

Medication Adherence in Pulmonary Tuberculosis Patients

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Article Info	Abstract
Article History Submitted, 2026-05-13 Accepted, 2026-06-24 Published, 2026-06-30 Keywords: Medication adherence, pulmonary tuberculosis, patient characteristics	Medication adherence in patients with pulmonary Tuberculosis (TB) is a critical factor for treatment success and disease transmission prevention. This study aimed to describe the characteristics of patients and the patterns of medication adherence among pulmonary TB patients in three healthcare facilities in Indonesia, namely Puskesmas Permata Kecubung, Sukamara Regency; Puskesmas Tanah Kuning, Bulungan Regency; and RSUD Muhammad Zein, East Belitung Regency. A descriptive quantitative method with a survey design was used. The sample consisted of 60 patients, with 20 patients from each location, selected using accidental sampling. Data collection was conducted simultaneously on March 29, 2026. Data were collected using a medication adherence questionnaire and an observation sheet to record patient characteristics, including age, gender, and education level. The results showed that the majority of respondents were aged 30–50 years (48.3%), with an equal distribution of males and females (50% each), and most respondents had a secondary education level (45%). The findings on medication adherence indicated that most respondents were in the adherent category (45%), followed by moderately adherent (35%) and non-adherent (20%). Variation among locations revealed the highest adherence at RSUD Muhammad Zein (50%) and the lowest at Puskesmas Tanah Kuning (40%). In conclusion, medication adherence among pulmonary TB patients in the three healthcare facilities is still at a level that needs improvement. Therefore, continuous education, routine monitoring, and strengthening support from family and healthcare providers are required to enhance patient adherence to completing their treatment. These efforts are expected to improve therapy success and reduce TB transmission in the community.

Introduction

Medication adherence among pulmonary tuberculosis (TB) patients remains a critical determinant of treatment success and disease control. In Indonesia, although TB treatment is provided free of charge through national programs, non-adherence is still commonly reported and contributes to treatment failure, ongoing transmission, and drug resistance (Ministry of Health of the Republic of Indonesia, 2023). Therefore, understanding adherence patterns at the local level is essential for improving program effectiveness.

At the field level, variations in medication adherence among pulmonary TB patients are evident across the three research locations. In Sukamara Regency, Central Kalimantan, through Puskesmas Permata Kecubung, 45% of patients are classified as adherent, 35% moderately adherent, and 20% non-adherent. In Bulungan Regency, North Kalimantan, through Puskesmas Tanah Kuning, 40% of patients are adherent, 40% moderately adherent, and 20% non-adherent. Meanwhile, in East Belitung Regency, through RSUD Muhammad Zein, 50% of patients are adherent, 30% moderately adherent, and 20% non-adherent. These figures indicate that a considerable proportion of patients still do not fully comply with TB treatment regimens, highlighting the need for targeted interventions to improve adherence in each setting.

Non-adherence to pulmonary TB medication can lead to various serious impacts, both for individuals and the community. Non-adherent patients are at risk of treatment failure, relapse, and the development of drug resistance such as Multidrug-Resistant Tuberculosis (MDR-TB), which is more difficult to treat and requires higher costs. Additionally, patients who do not

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complete treatment may become a source of transmission in their surroundings. This will inevitably worsen national TB control efforts and increase morbidity and mortality due to TB (Kinsay et al., 2024).

Medication adherence in TB patients is influenced by various factors. Some of these factors include patients' knowledge about the disease and treatment, side effects experienced, family support, access to healthcare facilities, and individual motivation to undergo long-term therapy. Moreover, some patients feeling cured before completing treatment is also a major cause of non-adherence. This indicates that patient adherence is influenced not only by medical factors but also by behavioral and social factors (Mia Meilani et al., 2025; Nabila, 2023).

One effort to address this issue is to improve monitoring and evaluation of medication adherence among pulmonary TB patients. By assessing patient adherence, healthcare workers can identify patient groups at risk of non-adherence and provide appropriate interventions, such as health education, treatment assistance, and strengthening family support. This approach is considered effective as it can help raise patient awareness and encourage regularity in completing therapy (Nisa et al., 2025).

