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Analysis of Anti-Tuberculosis Medication Adherence Among TB Patients in Private Medical Practices in Cirebon City

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ABSTRACT

Tuberculosis (TB) is a disease caused by infection with the bacterium Mycobacterium tuberculosis. This disease is highly contagious, so adherence to anti-TB treatment is very important. The aim of this study is to determine patient characteristics (gender, age, educational level, occupation, and duration of tuberculosis treatment), assess patient adherence to tuberculosis treatment, and examine the relationship between patient characteristics and medication adherence in private practice settings in the city of Cirebon. This type of research is non-experimental. Data collection was conducted prospectively using a tuberculosis patient characteristic questionnaire and MARS-5 questionnaire (Medication Adherence Report Scale-5). The sample consisted of all tuberculosis patients undergoing treatment at private medical practices in Cirebon City who met the inclusion criteria, totaling 108 respondents. The characteristics of tuberculosis patients at private medical practices in Cirebon City were predominantly male (58.3%), aged 45–59 years (33.3%), with a high school education level (47.2%), self-employed occupation (37,0%), and treatment duration < 1 year (71.3%). The rate of high treatment adherence was 67.6%. Based on the results of the Multivariate Logistic Regression statistical test, there was no significant relationship between gender (p=0.751), age (p=0.870), education level (p=0.364), occupation (p=0.779), and duration of treatment (p=0.897) with adherence to tuberculosis medication.

INTRODUCTION

Indonesia ranks second in the world in terms of the number of tuberculosis patients. Overall, the detection of tuberculosis cases in Indonesia in 2020 was the highest in the last decade, with 724,309 cases (Kementerian Kesehatan Republik Indonesia, 2024). The highest prevalence of tuberculosis cases in provinces with the highest results is West Java. In 2022, 160,661 tuberculosis cases were reported out of a total of 656,154 suspected tuberculosis cases, with a significant increase in the number of cases recorded. The highest number of tuberculosis cases was found in Bogor, Bandung, and Bekasi districts, contributing 6-14%, and in Cirebon district, accounting for 32.5% of new cases in West Java. Tuberculosis cases are more prevalent among men (Dinas Kesehatan Jawa Barat, 2020).

Tuberculosis is a disease caused by infection with the bacterium Mycobacterium tuberculosis in the lungs. Treatment of tuberculosis usually takes months of strict adherence to medication regimens to prevent the risk of antibiotic resistance. Tuberculosis treatment depends on patients' understanding of whether their motivation and support for comprehensive treatment affect patient adherence (Halim et al., 2023). However, tuberculosis treatment still faces many obstacles, as the long treatment period of at least six months causes patients to become bored with the treatment program (Jupriadi et al., 2023).

Non-adherence to tuberculosis treatment is a significant barrier and one of the most important obstacles to global tuberculosis control. This can increase the risk of disease and death, and lead to more pulmonary tuberculosis patients developing acid-fast bacilli (AFB) resistance to standard treatment. Patients who are resistant to drugs can become a source of drug-resistant bacteria transmission in the community (Kurniasih et al., 2022).

Patient adherence to medication can be measured using various methods, one of which is the MARS-5 questionnaire (Medication Adherence Report Scale-5), which has been translated and validated in Indonesian. It consists of 5 questions that assess non-adherence behaviors (forgetting, changing the dose, stopping, deciding to take a smaller dose, and using less medication than prescribed) (Ambarwati & Perwitasari, 2022). Based on research (Setyowati & Emil, 2021), the level of medication adherence was found to be 77.5%. The level of medication adherence at the Putri Ayu Community Health Center in Jambi was 26 respondents (76.47%) in the high adherence category (Ahdiyah et al., 2022). The level of adherence with anti-tuberculosis medication among 38 respondents (86.8%) at the Tombulilato Community Health Center was classified as compliant (Amran et al., 2021). Research conducted at the Sungai Betung Community Health Center in West Kalimantan shows that the majority of patients are male (83.3%), of productive age (80%), have a high school education (33.3%), are employed (83.3%), live more than 2 km from health services (90%), and the majority undergo treatment for exactly 6 months (63.3%) (Novalisa et al., 2022). Causes of non-adherence include patient factors (lack of motivation, forgetting to take medication, not understanding explanations from health workers, patients being confused about how to take medication), access factors (no transportation), social factors (work), family support, and the lack of a Medication Adherence Supervisor (Priyaputranti et al., 2023). This research supports the Indonesian government's target of eliminating tuberculosis by 2030 and ending the epidemic by 2050 (Kementerian Kesehatan Republik Indonesia, 2023). The purpose of this study was to determine the characteristics of patients, the level of adherence of tuberculosis patients, and the relationship between patient characteristics and the level of adherence with medication in private medical practices in Cirebon City.

