Analysis of Factors Associated with Adherence to Taking Medication in Pediatric Patients with Pulmonary Tuberculosis in Mesuji Regency, Lampung, Indonesia

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A B S T R A C T

Background: One disease that is still a health problem in the world, including Indonesia, is tuberculosis (TB) which is caused by germs *Mycobacterium tuberculosis*. The success of TB treatment requires patient compliance in taking antituberculosis drugs (OAT), family support such as supervision, and motivating TB sufferers are factors that play a role in patient compliance. This study aims to determine the factors associated with medication adherence in pediatric patients with pulmonary tuberculosis in Mesuji Regency, Lampung, Indonesia. **Methods:** This study was an observational study with a cross-sectional approach, where as many as 52 respondents were included in this study. Data collection through interviews using a structured questionnaire. The subject of the study consisted of tuberculosis patients who were reported to have attended treatment for at least two months in Mesuji Regency. Data analysis was carried out using SPSS using univariate and bivariate methods. Results: The results showed that 76.9% of respondents adhered to the treatment of pulmonary tuberculosis. Patient medication adherence to tuberculosis was influenced by the presence of drug side effects (p-value = 0.007) and the supervisor's support for taking medication (p-value = 0.021). **Conclusion:** Compliance with taking medication in tuberculosis patients is influenced by the presence of medication supervisors and the uncomfortable side effects of antituberculosis drugs.

1. Introduction

Tuberculosis is a contagious infectious disease caused by the bacteria *Mycobacterium tuberculosis*. These aerobic and acid-resistant rods can be pathogenic or saprophytic organisms and attack the lung parenchyma or other parts of the human body. Based on WHO Global tuberculosis report data. Indonesia is in second place with the highest TB cases in the world. It is sufficiently apprehensive where in WHO Global Tuberculosis Report data. Indonesia is ranked 5th and is said to be quite successful in tackling TB. Until 2018, the incidence of TB cases in Indonesia has not shown a decrease, and this is because there are still many cases that have not been reached and detected. In cases detected and treated, the lack of monitoring from health workers of the patient's condition is one of the reasons for the failure of current treatment therapy. Based on the Global Burden of Disease study, TB is the second leading cause of death in the world. The TB rate in Indonesia is based on microscopy of 759 per 100,000 population for ages over 15 years, with a higher number of male sufferers than female sufferers and a higher number of sufferers living in urban areas than in rural areas.[1-5]

Many factors influence the occurrence of pulmonary TB disease. These factors can be in the form of individual factors, germ factors, and

environmental factors. Individual factors can be in the form of various things that affect the individual's immune system, for example, HIV/AIDS, malnutrition, diabetes mellitus (DM), and drug use immunosuppression. The germ factor can be the concentration of germs and the duration of contact with germs. Environmental factors can be in the form of ventilation, density, and lighting in the room. Nutritional status is an important factor in the course of infectious diseases. Poor nutritional status can put a person at greater risk of being infected with TB bacteria. The existence of a drug consumption supervisors (PMO) is very important for TB patients to ensure that the patient is always regular and on time in taking OAT. The existence of PMO is expected to increase the success of TB treatment, as seen from the increased cure rate and decreased dropout rate. A PMO is a health worker. It could also come from a health cadre or a family member. Several studies have shown that the role of PMO largely influences treatment success. Adherence is the extent to which a person's behavior – taking medication, following a diet, and/or implementing lifestyle changes, conforms to agreed recommendations from a health care provider. Compliance with taking antituberculosis drugs is closely related to the patient's quality of life, but the number of cases of recurrence should be food for thought whether the patient's adherence to taking the drug will have a significant impact on the patient's quality of life.[6-10] This study aimed to analyze the relationship of factors related to compliance in pediatric patients with pulmonary tuberculosis to take medication in Mesuji Regency, Lampung, Indonesia.

