

Original Article

Level of Knowledge, Attitude, and Family Support in Pulmonary TB Patients in Compliance with Taking Anti-Tuberculosis Drugs

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ABSTRACT

Background: Tuberculosis (TB) is a disease caused by the bacteria *Mycobacterium tuberculosis*. TB is one of the top 13 causes of death in the world. This research aims to determine the level of knowledge, attitudes and family support for pulmonary TB sufferers in compliance with taking OAT in the Depok III Health Center working area, Sleman Regency.

Methods: This research is descriptive research with quantitative descriptive methods. This research was conducted at the Depok III Community Health Center, Sleman Regency with a sample of 33 respondents. The sampling technique uses total sampling, and univariate analysis was conducted to describe the observed variables, including the level of knowledge, attitude, family support, and compliance with taking anti-tuberculosis drugs.

Results: This study showed that of the 33 respondents with compliance in taking medication in the compliant category of 75.8%, the level of knowledge of pulmonary TB sufferers regarding compliance with taking OAT was highest in respondents with good knowledge and compliance with taking medication (42.4%), attitude Pulmonary TB sufferers who adhere most to taking OAT have a positive attitude and adhere to taking medication (39.4%). Meanwhile, family support for pulmonary TB sufferers in adherence to taking OAT was highest among respondents with good family support and adherents to taking medication (45.5%).

Conclusions: Based on the research results, it can be concluded that the level of adherence to taking OAT in pulmonary TB sufferers is (75.8%) adherent to taking medication. Description of the knowledge of pulmonary TB sufferers regarding adherence to taking OAT. Most of them have good knowledge and are obedient to taking OAT. The attitude of pulmonary TB sufferers in taking OAT is mostly positive, but only 39.4% adhere to taking medication.

Likewise, with the support of families of pulmonary TB sufferers in compliance with taking OAT, the majority have good family support and are adherent to taking medication.

Keywords: *Knowledge; Attitude; Family support; Medication Adherence.*

INTRODUCTION

Tuberculosis (TB) is an infectious illness caused by the bacteria *Mycobacterium tuberculosis*. Tuberculosis is a significant cause of disease and death, ranking among the top 13 worldwide. TB bacteria can spread from TB patients through the air and often affect the lungs, but they can also damage the pleura, meninges, pericardium, lymph nodes, bones or joints, skin, and kidneys ¹. TB cases in Indonesia continue to rise, with 393,323 cases in 2020, 443,235 in 2021, and 724,309 in 2022. The estimated incidence of cases is 354 per 100,000 population, with a death rate of 52 per 100,000. Treatment success rates have also increased, notably to 83.1% (2020), 85.9% (2021), and 86.5% (2022), but have not yet met the national goal of 90% ².

TB is a disease with a high risk of transmission, and patient adherence to medication is a key factor in its effectiveness. Compliance with therapy has an impact on a person's long-term health. Patient compliance in TB therapy is critical for healing, preventing transmission, and avoiding medication resistance Kemenkes RI (2020). The Stop TB approach, as suggested by the WHO, emphasizes the necessity of direct observation in anti-TB drug administration (DOTS). The primary goal of DOTS is to detect and cure patients, particularly those with infectious tuberculosis, to break the chain of transmission and reduce TB prevalence in the community through appropriate diagnosis, effective short-term treatment, and tight supervision ⁴.

Compliance with taking TB medicine for 6 months without interruption is critical for healing and preventing

transmission. After two weeks of consistent therapy, germs begin to be eliminated, lowering the chance of transmission. Motivation and the desire to recover impact compliance, which permits OAT to destroy dormant and active bacteria more effectively ⁵. Noncompliance with TB therapy can result in treatment failure, ongoing transmission, increased morbidity, mortality, and drug resistance (MDR), making pulmonary tuberculosis harder to treat. Several factors influence medication compliance in TB patients, including the level of knowledge, patient attitudes, family support, and the role of healthcare workers ⁶.

