Medication Adherence among Drug-Resistant Tuberculosis (DR-TB) Patients at Universitas Indonesia Hospital

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Abstract

Background: Drug-resistant tuberculosis (TB-DR) is a deadly disease caused by infectious agents. Indonesia is one of the countries with the highest drug-resistant tuberculosis (TB-DR) rates in the world. The prevalence of tuberculosis cases in Depok City between 2019-2022 showed an increase in cases every year. This study aims to measure the level of adherence of drug-resistant tuberculosis (TB-DR) patients to their treatment using the Eight-Item Morisky Medication Adherence Scale (MMAS-8) questionnaire.

Methods: This study is an observational study using a cross-sectional study design, conducted from February 2024 to March 2024 at the University of Indonesia Hospital. Eighty-seven respondents participated in this study. Respondents completed the validated Indonesian version of the MMAS-8 questionnaire after signing informed consent forms.

Results: The results of the study showed that 50.6% of respondents had low adherence levels, 47.1% had moderate adherence levels, and 2.3% had high adherence levels. The data was then statistically analyzed using the SPSS version 29 statistical package with Chi-Square analysis, which resulted in a significant correlation ($P<0.05$) between adherence levels and gender.

Conclusion: There was a significant correlation between gender and respondent adherence. More than 50% of drug-resistant tuberculosis (TB-DR) patients at the University of Indonesia Hospital still have low adherence levels to their treatment.

Keywords: drug-resistant tuberculosis, level of adherence, hospital

INTRODUCTION

Drug-resistant tuberculosis (TB-DR) is among the top 10 causes of death globally and is the leading cause of death from infectious agents. According to the Global Tuberculosis Report 2023, Indonesia (10%) ranks second in the world for the highest number of tuberculosis (TB) cases, after India (27%). This is followed by China (7.1%) and the Philippines (7.0%).[1]

Indonesia is one of the countries with the highest drug-resistant tuberculosis (TB-DR) rates in the world. It was estimated that there were 24,666 TB-DR cases in Indonesia in 2022. Based on data from the Tuberculosis Information System (SITB) as of March 2023, 7 provinces exceed the national target. The highest case findings are in DKI Jakarta (94%), followed by North Sulawesi (91%), North Maluku (82%), Banten (78%), West Java (78%), and Gorontalo (77%).[2] The number of TB cases in Depok City has increased yearly from 2019 to 2022.[3]

One of the tuberculosis control measures is treatment. The treatment success rate is an indicator used to evaluate treatment, obtained by adding the cure and completion rates. The percentage of tuberculosis treatment success rate in Depok City has decreased from 2019 to 2022. In 2019, the success rate was 89.37%, in 2020 it was 88.99%, in 2021 it was 84.84%, and in 2022 it was 84.18%.[3]

Improving patients' quality of life is the goal of pharmaceutical care, which involves providing medication and information, counseling, and education to patients. Monitoring therapy outcomes is also conducted to improve patient adherence. The effectiveness of therapy and the improvement of patient quality of life can be achieved under various conditions, one of which is adherence. If patients are non-adherent in taking medication, it can be one of the primary factors leading to therapy failure.[4]

Medication adherence is measured using the Eight-Item Morisky Medication Adherence Scale;

scores range from 0 to 8, with higher scores indicating better adherence. It has been suggested that a 2-point change over time on the Morisky Medication Adherence Scale represents a meaningful change in medication adherence.[5] This study aims to assess the adherence level of drug-resistant tuberculosis (TB-DR) patients to their treatment.

METHODS

This observational study used a cross-sectional design at Universitas Indonesia Hospital in Depok City from February 2024 to March 2024. Data collection was conducted using the Morisky Medication Adherence Scale (MMAS-8) questionnaire in the Indonesian version which has been validated and tested for reliability. The results of patient adherence measurements were categorized into three groups: low adherence (score <6), moderate adherence (score 6 to <8), and high adherence (score = 8).

A total of 87 respondents were involved in this study and completed the questionnaire after providing prior willingness statements and signing informed consent. The inclusion criteria for respondents in this study were patients aged at least 18 years old, patients who had undergone drug-resistant tuberculosis therapy for at least 2 weeks, patients willing to receive counseling interventions, and patients undergoing routine monthly check-ups. Exclusion criteria included refusal to participate, unevaluated patients, and those who discontinued treatment. The research data were then analyzed using Chi-Square with SPSS version 29 statistical package with a significance level of $P<0.05$. This study has obtained approval from the Research Ethics Committee of Universitas Indonesia Hospital with approval number S-018/KETLIT/RSUI/II/2024.

RESULTS

Based on the descriptive analysis, it can be observed that most of the drug-resistant tuberculosis (TB-DR) patients fall within the 18–59 age group and are predominantly male. About 40% of the research respondents have completed secondary education. The results of the descriptive analysis of sociodemographic and clinical characteristics of patients can be seen in Table 1.

Table 1. Sociodemographic and Clinical Characteristics of Respondents (n=87)

General characteristics	n	%
Sex		
Male	45	51.7%
Female	42	48.3%
Age		
18–59 years old	75	86.2%
>60 years old	12	13.8%
Occupation status		
Employed	49	56.3%
Non-Employed	38	43.7%
Education level		
Elementary Education	25	28.7%
Secondary Education	40	46.0%
Higher Education	22	25.3%
Treatment		
Long-term treatment	76	87.4%
Short-term treatment	11	12.6%
Previous treatment history of patients/disease history		
New case	48	55.2%
Relapse	14	16.1%
Treatment Failure	19	21.8%
Drop out	6	6.9%

Generally, the patients are new cases undergoing treatment for TB or TB-DR. More than 55.2% of respondents are new cases, while 21.8% have previously failed treatment. Most patients (87.4%) are undergoing long-term treatment, while 12.6% are on short-term treatment, tailored to each patient's clinical condition.

