

Overview of Anti-Tuberculosis Treatment Compliance in Pulmonary Tuberculosis Patients

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ARTICLE INFO

Article history

Received 19 May 2024

Revised 29 June 2024

Accepted 30 June 2024

Keywords

Anti-tuberculosis

Healthcare

Pulmonary Tuberculosis

ABSTRACT

This research was motivated by an increase in pulmonary tuberculosis cases of 10% and cases of loss to follow-up treatment of 11.25%. This research aimed to determine the description of Anti-TB treatment compliance in pulmonary tuberculosis patients at the Pameungpeuk Community Health Center. This research method uses descriptive quantitative with a cross-sectional design. The instrument used the MARS-5 questionnaire with 120 pulmonary tuberculosis patient respondents who received treatment at the health center. The sampling technique uses a Total sampling technique with criteria for patients undergoing treatment for a minimum of three months from 17-74 years. The research results were obtained from univariate analysis with the results that most were female (52.5%), almost half were in their late teens (32.5%), most had a high school education (60%), almost half the length of treatment was in the intensive phase (48.3%), most experienced side effects (64.2%), most underwent routine examinations (75%), most had treatment supervision (60%), high compliance (58.3%), moderate compliance (41.7%). It can be concluded that compliance is influenced by age, education, treatment supervision, side effects, length of treatment, routine check-ups, and gender and it is hoped that community health centers can optimize educational strategies for handling side effects to obtain maximum compliance results.

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Introduction

Pulmonary tuberculosis is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*, which usually attacks the lungs and attacks several areas outside the lungs, such as. Lymph nodes, bones, and lining of the brain. Tuberculosis is transmitted through coughing air and mucus [1].

According to the 2020 Global Tuberculosis Report published by the World Health Organization (WHO), Southeast Asia is home to 26 % of the world's population and 43 % of tuberculosis cases. It is estimated that in 2020 almost 4.3 million people were infected with tuberculosis and an estimated 700,000 people died (excluding HIV+TB deaths). In 2020, the number of deaths from tuberculosis increased by 1.3 million [2]. According to the Global TB Report 2021, there are around 824,000 cases of tuberculosis in Indonesia, but only 393,323 (48%) tuberculosis patients have been identified, treated, and reported to the national information system. However, around 52 percent of TB cases are unknown or detected but not reported [3]. In 2022, West Java will be the province with the most tuberculosis cases. In January-August 2022 there were 75,296 confirmed and reported cases of tuberculosis, which is around 59% of the target, compared to 60% in August. In 2019, 341,948 cases of tuberculosis were detected in the Bandung area. Based on preliminary research data from the Pameungpek Community Health Center, the prevalence of tuberculosis will be 55.20% in 2021 and 64.85% with a population of 86,272. This means that confirmed TB cases are increasing in the Acid-Fast Bacilli (AFB) band there are cases at the Pameungpek Community Health Center, Bandung Regency where follow-up Anti-TB treatment was lost by 11.25% and one death occurred.

Based on Ref. [4], therapy compliance is the patient's behavior in taking medication correctly, depending on dose, frequency, and time. The results of a survey of 100 respondents at two community health centers in the Cimaung district showed that (54%) were compliant with taking TB medication, (40%) were less compliant and (6%) were not compliant. Previous research used the Morisky Medications Adherence Scale-8 (MMAS-8) questionnaire, while this research used the MARS-5 questionnaire.

Pulmonary tuberculosis compliance is important for all tuberculosis patients to achieve the desired cure. One of the impacts of non-compliance is Multi Drug Resistant Tuberculosis (MDR-TB). MDR-TB is a problem that is the world's main obstacle in eradicating TB. Some factors contribute to the increasing number of MDR-TB sufferers, namely the level of knowledge of sufferers and their families about the disease, poor level of compliance with taking anti-tuberculosis medication, inadequate therapy, low regularity of treatment, poor motivation, lack of regularity in supplies. Drug quality contributes to the occurrence of secondary drug resistance. Anti-TB treatment resistance is closely related to previous

treatment history. Patients who have been previously treated have a 4 times higher probability of resistance and a 10 times higher probability of resistance for MDR-TB than those who have never undergone treatment. It must be admitted that treatment of tuberculosis with double resistance is very difficult and requires a longer time, even up to 24 months [5].