METHODS

Type of Research

This type of research is non-experimental. Data collection was conducted prospectively using a tuberculosis patient characteristic questionnaire and MARS-5 questionnaire (Medication Adherence Report Scale-5).

Place and Time of Research

The research period is from March to August 2025. The research location is an private medical practices in Cirebon City.

Population and Sample

The population in this study were tuberculosis patients undergoing treatment at private practices in Cirebon City. The sample used in this study were tuberculosis patients undergoing treatment at private practices in Cirebon City who met the inclusion criteria, totaling 108 respondents. The sampling technique used in this study was total sampling.

Inclusion and Exclusion Criteria

Inclusion criteria

1. Patients diagnosed with tuberculosis.
2. Patients aged 15 years or older.
3. Patients undergoing treatment for more than 2 months.
4. Patients who are willing to be respondents.

Exclusion criteria

Patients who did not complete the questionnaire.

Tools and Materials

Tools

MARS-5 questionnaire (Medication Adherence Report Scale-5) and questionnaire on tuberculosis patient characteristics (gender, age, education level, occupation, and duration of tuberculosis treatment).

Materials

Patients, patient medical records.

Research Variables

Independent variables

Gender, age, education level, occupation, duration of tuberculosis treatment.

Dependent variables

Medication adherence among tuberculosis patients at private practices in Cirebon City.

Analysis of Results

The data obtained included characteristics of tuberculosis patients, namely gender, age, education level, occupation, and duration of tuberculosis diagnosis. Data analysis in this study was performed descriptively in the form of percentages (%). Adherence was measured based on the MARS-5 questionnaire score. Adherence was evaluated based on the answers to questions 1 to 5 on the questionnaire. The MARS-5 consists of 5 items that assess non-adherence behaviors (forgetting, changing the dose, stopping, skipping doses, and using less than the prescribed amount of medication). The level of adherence of respondents was assessed by looking at the frequency of answers to each question with an interpretation of a score of 0-5 = low adherence, a score of 6-24 = moderate adherence, and a score of 25 = high adherence (Firdiawan et al., 2021). To determine the relationship between tuberculosis patient characteristics and treatment adherence, the analysis was performed using Multivariate Logistic Regression. Two variables are considered related if they have a p-value <0.05.

RESULTS AND DISCUSSION

The sample used in this study consisted of 108 tuberculosis patients undergoing treatment at private practices in Cirebon City who met the inclusion criteria. The sampling technique used in this study was total sampling. This study utilized a patient characteristic questionnaire and the MARS-5 (Medication Adherence Report Scale-5). This study has obtained an ethical approval letter with No. 002/VI/25/0001/KEPK/STFMC. The limited sample size was due to the fact that some of the patients treated were under 15 years of age and therefore did not meet the inclusion criteria, and the data we collected was only from one private practice.

Patient Characteristics

Patient characteristics included gender, age, education level, occupation, and duration of tuberculosis treatment. The characteristics of tuberculosis patients undergoing treatment at private practices in Cirebon City are shown in **Table 1**.

Based on **Table 1**, the results of the study involving 108 respondents showed a frequency distribution of data based on gender, with 63 respondents (58.3%) being male and 45 respondents (41.7%) being female. These results align with a study conducted by (Hasina et al., 2023) which showed that the frequency distribution of respondent characteristics based on gender was predominantly male, with 42 respondents (73%), while female respondents accounted for 15 (26.3%).

Men are believed to be more susceptible to pulmonary tuberculosis because they have more friends and are more likely to smoke and drink alcohol. Smoking weakens the immune system of the respiratory tract, making it more susceptible to infection. Men are also more frequently exposed to tuberculosis bacteria than women, as men engage in more outdoor activities (for livelihood purposes), making them more likely to contract tuberculosis bacteria from other tuberculosis patients compared to women (Baiq 2020 dalam (Hasina et al., 2023).

The results of the study for age groups showed that the 15-19 age group had 15 respondents, which was the age group with the lowest percentage (13.9%), the 20-44 age group had 29 respondents (26.9%), the 45-59 age group had 36 respondents, which was the age group with the highest percentage (33.3%), and the group aged over 60 had 28 respondents (25.9%). These results align with the study conducted by (Sari et al., 2023) that the age group most affected by TB is 46-55 years old, as productive-aged individuals have a 5-6 times higher risk of contracting TB.

Pulmonary tuberculosis mostly affects people of productive age. Most respondents were of productive age (15–65 years), proving that tuberculosis patients are mostly of productive age, where people who engage in activities without maintaining their health are more susceptible to tuberculosis, the main factors being active smokers and hard workers (Amran et al., 2021). This aligns with the view expressed

by (Nurhaini et al., 2019) that as age increases, understanding and thinking patterns develop, leading to greater adherence. Older adults are more likely to follow doctors' advice, have greater responsibility, be more systematic, meticulous, moral, and committed compared to younger individuals (Bart dalam Riyanti *et al*, 2019).