Research in the working area of Puskesmas Girimaya, Pangkalpinang City, found that the role of healthcare workers and Directly Observed Treatment (DOT) supervisors is strongly associated with pulmonary TB patient adherence (for example, the role of DOT supervisors increases the likelihood of adherence by up to 20 times). Family support and education level also significantly influence TB patient adherence ($p < 0.05$) (Afilla Christy et al., 2022). Another study at Puskesmas Ujung Gading, West Pasaman Regency, reported that knowledge and family support were significantly associated with medication adherence in pulmonary TB patients, showing that patients with good knowledge and strong family support tend to be more adherent (Elizah et al., 2024). Similarly, a study in Telaga Dewa, Bengkulu, found that knowledge, positive attitudes, and family support were significantly related to patients' adherence to pulmonary TB treatment (Saad et al., 2024). These findings reinforce the analysis that low adherence observed in this study is not an isolated phenomenon but consistent with adherence patterns in various locations. Factors such as lack of knowledge about the importance of completing therapy, poorly managed drug side effects, suboptimal family support, and limited direct monitoring by healthcare workers may explain why most patients fall into the moderately adherent or non-adherent categories.

This is also relevant to health behavior theory, which states that treatment adherence is influenced by predisposing factors (e.g., patient knowledge and attitudes), enabling factors (e.g., social support and healthcare services), and reinforcing factors that motivate patients to continue treatment until completion. Imbalances in these components can contribute to the low adherence observed, consistent with previous research findings (Solin & Putri, 2023).

Based on the above description, this study is important to conduct in order to determine the picture of medication adherence among pulmonary TB patients at Puskesmas Permata Kecubung, Puskesmas Tanah Kuning, and RSUD Muhammad Zein. The results are expected to provide accurate information regarding patient adherence in these locations, which can serve as a basis for improving healthcare service quality and the success of TB control programs at the regional level.

Methods

This study employed a descriptive quantitative design aimed at depicting medication adherence among pulmonary Tuberculosis (TB) patients without providing any intervention or treatment to the variables under study. The research was conducted simultaneously on March 29, 2026, at three locations: Puskesmas Permata Kecubung, Sukamara Regency, Central Kalimantan; Puskesmas Tanah Kuning, Bulungan Regency, North Kalimantan; and RSUD Muhammad Zein, East Belitung Regency.

The population in this study consisted of all pulmonary TB patients currently undergoing treatment and present at each healthcare facility at the time of data collection. The sampling technique used was accidental sampling, meaning pulmonary TB patients who were present and met the research criteria during data collection were selected. The sample size was set at 20 respondents per research location, resulting in a total of 60 patients. Inclusion criteria for this study included patients who had been diagnosed with pulmonary TB, were undergoing treatment, were present at the time of data collection, were willing to participate by signing an informed consent form, and were able to read and understand the questionnaire. Exclusion criteria included patients with unstable general conditions during data collection, those who did not complete the questionnaire, or those who withdrew from the study process.

The research instruments consisted of two parts. First, an observation sheet was used to record respondent characteristics, including age, gender, and education level. Second, a pulmonary TB medication adherence questionnaire was used to measure the patients' adherence to therapy, including regularity of medication intake, timeliness of drug consumption, adherence to scheduled check-ups, and continuity of treatment as recommended by healthcare providers. The questionnaire was developed based on literature and TB treatment

guidelines from the Ministry of Health of the Republic of Indonesia, as well as previous research references, and was tested for validity and reliability before use.

The data collection procedure began with coordination and obtaining permission from each healthcare facility. On the day of data collection, respondents were given an explanation of the study’s purpose and procedures and were asked to sign informed consent. Subsequently, respondents were asked to complete the questionnaire independently, with assistance from the researcher if needed. Respondent characteristics were recorded on the observation sheet.

Ethical aspects of the research were fully implemented, including the principles of informed consent, anonymity, confidentiality, veracity, and justice. Respondents were given the freedom to participate or decline without any impact on the healthcare services they received. Respondent identities were not included in the research report, and all data were kept confidential.

The data processing procedure involved editing (checking data completeness), followed by scoring the adherence questionnaire using a specific scale (e.g., score 1 for appropriate responses and 0 for inappropriate responses), followed by coding and tabulating the data. Data were entered into Microsoft Excel and analyzed using SPSS version 26. Adherence scores were then categorized into adherent, moderately adherent, and non-adherent based on the obtained percentage values. Data analysis was conducted descriptively (univariate). Analysis of respondent characteristics was presented in the form of frequency distribution and percentage to describe age, gender, and education level of patients. Univariate analysis was also used to describe the distribution of medication adherence among pulmonary TB patients in the categories of adherent, moderately adherent, and non-adherent. The results of this analysis were used to provide an overall picture of medication adherence among pulmonary TB patients at the three research locations.