Compliance with taking medication plays an important role in the success of therapy for pulmonary tuberculosis patients because irregular treatment can result in the resistance of the mycobacterium tuberculosis bacteria to anti-tuberculosis treatment. Non-adherence to treatment causes high rates of therapy failure, thereby increasing the risk of morbidity and death, which are increasingly found in pulmonary tuberculosis patients who are resistant to standard treatment [5].

Factors that influence medication adherence in pulmonary tuberculosis patients include predisposing factors consisting of knowledge, information that has been combined with understanding, and the potential to act beliefs, beliefs, values, and attitudes. As well as enabling factors including the availability of health facilities or facilities and reinforcing factors consisting of family support that occurs throughout life and the attitude of health workers who have an educational background and have a good attitude [6].

This study aimed to determine the description of compliance with anti-tuberculosis treatment (Anti-TB treatment) in pulmonary tuberculosis patients at the Pameungpek Community Health Center, Bandung Regency, Indonesia. One of the roles of nurses in health services is as educators who provide motivational support to patients. The role of the nurse as an educator is to provide explanations of information about the disease, patient's condition, and treatment plans, provide advice, and facilitate patients in teaching healthy behavior and supporting the patient's abilities as well as providing examples of health-related behavior. The role of nurses as educators in tuberculosis compliance is very important. Therefore, the better the education provided by nurses and the health services provided, the higher the patient's desire to be enthusiastic about their treatment and achieve recovery, and the higher the quality of health services in the view of the public. The role of nurses is to help patients in improving the healing process for tuberculosis patients, especially in increasing compliance with taking anti-TB treatment [7].

Material and Methods

This research is research using descriptive quantitative methods with a cross-sectional design. This research was conducted from May to June 2023. The variable in this research is the level of compliance. The level of compliance is the level of attention of pulmonary TB patients in carrying out anti-TB treatment based on the Medication Adherence Rating Scale. The population in this study were all patients diagnosed with pulmonary tuberculosis with a minimum treatment period of 3 months, aged 17-74 years. Sampling used a total sampling

technique and the results obtained were 120 patients. Data collection was carried out using the MARS-5 (Medication Adherence Rating Scale-5) questionnaire, which consisted of 5 questions with answers always, often, sometimes, rarely, and never. The results of the validity test on the MARS-5 questionnaire show that all questions have a coefficient of >0.444 , this shows that the 5 questions in the questionnaire are valid. The reliability test was carried out by calculating the Cornbach's alpha coefficient value using the SPSS program. On this instrument, the Cornbach's alpha value was obtained, namely 0.566 and it can be concluded that the instrument used is reliable and reliable. The data collection process was obtained by distributing questionnaires to pulmonary tuberculosis patients with the assistance of seven community health center cadres. The reason for choosing Pameungpeuk Community Health Center was because there were several cases of treatment dropout or loss of follow-up in patients due to non-compliance with taking anti-TB treatment.

This research has received ethical approval from the Research Ethics Committee of 'Aisyiyah Bandung University with Number 424/KEP.01/UNISABANDUNG/V/2023 and this research has received permission from the Head of the Community Health Center to be a research site while still adhering to the ethical principles of informed consent and confidentiality. Researchers provide information to respondents verbally and using consent forms, time to fill out the questionnaire, benefits of the research, problems that may occur during the research, and confidentiality of respondent data. Researchers maintain the confidentiality of the contents and research results of the observation sheet. So any data that is processed will be immediately stored and kept private by researchers and supervisors involved in the research for around five years. Researchers will not disseminate the respondent's identity to anyone and it will remain confidential from unauthorized parties.