Table 1. Characteristics of tuberculosis patients in private medical practices in Cirebon City

No.	Characteristic	Category	Total	Percentage
1	Gender	Male	63	58.3 %
		Female	45	41.7 %
		Total	**108**	**100 %**
2	Age	Teenagers (15-19 years old)	15	13.9 %
		Mature (20-44 years old)	29	26.9 %
		Pre-elderly (45-59 years old)	36	33.3 %
		Elderly (>60 years old)	28	25.9 %
		Total	**108**	**100 %**
3	Education Level	Primary school	22	20.4 %
		Junior high school	13	12.0 %
		Senior High School	51	47.2 %
		College education	22	20.4 %
		Total	**108**	**100 %**
4	Occupation	Not Working	2	1.9 %
		Student	17	15.7 %
		Housewife	16	14.8 %
		Civil servant	4	3.7 %
		Selfemployed	40	37.0 %
		Employees	29	26.9 %
		Total	**108**	**100 %**
5	Duration of treatment	>1 year	31	28.7 %
		<1 year	77	71.3 %
		Total	**108**	**100%**

Based on the highest percentage of educational attainment, the highest percentage was high school education, with 51 respondents (47.2%), followed by elementary school education with 22 respondents (20.4%), junior high school education with 13 respondents (12.0%), and college education with 22 respondents (20.4%). Educational level is an important factor that can reflect social status and serve as a fundamental basis for decision-making and action. Educational level influences an individual's behavior, as education impacts their awareness of life and their ability to process information related to the illness they are experiencing.

The results of this study are in line with (Saraswati et al., 2022), which shows that the distribution of tuberculosis patients with the highest level of education is at the high school level, at 48.3%. Educational level influences an individual's behavior, as education impacts awareness of life and the respondent's ability to receive information related to the disease they are suffering from. Education is not always a standard for comparing tuberculosis, and sufficient education cannot be considered a determinant of the success of treatment, as patients can seek information by reading and asking questions. The higher the level of understanding about the benefits of treatment and the risks of treatment failure or discontinuation of medication, the more compliant respondents will be in following the treatment program and undergoing routine examinations according to the schedule determined by the doctor (Sari et al., 2023).

Based on the characteristics of the respondents' occupations, the highest number was found in the self-employed group, with 40 respondents (37.0%), followed by the unemployed group with 2 respondent (1.9%), the housewife group with 16 respondents (14.8%), the civil servant group with 4 respondents (3.7%), and the employee group with 29 respondents (256.9%). Self-employment is a type of work where one can

stand on their own strength to create their own job, earn a living, and build a career with an independent attitude without receiving assistance from government agencies or social institutions. Having a high motivation to recover, patients follow medication schedules and scheduled follow-up appointments as directed by healthcare workers or Medication Adherence Monitoring to achieve optimal treatment outcomes (Humaidi & Anggarini, 2020).. The results of this study align with research conducted by (Ahdiyah et al., 2022), which found that based on job characteristics, the highest adherence rate was among self-employed individuals, with 20 respondents (39.2%).

Based on the duration of tuberculosis treatment, the group with a treatment duration of more than 1 year had the smallest percentage, with 31 respondents (28.7%), while the group with the longest treatment duration, less than 1 year, had 77 respondents (71.3%). Most respondents in this study had a treatment duration of less than 1 year. It is known that respondents with high knowledge about the duration of tuberculosis treatment until recovery are more compliant in taking tuberculosis medication according to the schedule provided by healthcare workers. This is because every new pulmonary tuberculosis patient is informed about the disease, including how it is transmitted, treatment, and prevention of transmission (Rosadi, 2020)

Patient adherence rate

Medication adherence can be defined as the act of taking medication prescribed by a doctor at the correct time and dosage. Treatment adherence is a key factor in the success of treatment in cases of tuberculosis, which is also a chronic disease (Siswanto *et al,* 2015). A compliant patient is one who completes their treatment as advised by healthcare professionals and returns to the health center to collect their next medication according to the scheduled timeline.

Tabel 2. Patient adherence of tuberculosis patients treated by independent practitioners in Cirebon City

No	Patient adherence	Total	Percentage
1	High	73	67.6
2.	Moderate	35	32.4
3.	Low	0	0.0
Total		**108**	**100**

The questionnaire used in this study is the MARS-5 (Medication Adherence Report Scale-5), which consists of 5 questions that assess non-adherence behavior (forgetting, changing the dose, stopping, deciding to take a small dose, and using less medication than prescribed).The level of adherence of the respondents was assessed by looking at the final score of the answers to the 5 questions with the following options: always (1 point), often (2 points), sometimes (3 points), rarely (4 points), and never (5 points). The final total score of the 5 types of questions was between 5-25 points (Ambarwati & Perwitasari, 2022).

