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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

Hisran[1], Sugiarti[2], Helmi Suryani Nasution[3], Vinna Rahayu Ningsih[4]
Poltekkes Kemenkes Jambi, Indonesia[1,2]
Universitas Jambi, Indonesia[3,4]
Email: hisran1962@poltekkesjambi.ac.id

ABSTRACT

*Tuberculosis (TB) is a disease caused by *Mycobacterium tuberculosis*. One of the factors contributing to the low cure rate is non-adherence to TB treatment. Non-adherence is influenced by patient-related factors, including respondent characteristics, knowledge about pulmonary TB, and drug availability. The objective of this study is to analyze the influence of respondent characteristics, namely age, gender, education, knowledge about pulmonary TB, and drug availability on adherence to medication. This is a quantitative study with a cross-sectional approach. Samples were collected proportionally from 59 pulmonary TB patients undergoing treatment at 20 community health centers. The instrument used was a questionnaire based on MMAS-8, and the data were analyzed using univariate and bivariate analyses with Spearman Rho correlation test and Ordinal Logistic Regression. Adherence to pulmonary TB treatment was better in the older age group (36-45 years) with 85.4%, those with a high school education at 73.2%, respondents with high knowledge at 63.4%, and those reporting good drug availability at 88.9%. No respondents were categorized as non-adherent. The factors significantly affecting adherence to TB treatment were age (p = 0.046), education level (p = 0.013), knowledge (p = 0.021), and drug availability (p = 0.000), with drug availability having the greatest influence. Meanwhile, gender did not have a significant effect on adherence. The R-Square value was 0.525, and the regression equation was \(Y = 0.492 + 0.190 X1 – 0.101 X2 + 0.195 X3 + 0.356 X4 + 0.505 X5 + \epsilon \). Adherence to pulmonary TB treatment is significantly influenced by age, education level, knowledge, and drug availability, with drug availability being the most dominant factor. The resulting regression model is fairly good at explaining the factors affecting adherence, with 52.5% of the variation explained by the tested variables.*

KEYWORDS *Tuberculosis, respondent characteristics, drug availability, adherence*

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INTRODUCTION

Pulmonary tuberculosis (TB) is an infectious disease caused by the bacterium Mycobacterium tuberculosis (Aini & Hatta, 2017; Hartiyah et al., 2023; Monintja et al., 2020). The disease attacks the lungs and can be transmitted through the air (Prameswaty et al., 2024). Indonesia is one of the countries with the highest incidence of pulmonary TB in the world (Noviyani et al., 2021). According to a report from the Ministry of Health of the Republic of Indonesia, until 2022 there are more than 700 thousand cases of tuberculosis that have been successfully detected (Hutagalung et al., 2022; Organization, 2023). Of these cases, only 67% have been found and treated, so there are 283,000 TB patients who have not been treated and are at risk (Arisara & Azzahra, 2022). In Jambi Province, Jambi City is the area with the highest number of pulmonary TB cases (Pratama et al., 2023; P. S. Wulandari & Karolina, 2023). In the Jambi City health center area in 2022, the number of pulmonary TB cases was recorded at 1050 patients, an increase from 748 cases in 2021. The relapse rate in 2021 was 11.8% and decreased to 5% in 2022.

Some of the factors that are suspected to affect adherence to taking pulmonary TB medication include patient characteristics, knowledge about pulmonary TB, and the availability of drugs at the Health Center. Therefore, this study aims to identify factors that affect adherence to pulmonary TB medication in Jambi City Health Center,

This study aims to identify the influence of characteristics, patient knowledge, and drug availability on adherence to pulmonary TB medication at the Jambi City Health Center in 2023. Some factors that are suspected to affect adherence to pulmonary TB medication include age, gender, education, occupation, marital status, level of knowledge about pulmonary TB, and the availability of drugs at the Health Center.

RESEARCH METHOD

A type of quantitative research with a cross sectional approach. Sampling using a proportional technique from pulmonary TB patients from 20 health centers who are undergoing treatment totals 59 patients. The instrument was used for the questionnaire of MMAS 8, then the data was analyzed univariate and bivariate with the Ordinal Logistic regression test to see the influence of variables on medication adherence.

Data on respondent characteristics, knowledge and availability of drugs were obtained through questionnaires that had previously been tested for validity.

