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Overview of Family Support and Medication Compliance for Pulmonary TB Patients at the Limboto Health Center

Melisafitri Paramata[1], Zuriati Muhamad[2], Rona Febriyona[3]
[1,2,3]Program Studi Keperawatan Fakultas Ilmu Kesehatan Universitas Muhammadiyah Gorontalo
***Email: paramatamelisa@gmail.com**

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ABSTRACT

Pulmonary tuberculosis (TB) is an infectious disease that is still a public health problem and requires long-term treatment so that patient compliance in taking medication is very important to achieve the success of therapy, where one of the factors that can affect patient compliance in undergoing treatment is family support provided during the treatment process. This study aims to describe the picture of family support and medication adherence in pulmonary TB patients at the Limboto Health Center, Gorontalo Regency. This study uses a quantitative method with a descriptive design carried out on pulmonary TB patients at the Limboto Health Center by collecting data using family support questionnaires which include emotional support, awards, information, and instrumentals as well as medication compliance questionnaires which are then analyzed using univariate analysis to describe the distribution of each research variable.
The results showed that most of the respondents received good family support, namely 33 respondents (70.2%), while respondents who did not receive family support were 14 respondents (29.8%), and most of the respondents were in the compliant category in undergoing pulmonary TB treatment, namely 43 respondents (91.5%), while respondents who did not comply were 4 respondents (8.5%).
Conclusion: Based on the results of the study, it can be concluded that the majority of pulmonary TB patients at the Limboto Health Center have family support and are obedient in taking medication during treatment.

INTRODUCTION

Pulmonary tuberculosis (pulmonary TB) is still one of the serious global public health problems. Every year, TB infects about 10 million people and is among the top 10 causes of death in the world. It is estimated that one-third of the world's population has latent infections *Mycobacterium tuberculosis*, with 95% of them in developing countries (Saputra) *et al.,* 2022). The high burden of TB is exacerbated by the increase in cases *multidrug-resistant tuberculosis* (MDR-TB) and *Drug-resistant tuberculosis* (XDR-TB) which poses major challenges in control and treatment. In addition, the association of TB with HIV/AIDS also worsens the patient's prognosis, as HIV infection increases the risk of developing latent TB into active TB *(WHO, 2023)*.

Socioeconomic conditions also play a big role in the spread of TB. Individuals who live in poverty, malnutrition, and live in densely populated environments are at higher risk of contracting TB and have difficulty accessing treatment. WHO estimates that in 2022 around 2.2 million cases of TB will arise due to poor nutrition. TB rates also tend to be higher in populations with low levels of economic well-being, as shown by the inverse relationship between GDP per capita and TB incidence (*WHO, 2023*; Yassin & Betigeri, 2024).

In Indonesia, the burden of TB is still very high. In 2022, around 1,060,000 cases were recorded with an incidence rate of 354 per 100,000 population, making Indonesia the country with the second highest number of TB cases in the world after India (Ministry of Health, 2024). In addition, Indonesia is among the 27 countries with the highest burden of MDR-TB, with about 6,800 new cases annually, which is 2.8% of new cases and 16% among patients who have undergone previous treatment (Beda Ama *et al.,* 2020). TB transmission occurs through the air when people cough or sneeze, so that *Mycobacterium tuberculosis* easily spread in the surrounding environment (Pramono) *et al.,* 2023).

The burden of TB at the regional level is also still a challenge, as can be seen from data from the Gorontalo Regency Health Office in 2024 which shows the achievement of discovering new pulmonary TB cases by 73% of the target (1,698 out of 2,317 cases). In the working area of the Limboto Health Center in 2025, 87 cases of pulmonary TB were recorded, while in the previous year 218 patients were declared cured, but there were still 12 patients who stopped receiving treatment. This condition shows that patient compliance in undergoing therapy has not been optimal even though TB control programs have been implemented. In addition, there is still discrimination against pulmonary TB patients in the community. This social stigma causes some patients to hide their illness for fear of being ostracized, which can hinder openness and reduce family support in the treatment process.