This adherence questionnaire has undergone validity and reliability testing to ensure that it is not ambiguous or confusing for respondents when filling it out. Based on the results of the questionnaire reliability analysis, a Cronbach Alpha value of 0.482 was obtained, indicating that it is reliable, because a variable is considered reliable if the calculated r correlation value is greater than the r table value of 0.2542 (Octavia et al., 2024). The results of patient adherence among those undergoing treatment at private medical practices in the city of Cirebon are presented in **Table 2**.

Based on **Table 2**, the results show that most respondents had high adherence, with 73 respondents (67.6%), moderate adherence with 35 respondents (32.4%). The high level of adherence observed was due to patients' fear of the consequences of irregular medication use. The results of this study are in line with research conducted by (Ambarwati & Perwitasari, 2022) where medication adherence was 60.82%.

Based on the high level of adherence observed in this study, it indicates that pulmonary tuberculosis patients have good attitudes and behaviors toward medication adherence, although there are also patients with low levels of medication adherence (Christy et al., 2022).

Patient adherence is influenced by several factors, including treatment, health, environment, socioeconomic status, and home environment. One factor that influences

treatment adherence is support from the PMO, which reminds pulmonary tuberculosis patients to take their medication. The role of PMOs in the use of antituberculosis medications and the role of family are crucial during the initial active phase of the patient's daily treatment regimen, and under direct supervision to prevent drug resistance, including antituberculosis medications (Ahdiyah et al., 2022). Non-adherence to treatment in tuberculosis patients can be caused by patients forgetting to take their medication, not taking it on time, or constantly switching medications, not being accustomed to taking medication at the same time, or not being accustomed to taking medication at the same time. Patients may delay taking their medication and be late in rechecking their sputum (Prihantana *et al*, 2016).

The relationship between patient characteristics and medication adherence in private medical practices in Cirebon City.

The results of this adherence questionnaire were then statistically tested using Multivariate Logistic Regression Test analysis to examine the relationship between gender and adherence, age and adherence, educational level and adherence, occupation and adherence, and the duration of treatment and adherence. The relationship between patient characteristics and the level of adherence among patients undergoing treatment at private medical practices in the city of Cirebon is shown in **Tables 3**.

The relationship between gender and patient adherence

The relationship between gender and the level of adherence among tuberculosis patients undergoing treatment at private practices in Cirebon City is shown in **Table 3**.

Based on the research results, male respondents had the highest adherence compared to female respondents, with the percentage of medication adherence among male respondents shown in **Table 3**, with 44 respondents (40.7%) having a high level of adherence, while moderate adherence was observed in 19 respondents (17.6%).

Based on the results of statistical testing using Multivariate Logistic Regression, the p-value was 0.751 > 0.050, indicating that there was no significant relationship between the gender of patients and treatment adherence in tuberculosis patients at private practices in Cirebon City. The results of this study are in line with the study (Setyowati & Emil, 2021) with a Chi Square test value of 0.769, which means that there is no relationship between gender and treatment adherence influence patients' adherence to treatment. Medication adherence is influenced by various factors besides gender, such as socio-economic factors, healthcare system support, and conditions and factors related to the patient themselves. Tuberculosis patients have the same risk of being compliant or non-compliant with treatment, and their willingness to recover from the disease is not determined by gender (Nailius & Anshari, 2022).

The relationship between age and patient adherence

Age is one of the variables included in socioeconomic factors that influence medication adherence. Younger individuals are found to be more compliant with medication because they tend to be more productive, thereby having higher motivation to follow treatment. Similarly, children who are supervised by their parents are more compliant with treatment (Nailius & Anshari, 2022). The relationship between age and the level of adherence among tuberculosis patients undergoing treatment at private practices in Cirebon City is shown in **Table 3**.

Based on the research results, the highest adherence rate was found in the 45-59 age group with 24 respondents (22.2%). Based on the statistical test using the Multivariate Logistic Regression test, the p-value was 0.870 > 0.05, indicating no significant association between age and medication adherence for tuberculosis treatment at private clinics in Cirebon City.

The results of this study are consistent with the study (Setyowati & Emil, 2021), which obtained a Chi Square value of 0.567, indicating no relationship between age and treatment adherence. In contrast, obtained a p-value of 0.000, indicating a relationship between age and adherence with pulmonary tuberculosis medication (Elizah et al., 2024). This is because the age group of 45–64 years has the highest incidence of tuberculosis, as individuals in this productive age group who engage in activities without maintaining their health are at higher risk of contracting tuberculosis and are more susceptible to the spread of pulmonary

tuberculosis infection, especially in crowded environments.