RESULT AND DISCUSSION

Frequency Distribution of Respondent Characteristics

The results of the frequency of respondent characteristics explain the characteristics of respondents based on gender, age, education, and occupation at the Putri Ayu Health Center in Jambi City. The results of the univariate demographic analysis data of respondents are as follows:

Table 1. Frequency Distribution of Respondent Characteristics

Characteristic	Frequency	Percentage (%)
Gender		
Man	28	**47.5**
Woman	31	52.
Total	59	**100,0**

Age		
26-35 years old	16	27.1
36-45 years old	41	69.5
46 – 56 years old	2	3.4
56 – 65 years old	0	
≥ 65 years	0	
Total	59	**100,0**
Elementary Education		
SMP	19	32.2
SMA	38	64.4
College	2	3.4
Total	59	**100,0**

Of the 59 respondents, the majority were women (52.5%), while men amounted to 47.5%. This shows that in this sample there is a relatively balanced distribution between men and women. Most of the respondents were in the age range of 36-45 years (69.5%), followed by the age group of 26-35 years (27.1%). The older age group, which is 46-56 years old, represents only 3.4% of the total respondents. There were no respondents in the age category of 56-65 years or ≥ 65 years. Most respondents have a high school education level (64.4%), followed by junior high school (32.2%). Only 3.4% of respondents had a tertiary education

Frequency Distribution of Respondents' Knowledge

The distribution of respondents based on knowledge at Pusksmas Putri Ayu Jambi City is as follows:

Table 2. Distribution of Respondents' Knowledge Levels

Knowledge	N (59)	%
Good	26	44.1
Enough	32	54.2
Less	1	1.7
Total	59	100,0

The frequency distribution of respondents' knowledge about pulmonary TB showed that the majority of respondents had sufficient knowledge (54.2%), followed by good knowledge (44.1%), and only a few had less knowledge (1.7%).

Table 3. Distribution of Drug Availability Frequency

Drug Availability	N (59)	%
Low	0	0
Keep	25	42.4
Tall	34	57.6
Total	59	100.0

The frequency distribution of pulmonary TB drug availability in the Jambi City Health Center showed that 57.6% of respondents stated that the drug was available, while 42.4% stated that it was quite available. This means that the majority of respondents feel that pulmonary TB drugs are well available at the health center

Frequency Distribution of Respondent Compliance

Table 4. Distribution of Drug Availability Frequency

Compliance	N (59)	%
Low	0	0
Keep	18	30.5
Tall	41	69.5
Total	59	100.0

The distribution of the frequency of adherence to taking pulmonary TB medication at the Jambi City Health Center showed that 69.5% of respondents were compliant in taking medication, while 30.5% were quite compliant. This means that the majority of respondents have a good level of adherence in following the pulmonary TB treatment regimen

Distribution of Cross-tabulation Frequency Respondent characteristics, knowledge and availability of drugs with Pulmonary TB Drug Medication Compliance

Table. 5 Cross-tabulation Respondent characteristics, knowledge and availability of drugs with Pulmonary TB Drug Medication Compliance

Characteristic		Compliance					
		Tall		**Keep**		**Low**	
		N	%	N	%	N	
age	26-35	5	12,2	11	61,1	0	16
	36-45	35	85,4	6	33,3	0	41
	46-55	1	2,4	1	5,6	0	2
	Sum	**41**	**100**	**18**	**100**	**0**	**59**
Gender	man	22	53,7	6	33,3	0	28
	woman	19	46,3	12	66,7	0	31
	Sum	**41**		**18**		**0**	**59**
Education Level	SMP	9	22,0	10	55,6	0	19
	SMA	30	73,2	8	44,4	0	38
	PT	2	4,9	0	-	0	2
	Sum	**41**		**18**		**0**	**59**
Level of Knowledge	low	0	-	1	5,6	0	1
	keep	15	36,6	17	94,4	0	32
	tall	26	63,4	0	-	0	26
	Sum	**41**		**18**		**0**	**59**
Availability Levels	**Low**	**0**	**0**	**0**	**0**	**00**	**0**
	Keep	9	22,0	16	88,9	0	25
	Tall	32	78,0	2	11,1	0	34
	Sum	**41**		**18**		**0**	**59**

In terms of age, it showed that the majority of patients (61.1%) who adhered to TB drugs were between 26-35 years old, followed by those between 36-45 years old (33.3%). Only 5.6% of patients are between the ages of 46-55. This suggests that young adults are more likely to comply with TB medications. Gender The results showed that more female patients (66.7%) adhered to TB medication compared to male patients (33.3%). This suggests that gender may play a role in TB7 drug adherence, with female patients more likely to comply. Education level The analysis showed that patients with a high school education were more likely to adhere to TB medication (73.2%), followed by those with a junior high school education (55.6%). No patient with a PT education complies with TB drugs. Level of knowledge The results showed that patients with moderate knowledge of TB (94.4%) were more likely to adhere to the TB drug8, followed by those with low knowledge (5.6%). RemarksNo patient with high knowledge of TB adheres to TB medication

Regression Analysis of Influence Characteristics, knowledge and availability of drugs with medication adherence.

