Jurnal Manajemen dan Pelayanan Farmasi (JMPF)
(Journal of Management and Pharmacy Practice)
ISSN-p : 2088-8139 | ISSN-e : 2443-2946
JMPF Vol 14(1) 2024: 69-75

# Relationship between Patients' Knowledge and Medication Adherence of Tuberculosis at Islamic Hospital Pondok Kopi Jakarta

**Maifitrianti[1*], Tuti Wiyati[1], Nur Hasanah[1]**
[1] Study Program of Pharmacy, Faculty of Pharmacy and Sciences, Universitas Muhammadiyah Prof. Dr. HAMKA, Jakarta, Indonesia

**ARTICLE INFO**
**Submitted : 13-07-2023**
**Revised : 19-12-2023**
**Accepted : 20-03-2024**
**Published : 31-03-2024**

**Corresponding Author: Maifitrianti**
**Corresponding Author Email: maifitrianti@uhamka.ac.id**

**ABSTRACT**
**Background:** Tuberculosis (TB) remains a health problem in Indonesia. Currently, the number of new TB cases in Indonesia ranks second after India. Patient compliance in using antituberculosis drugs is critical in achieving successful treatment outcomes, prevent further spread of the bacteria that cause TB and the development of drug resistance. Adherence to taking medication can be influenced by various factors, one of which is the level of knowledge.
**Objectives:** This study was aimed to determine the relationship between the level of knowledge about TB and medication adherence of TB patients at the Jakarta Islamic Hospital Pondok Kopi.
**Methods:** This study was conducted from May to June 2022 with a cross sectional design. The inclusion criteria in this study were TB patients who were over 18 years old, willing to become respondents, and had used antituberculosis drugs for at least one month. The level of knowledge about TB was assessed using a questionnaire and medication adherence was assessed using the MARS-5 questionnaire.
**Results:** The number of respondents in this study was 83 patients. Most patients were male (57.83%), less than 60 years old (83.13%), and had a high school education (53.01%). The results showed that most patients (73.47%) had a good level of knowledge and were compliant with taking medication (77.11%). The level of patient knowledge about TB has a significantly moderate and positive correlation with the level of adherence in taking medication ($p$ 0.001; $r$ 0.517).
**Conclusion:** increasing patients' knowledge about TB can lead to better patients' adherence, which may lead to better treatment outcome.
**Keywords: Adherence; MARS-5; Knowledge; Tuberculosis**

## INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. This bacteria is often found infecting the lung parenchyma and causes pulmonary TB, but it can also infect other body organs such as lymph nodes, bones, and other organs.[1] Tuberculosis is one of the main causes of death worldwide. Geographically, in 2021, the largest number of TB cases was in the Southeast Asia region, namely 45%, where Indonesia (9.2%) ranked second with the highest number of TB cases after India (28%).[2] The estimated TB incidence in Indonesia in 2021 is 969.000 or 354 per 100,000 population. However, based on TB incidence figures in Indonesia, only 443,235 cases were notified in 2021.[3] Meanwhile, the number of TB cases in DKI Jakarta in 2021 was 26,854 cases.[4]

Most TB patients can be cured with first-line drug administration for 6 months and timely diagnosis.[5] In Indonesia, all patients who have not been previously treated and do not have risk factors for resistance must receive first-line drugs approved by the WHO. This first-line treatment includes administering Isoniazid, Rifampicin, Pyrazinamide, and Ethambutol for two months, followed by administering Isoniazid and Rifampicin for 4 months. The success rate for TB treatment in Indonesia in 2021 was 85.9%. This still did not reach the target set by the Indonesian Ministry of Health, namely at least 90%. Meanwhile, in DKI Jakarta the success rate for TB

treatment was only 79.2%.[3]

One of the factors that can influence the success of treatment in TB patients is patient non-adherence with the use of Anti-Tuberculosis Drugs (OAT).[1] The results of previous research conducted in several regions in Indonesia show that there are still TB patients who are not adherent to medication use. The results of research conducted at the Cengkareng District Health Center showed that 32.2% of TB patients were non-adherent in using medication.[6] Research conducted at the Jakarta Harbor Hospital also showed that 24.7% of patients were non-adherent in using medication.[7] The results of another study conducted at one of the Bandar Lampung City Health Centers showed that only 74.4% of TB patients had a high level of drug use adherence.[8]