Results and Discussion

Table 1. Distribution and Characteristics of Respondents Based on Research Location						
Characteristic	Category	Permata Kecubung (n=20)	Tanah Kuning (n=20)	RSUD M. Zein (n=20)	Total (n=60)	%
Age	< 30 years	2	3	2	7	11.7%
	30–50 years	10	9	10	29	48.3%
	> 50 years	8	8	8	24	40%
Gender	Male	11	10	9	30	50%
	Female	9	10	11	30	50%
Education	Low	8	7	9	24	40%
	Medium	9	10	8	27	45%
	High	3	3	3	9	15%
Total Respondents	-	20	20	20	60	100%

Table 2. Overview of Medication Adherence Among Pulmonary TB Patients by Location				
Location	Adherent (n/%)	Moderately Adherent (n/%)	Non-Adherent (n/%)	Total
Permata Kecubung	9 (45%)	7 (35%)	4 (20%)	20
Tanah Kuning	8 (40%)	8 (40%)	4 (20%)	20
RSUD M. Zein	10 (50%)	6 (30%)	4 (20%)	20
Total	27	21	12	60

Based on the results presented in Table 1, most respondents were in the productive age group of 30–50 years (48.3%), followed by >50 years (40%) and <30 years (11.7%). This age distribution is relevant to medication adherence, as the productive age group is often associated with higher mobility and work-related activities that may interfere with regular medication intake. This condition may partly explain the presence of patients in the moderately adherent and non-adherent categories observed in this study.

In terms of gender, the distribution was balanced between males and females (50% each). This indicates that medication adherence issues are not dominated by a specific gender group, suggesting that both male and female patients face similar challenges in maintaining consistent TB treatment. However, daily responsibilities and social roles that may differ between genders could still influence individual adherence patterns, although this was not specifically measured in this study.

Regarding education level, most respondents had medium education (45%), followed by low education (40%) and high education (15%). Education level is an important factor in

understanding disease knowledge and treatment compliance. Patients with lower educational backgrounds may have limited understanding of TB treatment duration and the importance of completing therapy, which can contribute to premature discontinuation of medication when symptoms improve.

Table 2 shows that medication adherence among pulmonary TB patients was still suboptimal. Out of 60 respondents, only 45% were adherent, while 35% were moderately adherent and 20% were non-adherent. When viewed by location, RSUD M. Zein showed the highest adherence rate (50%), followed by Puskesmas Permata Kecubung (45%) and Puskesmas Tanah Kuning (40%). The relatively similar pattern of adherence across all sites suggests that non-adherence is a consistent issue across different healthcare settings.

When linked to respondent characteristics, the predominance of productive-age patients (88.3% aged ≥ 30 years) may contribute to irregular medication behavior due to work demands and busy daily schedules. In addition, the relatively high proportion of respondents with low to moderate education levels (85%) may affect their understanding of TB treatment importance, which is reflected in the presence of 20% non-adherent patients across all locations. Meanwhile, the equal gender distribution further supports that adherence challenges are shared across both male and female patients rather than being gender-specific.

These findings indicate that medication adherence is influenced by a combination of demographic factors, particularly age and education level, which may interact with patients' daily routines and level of understanding of TB treatment.

The phenomenon observed in this study is consistent with previous research. Pitoy et al. (2022) reported that TB patients often discontinue treatment due to feeling clinically recovered before completing therapy. Saad et al. (2024) found that patient knowledge and family support significantly influence adherence behavior. Meilani et al. (2025) also highlighted that long treatment duration and drug side effects are major barriers to adherence, while Kinsay et al. (2024) emphasized the importance of healthcare worker supervision in improving treatment compliance.

From a theoretical perspective, these findings align with Lawrence Green's Health Behavior Theory, which explains that health behavior, including medication adherence, is influenced by predisposing factors (such as age, gender, and education), enabling factors (access to health services), and reinforcing factors (family and healthcare worker support). In this study, the dominance of productive-age patients and those with moderate to low education levels represents key predisposing factors that may contribute to variations in adherence across locations. Furthermore, medication adherence in TB treatment is also strongly affected by the complexity and long duration of therapy. The DOTS (Directly Observed Treatment Short-course) strategy plays an important role in ensuring patients take medication regularly through direct supervision, which is particularly important for patients with busy daily activities and limited health literacy.

Overall, although nearly half of the patients showed good adherence, a considerable proportion remained in the moderately adherent and non-adherent categories. This highlights the need for strengthening adherence strategies through targeted health education, improved patient monitoring, and reinforcement of family and healthcare worker involvement. Such integrated efforts are essential to ensure treatment completion, improve recovery outcomes, and reduce TB transmission in the community.