Relationship between education level and patient adherence

The relationship between education level and adherence among tuberculosis patients undergoing treatment at private practices in Cirebon City is shown in **Table 3**.

Table 3. Relationship between tuberculosis patient characteristics and patient adherence in private medical practices in Cirebon City

Patient adherence								Sig
Characteristic		High		Moderate		Total		
		N	%	N	%	N	%	
Gender	Male	44	40.7	19	17.6	63	58.3	0.751
	Female	29	26.9	16	14.8	45	41.7	
	Total	**73**	**67.6**	**35**	**32.4**	**108**	**100**	
Age (year)	**15-19**	9	8.4	6	5.6	15	14.0	0.870
	20-44	19	17.6	10	9.3	29	26.9	
	45-59	24	22.2	12	11.1	36	33.3	
	> 60	21	19.4	7	6.4	28	25.8	
	Total	**73**	**67.6**	**35**	**32.4**	**108**	**100**	
Education Level	Primary school	16	14.8	6	5.6	22	20.4	0.364
	Junior high school	9	8.4	4	3.7	13	12.1	
	Senior High School	36	33.3	15	13.8	51	47.1	
	College education	12	11.1	10	9.3	22	20.4	
	Total	**73**	**67.6**	**35**	**32.4**	**108**	**100**	
Occupation	Not Working	1	0.9	1	0.9	2	1.8	0.779
	Student	10	9.3	7	6.5	17	15.8	
	Housewife	11	10.2	5	4.6	16	14.8	
	Civil servant	3	2.8	1	0.9	4	3.7	
	Self-employed	28	25.9	12	11.1	40	37.0	
	Employees	20	18.5	9	8.4	29	26.9	
	Total	**73**	**67.6**	**35**	**32.4**	**108**	**100**	
Duration of treatment	>1 year	20	18.5	11	10.2	31	28.7	0.897
	<1 year	53	49.1	24	22.2	77	71.3	
	Total	**73**	**67.6**	**35**	**32.4**	**108**	**100%**	

Based on the research results, it was found that high school education level had the highest adherence rate compared to elementary school, junior high school, and university education levels. Among respondents with a high school education, 36 respondents (33.3%) demonstrated high adherence, 15 respondents (13.8%) demonstrated moderate adherence.

Educational level is an important factor that reflects social status and can serve as a foundation for decision-making and action. Individuals with a good education have the ability to absorb and understand the knowledge they receive. The higher the educational level, the easier it is for society to absorb information and respond more quickly to the problems they face, enabling them to determine the best alternative solutions to a given issue. The higher the level of understanding about the benefits of treatment and the risks of treatment failure or discontinuation of medication, the more compliant respondents will be in following the treatment program and routine check-ups as scheduled by the doctor (Sari et al., 2023).

Based on the statistical test using the Multivariate Logistic Regression test, the p-value was 0.364 > 0.05, there is no significant relationship between education level and adherence to tuberculosis medication. The results of this study are in line with research showing that there is no significant relationship between education level and patient adherence

in taking pulmonary TB medication (Agustin et al., 2025).

Relationship between occupation and patient adherence

The relationship between employment and the level of adherence among tuberculosis patients undergoing treatment at private practices in Cirebon City is shown in **Table 3**.

Based on the results of the study in **Table 3**, it shows that the highest adherence rate is among self-employed individuals compared to those who are unemployed, students, housewives, civil servants, and private sector employees. The highest percentage of medication adherence among respondents was among self-employed individuals, totaling 28 respondents (25.9%). There are several social aspects that influence health status, including age, gender, occupation, and socioeconomic status, which are social aspects. Based on the results of the Multivariate Logistic Regression test, the p-value for the relationship between occupational status and medication adherence was 0.779, where $p > 0.05$ so there was no significant relationship between employment and medication adherence.

These results are in line with the study by (Maifitrianti et al., 2024), which concluded that occupation does not affect patient adherence. This differs from the study conducted by (Fitri et,al 2018), which reported a p-value of $0.001 < 0.05$, indicating a relationship between occupation and medication adherence in tuberculosis patients at the Padangsidimpuan City Health Center. This is because patients have a high motivation to recover, so they follow the medication schedule and attend follow-up appointments as scheduled by healthcare workers or medication adherence monitoring to achieve optimal treatment outcomes (Humaidi & Anggarini, 2020).

Relationship between duration of treatment and patient adherence

The relationship between occupation and level of adherence among tuberculosis patients undergoing treatment at private practices in Cirebon City is shown in Table 3.