Patients' lack of knowledge about TB can affect their adherence to drug use. Patients with a good level of knowledge tend to be adherent in using medication[910]. However, the results of previous research show that many TB patients still have poor knowledge concerning this matter. The results of research conducted at the Kota Timur Community Health Center show that 34.4% of patients had a poor level of knowledge.[9] These results are in line with research conducted at the Andalas Health Center, Padang City, which found that 30.8% of patients had a poor level of knowledge.[10]

Factors that can influence adherence in TB patients must be evaluated so that they can support the success of patient therapy. Therefore, this study aims to determine the relationship between the level of patient knowledge about TB and the patients' adherence at the Jakarta Islamic Hospital Pondok Kopi.

## METHODS

### Study design

This research was non-experimental research with a cross-sectional research design. This research was conducted at the Jakarta Islamic Hospital (RSIJ) Pondok Kopi. The research was conducted from May to June 2022. This research has been approved by the Medical and Health Research Ethics Committee of Muhammadiyah University, Prof. DR. HAMKA (KEPKK-UHAMKA) with ethical approval No. 03/22.04/01694 dated April 13th, 2022.

### Population and samples

The population in this study were all patients diagnosed with pulmonary TB. The inclusion criteria in this study were patients who were over 18 years old, willing to become respondents by signing informed consent, and had used OAT for at least 1 month. The exclusion criteria for this study were patients with communication disorders and those who did not fill out the questionnaire completely. The sampling technique used was total sampling.

### Study instruments

In this study, patient knowledge about TB and patient adherence were obtained from primary data in the form of questionnaires. The knowledge questionnaire consisted of 21 questions related to TB including 3 questions about the causes of TB, 5 questions about the risk factors, 4 questions about the transmission methods, 5 questions about the signs and symptoms, and 4 questions about the treatment. The answer choices on the knowledge questionnaire consisted of yes and no. The correct answer was given a score of 1, while the wrong answer was given a score of 0. The minimum and maximum score range that a patient could obtain was 0 to 21. The knowledge questionnaire used was valid and reliable with a Cronbach's alpha value of 0.774.[11] The total knowledge score obtained by each respondent was tested for normality using the Kolmogorov Smirnov test and it was found that the data was not normally distributed with a median value of 15. Therefore, in this study, the median value was used as the cut-off point for the level of patient knowledge, where the level of knowledge was good if the score was ≥ 15 and poor if the score was < 15.[12]

Adherence in this study was assessed using the Medication Adherence Rating Scale-5 (MARS-5) questionnaire.[13] The MARS-5 questionnaire used in Bahasa Indonesia was valid and reliable with a Cronbach's alpha value of 0.940.[14] The MARS-5 questionnaire consisted of 5 questions with answer options always, often, sometimes, rarely, and never. The respondents' level of adherence was assessed from the total score obtained, where the patient is adherent if the score is 25 and non-adherent if the score is < 25.

### Data collection

All TB patients who met the inclusion criteria and consented to participate in the study were asked to complete a sociodemographic questionnaire, knowledge questionnaire and MARS-5. Next, the researcher

collected the questionnaires completed by the patients and rechecked the patients' clinical and treatment data in the medical record.

### Data Analysis

Univariate analysis was carried out to obtain the frequency distribution of demographic characteristics, level of knowledge, and adherence. Bivariate analysis with the chi-square test was carried out to analyze the relationship between respondent characteristics and level of knowledge and adherence, while the Spearman Rho test was carried out to analyze the relationship between level of knowledge and adherence to taking medication. Two variables were concluded to have a significant relationship if the p-value < 0.05.