Conclusion

Based on the research results and discussion, it can be concluded that medication adherence among pulmonary TB patients at the three research locations is still suboptimal. Although most respondents fall into the adherent category, a significant proportion remains moderately adherent or non-adherent. This indicates that patient adherence to TB treatment remains an issue that requires attention. Factors such as productive age, education level, drug side effects, long treatment duration, and support from family and healthcare workers influence patient adherence. Therefore, more comprehensive efforts are needed through increased education, routine monitoring, and strengthened social support to improve adherence, ensure treatment completion, enhance therapeutic success, and reduce TB transmission in the community.

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References

- Afilla Christy, B., Susanti, R., & Nurmainah, N. (2022). Hubungan Tingkat Kepatuhan Minum Obat Pasien Tuberkulosis Terhadap Efek Samping Obat Anti Tuberkulosis (Oat). *Journal Syifa Sciences And Clinical Research*, 4(1). <https://doi.org/10.37311/Jsscr.V4i2.14830>

- Amirulah, F. F., Yanti, S. I., & Rosdayani, D. (2023). Hubungan Tingkat Kepatuhan Minum Obat Dengan Kualitas Hidup Pasien Tuberkulosis Paru Di Puskesmas Bojong Rawalumbu. *Jurnal Ilmiah Pharmacy*, 10(2), 49–62. <https://doi.org/10.52161/Jiphar.V10i2.495>
- Elizah, E., Chairil Zaman, & Arie Wahyudi. (2024). Analisis Kepatuhan Minum Obat Anti Tuberkulosis Paru Di Wilayah Kerja Puskesmas Tahun 2024. *Cendekia Medika: Jurnal Stikes Al-Ma'Arif Baturaja*, 9(1), 176–187. <https://doi.org/10.52235/Cendekiamedika.V9i1.352>
- Hermawan, D., Hilmi, I. L., & Sudarjat, H. (2025). Literature Review: Pengaruh Efek Samping Obat Anti Tuberkulosis (Oat) Terhadap Kepatuhan Minum Obat Pasien Tuberkulosis Di Indonesia: Literature Review: The Influence Of Side Effect Of Anti-Tuberculosis Drugs (Oats) On Drug Compliance Of Tuberculosis Patients In Indonesia. *Jurnal Surya Medika*, 11(2), 47–57. <https://doi.org/10.33084/Jsm.V11i2.8554>
- Kinsay, M. L., Pratama, P., & Na'ima. (2024). Faktor-Faktor Yang Mempengaruhi Kepatuhan Minum Obat Pada Penderita Tb Paru. *Comphi Journal: Community Medicine And Public Health Of Indonesia Journal*, 4(2). <https://doi.org/10.37148/Comphijournal.V4i2.163>
- Mia Meilani, Candra Junaedi, & Fajrin Noviyanto. (2025). Hubungan Kepatuhan Minum Obat Terhadap Kualitas Hidup Pasien Tb Paru Di Rumah Sakit Budiasih. *Jurnal Ilmiah Kedokteran Dan Kesehatan*, 4(1), 233–245. <https://doi.org/10.55606/Klinik.V4i1.5129>
- Nabila, N. (2023). Faktor-Faktor Yang Mempengaruhi Kepatuhan Minum Obat Anti Tuberkulosis (Oat) Pada Penderita Tuberkulosis Paru (Tb): Literature Review. *Media Publikasi Promosi Kesehatan Indonesia (Mppki)*, 6(8), 1478–1484. <https://doi.org/10.56338/Mppki.V6i8.3484>
- Nisa, Q., Ruhjana, N., & Affandi, T. T. (2025). Hubungan Usia Dan Tingkat Kepatuhan Pengobatan Terhadap Kesembuhan Pasien Tb Paru Di Rs Paru Sidawangi. 24(1).
- Pitoy, F. F., Padaunan, E., & Herang, C. S. (2022). Dukungan Keluarga Dan Kepatuhan Minum Obat Pada Pasien Tuberkulosis Paru Di Wilayah Kerja Puskesmas Sagerat Kota Bitung. *Klabat Journal Of Nursing*, 4(1), 1. <https://doi.org/10.37771/Kjn.V4i1.785>
- Saad, L. A., Hermiaty Nasaruddin, Sigit Dwi Pramono, Edward Pandu Wiryansyah, & Rahmawati. (2024). Evaluasi Kepatuhan Pasien Tuberkulosis Paru Terhadap Penggunaan Oat. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, 4(5), 349–357. <https://doi.org/10.33096/Fmj.V4i5.457>
- Solin, S., & Putri, Y. H. (N.D.). Tingkat Pengetahuan Dan Kepatuhan Pasien Tuberkulosis Paru Pada Puskesmas Di Kota Bengkulu.