Low levels of education correlate with low levels of knowledge, which can lead to noncompliance and harmful behavior such as carelessly spitting up phlegm ⁷. On the other hand, the higher a person's education, the greater their understanding of tuberculosis and its management and treatment efforts. The majority of respondents expressed negative views rather than positive ones, which were associated with a lack of knowledge. A favorable attitude toward pulmonary tuberculosis therapy requires a solid understanding of the subject ⁸.

Family support is essential in supporting medication adherence in TB patients and the success of TB patient treatment, for example, by demonstrating concern such as reminding patients to take medication and taking medication regularly, providing encouragement to continue taking medication diligently and a sense of sympathy, caring for patients, and being sensitive to TB patients if they experience side effects from TB medication. A link exists between family support and medication adherence, with a lack of family support contributing to low adherence, suggesting that the family's role needs to be strengthened further (9,10).

According to data from the DIY Health Office in 2022, there were 2,744 cases of tuberculosis, with a treatment success rate of 87.9%. This rate is still lower than the national objective of 90% ¹¹. Sleman Regency has the highest number of tuberculosis cases in DIY. In Sleman, the number of TB patients climbed from 335 in 2021 to 498 in 2022, although only 203 received complete treatment. The success percentage of TB treatment in Sleman declined from 90.2%

(2020) to 86.4% (2021) ¹². As a result, pulmonary TB remains a significant health concern, particularly at the Depok III Health Center, which had the most cases in Sleman in 2022, with 53 cases in a work area of 20 hamlets. Based on this description, researchers aim to conduct a quantitative descriptive study to examine the degree of knowledge, attitudes, and family support for medication compliance among pulmonary TB patients in the Depok III Sleman Health Center Work Area. This research is crucial for preventing the transmission and supporting efforts to reduce pulmonary tuberculosis.

METHODS

This research is a descriptive study using quantitative methodologies. The purpose of this study is to investigate the degree of knowledge, attitudes, and support among the families of pulmonary tuberculosis patients in the Depok III Health Center Work Area, Sleman Regency, regarding compliance with anti-tuberculosis medicine. This study was conducted in the Depok III Health Center construction area in Sleman Regency from October to November 2023.

The population of this study consisted of all pulmonary tuberculosis patients undergoing treatment at the Depok III Health Center. The sample used in this study comprised all patients from June to October 2023, a total of 39 individuals, with six excluded because two met the exclusion criteria and four had completed therapy. In this study, a total of 33 participants were selected using a total sampling approach, with the criterion of respondent age greater than 15 years and ongoing treatment at the time of data collection. This research already obtained ethical approval from the Research Ethics Committee of Universitas Ahmad Dahlan with the number 012311201. The observed variables in this study were the level of knowledge, attitude, family support, and compliance with taking anti-tuberculosis drugs. Data were collected using a structured questionnaire that had been tested for validity and reliability. The data were analyzed descriptively to present the distribution and characteristics of each variable.

RESULTS

1. Respondent Characteristics Based on Gender, Age, Education, Occupation, and Distance to Health Facilities

An overview of the characteristics of respondents based on gender, age, education, and occupation is presented in table 1 below:

Table 1. Frequency Distribution of Respondent Characteristics Based on Gender, Age, Education, Occupation, and Distance to Health Facilities

Characteristics	Frequency	Percentage (%)
Gender		
Male	14	42,4
Female	19	57,6
Age		
15-24	17	51,5
25-34	4	12,1
35-44	0	0
45-64	2	6,1
55-64	7	21,2
>64	3	9,1
Education		
Elementary	1	3
school	23	69,7
Senior high school	9	27,3
Undergraduate		
Occupation		
Worker	1	3
Housewife	5	15,2
Student	14	42,4
Freelance	1	3
Self-Employed	3	9,1
Private	4	12,1
Employee	1	3
PNS	3	9,1
Retiree	1	3
Not Working		
Total	33	100

Table 1 shows that the majority of the 33 respondents with pulmonary tuberculosis are female (57.6%). The majority of pulmonary tuberculosis patients are between the ages of 15 and 24 (51.5%), with 23 persons (69.7%) having completed high school as their most recent schooling. The responders with the most jobs are students, totaling 14 (42.2%). Next, a description of the characteristics of respondents based on distance to health facilities is presented in the following table.