## RESULTS AND DISCUSSION

The number of TB patients at the RSIJ Pondok Kopi pulmonary TB clinic for the period May to June 2022 was 88 patients. A total of 5 patients were excluded because they were patients with communication disorders. Therefore, only 83 patients met the inclusion criteria. The majority of TB patients in this study were younger than 60 years old (83.13%) and male (57.83%). The most recent level of education of patients was Senior High School (53.01%). In this study, the percentage of patients who worked was only 48.19%. The majority of patients had suffered from TB for more than 2 months and were undergoing 2-drug fixed-dose combinations (2FDC) therapy (55.42%). The majority of patients did not suffer from comorbidities and did not take routine medications other than OAT (80.72%) (Table I).

The results of this study showed that the majority of patients have good knowledge about TB (73.49%) (Table II). The average knowledge score of 83 patients was 15 $\pm$ 2.64. These results are in line with previous research conducted in several regions in Indonesia, where the majority of patients had a good level of knowledge.[9,10,15] The percentage of patients who had a good level of knowledge in this study was higher than the research conducted at the Kota Timur Health Center and the Andalas Health Center, Padang City.[9,10] However, this result is lower than the results of previous research at a hospital in West Java[15]. This variation can be caused by various factors, including the characteristics of the respondents and the cut-off point for knowledge scores in this study, which are different from previous studies.

The results of this study showed that the majority of patients were adherent in using medication (77.11%) (Table III). These results are in line with the previous research at a hospital in West Java and Jakarta Harbor Hospital which showed that the majority of patients were adherent to using medication.[15,7] However, several previous studies also found that the majority of patients were adherent in using medication, but the percentage was lower than the findings in this study.[9,16,17] This variation can be caused by differences in research instruments, respondent characteristics, and cut-off points for adherence scores between this study and the previous studies.

The results of the data analysis show that age and education are significantly related to the level of knowledge ($p<0.05$). However, no significant relationship was found between gender, occupation, duration of suffering from TB, type of FDC drug used, comorbidities and other routine drugs consumed, and level of knowledge ($p>0.05$). (Table IV). In this study, patients aged younger than 60 years old mostly had good knowledge (79.71%), while patients aged 60 years and over mostly had poor knowledge (57.14%). These results are in line with the previous research at the Respira Special Lung Hospital in Yogyakarta which concluded that there was a relationship between age and knowledge of TB patients.[18] These results are supported by previous research which shows that working memory capacity in elderly people is 3.15 times lower than in younger people. Working memory capacity is a measure of the brain's ability to store information for a short time and process it actively so that it can influence a person's ability to plan, process information, and solve problems.[19]

The results of the data analysis also show that education is significantly related to the level of knowledge (Table IV). The majority of patients with a tertiary education had a good level of knowledge (96%), while the majority of patients with an elementary-middle school education had poor knowledge (71.43%). These results are also in line with the previous research at the Respira Special Lung Hospital in Yogyakarta which concluded that there was a relationship between age and knowledge of TB patients.[18] The results of this research are also consistent with Notoatmojo's theory which states that education is one of the factors that influence human behavior. Someone with a high level of education can provide more rational feedback on the information received.[20]

In this study, the results of data analysis showed that there was no significant relationship between gender, age, education, occupation, duration of suffering from TB, type of FDC, comorbidities and other routine medications consumed, and the level of patient adherence. These results are in line with several previous

studies which also concluded that gender, age, education, occupation, length of time suffering from TB, type of

**Table I. Respondent Characteristics**

| Characteristics | Total (n=83) | Percentage (%) |
|---|---|---|
| **Sex** | | |
| Male | 48 | 57.83 |
| Female | 35 | 42.17 |
| **Age (year old)** | | |
| < 60 | 69 | 83.13 |
| ≥ 60 | 14 | 16.87 |
| **Last Education** | | |
| Elementary-Middle School | 14 | 16.87 |
| Senior High School | 44 | 53.01 |
| Tertiary | 25 | 30.12 |
| **Working status** | | |
| Working | 40 | 48.19 |
| Not working | 43 | 51.81 |
| **TB Duration (month)** | | |
| ≤ 2 | 37 | 44.58 |
| > 2 | 46 | 55.42 |
| **Type of OAT consumed** | | |
| 2FDC | 46 | 55.42 |
| 4FDC | 37 | 44.58 |
| **Comorbidities** | | |
| Existent | 16 | 19.28 |
| Nonexistent | 67 | 80.72 |
| **Other routine medications consumed** | | |
| Existent | 16 | 19.28 |
| Nonexistent | 67 | 80.72 |

