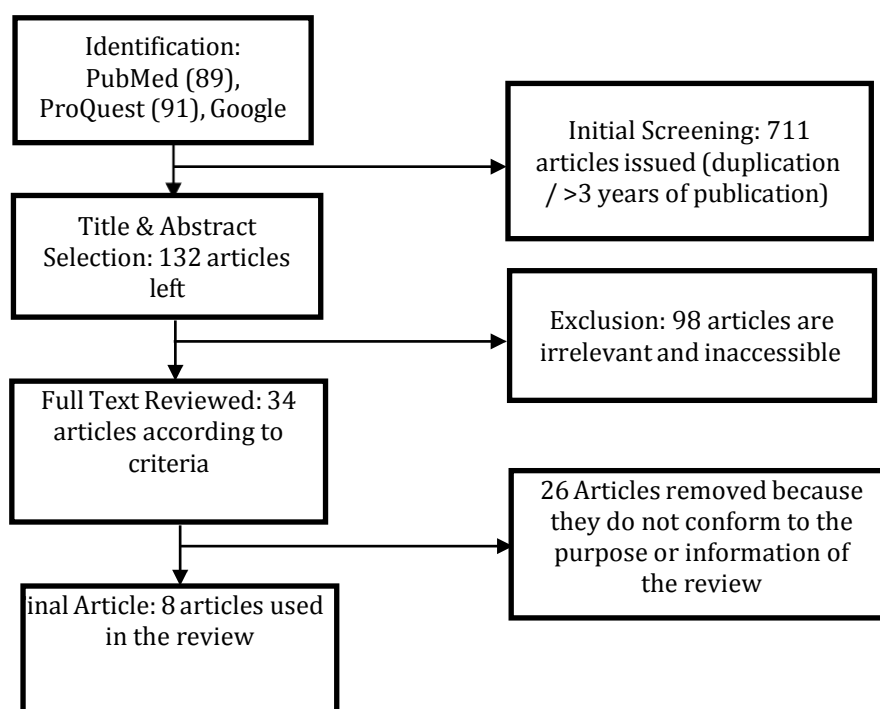
Previous research conducted by Nala Sintia (2020) examined factors that affect medication adherence in tuberculosis patients at the Karangsambung Health Center, and the results were found that the factors that affect TB are knowledge factors, and Medication Supervision (PMO). Meanwhile, research conducted by Agnes (2020) states that the factor that affects the adherence to taking TB medication at the Bunturaja Health Center, Dairi Regency is motivation from both family, the environment and health workers.

Another study from Dwi Nur aini (2023) states that compliance with taking TB medication at RSISA is support from the family. Similarly, Kusmiyani et al. (2024) examined the relationship between patient knowledge and adherence, and found that a better understanding of the disease resulted in higher adherence to treatment regimens. Another study by Yunitasari et al. (2023) highlights the impact of patient education on compliance, showing that improving health literacy is essential in improving treatment adherence in TB patients.

Although previous research has dominated a wide range of factors influencing treatment adherence in TB patients, existing research is limited on the combined effects of knowledge, social support, and access to health services on adherence. This study aims to fill this gap by evaluating these interrelated factors and proposing targeted interventions to improve treatment adherence, thereby reducing the incidence of TB transmission more widely. This study introduces a new approach by combining several factors knowledge, family support, and access to health services—to analyze its collective impact on treatment adherence in TB patients. The purpose of this study is to analyze the factors that affect treatment adherence in tuberculosis patients, especially related to patient knowledge, family support, and access to health services. This research also aims to propose effective strategies to improve compliance and support global efforts in TB control. The results of the study are expected to provide insights into the determinants of compliance, as well as practical recommendations for health workers and policymakers. Increased adherence is expected to improve therapy outcomes, reduce transmission, and reduce drug-resistant TB cases, while strengthening overall TB control strategies.

## Methods

This study uses secondary data through a literature review using the PRISMA method. The process starts from determining the topic, searching for relevant references, grouping, to analysis to summarize. Data sources were obtained from Google Scholar, ProQuest and PubMed with publication criteria since the last 5 years (2019-2024). The search was conducted using the keywords tuberculosis, TB adherence, taking TB medication, TB treatment, TB patients, and prevalence. The reviewed articles were selected based on titles, abstracts, methods, and results according to inclusion and exclusion criteria. The inclusion criteria include articles that discuss TB treatment adherence and are available in full-text form. Exclusion criteria are reports, essays, dissertations, literature reviews, and articles that are not fully available. From the search results, 8 articles were obtained that were eligible for further analysis. 8 articles were found that fit the criteria and will be further analyzed in this literature review.