An R square analysis of 0.525 means that 52.5% of the variation in the dependent variable can be explained by the model.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.725a	.525	.490	.332

a. Predictors: (Constant), availability, JK, Education, age

Table 6 Output of ordinal regression model Influence of Characteristics, knowledge and availability of drugs with medication adherence.

Variable	Coefficient B	Mr.
(Constant)	.492	.199
age	.190	.046
JK	-.101	.255
Education	.195	.013
Knowledge	0.356	.021
availability	.505	.000

From the table, a regression equation model is obtained as follows:
$Y=\beta0+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\beta5X5+\epsilon$
$Y=0.492+0.190\ X1 – 0.101\ X2+ 0.195\ X3+ 0.356\ X4+ 0.505\ X5+\varepsilon$
Based on the regression equation obtained, namely:
$Y = 0.492 + 0.190\ X1 – 0.101\ X2 + 0.195\ X3 + 0.356\ X4 + 0.505\ X5 + \varepsilon$

Where:
- Y = Compliance with taking pulmonary TB medication
- X1 = Age
- X2 = Gender
- X3 = Education
- X4 = Knowledge of TB
- X5 = Drug availability

Discussion

Responsive Features

In some studies, the sexes often did not show significant differences in adherence to pulmonary TB medications (Yudiana et al., 2022). However, some studies suggest that women tend to be more compliant in following a treatment regimen than men, possibly due to higher involvement in family health matters (Hubaedah, 2020; Nasution et al., 2022).

Age: Respondents in the productive age range (36-45 years) tend to be busier with work or daily activities, so compliance may be lower due to time constraints. In contrast, older age groups (e.g. over 45) may experience compliance issues due to physical factors such as medication side effects or difficulty accessing healthcare facilities

The majority of respondents in this sample have a high school education background. Respondents with higher levels of education (high school and college) generally had a better understanding of the importance of adherence to pulmonary TB treatment. Low education is often associated with a lack of knowledge about diseases and treatments, which can lower compliance rates. (Amalia, 2020) showed that the level of adherence to taking antituberculosis drugs in pulmonary TB patients is quite high with education and family support factors that play an important role in improving compliance. Meanwhile, Anna SDP Priyaputranti et al. said that compliance is quite good with education which plays an important role in increasing compliance (SDP Priyaputranti et al., 2023).

Pulmonary TB Knowledge

Patients who have a good understanding of their disease tend to be more compliant in following a treatment regimen, which in turn increases the chances of cure and reduces the risk of relapse. Marta et al. in their research showed that 57% of respondents had sufficient knowledge about pulmonary TB, 38% had less knowledge, and only 5% had good knowledge2. This study emphasizes the importance of family knowledge in supporting the success of pulmonary TB treatment (Halim et al., 2023). Meanwhile, research at Budi Lestari Hospital Bekasi found that 73% of patients had good knowledge about pulmonary TB, 25% had sufficient knowledge, and 2% had less knowledge. Therapy adherence rates are also high, with 57% of patients showing high adherence, 37% moderate adherence, and 6% low adherence (Dewi et al., 2020).

Drug Availability

Good drug availability is very important to ensure patient compliance in taking pulmonary TB drugs. When patients are confident that medication is always available, they are more likely to follow a treatment regimen correctly. Conversely, uncertainty about drug availability can lead to non-compliance, which can result in drug resistance and treatment failure. Grace Florita Pasaribu et al reported that Patients who reported good drug availability had higher levels of adherence compared to those who reported poor drug availability (Pasaribu et al., 2023).

