

Cross-Sectional Study of Anti-Tuberculosis Treatment Adherence Levels Under the DOTS Strategy at Betung Kota Community Health Center, Indonesia

Agung Palendra^{1*}, Yovi Pranata¹, Rahayu Wijayanti¹

¹Study Program of Pharmacy, Universitas Kader Bangsa Palembang, Palembang, South Sumatra, Indonesia, 30253

*Corresponding author: agungpalendra62@gmail.com

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ABSTRACT

Tuberculosis (TB) is an infectious disease that requires a high level of adherence to Anti-Tuberculosis Drugs (OAT), particularly through the implementation of the Directly Observed Treatment Short-Course (DOTS) strategy. This study aims to analyze the level of medication adherence to OAT based on the DOTS strategy at Betung Kota Community Health Center, Indonesia. This research employed an analytical quantitative method with a cross-sectional design, involving TB patients (35 respondents) who had undergone treatment for at least one month, selected using purposive sampling. Data were collected using structured questionnaires and analyzed using univariate and bivariate methods with the chi-square test. The results showed that the majority of patients had a good level of knowledge (82.9%) and a high level of treatment adherence (85.7%), in accordance with treatment success standards. The implementation of the DOTS strategy was considered quite optimal, as reflected by regular patient visits, the active role of treatment supervisors (PMO), and the availability of OAT. Statistical analysis indicated a significant relationship between the level of knowledge and medication adherence ($p = 0.003$), suggesting that better knowledge contributes to higher adherence to TB therapy. In conclusion, the DOTS strategy plays an important role in improving adherence to OAT among TB patients. Strengthening patient education, family support, and continuous monitoring is essential to maintain treatment success.

Keywords: Adherence; DOTS; Knowledge; Tuberculosis; Questionnaire.

INTRODUCTION

Tuberculosis (TB) remains one of the most pressing global health issues. According to a WHO report (1), in 2022 there were approximately 10.6 million new cases of TB worldwide with 1.3 million deaths, making this disease the second leading cause of infectious death after COVID-19. Indonesia ranks second after India, with an estimated 969,000 cases and more than 134,000 deaths per year. These figures indicate that TB transmission remains high and is a priority in global infectious disease control. Based on data from the 2018 Basic Health Research (Riskesdas), the prevalence of TB in Indonesia reached 0.42% of the total population, with an increase influenced by socioeconomic factors, population density, and limited access to health services (2).

TB can have serious health consequences if not treated properly. A study by The Lancet shows that around 50% of pulmonary TB patients who do not receive adequate treatment experience permanent lung damage, leading to reduced lung capacity and long-term respiratory disorders (3). Additionally, Addo *et al.* (4) reported that TB patients experience significant impairment in quality of life due to chronic symptoms and activity limitations, which impact both their physical and psychological well-being. In fact, approximately 18–21% of TB patients who have previously undergone treatment can develop drug-resistant tuberculosis (MDR-TB), which is difficult to treat and poses a risk of further complications (5). To address this, the WHO recommends the DOTS (Directly Observed Treatment Short-course) strategy, which is a short-term treatment approach directly supervised by health workers to ensure that patients take their medication regularly and completely.

The DOTS strategy has been adopted nationally through Indonesian Minister of Health Regulation No. 67 of 2016 concerning Tuberculosis Control, which covers five main components: government commitment, early detection, directly observed treatment, drug availability, and an effective recording and reporting system (6). Community health centers (Puskesmas), as primary health care facilities, play an important role in implementing this strategy. In South Sumatra Province, Palembang City reported 131,230 tuberculosis cases with 751 deaths in 2024, reflecting that the burden of TB remains high and that treatment adherence continues to be a major challenge. The Betung Kota Community Health Center Indonesia, was selected as the research location because it serves a large and diverse population within its catchment area and consistently reports TB cases that require long-term monitoring under the DOTS program. Internal monitoring data from this facility indicate that several patients experienced treatment interruptions during both the intensive and continuation phases. However, these interruptions have not been examined in depth, particularly in relation to patient knowledge, which plays a central role in shaping treatment attitudes and behaviors (7). Understanding this relationship is crucial for strengthening adherence strategies at the local level and providing evidence-based recommendations for TB control efforts in South Sumatra.