Results

Table 1 shows a relatively balanced gender distribution among the 120 surveyed individuals, with women making up 52.5% and men 47.5%. The age distribution indicates that late teenagers (32.5%) form the largest group, followed by early adults (27.5%), early seniors (20.8%), late adults (13.3%), and late seniors (5.8%). Regarding education levels, most participants have a senior high school education (60%), with smaller groups having junior high school (25%), college (8.3%), and elementary school (6.7%) education. In terms of treatment duration, 48.3% underwent treatment for 3-4 months, 43.3% for 5-6 months, and 8.3% for 7-9 months. A significant majority (64.2%) experienced side effects, while 35.8% did not. Regular check-ups were common, with 75% attending them compared to 25% who did not. Treatment supervision was reported by 60% of the participants, whereas 40% lacked such oversight.

Table 1. Characteristics of respondents from pulmonary tuberculosis patients

Characteristics	Frequency	Percentage
Gender		
• Woman	63	52.5%
• Man	57	47.5%
Age		
• Late Teenagers	39	32.5%
• Early adulthood	33	27.5%
• Late adulthood	16	13.3%
• Early seniors	25	20.8%
• Late seniors	7	5.8%
Level of education		
• Elementary school	8	6.7%
• Junior high school	30	25%
• Senior high school	72	60%
• College	10	8.3%
Length of treatment		
• 3-4 months	58	48.3%
• 5-6 months	52	43.3%
• 7-9 months	10	8.3%
Side effects		
• Yes	77	64.2%
• No	43	35.8%
Regular check-ups		
• Yes	90	75%
• No	30	25%
Treatment supervision		
• Yes	72	60%
• No	48	40%
Total	120	100%

The data on compliance levels among the 120 surveyed individuals (Table 2) shows that a majority, 58.3%, exhibit high compliance with their treatment or regimen. This is followed by 41.7% who demonstrate moderate compliance. Notably, there are no individuals categorized as having low compliance, indicating that all participants at least meet a moderate level of adherence. This distribution suggests a generally positive engagement with the treatment or regimen among the surveyed group.

Table 2. Respondents' level of compliance

Category	Frequency	Percentage (%)
High Compliance	70	58.3%
Moderate compliance	50	41.7%
Low compliance	0	0%
Total	120	100%

Discussion

In this study, the results of high compliance were 58.3%. In terms of treatment, the factors that influence the success of tuberculosis treatment are influenced by several factors, age, education, attitude of health workers, affordability of therapy, treatment supervision,

medication, and regularity in taking medication. This is by this study, where respondents who had supervisors took more medication by 60%, and the majority (75%) had regular check-ups. The results of this study are in line with Ref. [8] that the treatment supervision's relationship with respondents from their own families can influence respondents' medication adherence. The results of this research are supported by the theory of the Indonesian Ministry of Health that direct monitoring of drug use, at least during intensive treatment, is very important to ensure that these drugs are consumed in the right combination and at the right time. The treatment supervisor's job is to remind them to take their medicine every day, remind them to check their mucus now and then, inform other family members about the symptoms of TB, and tell them that TB can be cured with regular medicine.

Patient compliance with treatment is also influenced by education level, gender, and age. In this study, the majority were women (60%), of productive age, dominated by late teens (32.5%), and high school education level (60%). Based on research by Jufri (2020), shows that women are more dominant than men. The trigger is environmental conditions because women usually live among people who smoke. Active smoking can be one of the most common causes of TB and infects women. Apart from that, the higher the level of education, the easier it is for someone to get information about tuberculosis which also influences the level of compliance. The more compliant the patient is with treatment, the better the success of the treatment. This is by Ref. [9], the therapy compliance factor is influenced by the level of education, a high level of education influences their competence in managing treatment. The higher the level of education, the more they understand that health is an important thing in life, so they are motivated to visit better health centers. Productive age is the age when individuals actively work and tend to interact with many people in the work area, so the risk of exposure to disease is higher compared to non-productive age [10].