Table 2. Distribution of Characteristics of Pulmonary TB Patients Based on Distance to Health Facilities (Km)

n	Min	Max	Mean
33	1	15	2,9

Based on Table 2, it is evident that the minimum distance to health facilities for respondents is 1 km, the maximum distance is 15 km, and the average distance is 2.9 km.

2. Description of the Level of Knowledge, Attitude, Family Support, and Compliance in Taking Medication in Pulmonary TB Patients

The description of the distribution of research respondents based on the variables of knowledge level, attitude, family support, and compliance in taking pulmonary TB medication is as follows:

Table 3. Frequency Distribution of Knowledge Level, Attitude, Family Support, and Medication Compliance in Pulmonary TB Patients in the Depok III Health Center Working Area

Category	Frequency	Percentage (%)
Knowledge		
Bad	15	45,5
Good	18	54,5
Attitude		
Negative	15	45,5
Positive	18	54,5
Family Support		
Not Good	14	42,4
Good	19	57,6
Medication Compliance		
Non-Compliant	8	24,2
Compliant	25	75,8
Total	25	100

In Table 3, it is known that respondents who have good knowledge are 18 people (45.5%), based on the attitude variable, more respondents have a positive attitude, namely 18 people (45.5%), then based on the family support variable, more respondents have good family support, namely 19 people (57.6%). At the same time, the proportion of respondents based on the level of compliance in taking medication is higher in the compliant category, namely 25 people (75.8%).

The percentage description based on the knowledge questionnaire statements of pulmonary TB patients in the Depok III Health Center work area is presented in Table 4.

Table 4. Frequency Distribution Based on Knowledge Questionnaire Statement Items

Number	Statement	True n (%)	False n (%)
1	TB disease can be cured	33 (100)	0
2	By taking medication regularly and routinely, TB disease can be cured	33 (100)	0
3	Excessive smoking habits can worsen TB germs	29 (87,9)	4 (12,1)
4	Talking and coughing without covering can spread TB germs	33 (100)	0
5	A good immune system will accelerate the growth process of TB disease	13 (39,4)	20 (60,6)
6	Separating bathing and eating utensils can prevent transmission of TB disease	24 (72,7)	9 (27,3)
7	Side effects of TB treatment can cause disorders	21 (63,6)	12 (36,4)
8	If you have ever had TB and it relapses, this disease is difficult to cure	14 (42,4)	19 (57,6)
9	TB disease makes physical conditions decline and get worse	26 (78,8)	7 (21,2)
10	TB disease makes the body thinner	28 (84,8)	5 (15,2)
11	TB disease is easy to transmit because it can be transmitted through the air, for example sneezing, coughing, saliva, etc. TB germs do not only affect the lungs, but can also affect other organs	33 (100)	0
12	TB disease is only caused by Mycobacterium germs	24 (72,7)	9 (27,3)
13	TB disease most easily attacks the elderly and adults because of a decrease in the body's immune system	29 (87,9)	4 (12,1)
14	People get TB because they do not get BCG immunization	19 (57,6)	14 (42,4)
15	TB disease only develops in slums and dense settlements	11 (33,3)	22 (66,7)
16	The process of healing TB disease in addition to routine treatment also requires nutritious food	11 (33,3)	22 (66,7)
17	Consuming alcoholic beverages can worsen TB disease	33 (100)	0
18	If you experience complaints such as chest pain, shortness of breath, coughing up blood, fever, weakness, loss of appetite are symptoms of TB	28 (84,8)	5 (15,2)
19	TB infection can be detected by sputum/phlegm examination in the laboratory and photos and/or x-rays	33 (100)	0
20	TB disease can be cured	33 (100)	0

According to Table 4, three statements in the knowledge variable have a low percentage of correct answers, specifically item 8, which relates to whether you have ever had tuberculosis. It relapses; this disease is difficult to cure. Item 15 refers to People getting tuberculosis because they do not receive BCG immunization, and item 16 relates to TB only developing in slums and dense settlements, which was obtained based on respondents' responses.