Previous studies have shown that the success of DOTS programs is greatly influenced by the level of knowledge, social support, and communication between patients and health workers. Husna *et al.* (8) reported that patients with high knowledge and strong family support showed better treatment adherence. Widya & Maharani (9) found that consistent implementation of DOTS was able to increase treatment completion rates to 75%, while Merza (10) emphasized the importance of active communication from medication supervisors by consistently providing information about tuberculosis treatment management to increase patient knowledge. However, no research has been conducted that specifically evaluates the relationship between patient knowledge and medication adherence at the Betung Kota Community Health Center in Indonesia. Therefore, this study focuses on investigating the connection between knowledge and adherence to anti-tuberculosis medication in line with the DOTS strategy, along with patients' demographic characteristics, as a way to support treatment success and prevent drug resistance.

METHODS

This study used an analytical quantitative method with a cross-sectional design that referred to the DOTS (Directly Observed Treatment Short-Course) TB control strategy. The study was conducted at the Betung Kota Community Health Center Indonesia, with respondents selected using purposive sampling, including tuberculosis patients who had undergone at least one month of treatment and were willing to participate. This research has obtained ethical approval with the number KEPK/UMP/43/IX/2025.

The research instrument used was a structured questionnaire, designed based on indicators from the DOTS Strategy and adherence to the use of anti-tuberculosis drugs. This questionnaire was adapted from the Indonesian Ministry of Health guidelines (2022) and Notoatmodjo's (2018) health behavior theory. The questionnaire consisted of closed-ended questions with specific answer choices, covering aspects of monitoring by the PMO, consistency in program implementation, regularity of medication consumption, adherence to control, and patient understanding of the importance of completing therapy. All items were compiled based on relevant indicators, using nominal and ordinal scales according to the needs of the analysis, and had undergone validity and reliability tests before being used in data collection. The data obtained were then analyzed univariately and bivariately using the chi-square test. This study was conducted from May to July 2025.

The population in this study consisted of all tuberculosis patients undergoing treatment at the Betung Kota Community Health Center during the study period and who were recorded as participating in the DOTS treatment program, both those still undergoing treatment and those who had completed it. The sample consisted of 35 respondents calculated using the Slovin formula. Sampling was based on certain considerations and criteria set by the researcher. The inclusion criteria used were tuberculosis patients who had undergone at least one month of therapy, were aged 18 years and above, and expressed their willingness to become respondents by filling out a participation consent form. Meanwhile, the exclusion criteria included patients who could not cooperate during the research process and patients who had communication barriers that could interfere with filling out the questionnaire.

RESULT AND DISCUSSION

This study was conducted at the Betung Kota Community Health Center, Banyuasin District, South Sumatra Province. This community health center is a primary health facility that has implemented the Directly Observed Treatment Short-course (DOTS) strategy. The DOTS program is implemented to ensure that patients take their anti-tuberculosis drugs (OAT) regularly with the involvement of Drug Intake Supervisors (PMO).

The Directly Observed Treatment Short-course (DOTS) strategy is the primary approach recommended by the World Health Organization (WHO) for global tuberculosis control. This strategy emphasizes direct supervision of patients while they take anti-tuberculosis drugs (OAT) by health workers or Drug Administration Supervisors (PMO) to ensure treatment compliance and prevent drug resistance (11). DOTS has five main components, namely government commitment to the TB program, case detection through sputum examination, use of a standard short-term treatment regimen with direct supervision, ensuring continuous availability of drugs, and a system for regular recording and reporting of treatment results (12,13). The implementation of the DOTS strategy at the primary health care level, such as at the Betung Kota Community Health Center in Banyuasin District, plays an important role in improving patient adherence and treatment success rates, as shown in various studies in Indonesia that the active involvement of PMOs contributes to increased TB treatment success (14).

Validity and Reliability Testing of Knowledge and Compliance Instruments

The research instrument was first tested for validity and reliability using 30 pilot respondents outside the main sample. The validity test aimed to determine the extent to which the instrument was able to measure what it was supposed to measure (15). Validity was tested using Corrected Item-Total Correlation. An item is considered valid if the calculated r value is greater than the table r at a certain significance level, which means that the item has a strong correlation with the total score and is able to represent the construct being measured (16). The validity test results in this study showed that all items had a calculated r value greater than the table r , so all items were declared valid and suitable for use in the main study.