Patient non-compliance in undergoing therapy, especially in terms of adherence to regular medication, is one of the main causes of low success in pulmonary TB treatment. The TB treatment process takes a long time, which is at least six months, so many patients stop because they are bored, saturated, or experience side effects of the drug. This non-compliance not only lowers the cure rate, but also increases the risk of drug-resistant germ resistance (MDR-TB), which makes treatment more difficult, time-consuming, and expensive (Isaac) *et al.,* 2023).

Medication adherence and the success of pulmonary TB treatment are greatly influenced by family support. Lack of support can cause patients to stop treatment, increasing the risk of drug resistance. Family support can be in the form of emotional support (providing encouragement and psychological strengthening), informational support (providing knowledge about diseases and treatments), instrumental support (helping with patients' practical needs such as transportation costs and delivery controls), and appreciation support (providing positive appreciation and motivation) (Rismayanti) *et al.,* 2021; Wahyuni, 2024).

In an effort to control the global economy, WHO since 1994 launched the DOTS strategy (*Directly Observed Treatment Short Course*), which emphasizes direct supervision of patients to take medication regularly until they recover. One of the main pillars is the role of the PMO (Medication Supervisor) who accompanies the patient during therapy. Without this assistance, patients are prone to stop taking medication and transmitting the disease to others (Pertiwi & Kharin Herbawani, 2021; Purba & Sudirman, 2024).

Based on the background description, the researcher is interested in conducting research on "Overview of family support and the level of compliance with pulmonary TB medication in the Limboto Health Center"

RESEARCH METHODOLOGY

Place and time of the research

This research will be conducted at the Limboto Health Center, The time for the research is planned to be in November - December 2025

Research Methods

This study uses a quantitative method with a descriptive design, which aims to obtain an overview of family support and the level of medication adherence of pulmonary TB patients at the Limboto Health Center in one measurement time.

Population and sample

The population in this study is all pulmonary TB patients who are treated at the Limboto Health Center, which is 87 people. Meanwhile, the number of samples in this study was 47 respondents.

Data Analysis Techniques

Univariate Analysis

Univariate analysis aims to describe or describe the characteristics of each research variable in a single way. In the categorical variables, the analysis was carried out by calculating the frequency and percentage distribution for each category. The variables analyzed univariately in this study include:

a. Characteristics of respondents (age, education, occupation, and length of treatment).
b. Family support (emotional, appreciative, informational, instrumental).
c. Medication adherence to pulmonary TB patients (compliant, non-compliant).

RESEARCH RESULTS

Univariate Analysis

Respondent Characteristics

The characteristics of the respondents in this study included gender, age, last education, and occupation.

Table 1 Frequency Distribution of Respondents

Characteristics Respondents	Frequency	Percentage %
1. Gender		
Male – Male	22	46,8

Women	25	53,2
2. Age		
Infant/Toddler (<5 years)	0	0,0
Children (5-9 years)	0	0,0
Teenagers (10-18 years old)	7	14,9
Adults (19-59 years)	31	66,0
Senior (>60 years old)	9	19,1
3. Final Education		
No School	0	0,0
SD	21	44,7
Junior High School	7	14,9
High School	13	27,7
S1	6	12,8
4. Jobs		
Not Working	1	2,1
Student/Student	7	14,9
Farmer	6	12,8
IRT	16	34,0
Private/Self-Employed	10	21,3
Civil Servant/Honorary Satpol/Fire Fighter	5	10,6
	2	4,3
5. Immediate Family		
Husband	7	14,9
Wife	11	23,4
Lightweight	12	25,5
Children	11	23,4
Grandson	3	6,4
Siblings	3	6,4
TOTAL	47	100

Source : Primary Data

Based on table 1 of respondent characteristics, it is known that out of a total of 47 respondents, most of them were female, namely 25 people (53.2%), while male respondents were 22 people (46.8%). This shows that female respondents are slightly more than male respondents.