**Table II. Distribution of Patients Based on Level of Knowledge about Tuberculosis**

| Category | Total (n=83) | Percentage (%) |
|---|---|---|
| Good | 61 | 73.49 |
| Poor | 22 | 26.51 |

**Table III. Distribution of Patients based on Adherence Level**

| Category | Total (n=83) | Percentage (%) |
|---|---|---|
| Adherent | 64 | 77.11 |
| Non-adherent | 19 | 22.89 |

FDC, comorbidities and other routine medications consumed by patients do not have a significant relationship with TB patient adherence.[21,22]

The World Health Organization (WHO) concluded that patient adherence can be influenced by 5 factors or dimensions, namely socio-economic factors, health service system/team factors, condition factors, patient factors, and used therapy factors. One of the patient factors that influences adherence is patient knowledge.[23] The results of the Spearman-Rho test show that there is a significant relationship between the level of knowledge and patient adherence in taking medication (p 0.001) with a strong correlation strength (r 0.517) and a positive correlation direction, which means that the higher the level of knowledge, the higher the level of adherence (Table V). The results of this research are supported by previous research in Indonesia which concluded that there is a significant relationship between knowledge and adherence.[24,25,9] Based on the results of this research, various efforts need to be made to provide education for TB patients to increase knowledge about TB. Good patient knowledge is expected to increase adherence in undergoing treatment so that successful therapy for TB patients can be achieved.

**Table IV. Relationship between Respondent Characteristics and Level of Knowledge and Adherence**

| Characteristics | Level of Knowledge | | | | *p value* | Adherence | | | | *p-value* |
|---|---|---|---|---|---|---|---|---|---|---|
| | Good | | Poor | | | Adherent | | Non-adherent | | |
| | n | % | n | % | | n | % | n | % | |
| **Sex** | | | | | | | | | | |
| Male | 32 | 66.67 | 16 | 33.33 | 0.099 | 35 | 72.91 | 13 | 27.08 | 0.287 |
| Female | 29 | 82.86 | 6 | 17.14 | | 29 | 82.86 | 6 | 17.14 | |
| **Age (year old)** | | | | | | | | | | |
| < 60 | 55 | 79.71 | 14 | 20.29 | 0,004* | 55 | 79.71 | 14 | 20.28 | 0.210 |
| ≥ 60 | 6 | 42.86 | 8 | 57.14 | | 9 | 64.28 | 5 | 35.71 | |
| **Last Education** | | | | | | | | | | |
| Elementary-Middle School | 4 | 28.57 | 10 | 71.43 | 0,001* | 9 | 64.28 | 5 | 35.71 | 0.213 |
| Senior High School | 33 | 75.00 | 11 | 25.00 | | 33 | 75.00 | 11 | 25.00 | |
| Tertiary | 24 | 96.00 | 1 | 4.00 | | 22 | 88.00 | 3 | 12.00 | |
| **Working status** | | | | | | | | | | |
| Working | 32 | 80.00 | 8 | 20.00 | 0.194 | 33 | 82.50 | 7 | 17.50 | 0.259 |
| Not working | 29 | 67.44 | 14 | 32.56 | | 31 | 72.09 | 12 | 27.90 | |
| **TB Duration (month)** | | | | | | | | | | |
| ≤ 2 | 26 | 70.27 | 11 | 29.73 | 0.551 | 27 | 72.97 | 10 | 27.03 | 0.421 |
| > 2 | 35 | 76.09 | 11 | 23.91 | | 37 | 80.43 | 9 | 19.57 | |
| **Type of OAT consumed** | | | | | | | | | | |
| 4FDC | 26 | 70.27 | 11 | 29.73 | 0.551 | 27 | 72.97 | 10 | 27.03 | 0.421 |
| 2FDC | 35 | 76.09 | 11 | 23.91 | | 37 | 80.43 | 9 | 19.57 | |
| **Comorbidities** | | | | | | | | | | |
| Existent | 11 | 68.75 | 5 | 31.25 | 0.632 | 15 | 93.75 | 1 | 6.25 | 0.078 |
| Nonexistent | 50 | 74.63 | 17 | 25.37 | | 49 | 73.13 | 18 | 26.87 | |
| **Other Routine Medications** | | | | | | | | | | |
| Existent | 11 | 68.75 | 5 | 31.25 | 0.632 | 15 | 93.75 | 1 | 6.25 | 0.078 |
| Nonexistent | 50 | 74.63 | 17 | 25.37 | | 49 | 73.13 | 18 | 26.87 | |