## Results

The results of online journal searches were obtained from as many as 8 journals about tuberculosis. Then, journal topics were grouped in the form of medication adherence (7 journals), TB prevalence (1 journal). The following is an explanation in Table 1:

Researchers	Research Title	Research methods	Results
Nala Sintia (2020)	Factors that affect medication adherence in tuberculosis patients at the Karangsambung Health Center	Descriptive quantitative with crosssectional method	Factors that affect medication adherence are gender, knowledge, and PMO (Medication Supervision Control)
Agnes Herna M Rajagukguk (2020)	Factors Affecting Treatment Compliance of Pulmonary TB Patients at the Bunturaja Health Center, Dairi Regency in 2019	Mix Methods research method with Sequential Explanatory approach. The quantitative research sample was total sampling, the number of respondents was 31 patients with Pulmonary TB, and the qualitative sample was 5 informants.	The results of the qualitative research were that the two key informants had good knowledge, access to health facilities was lacking, informant 1 had family support, motivation and support of health workers was lacking, while informant 2 had good family support, motivation and support of health workers. Factors that cause pulmonary tuberculosis patients to not comply with treatment are lack of support from family, perception of feeling cured and side effects of OAT
Ipah Setyowati, Dwi Nur Aini, Dwi Retnaningsih (2023)	Factors Affecting Medication Adherence in Patients with Pulmonary Tb in RSI Sultan Agung Semarang	The design of this study uses Cross sections with sampling techniques purposive sampling with a sample of 30 respondents	The results of the study found that there was a relationship between knowledge and medication adherence to patients with pulmonary TB (p value 0.000). There is a relationship between family support and medication adherence in patients with pulmonary TB (p value 0.009).
Siti Nur Hasina, Arum Rahmawati, Imamatul Faizah, Ratna Yunita Sari,	The Relationship of Knowledge Level with Compliance with Taking Anti-	Correlational Analysis With Cross-Sectional Design	There is a relationship between knowledge level and medication compliance. So, self-care-based health promotion activities are needed to

Researchers	Research Title	Research methods	Results
Riska Rohmawati (2023)	Tuberculosis Drugs (Oats) in Pulmonary Tuberculosis Patients		overcome TB patients' non-compliance, increase compliance with treatment programs, and improve the health of pulmonary tuberculosis patients.
Annisa Novita Sata, Riva Nadia Putri, Nina Marini (2024)	Factors of Adherence to Taking Anti-Tuberculosis Drugs in Patients with Pulmonary TB	Cross-sectional study design	It was found that there was a relationship between the level of knowledge and family support with compliance in taking anti-tuberculosis drugs (OAT) in TB patients in the Ujung Gading Health Center Work
Annisa Novita Sata, Riva Nadia Putri, Nina Marini (2024)	Factors of Adherence to Taking Anti-Tuberculosis Drugs in Patients with Pulmonary TB	Cross-sectional study design	It was found that there was a relationship between the level of knowledge and family support with compliance in taking anti-tuberculosis drugs (OAT) in TB patients in the Ujung Gading Health Center Work Area, West Pasaman Regency. It is hoped that the community will increase public knowledge about TB disease and activate the participation of individuals, families, and communities in the TB disease control program
Fauzan Adima, Merita Arini (2024)	The Influence Of Healthcare Workers' Social Support On Compliance To Medication In Multi-Drug Resistant Tuberculosis Patients At The Regional General Hospital Of Dr. Saiful Anwar	Quantitative research methodology, specifically using a cross-sectional study design.	The respondents' gender was mostly male at 60.26%, while the age of the respondents was mostly 45– 64 years (43.59%), and the education level of the respondents was mostly high school graduates at 38.47%. The instrumental support variable is the variable that has the most influence on treatment compliance in MDR-TB patients (Sig. < 0.005).

## Discussion

The results of studies from various studies show that medication adherence in tuberculosis (TB) patients is influenced by various interrelated factors. Medication adherence is a very important element in the successful treatment of pulmonary tuberculosis (TB) patients. In the context of infectious diseases that require long-term treatment such as TB, patient non-adherence to medication regimens can result in not only therapy failure, but also an increased risk of drug resistance, sustained transmission, as well as a strain on the overall health system. Based on the results of a review of eight articles that were the data sources in this study, it was found that patient adherence to treatment is influenced by various factors that can be categorized into individual, social, and health service system aspects. One of the main factors found in almost all articles is the level of knowledge of the patient. Knowledge of the disease, the transmission process, the benefits of complete treatment, and the risks of non-compliance with medication have been shown to significantly affect patient compliance behavior.

Research conducted by Nala Sintia (2020) identified that the patient's gender, level of knowledge, and the existence of a Medication Supervisor (PMO) are important factors that contribute to TB patient compliance. These findings emphasize the importance of external roles and structural support in ensuring the regularity of medication taking. In line with that, Agnes Herna M. Rajagukguk (2020) found that in addition to the knowledge factor, patient non-compliance is often influenced by a lack of family support, the perception that the patient has recovered, and the side effects of Anti-Tuberculosis Drugs (OAT). This study confirms that psychological and social aspects play a very important role, where family support and motivation from health workers are important determinants of treatment success. Similar results were also obtained from the research of Ipah Setyowati, Dwi Nur Aini, and Dwi Retnaningsih (2023) which showed a

significant relationship between knowledge ( $p=0.000$ ) and family support ( $p=0.009$ ) and medication adherence. Adequate knowledge makes the patient better understand the importance of completing treatment, while family support provides ongoing supervision and motivation.