Based on age, the majority of respondents were in the adult age group (19–59 years) as many as 31 people (66.0%). The elderly age group (>60 years) amounted to 9 people (19.1%), while respondents of adolescent age (10–18 years) were 7 people (14.9%). There were no respondents in the infant/toddler age group and children.

Judging from the last education, most of the respondents had an elementary education, namely 21 people (44.7%). Furthermore, respondents with high school education were 13 people (27.7%), junior high school education as many as 7 people (14.9%), and S1 education as many as 6 people (12.8%). There were no respondents who did not attend school.

Based on the respondents' job characteristics table, most of the respondents were housewives (IRT) as many as 16 people (34.0%). Other jobs include private/self-employed 10 people (21.3%), students/students 7 people (14.9%), farmers 6 people (12.8%), civil servants/honorary 5 people (10.6%), satpol/firefighters 2 people (4.3%), and unemployed 1 person (2.1%).

Based on the closest family, it shows that most of the respondents' immediate families are mothers as many as 12 respondents (25.5%). Furthermore, wives and children each accounted for 11 respondents (23.4%), husbands as many as 7 respondents (14.9%), and grandchildren and siblings each as many as 3 respondents (6.4%).

Family Support

Table 2 Frequency Distribution of Family Support Categories

Categories Family Support	Frequency	Percentage %	Total
Support	46	97,9	
Enough Support	1	2,1	
Not Supported	0	0	
Total	**47**	**100,0**	**47 (100%)**

Based on Table 2, it is known that almost all respondents have family support in the supporting category, namely 46 respondents (97.9%). Meanwhile, respondents in the category of moderately supportive as many as 1 respondent (2.1%), and there were no respondents in the non-supportive category (0%). This shows that most of

the respondents in this study received good family support during treatment.

Medication Compliance

Table 3 Distribution of Medication Adherence Frequency

Categories Medication Adherence	Frequency	Present %	Total
Obedient	44	93,6	
Non-compliant	3	6,4	
Total	**47**	**100,0**	**47 (100%)**

Based on Table 3, it is known that most of the respondents are in the category of compliant in taking drugs, namely 44 respondents (93.6%). Meanwhile, respondents who were in the non-compliant category were 3 respondents (6.4%). This shows that the majority of respondents in this study have a good level of adherence in undergoing treatment.

DISCUSSION

Family Support

Based on the results of the study, it is known that almost all respondents are in the supportive category, namely as many as 46 respondents (97.9%), and a small number are in the category of supporting enough as many as 1 respondent (2.1%), and there are no respondents in the non-supporting category. The category of family support was determined based on the results of filling out a questionnaire that included four dimensions, namely emotional support, reward support, informational support, and instrumental support. These four dimensions are used to describe the extent of family involvement and role in providing attention, motivation, real help, and information needed by patients during the treatment and treatment process.

In the group of respondents who were included in the category of supportive families (97.9%), the results of the questionnaire showed that emotional support was the most prominent dimension. This is reflected in most of the respondents who stated that the family often or always gives full attention and affection during treatment, provides encouragement and moral support, and creates a comfortable atmosphere for patients to share their complaints and feelings. In addition, respondents also felt that the family understood their emotional state and did not consider the complaints felt as trivial, and the existence of the family made the patient feel stronger and less easily discouraged during the treatment process. This emotional support plays an important role in maintaining the psychological stability of pulmonary TB patients and increasing motivation to undergo treatment regularly.

In the award support dimension, respondents who fall into the support category show good values. This is shown through the statement that the family often or always gives praise and appreciation when the patient is disciplined in taking medication, acknowledging the patient's efforts and struggles in undergoing pulmonary TB treatment, and appreciating every small progress made during the treatment period. In addition, the family also shows pride in the patient's determination to recover and appreciates the patient's decision regarding the treatment undergone. The support of this award contributes to increasing patient confidence and strengthening the commitment to adherence to treatment.