In addition, reliability testing was conducted using Cronbach's Alpha method through the SPSS application to assess the consistency of measurement results. Reliability indicates the extent to which an instrument provides consistent results when measured repeatedly under the same conditions (15). An instrument is considered reliable if it has a Cronbach's Alpha value ≥ 0.70 , which indicates that the items in the instrument have a good level of internal consistency. The reliability test results in this study show that the knowledge and compliance questionnaire has an alpha value ≥ 0.70 , so it can be concluded that the instrument is reliable and suitable for use in the main study (17).

Table 1. Results of Instrument Knowledge Validity Test

No	Question	Calculated r	Table r	Note
1	Do you have a PMO (Medication Supervisor)?	0.615	0.361	Valid
2	Does your PMO regularly monitor you when you take your medication?	0.588	0.361	Valid
3	Do health center staff provide education before and during treatment?	0.543	0.361	Valid
4	Are you getting your TB medication regularly without any problems?	0.602	0.361	Valid
5	Is your PMO from your family or someone close to you?	0.570	0.361	Valid
6	Officers/PMO routinely remind people to get checked at health facilities.	0.634	0.361	Valid
7	During treatment, I felt that I was being monitored/guided by health workers.	0.556	0.361	Valid
8	I obtained information about the side effects of TB medication and how to deal with them.	0.481	0.361	Valid
9	Community health centers provide facilities that support the smooth treatment of TB.	0.667	0.361	Valid
10	The PMO understands its duties and assists me in my TB treatment.	0.692	0.361	Valid

Table 2. Results of the Compliance Instrument Validity Test

No	Question	Calculated r	Table r	Note
1	I take my TB medication every day according to schedule.	0.682	0.361	Valid
2	I never skip my medication even when I feel healthy.	0.651	0.361	Valid
3	I came for my scheduled checkup with the officer.	0.570	0.361	Valid
4	I followed all the healthcare provider's instructions during treatment.	0.613	0.361	Valid
5	I continued the treatment despite the mild side effects.	0.559	0.361	Valid

Table 3. Results of the Knowledge Instrument Reliability Test

Instrument	Number of Items	Cronbach's Alpha	Note
Knowledge	10	0.879	Reliable

Table 4. Results of the Compliance Instrument Reliability Test

Instrument	Number of Items	Cronbach's Alpha	Note
Compliance	5	0.841	Reliable

Respondent Characteristics

Respondent characteristics were analyzed using frequency distribution. Most respondents were aged 30–45 years (45.7%), male (57.1%), high school educated (48.6%), and worked as farmers (31.4%). According to Notoatmodjo (2018), sociodemographic factors such as age, education, gender, and occupation influence health behavior, including treatment adherence. This was evident in this study, where the majority of respondents were of productive age (30–45 years old), who generally have high activity levels, which can affect the regularity of control and medication consumption. This finding is in line with Mir (18), who reported that higher education and better socioeconomic status are positively correlated with adherence to long-term therapy in the context of this study, most respondents had a high school education, which may have resulted in moderate health literacy, thereby affecting their understanding of the importance of OAT treatment.

In addition, the predominance of male respondents supports the findings of Choliq *et al.* (19), who stated that differences in social roles and risk perceptions between men and women can affect discipline in taking medication. Other studies have also shown that productive age, gender, and health literacy are important factors in treatment behavior (20). Thus, variations in the characteristics of respondents in this study particularly productive age, education level, and gender have the potential to be factors that influence the level of knowledge and adherence to OAT treatment at the Betung Kota Community Health Center.

Table 5. Respondent Characteristic Results (n = 35)

Characteristics	Category	n	%
Gender	Male	20	57.1
	Female	15	42.9
Age	< 30 years	8	22.9
	30–45 years	16	45.7
	> 45 years	11	31.4
Education	Elementary/Junior High School	5	14.3
	Senior High School	17	48.6
	University	13	37.1

Occupation	Farmer/Laborer	11	31.4
	Housewife	10	28.6
	Employee/Civil Servant	6	17.1
	Other	8	22.9

Respondents' Level of Knowledge

The distribution of respondents' knowledge levels (Table 6) shows that most tuberculosis patients (82.9%) have good knowledge about their disease and anti-tuberculosis drug therapy (OAT). A good level of knowledge indicates that patients understand the causes, modes of transmission, the importance of medication adherence, and the consequences of not completing treatment. According to Notoatmodjo (21), knowledge is the result of a process of knowing after a person perceives an object, and is an important basis for the formation of health behavior. In line with this, Choliq *et al.*(19) explain that educating and increasing patients' understanding of TB can improve adherence to therapy, prevent drug discontinuation, and reduce the risk of resistance. Similar results were also found in previous studies reporting that TB patients with high levels of knowledge were more likely to complete treatment than patients with low knowledge (22,23). Thus, the high level of patient knowledge in this study has the potential to support the successful implementation of the DOTS strategy at the Betung Kota Community Health Center.