The duration of tuberculosis treatment refers to the length of time a patient has been suffering from tuberculosis and taking tuberculosis medication. In this study, the duration of diagnosis was categorized into two groups: < 1 year and > 1 year. Based on **Table 3**, the highest adherence rate was observed in patients with a tuberculosis treatment duration of < 1 year compared to those with a treatment duration of > 1 year. Among respondents with a treatment duration of < 1 year, 53 respondents (49.1%) had high adherence, 24 respondents (22.2%) had moderate adherence.

High patient adherence is due to strict monitoring of medication intake during the first two months and the frequency of daily dosing to prevent missed doses. However, as treatment progresses, adherence decreases due to boredom from the length of treatment and the occurrence of side effects such as joint pain, itching, nausea, and vomiting (Papeo et al., 2021). The duration of the disease is one of the factors that can influence patient adherence to treatment, including adherence to tuberculosis treatment. The longer a patient has the disease, the lower the level of medication adherence. The duration of treatment in private practice varies from 6 to 12 months. In this study, TB patients had a strong motivation stemming from a sense of responsibility, self-motivation, and undergoing at least 6 months of treatment in order to recover.

Based on the results of statistical tests using the Multivariate Logistic Regression test, a p-value of 0.897 (>0.005) was obtained, indicating no significant relationship between the duration of tuberculosis treatment and medication adherence among tuberculosis patients at the independent doctor's practice in Cirebon City. Similar results were also obtained in a study (Rojali & Noviatuzzahrah, 2018) which showed no significant relationship between the duration of treatment and medication adherence in tuberculosis patients at the Cipondoh Health Center in Tangerang, Banten, with a p-value of 1000.

It is known that respondents with a high level of knowledge about the duration of tuberculosis treatment until they are declared cured are compliant in taking tuberculosis medication according to the schedule set by health workers. This is because every new pulmonary tuberculosis patient is given an explanation about pulmonary tuberculosis, including how it is transmitted, how it is treated, and how to prevent transmission (Rosadi, 2020).

This study has several limitations, such as patients' awareness in filling out the

questionnaire, and patients who are less cooperative in data collection because they want to go home quickly. During data collection, the information provided by respondents through the questionnaire sometimes did not reflect their true opinions. This occurred due to differences in thinking, perceptions, and understanding among respondents, as well as other factors such as honesty in completing the questionnaire.

CONCLUSIONS

Based on the research conducted, the characteristics of tuberculosis patients at private practices in Cirebon City are predominantly male (58.3%), age range of 45–59 years (33.3%), high school education level (47.2%), self-employed occupation (37.0%), and treatment duration of less than 1 year (71.3%). Patient adherence was high at 67.6%. There is no significant association between adherence and gender (p=0.751), age (p=0.870), education level (p=0.364), occupation (p=0.779) and duration of treatment (p=0.897) with tuberculosis medication adherence.

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AUTHORS' CONTRIBUTIONS

Nur Rahmi Hidayati
Contribution: Conceptualization, Data Curation, Methodology, Visualization, Writing - Original Draft, Writing - Review & Editing.
Rinto Susilo
Contribution: Methodology, Supervision, Validation, Visualization, Writing - Review & Editing.
Indah Setyaningsih
Contribution: Methodology, Supervision, Validation, Visualization, Writing - Review & Editing.
Adha Zahara
Contribution: Data Curation

CONFLICT OF INTERESTS

There is no conflict of interest in this study.

ETHICAL CONSIDERATION

Ethical issues (including plagiarism, data fabrication, double publication, etc) have been completely observed by the author.

BIBLIOGRAPH

Agustin, F. P., Sihura, S. S. G., & Rizal, A. (2025). Relationship between Family Support as Drug Supervisor (PMO) and Respondent Characteristics with Patient Compliance in Taking Pulmonary Tuberculosis Medication in the Sirsak Ward, Cengkareng Hospital in 2024. *Jurnal Intelek Insan Cendekia (JIIC)*, *2*(4), 7365–7375. https://doi.org/https://jicnusantara.com/index.php/jiic.

Ahdiyah, N. N., Andriani, M., & Andriani, L. (2022). Level of Adherence to Anti-Tuberculosis Medication Use in Adult Pulmonary TB Patients at the Putri Ayu Community Health Center. *Lumbung Farmasi: Jurnal Ilmu Kefarmasian*, *3*(1), 23. https://doi.org/10.31764/lf.v3i1.6817.

Ambarwati, S. C., & Perwitasari, D. A. (2022). Compliance Of Taking Anti-Tuberculosis Drugs In Tuberculosis Patients At Several Puskesmas In Sleman Regency, Yogyakarta. *Journal Farmasi Klinik Dan Sains*, *2*(April 2020), 59–65. https://doi.org/10.26753/jfks.