Furthermore, the percentage description based on the attitude questionnaire questions for pulmonary TB patients in the Depok III Health Center work area is presented in Table 5.

According to Table 5, in the variable of pulmonary TB sufferers' attitudes, there is one item with the highest percentage of negative responses, namely item 3 about TB disease being easily transmitted, especially to people who are frequently in contact with pulmonary TB sufferers, with as many as 12 people disagreeing (36.4%). The percentage description based on the family support questionnaire questions for pulmonary TB patients in the Depok III Health Center work area is presented in Table 6.

Table 5. Frequency Distribution Based on Questionnaire Statement Items of Pulmonary TB Patients' Attitudes

Number	Statment	SA	A	DA	SD
		n (%)	n (%)	n (%)	n (%)
1	TB disease is a contagious disease	16 (48,7)	17 (51,5)	0	0
2	TB disease can be cured by taking TB medication regularly for 6 months and must not be stopped	11 (33,3)	22 (66,7)	0	0
3	TB disease is easily transmitted, especially to people who often come into contact with sufferers	7 (21,2)	14 (42,4)	12 (36,4)	0
4	To avoid the risk of transmission, when coughing and sneezing, you should cover your mouth with a tissue or handkerchief	10 (30,3)	23 (69,7)	0	0
5	Sunlight must enter the house every day	11 (33,3)	22 (66,7)	0	0
6	Doors and windows must be opened every day so that air circulation is good	10 (30,3)	23 (69,7)	0	0
7	TB sufferers must behave healthily (eat nutritious foods, exercise and do not smoke)	12 (36,4)	19 (57,6)	1 (3)	1 (3)
8	Sputum should not be thrown away in just any place	12 (36,4)	21 (63,6)	0	0
9	Supervisors are needed for taking TB medication, especially by family members at home	6 (18,2)	21 (63,6)	6 (18,2)	0
10	TB disease is closely related to environmental conditions and unclean living behavior	5 (15,2)	22 (66,7)	5 (15,2)	1 (3)

Table 6. Distribution Distribution Based on Family Support Questionnaire Statement Items

Number	Statment	Never n (%)	Seldom n (%)	Always n (%)
My Family:				
1	Picking up medicine when I can't get it myself	24 (72,7)	3 (9,1)	6 (18,2)
2	Encouraging me to get well and comply with treatment	1 (3)	0	32 (97)
3	There are times when I feel lonely	4 (12,1)	12 (36,4)	17 (51,5)
4	Taking me to treatment if I can't come myself	20 (60,6)	4 (12,1)	9 (27,3)
5	Informing me about the benefits and risks of not complying with taking medication	3 (9,1)	7 (21,2)	23 (69,7)
6	Reminding me to take medication when I forget	3 (9,1)	9 (27,3)	21 (63,6)
7	Giving affection	1 (3)	1 (3)	31 (93,9)
8	Taking me to check-ups	17 (51,5)	8 (24,2)	8 (24,2)
9	Listening to my complaints	2 (6,1)	11 (33,3)	20 (60,6)
10	Accompanying me when taking medication	16 (48,5)	12 (36,4)	5 (15,2)
11	Giving attention	2 (6,1)	2 (6,1)	29 (87,9)
12	There are times when it is needed	1 (3)	11 (33,3)	21 (63,6)
13	There are times when I feel alone	3 (9,1)	11 (33,3)	19 (57,6)
14	Exemplifying how to take medication when I can't	20 (60,6)	4 (12,1)	9 (27,6)
15	Meeting my food and drink needs at home	8 (24,2)	3 (9,1)	22 (66,7)
16	Managing me when I can't, even though the distance is close	19 (57,6)	4 (12,1)	10 (30,3)
17	Giving appreciation when I'm desperate	7 (21,2)	6 (18,2)	20 (60,6)
18	Reminding me to surrender and be grateful to God	2 (6,1)	3 (9,1)	28 (84,8)
19	Covers costs when I can't	3 (9,1)	1 (3)	29 (87,9)
20	Loving me	1 (3)	1 (3)	31 (93,9)
21	Help reading the dosage when I can't	16 (48,5)	3 (9,1)	14 (42,4)
22	Help facilitate my treatment when I can't	3 (9,1)	2 (6,1)	28 (84,8)
23	Giving advice when I have problems	2 (6,1)	2 (6,1)	29 (87,9)
24	Meeting and talking, when I need them	1 (3)	8 (24,2)	24 (72,7)
25	Providing medicine in a container when I can't	19 (57,6)	5 (15,2)	9 (27,3)