Table 6. Distribution of TB Patient Knowledge (n = 35)

Level of Knowledge	n	%
Good	29	82.9
Fair	4	11.4
Poor	2	5.7

Respondents' Level of Compliance

The level of compliance among tuberculosis patients in this study showed high adherence to treatment (85.7%), reflecting the effectiveness of the DOTS strategy implementation at the Betung Kota Community Health Center. Good compliance indicates that patients consistently took their anti-tuberculosis medication according to the schedule and recommendations of health workers. These results are in line with previous studies which state that patients with a high level of knowledge and good psychosocial support tend to be more compliant in undergoing therapy (19,24). In addition, a study by Hisran *et al.* (25) in Jambi shows that patient compliance is also influenced by the availability of drugs and assistance from health workers. An international study by Abas *et al.* (26) adds that technological innovations, such as digital monitoring applications, can increase patient motivation and adherence to TB treatment. According to Notoatmodjo (21), adherence is the result of health behaviors influenced by internal factors (knowledge, attitude, and motivation) and external factors such as environmental support and health workers. Thus, the high level of adherence in this study indicates that a combination of education, direct supervision, and health system support plays an important role in the success of tuberculosis therapy.

Table 7. Distribution of TB Patient Compliance Levels (n = 35)

Compliance Level	n	%
High	30	85.7
Medium	3	8.6
Low	2	5.7

The Relationship Between Knowledge and Compliance

The Chi-Square test results show a significant relationship between the level of knowledge and compliance of tuberculosis patients with treatment ($\chi^2 = 8.925$; $p = 0.003$; $df = 1$), with a Phi value of 0.504 indicating a moderate to strong relationship. This means that the better patients' knowledge of TB and OAT therapy, the more likely they are to comply with treatment. These results show that knowledge plays a crucial role in shaping patient compliance with TB therapy. Patients who have a good understanding of the causes of the disease, how the drugs work, and the importance of completing treatment tend to have stronger motivation and confidence to seek regular treatment until completion. These findings are in line with previous studies showing that patients with high levels of knowledge and adequate social support have better compliance rates than patients with low knowledge (27,28). Thus, the results of this study confirm that increasing patient knowledge not only has a direct impact on adherence but also plays a role in strengthening perceptions, beliefs, and positive attitudes toward the importance of continuous TB treatment, which then underlies the formation of healthy behaviors according to the Health Belief Model (HBM) theory.

Theoretically, the relationship between knowledge and compliance can be explained through the Health Belief Model (HBM), which states that a person's health behavior is determined by their perception of disease threats, the benefits of treatment, barriers, and self-efficacy. In this context, patients who understand the risks of TB complications and the benefits of treatment tend to be more motivated to adhere to therapy (29). Good knowledge also increases patients' confidence in managing their treatment and helps them overcome barriers such as side effects or boredom during long-term therapy. The consistency of these findings with the World Health Organization (11) report further reinforces that patient education and monitoring are important components of the DOTS strategy to achieve optimal adherence and prevent drug resistance.

The study's findings also demonstrate that the Betung Kota Community Health Center's high compliance rate is inextricably linked to the DOTS strategy's successful execution, especially when it comes to the Drug Adherence Supervisor's (PMO) proactive role in reminding patients of their medication schedule and closely monitoring them, as well as the ongoing availability of anti-TB medications. According to the HBM framework, this suggests that patients are more confident that completing treatment will result in significant health outcomes when they have a better understanding of the treatment's perceived benefits and perceived constraints.