Amran, R., Abdulkadir, W., & Madania. (2021). Level of Adherence to Anti-Tuberculosis Drug Use Among Patients at the Tombulilato Community Health Center in Bone Bolango District. *Indonesian Journal of Pharmaceutical*, *1*(1), 57–66. https://doi.org/10.22487/.ijpe.vlil.101223.

Christy, B. A., Susanti, R., Farmasi, J., Kedokteran, F., & Tanjungpura, U. (2022). The Relationship Between Tuberculosis Patients' Medication Adherence and the Side Effects of Anti-Tuberculosis Drugs (OAT). *Journal Syifa Sciences and Clinical Research (JSSCR)*, *4*, 484–493. https://doi.org/https://doi.org/10.37311/jsscr.v4i2.14830.

Dinas Kesehatan Jawa Barat. (2020). *Health Profile of West Java in 2022* (Issue July).

Elizah, E., Zaman, C., & Wahyudi, A. (2024). Analysis Of Compliance With Taking Anti-Tuberculosis Pulmonary Medications In The Working Area Of The Puskesmas In 2024. *Cendekia Medika :*

Jurnal STIKES Al-Ma'arif Baturaja, *9*(1), 176–187. https://doi.org/10.52235/cendekiamedika.v9i1.352.

Firdiawan, A., Kristina, S. A., & Andayani, T. M. (2021). Relationship of Medication Adherence to Clinical Outcome in Patients Type 2 Diabetes with Medication Adherence Rating Scale-5 (MARS-5). *Majalah Farmaseutik*, *17*(1), 22–28. https://doi.org/10.22146/farmaseutik.v17i1.48053.

Fitri, L. D. (2018). Medication Adherence in Patients with Pulmonary Tuberculosis. *Jurnal Ilmu Kesehatan Masyarakat*, *7*(01), 33–42. https://doi.org/10.33221/jikm.v7i01.50.

Halim, M., Nofrika, V., Widiyanto, R., & Puspitasari, D. (2023). The Relationship Between Knowledge Level and Adherence to Anti-Tuberculosis Drug (OAT) Treatment in Patients with Pulmonary TB. *Majalah Farmaseutik*, *19*(1), 24. https://doi.org/10.22146/farmaseutik.v19i1.81858.

Hasina, S. N., Rahmawati, A., Faizah, I., Sari, R. Y., & Rohmawati, R. (2023). The Relationship Between Knowledge Level and Adherence to Anti-Tuberculosis Drug (OAT) Treatment in Patients with Pulmonary Tuberculosis. *Urnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, *13*(2), 453–462. https://doi.org/http://journal.stikeskendal.ac.id/index.php/PSKM.

Humaidi, F., & Anggarini, D. R. (2020). Adherence to Anti-Tuberculosis Medication in TB Patients Regimen. *Jurnal Ilmiah Farmasi Attaamru*, *01*(01). https://doi.org/https://journal.uim.ac.id/index.php/Attamru/index.

Jupriadi, L., Pratiwi, D. R., Firmansyah, D., & Pujiastutik, T. D. (2023). Analysis of Knowledge Levels and Treatment Compliance Among Tuberculosis Patients at Regional General Hospitals in NTB Province. *Jurnal Farmasi Indonesia*, *15*(2), 122–125. https://doi.org/https://doi.org/10.35617/jfionline.v15i2.139.

Kementerian Kesehatan Republik Indonesia. (2023). *The 5th Indonesia Tuberculosis International Research Meeting (INA – TIME) in Yogyakarta*.

Kementerian Kesehatan Republik Indonesia. (2024). *Report on the Results of the 2023-2024 Indonesian Tuberculosis Inventory Study*.

Kurniasih, N., Nina Muthoharoh, Nurhidayati Harun, Siti Rahmah Kurnia Ramdan, & Marlina Indriastuti. (2022). The Relationship Between Knowledge and Drug Side Effects on Treatment Adherence Among Tuberculosis Patients at the Sukaratu Community Health Center in Tasikmalaya. *Medical Sains : Jurnal Ilmiah Kefarmasian*, *7*(2), 203–212. https://doi.org/10.37874/ms.v7i2.301.

Maifitrianti, Wiyati, T., & Hasanah, N. (2024). Relationship between Patients' Knowledge and Medication Adherence of Tuberculosis at Islamic Hospital Pondok Kopi Jakarta. *Jurnal Manajemen Dan Pelayanan Farmasi (JMPF)*, *14*(1), 69–75. https://doi.org/10.22146/jmpf.86864.

