

## RATIONALITY OF USING ANTITUBERCULOSIS DRUGS IN TB PATIENTS AT COMMUNITY HEALTH CENTERS

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### ARTICLE INFORMATION

Received: 20 September 2024

Revised : 27 September 2024

Accepted: 25 October 2024

DOI:

### KEYWORDS

Antituberculosis, Drug Use, Rationality

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### ABSTRACT

*Tuberculosis (TB) is an infectious disease that remains a serious health challenge. The management and treatment of TB requires special attention, so the Ministry of Health of the Republic of Indonesia has established national standards to optimize efforts to control this disease. These standards serve as guidelines for health workers at community health centers in controlling and treating pulmonary TB. This study aims to evaluate the rational use of anti-TB drugs in patients at the Katobengke Health Center, Baubau City. The method used was non-experimental with descriptive design, taking data retrospectively from 41 medical records. The results showed that at Puskesmas Katobengke, the majority of pulmonary TB patients were female, with a total of 21 people (51.22%), while men were 20 people (48.8%). There were seven age groups, ranging from 15 years to over 65 years. Most patients were new cases, with 39 people (95.12%), while 2 people (4.9%) were relapse cases. The accuracy of treatment of pulmonary TB patients reached 100%, with drug selection including Isoniazid (INH), Rifampicin, Pyrazinamide, Ethambutol, and Streptomycin which was also 100% appropriate. Indications and doses of drugs administered were appropriate in all patients, with a conformity rate of 100%.*

### INTRODUCTION

Worldwide, tuberculosis (TB) is a significant public health problem. In 2017, there were around 10 million new cases of TB recorded worldwide, consisting of around 5.8 million men, 3.2 million women and 1 million children. Tuberculosis (TB) cases can occur in various countries and age groups, but people aged over 15 years constitute 90% of patients, and 9% of them are HIV positive. While 44% of all cases and 18% of cases occurring in the Western Pacific, Southeast Asia and the Pacific Island are home to the majority of TB cases. The top eight countries accounting for two-thirds of all TB cases globally are India (26%), Indonesia (8.5%), China (8.4%), Philippines (6%), Pakistan (5.7%), Nigeria (4.4%), Bangladesh (3.6%), and South Africa (3.6%), (WHO, 2020).

After India, Indonesia was the country with the second highest number of TB cases in the world in 2015. In Indonesia, there were around 360,565 cases in 2016. Of the 9,549 TB cases found in South Sulawesi, 5,674 of them were smear positive pulmonary TB cases (Basir et al., 2021).

In Indonesia, pulmonary TB is a serious public health problem with high morbidity and mortality rates. *Mycobacterium tuberculosis* is a bacterium that causes pulmonary TB, a persistent infectious disease. The main way of transmission is through germs found in droplets exhaled by patients or even just talked about (Bakhtiar et al., 2021).

As a disease, tuberculosis still requires treatment in its management. To increase prevention efforts, health workers in public health service organizations such as Community Health Centers must comply with national standards for TB management published by the Ministry of Health of the Republic of Indonesia (Ismail et al., 2023).

Since ancient times, antibiotics have been used to treat infectious diseases such as tuberculosis. For long periods of time, anti-tuberculosis drugs include pyrazinamide (PZA), ethambutol (EMB), streptomycin, isoniazid (INH), and rifampicin (RIF). However, tuberculosis

sufferers are starting to become resistant to these first-line drugs. Since the 1980s, there has been a significant increase globally in the incidence of tuberculosis, with the main reason being multidrug-resistant tuberculosis (MDR-TB) (Tirangga et al., 2022).

WHO has developed a new plan known as End TB Strategy to combat TB disease. By 2035, the World Health Organization hopes to reduce the incidence and death rates from TB by 90-95% (Kemenkes RI, 2020).

WHO data shows that although patient compliance with long-term therapy for chronic diseases averages 50% in developed countries, it is lower in developing countries. For patients suffering from chronic diseases such as pulmonary tuberculosis, patient non-compliance is a serious problem. Patient characteristics, treatment plan, relationship with medical staff, and health care system are factors that influence how well patients adhere to tuberculosis therapy. Positive patient behavior towards treatment goals is referred to as compliance. When discussing medication therapy, compliance relates to the patient's compliance with the prescribed treatment plan (Della et al., 2023).