On information support, respondents who fall into the support category show better average scores. This can be seen from the role of the family in seeking information about TB and its treatment from health workers or trusted sources, explaining the importance of taking medication regularly and on time, and conveying the development of the patient's health condition based on information from medical officers. In addition, the family also plays a role in reminding the health control schedule and inviting patients to discuss how to maintain their health during the treatment period. This information support helps to improve patients' understanding of the disease and the therapy undergoing so as to support treatment adherence.

Meanwhile, in the instrumental support dimension, respondents who are included in the support category also show good values. This is shown through the real assistance provided by the family, such as providing or delivering patients to health care facilities, helping to meet daily needs such as nutritious food and clothing, helping to get medicines either by buying them or taking them at pharmacies or health facilities, and reminding and preparing medicines so that they can be taken on time every day. In addition, the family also helps manage finances or provide the necessary expenses for Pulmonary TB screening and treatment. This instrumental support is essential in reducing physical and economic barriers that can affect the success of treatment.

In respondents who are in the category of moderately supportive (2.1%), family support is still provided but not optimal. The results of the questionnaire showed that instrumental support and information support were the lowest valued dimensions. Based on the results of the questionnaire, families rarely help in taking medications, assistance during health control, reminders of medication schedules, and providing medical expenses, and rarely provide information related to the importance of pulmonary TB treatment and health control schedules. This condition shows that the involvement of the family in accompanying the patient during treatment is still limited

and has the potential to cause irregularities in undergoing treatment. This is in line with previous research which stated that limited family support can occur in several aspects, such as lack of family understanding of treatment protocols and limited time in providing assistance to patients (Maghfiroh et al., 2025)

The fact that no respondents were found in the non-supportive category shows that all respondents in this study received family support in various forms. This indicates that the family's involvement in accompanying the patient during the treatment process is relatively good. However, this condition also shows that the variation in the family support category in this study is relatively limited, so it cannot provide a broader picture of the comparison between the levels of family support.

The results of this study are in line with the research (Zulkarnain Nasution, 2020) and (Isaac) *et al.*, 2023) which states that family support is one of the important aspects in supporting the treatment process of pulmonary TB patients. Similar things were also put forward by (Muhamad et al., n.d.) that family support can help increase the patient's motivation in undergoing therapy. Research (Nugiawati, 2021) also emphasized that optimal family support, especially in emotional and instrumental aspects, plays a role in supporting the success of treatment.

Thus, the results of this study show that most respondents had good family support on all dimensions measured, with emotional support being the most dominant dimension. Emotional support that includes attention, empathy, care, and positive encouragement plays a role in maintaining the patient's psychological condition during treatment. These findings are also in line with research (Febriyona & Adam, 2023) which states that social support in the form of attention and empathy can help individuals cope with stressful conditions and maintain motivation in undergoing treatment.

Medication Compliance

Based on the results of the study, most of the respondents were included in the category of drug compliance, namely 44 people (93.6%), while 3 people (6.4%) were included in the non-compliant category. The assessment of medication adherence was carried out using a questionnaire consisting of eight yes/no questions, which described the behavior of forgetting to take medication, discontinuation of treatment without the knowledge of health workers, incompleteness of medication consumption, and saturation of long-term treatment of pulmonary TB.

The results of filling out the questionnaire showed that respondents who were classified as compliant generally gave answers that reflected medication compliance behavior. This is shown by the majority of respondents stating that they did not forget to take their medicine, never deliberately did not take their medicine other than because they had forgotten, and never stopped taking medicine without informing the doctor. In addition, obedient respondents also stated that they did not forget to bring medicine when traveling, as well as taking medication completely the day before.