This study showed moderate compliance of 41.7%. This was influenced by the side effects of anti-TB treatment that respondents felt, such as itching and skin rashes. The duration of treatment shows that the average length of treatment for tuberculosis sufferers the largest is in the intensive phase (3-4 months), namely 48.3% or as many as 58 people, and the least is in the advanced phase (5-9 months), namely amounting to 8.3% or as many as 10 people. Ref. [11] research results concluded that there was no significant relationship between length of treatment and treatment compliance in pulmonary tuberculosis patients. There was no significant relationship between the length of treatment and positive elimination of pulmonary TB treatment. This is caused by influencing factors such as good motivation, and internal motivation to recover, even if access to facilities is not enough, they try hard to achieve the desired recovery, so This is what causes sufferers to be non-compliant with treatment [11].

One way to increase medication adherence in patients with moderate levels of medication adherence is through self-management. Patient self-care must be strengthened through educational programs that help increase pulmonary TB patient compliance in taking anti-TB treatment. Self-management training is a program that helps people with ongoing health problems learn to live well. According to Ref. [12], self-management training has a good effect on commitment to using Anti-TB treatment, and then compliance can be improved on its own. management training, however, when providing self-management training, it is necessary to pay attention to the time and duration of management, because the estimated results of the analysis show that respondents are starting to get bored with training that takes too long. Management training is provided, can be carried out periodically and the time given is not too long [13].

Based on Table 3, tuberculosis patients' non-compliance with treatment is caused by taking small doses of medication independently without the health worker knowing. This is due to a lack of education to patients about the importance of taking the drug in full without reducing the dose and must comply with the health worker's instructions. This is in line with research by Ref. [14] that not consistently taking medication in full and according to instructions can cause tuberculosis treatment to be ineffective and can increase the risk of antibiotic resistance which can ultimately lead to therapy failure. Antibiotic resistance is a condition when bacteria are resistant or resistant to the antibiotics consumed. Simply put, the drug no longer works against or stops bacterial infections. This makes bacteria more free to reproduce in the body and damage healthy tissue. Antibiotic resistance can also cause TB transmission to become more widespread [15].

Non-compliance with taking medication can also occur because the patient takes less medication than prescribed, decides not to comply with the dosage, and changes the dosage of the medication due to the emergence of side effects from the medication. Patients need strong motivation to be able to comply with the treatment rules that have been set. Family support is one of the factors that determines adherence to taking medication [15].

Another factor that influences non-compliance is boredom. Not a few pulmonary tuberculosis patients feel bored and decide to stop treatment because they are taking treatment for too long and the sufferer is starting to get bored because they are not getting better. The boredom factor for treatment can certainly be experienced by every sufferer. They have to routinely take medication every day for months. This can cause boredom in sufferers. Treatment is carried out every day and is long-term, so compliance with taking medication is also often an issue that must be considered from the start of treatment. There is a need to regulate the use of drugs according to their purpose, especially Anti-TB treatment which influences the success of therapy [16].

Conclusion

Based on the results of research conducted at the Pameungpeuk Community Health Center, the results showed high compliance of 58.7% and moderate compliance of 41.3%. This is due to several factors, namely education level, length of treatment, drug side effects, treatment supervision, gender, age, and routine examinations. The factors that cause non-compliance are patients taking medication less than the instructions and taking medication in small doses. Tuberculosis patients increase their knowledge of the dangers of taking medication in small doses and not according to instructions because this can cause therapy failure and worsen the conditions that cause MDR-TB. It is hoped that the community health center optimize educational strategies regarding the importance of taking medication in its entirety and taking medication according to instructions so that patients increasingly understand the importance of complete anti-TB treatment to avoid dropout cases.

Conflict of Interest

The authors declare that there is no conflict of interest.

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