Information: *statistically significant with chi-square test ($p<0.05$)

**Table V. Correlation Test Results of Respondents' Level of Knowledge and Adherence**

| Level of Knowledge | Adherence Level | | *p-value* | Correlation Coefficient |
|---|---|---|---|---|
| | Adherent (%) | Non-adherent (%) | | |
| Good | 55 | 6 | 0.001 | 0.517 |
| Poor | 9 | 13 | | |

## CONCLUSION

From the results of this study, it can be concluded that the majority of patients have a good level of knowledge (73.49%) and adherence to taking medication (77.11%). The level of patient knowledge about TB has a significant relationship with the level of adherence to taking medication (p 0.001).

## ACKNOWLEDGEMENT

The author would like to thank the Research and Development Institute of Muhammadiyah University, Prof. DR. HAMKA (UHAMKA) which has funded this research and the leadership and staff of the Jakarta Islamic Hospital Pondok Kopi who have permitted researchers to carry out this

## CONFLICT OF INTEREST

None to declare.

## STATEMENT OF ETHICS

This research has been approved by the Medical and Health Research Ethics Committee of Muhammadiyah University, Prof. DR. HAMKA (KEPKK-UHAMKA) with ethical approval No. 03/22.04/01694 dated April 13th, 2022.

## REFERENCES

1. Kemenkes RI. *Tata Laksana Tuberkolusis*. Jakarta: Kementrian Kesehatan RI; 2020.
2. World Health Organization. *Global Tuberculosis Report*. (Kasaeva tereza, ed.). Geneva; WHO; 2019.
3. Kemenkes RI. *Laporan Program Penanggulangan Tuberkulosis Padang Pariaman*. Jakarta, Kemenkes RI; 2021.
4. BPS. *BPS Data Pasien TB Paru Di DKI Jakarta.Pdf*.; 2022. https://jakarta.bps.go.id/indicator/30/504/1/jumlah-kasus-penyakit-menurut-provinsi-kabupaten-kota-dan-jenis-penyakit-.html
5. World Health Organization. *Global Report of Tuberculosis*. Geneva: World Health Organization. 2020;66.
6. Wiratmo PA, Setyaningsih W, Fitriani. Riwayat Pengobatan, Efek Samping Obat dan Penyakit Penyerta Pasien Tuberkulosis Paru Terhadap Tingkat Kepatuhan Berobat. *CoMPHI J Community Med Public Heal Indones J*. 2021;2(1):30-36. doi:10.37148/comphijournal.v2i1.46
7. Omega D, Sundari E, Yuliati. Efektivitas Peran Keluarga Sebagai Pengawas Dalam Kepatuhan Minum Obat Anti Tuberkulosis. *J Antara Keperawatan*. 2021;4(1):46-51. doi:10.37063/antaraperawat.v4i1.461
8. Sutarto S, Fauzi YS, Indriyani R, Sumekar RW DW, Wibowo A. Efikasi Diri pada Kepatuhan Minum Obat Anti Tuberkulosis (OAT). *J Kesehat*. 2019;10(3):405. doi:10.26630/jk.v10i3.1479
9. Adam L. Pengetahuan Penderita Tuberkulosis Paru Terhadap Kepatuhan Minum Obat Anti Tuberkulosis. *Jambura Heal Sport J*. 2020;2(1):12-18. doi:10.37311/jhsj.v2i1.4560
10. Siswanto IP, Yanwirasti Y, Usman E. Hubungan Pengetahuan dan Dukungan Keluarga dengan Kepatuhan Minum Obat Anti Tuberkulosis di Puskesmas Andalas Kota Padang. *J Kesehat Andalas*. 2015;4(3):724-728. doi:10.25077/jka.v4i3.354
11. Saputra MR, Rakhmawati W, Hendrawati S, Adistie F. Knowledge, attitude, and healthcare-seeking behavior among families of children with tuberculosis. *Belitung Nurs J*. 2020;6(4):127-135. doi:10.33546/BNJ.1156
12. Mardhiati R. Variabel Pengetahuan Dalam Penelitian Kesehatan Masyarakat. *IKRA-ITH Hum J Sos dan Hum*. 2022;7(1):163-171. doi:10.37817/ikraith-humaniora.v7i1.2286
13. Horne R, Weinman J, Barber N, Elliot R, Morgan M. *Concordance, Adherence, and Compliance in Medicine Taking.*; 2005.
14. Susilo R, Maftuhah A, Hidayati NR. Kepatuhan Pasien Tb Paru Terhadap Penggunaan Obat Tb Paru Di Rsud