Nailius, I. S., & Anshari, D. (2022). The Relationship Between Socio-Demographic Characteristics and Health Literacy with Medication Adherence Among Tuberculosis Patients in Kupang City. *Indonesian Journal of Health Promotion and Behavior*, *4*(2), 44–57. https://doi.org/10.47034/ppk.v4i2.6332.

Novalisa, Susanti, R., & Nurmainah. (2022). Analysis of Factors Affecting Adherence to Tuberculosis Medication Use in Patients at Community Health Centers. *Journal Syifa Sciences and Clinical Research (JSSCR)*, *4*(2), 342–353. https://doi.org/https://doi.org/10.37311/jsscr.v4i2.14195.

Nurhaini, R., Hidayati, N., & Oktavia, W. N. (2019). Overview of Medication Adherence Among Tuberculosis Patients at the Klaten District Public Health Center (Balkesmas). *University Research Colloqium*, 788–795.

Octavia, D. R., Sholikha, J., & Utami, P. R. (2024). Validity and Reliability Test of the Medication Adherence Report Scale (MARS) Questionnaire for Tuberculosis (TB) Patients. *Journal Pharmasci (Journal of Pharmacy and Science)*, *9*(1), 7–11. https://doi.org/https://scispace.com/journals/journal-pharmasci-journal-of-pharmacy-and-

science-1c052m3o.

Papeo, D. R. P., Immaculata, M., & Rukmawati, I. (2021). Relationship Between Medication Adherence (MMAS-8) and Quality of Life (WHOQOL-BREF) of Tuberculosis Patients at Community Health Centers in Bandung City. *Indonesian Journal of Pharmaceutical Education*, *1*(2), 86–97. https://doi.org/10.37311/ijpe.v1i2.11143.

Prihantana, A. S., & Wahyuningsih, S. S. (2016). The Relationship Between Knowledge and Treatment Adherence Levels in Tuberculosis Patients at Dr. Soehadi Prijonegoro Regional General Hospital, Sragen. *Jurnal Farmasi Sains Dan Praktis*, *II*(1), 47. https://doi.org/https://doi.org/10.31603/pharmacy.v2i1.188.

Priyaputranti, A. S. D. ., Rahmawati, F., & Yasin, N. M. (2023). Overview of Antituberculosis Drug Adherence in Patients with Pulmonary Tuberculosis at the Pahandut Community Health Center in Palangkaraya City. *Jurnal Manajemen Dan Pelayanan Farmasi (JMPF)*, *13*(3), 140–152. https://doi.org/10.22146/jmpf.83777.

Riyanti, E., & Yardes, N. (2019). The Role of Medication Adherence Supporters (PMO) in Ensuring Regular Medication Consumption by TB Clients. *JKEP*, *4*(1), 54–61. https://doi.org/https://doi.org/10.32668/jkep.v4i1.280.

Rojali, & Noviatuzzahrah. (2018). Risk Factors for Treatment Adherence in Patients with BTA-Positive Pulmonary Tuberculosis. *Jurnal Kesehatan*, *9*(April), 70–79. https://doi.org/10.26630/jk.v9i1.754.

Rosadi, D. (2020). Factors Associated with Patient Compliance with Anti-Tuberculosis Drugs for Pulmonary Tuberculosis. *Jurnal Berkala Kesehatan*, *6*(2), 80–84. https://doi.org/http://dx.doi.org/10.20527/jbk.v6i2.9452.

Saraswati, F., Zulfitriani, M., Rasfayanah, E., Pandu, W., Marlyanti, A., Rusman, & Rachmat, L. (2022). Characteristics of Patients with Relapsed Pulmonary Tuberculosis at Ibnu Sina Hospital, Makassar. *Fakumi Medical Journal*, *2*(5), 319–328. https://doi.org/https://doi.org/10.33096/fmj.v2i5.8.

Sari, E. A., Pdw, K. S., & Rafika, D. (2023). *Relationship Between Knowledge Level and Compliance in Tuberculosis Patients*. *3*(1), 103–109. https://doi.org/10.37311/ijpe.v3i1.18774.

Setyowati, L., & Emil, E. S. (2021). Analysis of Tuberculosis Drug Adherence Using the Medication Adherence Rating Scale (MARS). *JI-KES (Jurnal Ilmu Kesehatan)*, *5*(1), 14–18. https://doi.org/https://doi.org/10.33006/ji-kes.v6i1.307.

Siswanto, I. P., Yanwirasti, & Usman, E. (2015). The Relationship between Knowledge and Family Support with Adherence to Anti-Tuberculosis Medication at the Andalas Community Health Center in Padang City. *Jurnal Kesehatan Andalas*, *4*(3), 724–728. https://doi.org/https://doi.org/10.25077/jka.v4i3.354.