Based on Table 6, in the family support variable, 4 statement items have low-income family support for pulmonary TB patients, namely in item 1 related to family getting medicine if I cannot get it myself, in item 4 related to family taking me to the doctor if I cannot come myself, in item 14 related to family giving examples of how to take medicine if I cannot afford it, and in item 25 related to family providing medicine in a container if I cannot afford it, there are still many

respondents who have the answer in the option "Never". The description of the percentage of compliance in taking medication in patients with pulmonary TB in the Depok III Health Center work area is presented in Table 7.

Table 7. Frequency Distribution of Medication Compliance Based on MMAS-8 Questions

Number	Statment	Yes n (%)	No n (%)
1	Do you sometimes forget to take your anti-tuberculosis medication?	9 (27,3)	24 (72,6)
2	Think about the past 2 weeks. Was there a day when you did not take your anti-tuberculosis medication?	1 (3)	32 (97)
3	Have you ever reduced or stopped your medication without telling your doctor because you felt worse while taking the medication?	2 (6,1)	31 (93,9)
4	When you are traveling, do you sometimes forget to bring your anti-tuberculosis medication?	5 (15,2)	28 (84,8)
5	Did you take your anti-tuberculosis medication yesterday?	32 (97)	1 (32)
6	When you feel better, do you ever stop your medication?	0	33 (100)
7	Have you ever felt disturbed or bored with your regular medication schedule?	15 (45,5)	18 (54,5)
8	How difficult is it for you to remember to take all your medications?		
	a. Never	2 (6,1)	
	b. Once in a while	9 (27,3)	22 (66,7)
	c. Sometimes	0	
	d. Usually	0	
	e. Always		

Table 7 shows that the respondents who answered the question with the option "yes" or not compliant in taking medication were mostly in item 1 regarding whether respondents sometimes forget to take anti-tuberculosis medication, as many as 9 (27.3%), item 4, namely 5 (15.2%), and item 7, namely 15 (45.5%).

3. Cross Tabulation of Respondent Characteristics Based on the Proportion of Level of Knowledge, Attitude and Family Support in Compliance with Taking Medication

The description of the distribution of research respondents based on respondent characteristics, in compliance with taking anti-tuberculosis drugs in pulmonary TB patients at the Depok III Health Center, Sleman Regency is presented in Table 8.

Table 8. Cross Tabulation of Respondents' Characteristics in Medication Compliance in Pulmonary TB Patients in the Depok III Health Center Work Area

Variable	Compliance		Total n (%)
	Non-Compliant n (%)	Compliant n (%)	
Gender			
Male	5 (15,1)	9 (27,3)	14 (42,4)
Female	3 (9,1)	16 (48,5)	19 (57,6)
Age			
15-24	6 (18,2)	11 (33,3)	17 (51,5)
25-34	0	4 (12,1)	4 (12,1)
35-44	0	0	0
45-64	0	2 (6,1)	2 (6,1)
55-64	2 (6,1)	5 (15,1)	7 (21,2)
>64	0	3 (9,1)	3 (9,1)
Education			
Elementary school	0	1 (3)	1 (3)
Junior high school	0	0	0
Senior high school	7 (21,2)	16 (48,5)	23 (69,7)
Undergraduate	1 (3)	8 (24,3)	9 (27,3)
Occupation			
Worker	1 (3)	0	1 (3)
Housewife	0	5 (15,2)	5 (15,2)
Student	5 (15,1)	9 (27,4)	14 (42,4)
Freelance	0	1 (3)	1 (3)
Self-Employed	1 (3,0)	2 (6,1)	3 (9,1)
Private Employee	0	4 (12,1)	4 (12,1)
PNS	0	1 (3,0)	1 (3)
Retiree	0	3 (9,1)	3 (9,1)
Not Working	1 (3,0)	0	1 (3)
Total	8 (24,2)	25 (75,8)	33 (100)