2. Methods

This study was an observational study with a cross-sectional approach and used primary data obtained from research subjects in Mesuji Regency, Lampung, Indonesia. A total of 52 research subjects participated in this study, where the research subjects met the inclusion criteria. The inclusion criteria in this study were patients who had been diagnosed with pulmonary tuberculosis consuming antituberculosis

drugs for at least 2 months, and were willing to participate in this study, which is marked with signed informed consent. Data was collected by means of interviews using a structured questionnaire.

The validity and reliability test of the questionnaire was conducted on 30 respondents. To find out the validity of the questionnaire is done by comparing the value of the r table with the value of the r count. At the significance level α = 5%, it means that the decision to reject or support the null hypothesis has an error probability of 5% or 0.05. With a significance level of α = 5%, the value of r table = 0.3610 is obtained. Of the 23 questionnaire questions, each question/variable has a calculated value above the r table value, so the questions in the questionnaire are valid. From the results of the reliability test, the value of r Alpha (0.951) is greater than the value of r table, so the questions in the questionnaire used are reliable. The independent variables in this study were drug side effects, the role of the supervisor taking medication, and a history of other illnesses, while the dependent variable was adherence to treatment for tuberculosis patients. Compliance with the treatment of pulmonary TB patients referred to in this study is the patient's behavior in accordance with the provisions/instructions or suggestions given by medical personnel, especially in following the suggestions for using OAT in accordance with the proper rules of use, including the number of drugs taken, frequency and time of taking the right drug and timeliness to come to take the drug and control it regularly and completely without interruption, for at least 6 months. Drug side effects are effects that are caused/unwanted effects that occur at therapeutic doses after the patient takes OAT. The role of the PMO is an action taken by the family or PMO in an effort to support patient treatment, including reminding them to take medication regularly and uninterruptedly, reminding them to come for treatment/control at the health center according to a predetermined schedule, providing enthusiastic support to recover, helping with costs treatment, accompanying patients to carry out examinations/controls, recommend rest and provide

nutritious food and clean the house and environment properly. History of comorbidities is the presence or absence of other diseases suffered by patients who also require taking medication while carrying out pulmonary TB treatment. Data analysis was carried out using SPSS software version 25. Univariate analysis was performed to present the frequency distribution of each variable test. Meanwhile, bivariate analysis was performed to assess the relationship between risk factors and medication adherence, where bivariate analysis was performed using the Chi-square test with p<0.05.

3. Results

Table 1 shows that as many as 38 respondents were male, dominated by more than 10 years of age, and the education level of most of the respondents was a primary school. There were 43 respondents who felt the impact of the use of antituberculosis drugs (OAT), felt support from the presence of a drug consumption supervisor (PMO) 45, and only a small number stated that there was a history of comorbidities other than tuberculosis, as many as three respondents.

Table 1. Demographic characteristics of children with pulmonary TB in Mesuji Regency.

Variable	Frequency	Percentage (%)
Compliance status		
Adherence	40	76,9
Non-adherence	12	23,1
Gender		
Male	38	73,1
Female	14	26,9
Age		
10 years	38	73,1
Less than 10 years	14	26,9
Education		
Primary school	38	73,1
Not in school yet	14	26,9
Medication side effects		
Yes	6	11,5
No	46	88,5
PMO role		
Support	45	86,5
Not supported	7	13,5
History of comorbidities		
Yes	3	5,8
No	49	94,2

Table 2 shows that the proportion of respondents who experienced the effects of OAT was more dominant who were non-adherent, with a total of 4 people (66.7%) compared to the proportion of respondents who adhered to treatment, namely 2 people (33.3%). The proportion of respondents based on the role of PMO who provided more support was 37 people (82.2%) adherent to treatment compared to 8 people (17.8%) who were non-adherence, and the proportion of respondents who had a history of comorbidities was 1 person (33 .3%) adhered to treatment, and 2 people (66.7%) of them did not comply with treatment. The results of statistical tests using the Chi-square test showed that only side effects of drugs and PMO support were significant on adherence to treatment of pulmonary tuberculosis patients in Mesuji Regency (p-value 0.05). This means that patients who take treatment/therapy and experience the effects of using OAT cause respondents to be less compliant with treatment, whereas patients who undergo treatment for pulmonary TB with support from the PMO will cause patients to adhere to regular treatment.