This support is also strengthened by the research of Siti Nur Hasina et al. (2023), which confirms the relationship between knowledge level and compliance of TB patients. The research emphasizes the importance of self-care-based health promotion as a strategy in increasing adherence and preventing medication non-compliance. In addition, Annisa Novita Sary et al. (2024) show that the compliance of TB patients is greatly influenced by the level of knowledge and family support. The study also recommends increased community and family participation in TB control programs, so that a more comprehensive approach can be taken at the community level.

In patients with Multi-Drug Resistant Tuberculosis (MDR-TB), the factors that affect it are slightly different. Research by Fauzan Adima and Merita Arini (2024) highlights that social support from health workers, especially instrumental support, is the dominant factor influencing compliance. This shows that patients with MDR-TB require special attention and intensive assistance from health workers due to the heavier burden of treatment.

Overall, the results of these studies show that TB treatment adherence is influenced by a combination of individual factors (knowledge, perception of recovery), social support (family and health workers), and external factors (PMO and access to health services). These findings emphasize the need for a multidimensional approach that focuses not only on the medical aspect, but also on the aspects of education, family support, and social interventions to improve the success of TB treatment. Although various studies show consistency that knowledge, family support, and health workers have an effect on TB treatment adherence, some methodological limitations need to be noted. Most studies use a cross-sectional design, so it can only describe relationships at a single point in time and are not able to ascertain cause-and-effect relationships.

In addition, some studies involved a relatively small sample size (e.g. 30–31 respondents in the study of Ipah Setyowati et al. and Agnes Rajagukguk), so generalization of results to the wider population is still limited. Small sample sizes also risk generating bias, especially if the respondent characteristics do not represent the general condition of TB patients.

Studies with a qualitative approach, such as those conducted by Agnes Rajagukguk (2020), do provide in depth insights into patient experiences, but these qualitative findings are difficult to generalize. Meanwhile, quantitative research often does not explore contextual factors such as social stigma, economic conditions, or health system barriers that can also affect compliance.

In addition, there is still a lack of research with longitudinal designs or interventions, which can provide stronger evidence on the effectiveness of compliance-enhancing strategies. Most of the research has focused on individual and social factors, while structural factors such as TB program policies, quality of health services, and the sustainability of government support have not been discussed in depth. Thus, while the findings are relevant, it is important for future research to use a more robust design, involve a larger and more diverse sample, and consider systemic factors so that the resulting recommendations are more comprehensive and can be widely implemented

## Conclusion

The results of the literature review showed that treatment adherence in tuberculosis patients was influenced by various interrelated factors, including patient knowledge, family support, the role of health workers, and the existence of a Medication Supervisor (PMO). Good knowledge has been shown to increase patient awareness of the importance of completing therapy, while family and healthcare worker support acts as a motivational and supervisory booster. In the case of Multi-Drug Resistant Tuberculosis (MDR-TB), social support for health workers, especially instrumental support, is the dominant factor in improving compliance. However, most studies are still limited to cross-sectional designs with small sample counts, so the results are not yet fully generalizable. Further research with longitudinal designs, larger samples, and considering structural factors such as TB program policies and health service quality is urgently needed.

Overall, improving TB treatment adherence requires a multidimensional approach that emphasizes not only the medical aspect, but also education, family support, and social and systemic interventions. With the right strategy, it is hoped that patient compliance can be improved, therapy outcomes improved, the risk of drug resistance is reduced, and TB transmission in the community can be suppressed. Global policy frameworks such as WHO's End TB Strategy 2035 provide a clear direction to reduce tuberculosis incidence and mortality, with the ultimate goal of disease elimination by 2035. However, achieving these ambitious targets requires a comprehensive and multidisciplinary approach, which includes increasing the allocation of financial resources, utilizing technological innovations, strengthening cross-sector collaboration, and empowering communities in addressing the social determinants of health that play a role. In line with this, further research is needed to identify the most effective strategies in addressing barriers to TB treatment adherence, particularly in resource-constrained areas. Future research is suggested to explore the use of digital health technologies, such as mobile-based applications, to improve



patient engagement and the effectiveness of therapy monitoring. In addition, it is necessary to conduct a more in-depth analysis of socio- economic and cultural factors that affect medication adherence and health service seeking behavior.

Research focus also needs to be directed at evaluating the sustainability of TB control programs in the long term, especially in areas with a high burden of disease, so that innovations in diagnosis and treatment can reach the groups most in need. The development of research on personalized treatment regimens and community-based interventions is crucial to closing the gaps that remain in TB elimination efforts globally.

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