In Table 8, it can be seen that the proportion of respondents with female gender is more compliant in taking OAT, with 16 people (48.5%). In contrast, among males, many are not compliant with taking medication, with five people (15.1%). Then, the proportion of respondents aged 15-24 years who are more compliant in taking OAT is 11 people (33.3%). At the same time, those who are not compliant in taking medication are most prevalent in this age group, specifically six people (18.2%). The proportion of respondents with a high school education is more compliant in taking the OAT, namely 16 people (48.5%), as well as those who are not compliant, with seven people (21.2%). The proportion of respondents based on occupation is highest among students, where students who are compliant with taking OAT are nine people (27.4%), while those who are not compliant with taking OAT are the most numerous, comprising five people (15.1%).

Next, a description of the level of knowledge, attitudes, and family support among pulmonary TB patients regarding compliance with anti-tuberculosis

drugs in the Depok III Health Center work area is presented in Table 9.

Table 9. Cross Tabulation of Proportion of Level of Knowledge, Attitude, and Family Support Towards Compliance in Taking Pulmonary TB Medication in the Work Area of Depok III Health Center

Variable	Compliance		Total n (%)
	Non-Compliant n (%)	Non-Compliant n (%)	
Knowledge			
Bad	4 (12,1)	11(33,4)	15 (45,5)
Good	4 (12,1)	14 (42,4)	18 (54,5)
Attitude			
Negative	3 (9,1)	12 (36,4)	15 (45,5)
Positive	5 (15,1)	13 (39,4)	18 (54,5)
Family Support			
Not Good	4 (12,1)	10 (30,3)	14 (42,4)
Good	4 (12,1)	15 (45,5)	19 (57,6)
Total	8 (24,2)	25 (75,8)	25 (100)

In Table 9, it is evident that the proportion of respondents with good knowledge is more likely to be compliant in taking medication, comprising 14 people (42.4%). Then, the proportion of respondents based on their attitudes towards taking medication shows that respondents with positive attitudes are more compliant in taking medication, with 13 people (39.4%) falling into this category. Likewise, the proportion of respondents based on family support in compliance with taking medication shows that respondents with good family support are more compliant in taking medication, with 15 people (45.5%) falling into this category.

DISCUSSION

1. Overview of Knowledge in Medication Compliance

Internal factors such as individual characteristics and treatment perceptions influence medication compliance in patients with pulmonary tuberculosis, as do external factors such as distance to health facilities, discrimination, family support, information, motivation, and the role of health workers or PMO. According to this study, the majority of patients with pulmonary tuberculosis are between the ages of 15 and 24, which is considered a productive age. The most significant degree of drug compliance is 33.3%. The productive age is vulnerable to tuberculosis because intense activity might weaken the immune system¹³. They found that 91.5% of respondents aged 15-34 years were compliant with taking OAT, owing to young people's high motivation to receive therapy¹⁴.

Furthermore, it is known that the proportion of female respondents who are compliant with taking medicine is 16 (48.5%), which is higher than the proportion of male respondents, at 9 (27.3%). Investigation found that pulmonary tuberculosis was more prevalent in men¹⁵. Gender, however, is not the primary risk factor, as women who are active outside the house are as susceptible to infection. When patients cough, sneeze, or talk, droplets of pulmonary tuberculosis enter the lungs, increasing the risk of infection. Gender influences medication adherence owing to variations in social, behavioral, environmental, and biological variables. However, men and women have equal access to information and treatment for pulmonary tuberculosis. The completion of treatment is dependent on each individual's decision and willingness to heal. If both are compliant with therapy, the chances of recovery remain the same¹⁶.