Table 2. Bivariate analysis of factors related to adherence to treatment for pulmonary TB patients in Mesuji Regency.

Variable	Compliance level		Total (frequency (%))	P-value
	Adherence	Non-adherence		
Medication side effects				
Yes	2 (33,3)	4 (66,7)	6 (100)	0,007*
No	38 (82,6)	8 (17,4)	46 (100)	
PMO role				
Support	37 (82,2)	8 (17,8)	45 (100)	0,021*
Not supported	3 (42,9)	4 (57,1)	7 (100)	
History of comorbidities				
Yes	1 (33,3)	2 (66,7)	3 (100)	0,065*
No	39 (79,6)	10 (20,4)	49 (100)	

*Chi-square test.

4. Discussion

Support from family, friends, or support groups can have a positive impact on patient adherence. This support can encourage patients to remain committed to taking medication regularly, especially in the presence of a medication supervisor. Family members who are supportive and actively involved in the patient's treatment can play an important role as medication supervisors. They can remind patients to take their medications regularly, administer medications according to a schedule, and provide emotional support. Health workers, such as trained nurses or medical personnel, can act as drug-taking supervisors. They can visit patients regularly, administer medications, and confirm patients consume it correctly. Surveillance by health workers is often required in the treatment of more complex tuberculosis, such as drug-resistant tuberculosis. Having a friend or volunteer who can help monitor taking medication can provide additional social support. They can provide motivation, remind patients about medication schedules, and provide emotional support. Being involved in a support group for people with tuberculosis can provide an opportunity for patients to share their experiences and gain support from other individuals who are dealing with similar conditions. Support groups can also provide an opportunity for the patient to obtain additional information about the disease and its treatment. In some cases, technology can be used to monitor medication adherence. For example, there are cell phone apps that can remind patients about medication schedules, track adherence, and provide reminders to patients and their caregivers. Medication monitoring can help improve patient adherence to tuberculosis treatment, especially in cases that require complex treatment or patients with a low risk of adherence. However, it is also important to ensure that this monitoring is carried out with a sensitive approach and respects patient privacy and autonomy.[11-15]

Some antituberculosis drugs can have unpleasant side effects, such as nausea, vomiting, indigestion, and fatigue. Patients who experience these side effects may feel less motivated to continue their treatment. Good medical support and monitoring of side effects can help with this problem. It is important to have good medical support during treatment. Healthcare workers should monitor patients regularly, including checking for possible side effects. If the patient experiences uncomfortable side effects, the doctor or health worker can provide advice, adjust the dosage, or replace the drug with a more suitable alternative. Providing clear and accurate information to patients about possible side effects of tuberculosis drugs can help reduce anxiety and increase patient readiness to deal with them. Patients need to know that these side effects are common and that they can be managed with medical support. Patients should be given guidance on how to deal with side effects that may arise. For example, nausea and vomiting can be reduced by eating before or at the same time as taking

medication. Digestive disorders can be overcome by dividing the dose of the drug or consuming it with foods that reduce gastric irritation. Fatigue can be overcome with adequate rest and regular sleep patterns. Patients should also be provided with information about any side effects that are worrisome and need to be reported to a health professional immediately. Patients experiencing unpleasant side effects may need additional emotional support. Providing opportunities for patients to talk about their experiences and providing moral support can help reduce the negative impact of side effects. In some cases, supportive therapy, such as psychological therapy or counseling, may be useful. Therapists can help patients deal with anxiety, depression, or other negative feelings that can arise as a result of drug side effects. It is important to ensure that patients feel heard and supported during their treatment. Good medical support, monitoring of side effects, and appropriate treatment can help patients stay motivated and committed to continuing their tuberculosis treatment.[16-20]

5. Conclusion

The existence of drug side effects and support from medication supervisors are the main factors for patient adherence in carrying out pulmonary tuberculosis treatment in Mesuji Regency, Lampung, Indonesia.

6. References

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