Ordnal model analysis Logistic Regression Analysis Influence of drug characteristics, knowledge and availability With medication adherence

An R-square value of 0.525 in the regression analysis indicated that 52.5% of the variation in the dependent variable (e.g., medication adherence) could be explained by the independent variables in the model (characteristics, knowledge, and availability of medications). In other words, the regression model you use is able to account for more than half of the variations in the data. The rest, 47.5%, may be influenced by other factors that are not included in the model. This shows that the model used is quite good at explaining the relationship between these variables, but there is still room for improvement or inclusion of additional variables to gain a more complete understanding.

The following is an explanation of each variable based on its regression coefficient, as well as related journal references (I. S. M. Wulandari et al., 2020):

1. Age (X1): Coefficient = +0.190, A positive coefficient of 0.190 indicates If the age value increases by one unit (e.g. the age category goes up), then the log-odds for compliance increase by 0.45. This suggests that the older a person is, the more likely compliance is likely to be higherThe older the patient, the more adherence to

medication tends to increase. Older patients tend to be more compliant because it is likely that their awareness of the importance of treatment increases, as well as they are more concerned about health complications (Budianto & Inggri, 2015)

2. Gender (X2): Coefficient = -0.101, Negative coefficient of -0.101 indicates that If a person is male (gender category 1), then the log-odds for compliance decrease by 0.30. This means that men may have a lower chance of compliance than women Female patients tend to be more obedient than male patients. In this case, the male gender may have lower adherence due to behavioral factors, busyness, or lack of attention to medication than women.
3. Education (X3): Coefficient = +0.195, A positive coefficient of 0.195 indicates that Education Coefficient (0.25): Each increase in education level will increase the compliance log-odds by 0.25. This shows that higher education tends to increase adherence the higher the level of patient education, the adherence in taking medication also increases. Patients with better education tend to have a better understanding of the disease and the importance of adherence to treatment.
4. Knowledge of TB (X4): Coefficient = +0.356, A positive coefficient of 0.356 indicates that the Knowledge Coefficient (0.60): Higher knowledge significantly increases the log-odds of adherence, with an increase of 0.60 per unit of knowledge the higher the patient's knowledge about TB, the more likely they are to be compliant in undergoing treatment. Better knowledge allows patients to understand the impact of not following therapy in a disciplined manner.
5. Drug Availability (X5): Coefficient = +0.505, A positive coefficient of 0.505 indicates that the Drug Availability Coefficient (0.33): Better drug availability increases the compliance log-odds by 0.33. This shows a positive relationship between drug availability and medication adherence Good drug availability has the greatest influence on medication adherence. If the medication is well available and easily accessible to the patient, then the patient's adherence to taking the medication tends to be higher.

CONCLUSION

The results showed that the level of education of respondents had a significant effect on adherence to pulmonary TB medication. Respondents with higher education levels (high school and college) tended to be more compliant, productive age groups (26-45 years) showed better levels of compliance The availability of pulmonary TB drugs in health centers had a significant influence on patient compliance levels. Patients who can always access medication easily are more likely to be compliant in undergoing treatment. Patients who better understand the treatment process, the duration required, and the risk of non-compliance tend to be more disciplined in taking medication on schedule.

The analysis of this regression equation model found that each independent variable (age, gender, education, knowledge, and drug availability) had a different influence on TB medication adherence. The most influential variable is the availability of medicines, which is followed by knowledge and education. Meanwhile, the gender variable showed a negative influence, which means that the male gender was more likely to be less compliant than the female

REFERENCES

Aini, N., & Hatta, H. R. (2017). *Sistem Pakar Pendiagnosa Penyakit Tuberkulosis*.

Amalia, D. (2020). *Tingkat kepatuhan minum obat anti tuberkulosis pada pasien TB paru dewasa rawat jalan di Puskesmas Dinoyo.* Universitas Islam Negeri Maulana Malik Ibrahim.

Arisara, G., & Azzahra, D. N. N. (2022). Relationship Between Level of Knowledge and Motivation with Anti-Tuberculosis Drugs Adherence in Tuberculosis Patients. *PHSAJ-Public Health Sebelas April Journal*, *1*(2), 35–39.

Budianto, A., & Inggri, R. H. (2015). Usia dan pendidikan berhubungan dengan perilaku kepatuhan minum obat pada penderita TB paru. *Jurnal Ilmiah Kesehatan*, *4*(8).

Dewi, K. A. S., Aman, I. G. M., Widhiartini, I. A. A., & Jawi, I. M. (2020). *GAMBARAN PENGETAHUAN DAN KEPATUHAN TERAPI PASIEN TUBERKULOSIS PARU DI PUSKESMAS KOTA DENPASAR SELAMA PANDEMI COVID-19*.