Based on the data, most pulmonary TB patients had a high school education (69.7%), with 48.5% of them being compliant with their medication. This result aligns with previous studies, which have shown the highest level of compliance in patients with a high school education or higher¹⁷. Education is not always associated with compliance, as the length of treatment may generate boredom or a sense of being healed,

leading patients to discontinue their medication, which can risk the emergence of resistant microorganisms¹⁸.

Based on profession, the majority of pulmonary TB patients (42.4%) are students, with a 27.4% compliance rate with OAT. A crowded work environment or social engagement, such as on campus, raises the chance of getting pulmonary tuberculosis due to increased interaction with a large number of individuals¹³. An unsupportive atmosphere, boredom, and a lack of knowledge of the need for compliance all contribute to up to 15.1% of students' noncompliance with TB treatment. The majority of students with tuberculosis at Depok III Health Center are migrants, which may increase transmission in the surrounding area. As a result, more research among students is required to break the chain of transmission of pulmonary tuberculosis.

Meanwhile, pulmonary tuberculosis patients travel a minimum of 1 km and a maximum of 15 km to health facilities, with an average distance of 2.9 km from their homes. Ryansyah et al. (2023) classified the distance to health services as either near (≤ 2 km) or distant (> 2 km). According to the study's findings, respondents who lived nearby were more likely to take their prescription than those who lived further away. In this survey, the average distance to health services was 2.9 kilometers; hence, the majority of respondents fell into the far distance category¹⁹. According to Hasanuddin and Mardiana (2021) research, good health services are those that are easily accessible to the general population, particularly in terms of location. The greater the distance to a healthcare center, the more difficult it is for patients, particularly the elderly, to seek treatment. This has an impact on TB patients' compliance with treatment since they prefer to visit health institutions near their homes²⁰.

2. Overview of Knowledge in Medication Compliance

Knowledge is anything that is known and received via the process of seeing, hearing, experiencing, and thinking, which serves as the foundation for human behavior and actions²¹. The findings revealed that 54.5% of respondents had a strong understanding of pulmonary tuberculosis, compared to 45.5% who had poor knowledge. Respondents with excellent knowledge (42.4%) were more likely to comply with medicine use than those with poor knowledge (33.4%). However, there was still a mismatch between knowledge and conduct, as evidenced by people continuing to smoke despite being aware of the hazards. Respondents also lacked knowledge of airborne TB transmission, the relevance of slum surroundings, and the necessity of the BCG vaccine, indicating that more education is needed to avoid pulmonary tuberculosis.

Patients who are well-informed about pulmonary tuberculosis are more likely to take their treatment as directed. Good information instills confidence in patients to follow the doctor's orders, hence preventing

transmission and increasing the likelihood of recovery¹⁶. Good knowledge is influenced by both formal and informal information, as well as the environment, which plays a role in the process of generating individual knowledge²².

Previous research found that patients with excellent knowledge were more likely to comply with therapy (23 people) than those with poor knowledge (9 people)²³. Experience, age, and education all have an impact on knowledge, with older individuals typically having more education and experience with tuberculosis. A good understanding of pulmonary tuberculosis prevention will change behavior and increase awareness of the need for accurate treatment. The more knowledgeable a person is, the more likely they are to follow treatment instructions²¹.

3. Description of Attitudes in Compliance with Taking Medication

The survey found that 54.5% of patients with pulmonary tuberculosis at Depok III Health Center had a favorable attitude. There was no significant difference in medication compliance between those with positive and negative views. In addition, several responders were unaware that pulmonary tuberculosis might be spread through intimate contact with patients. The percentage of conformity with positive attitudes is 94%, whereas compliance with negative attitudes is 1%. Attitude refers to an individual's conduct before taking action²⁴. If people's attitudes are excellent, it is simple for someone to accomplish something nice; nevertheless, if people's attitudes are still not good, it will have a negative influence on people's health²¹. Attitude influences how individuals act and make decisions during the healing process. Furthermore, a good attitude toward the condition will result in positive health-seeking behavior; therefore, it is believed that this positive attitude would inspire someone to continue the treatment procedure²⁵.