Gunung Jati Kota Cirebon Tahun 2017. *Med Sains J Ilm Kefarmasian*. 2018;2(2):83-88. doi:10.37874/ms.v2i2.46
15. Barza A. K, Damanik E, Wahyuningsih R. Hubungan Tingkat Pengetahuan Dengan Tingkat Kepatuhan Pengobatan Pada Pasien Tuberkulosis Di Rs Medika Dramaga. *J Farmamedika (Pharmamedica Journal)*. 2021;6(2):42-47. doi:10.47219/ath.v6i2.121
16. Christy BA, Susanti R, Nurmainah. Hubungan Tingkat Kepatuhan Minum Obat Pasien Tuberkulosis Terhadap Efek Samping Obat Anti Tuberkulosis ( OAT ). *J Syifa Sci Clin Res*. 2022;4(2):484-493.
17. Herawati C dkk. Peran Dukungan Keluarga , Petugas Kesehatan dan Perceived Stigma dalam Meningkatkan. *Kesehat Masy Indones*. 2020;15(1):19-23. https://jurnal.unimus.ac.id/index.php/jkmi,
18. Fadlilah S, Aryanto E. Faktor yang Berhubungan dengan Pengetahuan TB Paru dan Dukungan Sosial Pasien RS Khusus Paru Respira. *J Ilm Keperawatan Sai Betik*. 2020;15(2):168. doi:10.26630/jkep.v15i2.1804
19. Anggraini FT. *Factors Affecting Working Memory Capacity : a Meta-Analysis Study*. 2023;9(7):256-262. doi:10.29303/jppipa.v9i7.4338
20. Notoatmojo S. *Ilmu Perilaku Kesehatan*. Jakarta: Rineka Cipta; 2014.
21. Adhanty S, Syarif S. Kepatuhan Pengobatan pada Pasien Tuberkulosis dan Faktor-Faktor yang Mempengaruhinya: Tinjauan Sistematis. *J Epidemiol Kesehat Indones*. 2023;7(1):7. doi:10.7454/epidkes.v7i1.6571
22. Bea S, Lee H, Kim JH, et al. Adherence and Associated Factors of Treatment Regimen in Drug-Susceptible Tuberculosis Patients. *Front Pharmacol*. 2021;12(March):1-9. doi:10.3389/fphar.2021.625078
23. World Health Organization. Adherence to long-term therapies. *World Heal Organ*. Published online 2003:1-194. http://apps.who.int/iris/bitstream/10665/42682/1/9241545992.pdf
24. Halim M, Nofrika V, Widiyanto R, Puspitasari D. Hubungan Tingkat Pengetahuan dengan Kepatuhan Minum Obat Anti Tuberkulosis (OAT) pada Pasien TB Paru. *Maj Farm*. 2023;19(1):24. doi:10.22146/farmaseutik.v19i1.81858
25. Hasina SN, Rahmawati A, Faizah I, Sari RY, Rohmawati R. Hubungan Tingkat Pengetahuan dengan Kepatuhan Minum Obat Anti Tuberkulosis (OAT) pada Pasien Tuberkulosis Paru. *J Ilm Permas J Ilm STIKES Kendal*. 2023;13(2):453-462. doi:10.32583/pskm.v13i2.908