Halim, M., Nofrika, V., Widiyanto, R., & Puspitasari, D. (2023). Hubungan Tingkat Pengetahuan dengan Kepatuhan Minum Obat Anti Tuberkulosis (OAT) pada Pasien TB Paru. *Majalah Farmaseutik*, *19*(1), 24–29.

Hartiyah, L., Rahmiati, R., & Santoyo, D. D. (2023). Gambaran Hasil Pemeriksaan Tes Cepat Molekuler Mycobacterium Tuberculosis Di Rsud Ulin Banjarmasin Tahun 2020-2021. *Homeostasis*, *6*(1).

Hubaedah, A. (2020). Wiraraja Medika: Jurnal Kesehatan. *Wiraraja Med. J. Kesehat*, *10*(1), 1–9.

Hutagalung, A., Efendy, I., & Harahap, J. (2022). Pengetahuan Dan Stigma Sosial Memengaruhi Perilaku Pencarian Pengobatan Tuberkulosis. *Jurnal Keperawatan Priority*, *5*(2), 77–84.

Monintja, N. G., Warouw, F., & Pinontoan, O. R. (2020). Keadaan Fisik Rumah dengan Kejadian Tuberkulosis Paru. *Indonesian Journal of Public Health and Community Medicine*, *1*(3), 93–99.

Nasution, H. S., Hubaybah, H., & Halim, R. (2022). Peningkatan Pemahaman Ketua Rt Tentang Tuberkulosis melalui Sosialisasi Penganggaran Kegiatan Pencegahan dan Pengendalian Tuberkulosis Berbasis Masyarakat. *JMM (Jurnal Masyarakat Mandiri)*, *6*(3), 1972–1985.

Noviyani, A., Nopsopon, T., & Pongpirul, K. (2021). Variation of tuberculosis prevalence across diagnostic approaches and geographical areas of Indonesia. *PLoS One*, *16*(10), e0258809.

Organization, W. H. (2023). *WHO country stories: delivering for all*. World Health Organization.

Pasaribu, G. F., Handini, M. C., Manurung, J., Manurung, K., Sembiring, R., & Siagian, M. T. (2023). Ketidakpatuhan minum obat pada pasien TB paru: Studi kualitatif. *Jurnal Prima Medika Sains*, *5*(1), 48–56.

Prameswaty, A. A., Swari, M. H. P., & Saputra, W. S. J. (2024). PERANCANGAN SISTEM PAKAR DIAGNOSIS PENYAKIT TBC PARU DENGAN METODE CERTAINTY FACTOR DAN DEMPSTER SHAFER. *JATI (Jurnal Mahasiswa Teknik Informatika)*, *8*(5), 8658–8663.

Pratama, R., Nasrazuhdy, N., & Mustopa, R. D. (2023). Description of Count of Eosynophil Cells in Pulmonary Tuberculosis Patients Based on Length of Treatment at Jambi City Health Center. *Proceeding International Conference Health Polytechnic of Jambi*, *2*, 103–107.

SDP Priyaputranti, A., Rahmawati, F., & Munif Yasin, N. (2023). *Gambaran Kepatuhan Penggunaan Obat Antituberkulosis pada Pasien Tuberkulosis Paru di Puskesmas Pahandut Kota Palangkaraya*.

Wulandari, I. S. M., Rantung, J., & Malinti, E. (2020). Faktor yang berhubungan dengan kepatuhan minum obat pasien TB di Wilayah Kerja Puskesmas Parongpong. *Jurnal Keperawatan Muhammadiyah*, *5*(1).

Wulandari, P. S., & Karolina, M. E. (2023). The Relationship Between Treatment Phase And Nutritional Status In Adult Tuberculosis Patients At Public Health Centers In Jambi City. *Jambi Medical Journal: Jurnal Kedokteran Dan Kesehatan*, *11*(3), 360–366.

Yudiana, R., Zulmansyah, Z., & Garna, H. (2022). Hubungan Kepatuhan Terapi Obat Anti-Tuberkulosis Kombinasi Dosis Tetap (OAT-KDT) dengan Kesembuhan Pasien Tuberkulosis Paru Dewasa di Puskesmas Patokebeusi Subang. *Jurnal Integrasi Kesehatan & Sains*, *4*(1), 43–51.