In the aspect of therapy continuity, compliant respondents also showed positive behavior, namely continuing to take medication even though they did not feel symptoms and did not feel upset about the length of the pulmonary TB treatment plan. These findings show that respondents have a good understanding, awareness, and commitment to the importance of regular and thorough treatment of Pulmonary TB, even though treatment must be undergone over a long period of time.

On the other hand, respondents who were included in the non-compliant category showed one or more behaviors that were not in accordance with the principles of medication compliance based on the results of the questionnaire. Respondents in this group stated that they had forgotten to take medication or often forgot to take medication, had not taken medication other than for forgetting reasons, had stopped taking medication without informing health workers, and did not take medication when traveling. In addition, some respondents also stated that they did not take the medication completely the day before, had stopped taking the medication when they did not feel symptoms, and felt upset about the length of the treatment plan, which overall can have an impact on irregular medication consumption and increase the risk of pulmonary TB treatment failure.

These behaviors indicate the risk of drug withdrawal or medication irregularities, which has the potential to reduce the success of pulmonary TB therapy. Non-adherence to taking medication can lead to treatment failure, disease recurrence, and increased risk of drug resistance.

The findings of this study are in line with the research (Cut Novita, 2024) which states that adherence to pulmonary TB treatment is demonstrated by regularity of taking medication, not stopping treatment prematurely, and completion of therapy without discontinuation of medication for 6–9 months. Research (Rohmawat, 2023) also affirmed that medication adherence is a major factor in the success of Pulmonary TB treatment, as irregular medication consumption can increase the risk of therapy failure and drug resistance.

In addition to individual factors, family support also plays a role in influencing medication adherence. Respondents who received supervision, reminders, and encouragement from their families tended to be more disciplined in taking medication and undergoing treatment until it was complete. This is in line with research (Nugiawati, 2021) which states that Pulmonary TB treatment adherence is influenced by patient motivation, complexity of therapy, drug side effects, as well as the quality of family support and patient-health worker relationships.

Thus, the results of this study show that respondents who comply with taking medication are characterized by the absence of forgetful medication behavior, discontinuation of treatment without the consent of health professionals, and saturation of therapy based on eight questionnaires. On the other hand, non-compliant respondents are characterized by the presence of one or more of these behaviors. Medication adherence is a key factor in the success of pulmonary TB treatment and needs to be supported through continuous education, routine monitoring, and strengthening the role of the family.

CONCLUSION

Based on the results of the study on family support and medication adherence in pulmonary TB patients, it can be concluded that most of the respondents had family support in the supportive category, namely as many as 46 respondents (97.9%), a small number were in the category of sufficient support as much as 1 respondent (2.1%), and there were no respondents in the non-supportive category. This shows that in general, respondents received good family support during the treatment process.

In addition, most of the respondents were in the compliant category in taking medication, namely 44 respondents (93.6%), while respondents in the non-compliant category were 3 respondents (6.4%). This shows that in general, respondents have a good level of compliance in undergoing pulmonary TB treatment.

Thus, the results of this study illustrate that respondents generally have good family support and a high level of compliance during treatment.

SUGGESTIONS

1. For Limboto Health Center
   It is hoped that the Puskesmas can continue to improve education and assistance programs for families of Pulmonary TB patients, so that family support remains optimal in supporting medication compliance and treatment success.
2. For Patients' Families
   The family is expected to maintain and improve its role as the patient's main support, especially in providing motivation, attention, and reminding the medication schedule regularly during the treatment period.
3. For the Next Researcher
   It is recommended that further research use analytical or longitudinal designs to analyze the relationship and influence of family support on medication adherence in more depth. In addition, the addition of other variables such as socioeconomic factors, environmental conditions, and family knowledge levels can provide a more comprehensive picture of pulmonary TB treatment adherence.
4. For Institutions

   It is hoped that educational institutions can strengthen learning about the role of the family in patient care and encourage the development of more in-depth research related to family support and medication adherence.

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