4. Description of Family Support in Medication Compliance

The results showed that most pulmonary TB patients at Depok III Health Center received good family support (57.6%), with 45.5% of them being compliant in taking medication. Conversely, 42.4% of respondents received low-income family support, which has the potential to reduce compliance. Lack of closeness with family makes patients reluctant to ask for help, such as getting medication. Therefore, the active role of the family needs to be increased to support medication compliance.

As is well known, the family serves as a support system for its members. Family support plays a crucial role in the effectiveness of treatment for patients with pulmonary tuberculosis, specifically by reminding them to take their medication regularly and encouraging them to continue doing so²⁶. This is because family support is one of the most important variables influencing

pulmonary tuberculosis patients' adherence to therapy. Family support is crucial in promoting compliance with medication among patients with pulmonary tuberculosis, thereby reducing the likelihood of them discontinuing treatment. The assistance offered also serves as a reminder to patients to remain positive and to take their prescriptions on time. Families that do not completely accompany their pulmonary tuberculosis patients may have an impact on their treatment. Family members play a crucial role in providing support to patients with pulmonary tuberculosis by motivating them to recover and adhere to their treatment plan until they are fully recovered²⁷.

Family support is one of the most essential family tactics because the family views it as something that can be achieved to help them overcome their challenges. Patients with pulmonary tuberculosis will find comfort, care, and admiration from their family members, allowing them to accept their situation. The more family members provide knowledge, support, encouragement, and motivation to pulmonary TB patients, the more likely they are to take their medication²⁸.

5. Description of Medication Compliance in Pulmonary TB Patients

According to the study's findings, the majority (75.8%) of the 33 respondents were compliant in taking their pulmonary tuberculosis medication, motivated by awareness and a belief in the effectiveness of their treatment. However, eight respondents were disobedient because they forgot, were bored, or discontinued therapy without the knowledge of health professionals. To promote treatment compliance, families and healthcare staff will need to provide additional support and supervision to ensure effective treatment outcomes.

Irregular, incorrect, or stopped tuberculosis therapy might lead germs to develop drug resistance, perhaps producing multiple drug Resistance (MDR)²⁹. The findings of this study are consistent with those of Taek et al., who found that the majority of respondents, 20 out of 22 (90.91%), were compliant with medication use³⁰. Compliance with pulmonary tuberculosis medication is critical in healing the condition since pulmonary tuberculosis patients will only recover entirely if they take their medicine on a regular and consistent basis³¹.

According to Dhiyantari et al., high compliance may be attributed to a variety of factors, including free medications and health services, conveniently accessible healthcare centers, and a desire to maintain good health³². According to Oktaviani and Mahwati research, one way to increase compliance in taking OAT is to provide peer group support, in which someone offers support and encouragement to each TB sufferer so that they feel loved and make themselves more meaningful, making patients more obedient in undergoing treatment until it is completed³³.

This study has several limitations. The descriptive design used in this research only provides an overview of the level of knowledge, attitude, family support, and compliance of pulmonary TB patients without assessing causal relationships among the variables. The study was also conducted in a single health center with a limited number of respondents, which may restrict the generalization of the findings to a wider population. In addition, the data were collected using self-reported questionnaires, which may be subject to response bias or inaccuracies in participants' answers.

CONCLUSIONS

The study found that the majority of pulmonary tuberculosis patients at Depok III Health Center in Sleman Regency are women aged 15-24, with a high school education and an average distance to the health center of 2.9 kilometers. The responders' level of understanding is generally high, but it has not been matched by full compliance with medicine. Similarly, while most respondents have positive views and strong family support, this may not always correspond to drug adherence. The degree of compliance with OAT in patients with pulmonary TB in this research was excellent, at 75.8%, but 24.2% still did not comply, indicating that efforts are needed to promote education, positive attitudes, and family support to increase compliance and treatment effectiveness.

ACKNOWLEDGMENTS

The researcher would like to express his sincere gratitude to all respondents who took the time to provide the information needed for this study. Gratitude is also extended to the Depok III Health Center for their assistance, support, and cooperation, which enabled this study to run smoothly and be completed.

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