Table 8. Knowledge × Compliance Crosstab (n = 35)

Knowledge	High Compliance	Moderate/Low Compliance	Total
Good	28	1	29
Fair/Poor	2	4	6
Total	30	5	35

Increasing patient knowledge is crucial to the success of TB treatment at the Betung Kota Community Health Center, as demonstrated by the study's Phi value of 0.504, which indicates a moderate to strong correlation between knowledge and adherence. Increasing patient understanding can therefore be a crucial basis for enhancing adherence to TB treatment, according to theory and empirical data.

The results of this study indicate that increasing patient knowledge is an effective strategy for improving TB treatment adherence. Continuous health education, individual counseling by health workers, and support from Drug Administration Supervisors (PMO) play an important role in strengthening patients' understanding and motivation to complete therapy. The study by Sazali *et al.* (30) shows that technology-based interventions and personalized communication can improve TB treatment adherence in several developing countries, such approaches may serve as a future recommendation for Puskesmas Betung to consider adapting simpler, non-digital forms of personalized communication that align with local resources and service capacity. The cross-sectional design of this study, which precludes causal interpretation, the use of self-reported adherence, which could result in recall or social desirability bias, and the small sample size from a single health center could all have an impact on how broadly the results can be applied.

CONCLUSION

Based on the results of the study, it can be concluded that the knowledge and compliance questionnaire instruments used are valid and reliable, enabling consistent measurement of variables. The majority of patients had a good level of knowledge and adherence to treatment, with adherence levels meeting treatment standards. Statistical analysis showed a significant relationship between the level of knowledge and adherence to medication, confirming that the better the patient's knowledge, the higher their level of adherence to pulmonary tuberculosis therapy.

REFERENCES

1. World Health Organization. Global Tuberculosis Report 2023. Geneva: WHO; 2023.
2. Kemenkes RI. Laporan Nasional Riskesdas 2018. Jakarta: Badan Litbangkes Kemenkes; 2018.
3. Ivanova O, Hoffmann VS, Lange C, Hoelscher M, Rachow A. Post-tuberculosis Lung Impairment : Systematic Review and Meta-analysis of Spirometry Data from 14 621 People. *Eur Respir Rev* [Internet]. 2023;32:1–14. Available from: <http://dx.doi.org/10.1183/16000617.0221-2022>
4. Addo J, Pearce D, Metcalf M, Lundquist C, Thomas G, Aguirre DB, et al. Living with Tuberculosis : a Qualitative Study of Patients ' Experiences with Disease and Treatment. *BMC Public Health* [Internet]. 2022;22:1–16. Available from: <https://doi.org/10.1186/s12889-022-14115-7>
5. Ministry of Health and Family Welfare Government of India. National Guidelines for Management of Drug

Resistant TB. India: Central TB Division; 2024.