The adherence level of respondents is categorized into three groups: low (50.6%), moderate (47.1%), and high (2.3%). Table 2 shows that female respondents have a higher level of adherence compared to males. Similarly, patients in the 18-59 age range exhibit better adherence. Patients with a secondary education level demonstrate better adherence. Patients with a new disease history also show better adherence. Additionally, patients undergoing long-term treatment exhibit better adherence. The results of the statistical analysis of sociodemographic factors and clinical data of patients regarding adherence levels can be seen in Table 2.

Table 2. Adherence Level with Sociodemographic and Clinical Data of Respondents

General characteristics	Adherence Level			P
	Low (n=44)	Moderate (n=41)	High (n=2)	
Age				
18–59 years old	39 (52.0%)	34 (45.3%)	2 (2.7%)	0.635
>60 years old	5 (41.7%)	7 (58.3%)	0 (0.0%)	
Sex				
Male	28 (62.2%)	17 (37.8%)	0 (0.0%)	0.041*
Female	16 (38.1%)	24 (57.1%)	2 (4.8%)	
Education Level				
Elementary Education	9 (36.0%)	15 (60%)	1 (4.0%)	0.369
Secondary Education	24 (60.0%)	15 (37.5%)	1 (2.5%)	
Higher Education	11 (50.0%)	11 (50.0%)	0 (0.0%)	
Occupation status				
Employed	25 (51.0%)	24 (49.0%)	0 (0.0%)	0.264
Non-Employed	19 (50.0%)	17 (44.7%)	2 (5.3%)	
Treatment				
Long-term treatment	38 (50.0%)	36 (47.4%)	2 (2.6%)	0.845
Short-term treatment	6 (54.5%)	5 (45.5%)	0 (0.0%)	
Disease history				
New case	22 (45.8%)	25 (52.1%)	1 (2.1%)	0.672
Relapse	9 (64.3%)	5 (35.7%)	0 (0.0%)	
Treatment Failure	11 (57.9%)	7 (36.8%)	1 (5.3%)	
Drop out	2 (33.3%)	4 (66.7%)	0 (0.0%)	

DISCUSSION

Based on the results of this study, the largest respondent group is male, with a percentage that is not significantly different from the number of female respondents. This aligns with a study that stated that male gender is significantly associated with medication adherence.[6] The respondent group with the highest percentage is in the age range of 18–59 years (86.2%), followed by the age group >60 years (13.8%). Previous studies have also stated that age influences medication adherence.[7]

Meanwhile, the results of another study showed a relationship between respondent age and the occurrence of dropouts in multidrug-resistant tuberculosis (MDR-TB) treatment.[8] The findings of yet another study indicate that treatment adherence in elderly tuberculosis patients is a complex and multidimensional phenomenon.[9]

Based on the data obtained, the group of drug-resistant tuberculosis (TB-DR) patients is most prevalent among those with a secondary education level, accounting for 46.0%. This aligns with a previous study that found a positive relationship between medication adherence in TB-DR treatment and treatment outcomes.[10] Clinical pharmacy services as a single or combined intervention have the potential to improve tuberculosis outcomes.[11] Over 56% of respondents are employed, in line with research identifying occupation as a significant predictor of treatment discontinuation risk.[12]

Long-term treatment (87.4%) is most prevalent, tailored to each patient's clinical condition. This aligns with previous research indicating that treatment duration also plays a role in medication adherence in tuberculosis treatment.[7] Lower adherence is associated with an increased number of medications consumed.[13]

Based on the data obtained, the treatment history with new cases accounts for 55.2%, followed by cases of treatment failure at 21.8%. This is consistent with previous research, where a history of previous anti-tuberculosis treatment is the most identified risk factor for TB-DR.[14] Therefore, enhancing TB follow-up strategies to the provision of strong primary tuberculosis care and TB-DR treatment can improve tuberculosis control. Meanwhile, according to the findings of another study, it is stated that the majority of TB-RR and TB-MDR patients are relapse cases.[15]

Table 2 shows a significant correlation between gender and medication adherence among TB-DR patients, with male respondents exhibiting lower adherence levels (P=0.041). Male respondents exhibit lower adherence levels, which aligns with the findings of previous research indicating that significant predictive factors for a higher risk of treatment discontinuation include male gender.[12]

Meanwhile, based on the results of this study, there is no significant correlation between age, employment status, education level, type of treatment, and treatment history with medication adherence among drug-resistant tuberculosis (TB-DR) patients (P>0.05). Successful drug-resistant tuberculosis treatment can be achieved if patient adherence is high. According to the findings of previous research, there is a significant between medication adherence in TB-DR treatment and treatment outcomes.[10]

LIMITATION

A limitation of this study does not include other variables that may affect an individual's adherence to treatment, such as treatment/therapy costs, drug availability, side effects, the use of traditional medicine, and several other variables. This study serves as preliminary research to provide an overview of drug-resistant tuberculosis (TB-DR) patient adherence to treatment.

CONCLUSION

Patients with drug-resistant tuberculosis (TB-DR) at Universitas Indonesia Hospital in Depok City have a low adherence rate of 50.6%, a moderate adherence rate of 47.1% and a high adherence rate of 2.3%. Patient adherence levels are significantly correlated with gender. Knowledge regarding drug-resistant tuberculosis treatment can improve treatment adherence and lead to optimal therapy outcomes.

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CONFLICT OF INTEREST

None

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