6. Kementerian Kesehatan Republik Indonesia (Kemenkes RI). Peraturan Menteri Kesehatan Republik Indonesia Nomor 67 Tahun 2016 tentang Penanggulangan Tuberkulosis. Jakarta: Kementerian Kesehatan RI; 2016.
7. Maura K, Pratama P, Na'ima. Faktor-faktor yang Mempengaruhi Kepatuhan Minum Obat pada Penderita TB Paru. *CoMPHI J Community Med Public Heal Indones J*. 2023;4(2):166–73.
8. Husna HBI, Abidin Z, Ramadhanintyas KN. Pengaruh Pengetahuan Dan Dukungan Keluarga terhadap Kepatuhan Berobat Pada Pasien Tuberkulosis Paru Di RSUD Dr. Soeroto, Kabupaten Ngawi. *Care J Ilm Ilmu Kesehat*. 2024;12(1):99–113.
9. Widya RR, Maharani C, Masyarakat IK, Keolahragaan FI, Semarang UN, Semarang K. Evaluasi Strategi DOTS (Directly Observed Treatment Short Course) Di Puskesmas Tlogomulyo Kabupaten Temanggung Tahun 2021. *J Kesehat Masy*. 2022;10(4):485–92.
10. Merza MA. A 5-year Experience Characterizing the Demographic and Clinical Profile and Directly Observed Treatment Short-course Treatment Outcome in National Tuberculosis Center of Duhok province , Iraqi Kurdistan. *SAGE Open Med*. 2020;8:1–10.
11. World Health Organization. Tuberculosis: The Directly Observed Treatment, Short-course (DOTS) Strategy. Geneva: WHO; 2022.
12. Kemenkes R. Pedoman Nasional Pengendalian Tuberkulosis. Jakarta: Direktorat Jenderal Pencegahan dan Pengendalian Penyakit; 2021.
13. World Health Organization. Treatment of Tuberculosis: Guidelines (4th ed.). Geneva: WHO Press; 2010.
14. Yanti NLD, Jati SP, Arso SP. Peran dan Efektivitas Pengawas Minum Obat (PMO) dalam Pengobatan Tuberkulosis: Scoping Review. *PREPOTIF J Kesehat Masy*. 2024;8(3):7142–52.
15. Sugiyono. Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta Bandung; 2019.
16. Azwar S. Reliabilitas dan Validitas. Yogyakarta: Pustaka Pelajar; 2012.
17. Ghozali I. Aplikasi Analisis Multivariate dengan Program IBM SPSS 25. Semarang: Badan Penerbit Universitas Diponegoro; 2018.
18. Mir SA. Sociodemographic Factors Affecting Patient Compliance to Long-term Therapies. *Mir Asian J Pharm Clin Res*. 2021;14(7):6–9.
19. Choliq I, Sukartini T, Makhfudli M. The Effect of Psychological and Health Education Approaches Based on Self-efficacy on Compliance with Tuberculosis Patient: A Systematic Review. *Nurse Heal J Keperawatan*. 2020;9(2):111–23.
20. Huang CL, Chiang CH, Yang SC. The Associations among Gender, Age, eHealth Literacy, Beliefs about Medicines and Medication Adherence among Elementary and Secondary School Teachers. *Int J Environ Res Public Heal Artic*. 2022;19:1–13.
21. Notoatmodjo S. Promosi Kesehatan dan Perilaku Kesehatan. Jakarta: Rineka Cipta; 2018.
22. Maifitrianti, Wiyati T, Hasanah N. Relationship between Patients' Knowledge and Medication Adherence of Tuberculosis at Islamic Hospital Pondok Kopi Jakarta. *J Manaj dan Pelayanan Farm*. 2024;14(1):69–75.
23. Hidayat J, Lee M, Lee M, Lee M. The Relationship between Knowledge and Medication Compliance Behavior among Patients with Tuberculosis in Indonesia. *South East Asia Nurs Res*. 2020;2(2):1–9.

24. Fernandes A, Laohaprapanon S, Nam TT, Sequeira EMD, Le CN. Adherence to Pulmonary Tuberculosis Medication and Associated Factors Among Adults : A Cross-Sectional Study in the Metinaro and Becora Sub-Districts, Dili, Timor-Leste. *Int J Environ Res Public Health*. 2024;21:1–14.
25. Hisran, Sugiarti, Nasution HS, Ningsih VR. The Effect of Characteristics, Patient Knowledge and Availability of Pulmonary TB Drugs with Compliance with Taking Pulmonary TB Drugs at the Jambi City Health Center in 2023. *Eduvest – J Univers Stud*. 2024;4(11):10948–56.
26. Abas SA, Ismail N, Zakaria Y, Yasin SM, Ibrahim K, Ismail I, et al. Enhancing Tuberculosis Treatment Adherence and Motivation Through Gamified Real- time Mobile App Utilization : A Single-arm Intervention Study. *BMC Public Health*. 2024;24:1–10.
27. Palangan O, Peristiowati Y, Ellina AD. Factors Related to Medication Adherence among Pulmonary Tuberculosis Patients : A Literature Review. *Saudi J Nurs Heal Care*. 2021;7921(Picture 1):284–92.
28. Kurniawan HD, Aqsyari R, Azizah FK. The Role of Social Support in Improving Treatment Compliance in Tuberculosis Patients : A Meta-Analysis. *J Heal Promot Behav*. 2025;10(2):316–27.
29. Khamai N, Seangpraw K, Ong-artborirak P. Using the Health Belief Model to Predict Tuberculosis Preventive Behaviors Among Tuberculosis Patients' Household Contacts During the COVID-19 Pandemic in the Border Areas of Northern Thailand. *J Prev Med Public Heal*. 2024;57:223–33.
30. Sazali MF, Sharizman S, Abdul S, Ch MBBBAO. Improving Tuberculosis Medication Adherence : The Potential of Integrating Digital Technology and Health Belief Model. *Tuberc Respir Dis*. 2022;82–93.