Previous research findings by (Kahar et al., 2022) entitled "Evaluation of the Use of Anti-Tuberculosis Drugs in Outpatients at the Pokenjior Health Center, Padangsidimpuh City" showed that eight patients (20.5%) received inappropriate doses of OAT, while 31 outpatients (79.5%) received appropriate dose.

Anti-Tuberculosis Drugs (OAT) are very limited, patient compliance with treatment regimens is low and public education is still lacking because the TB program team has dual responsibilities (Tirangga et al., 2022).

Systemic symptoms and local symptoms are two categories of clinical symptoms associated with TB. If the lung is the damaged organ, the symptoms that appear, sometimes referred to as local symptoms, are respiratory symptoms (according to the organ involved). When symptoms are felt throughout the body and impact multiple organ systems they are referred to as systemic symptoms. Respiratory symptoms of tuberculosis (TTB) include cough with phlegm, shortness of breath, chest pain, and coughing for at least two weeks. Respiratory symptoms can range from none at all to severe symptoms, depending on the extent of the lesion. Sometimes the patient's condition is first discovered during a normal physical examination (Masrifa et al., 2018).

Over the course of six to nine months, during which time patients must take medication consistently, adherence to treatment is essential for effective tuberculosis treatment. However, there are still many cases of patients in Indonesia who stop treatment for various reasons, including unwanted drug reactions, lack of family support, and financial difficulties. Anti-Tuberculosis drugs (OAT) can cause pulmonary TB germs to become resistant to the drug, which can ultimately lead to multi-drug resistant tuberculosis (MDR TB). This may occur if the patient misses a dose or discontinues therapy. Treatment for this disease is very expensive, takes a long time, and can even be fatal (Safri et al., 2016).

If tuberculosis (TB) therapy is administered according to proper protocols, the disease can be eradicated. TB control using the Directly Observed Treatment Short-course (DOTS) technique has been implemented in various health institutions, including community health centers. Puskesmas is a health center that provides primary health services for individuals and also community health services (Fraga et al., 2021).

The infectious disease TB is caused by *Mycobacterium tuberculosis* infection. The lungs are an organ that is often affected, but it has the potential to affect other organs. The approved treatment categories state that different drugs should be used for tuberculosis (TB) in sufficient quantities and at recommended doses (Prananda et al., 2015).

Dengue fever patients who did not have comorbidities were treated with cefixime up to 27.77%, cefotaxime 18.51%, ceftriaxone 9.25%, and ciprofloxacin 11.11% of the total number of antibiotics. With 58.8% of the total, the cephalosporin group used the most antibiotics. Antibiotics work to prevent or inhibit the development of microorganisms such as bacteria (Alfyanita et al., 2023).

Adverse impacts on the population at large can occur due to drug abuse in health centers. This is because the majority of Indonesian people, who are members of the lower middle class, often prefer to receive medical care at community health centers (Hamzah et al., 2022). However, there has been no research regarding the profile of outpatient drug prescribing at Community Health Centers.

## METHODOLOGY

With descriptive methodology and non-experimental design, this study collects data retroactively. The purpose of retrospective research is to examine past events to present an impossible picture or description of a situation. when this research was carried out in August 2023 - September 2023. The place of this research was carried out at the Katobengke Community Health Center, Baubau City.

In this study, patient factors, indications, drug selection, dosage, and appropriate treatment intervals were used to evaluate the rationality of using antituberculosis drugs. Using an operational definition, that is, when a patient receives medical treatment appropriate to their condition, both medication and therapy are given according to the patient's medical history. Appropriate indication refers to how well the drug is given based on the doctor's indication and diagnosis. Drug selection is a method for establishing a diagnosis; if the diagnosis is incorrect, then the recommended medication will not match the medication being taken. The process of selecting the best drug to treat a patient's medical condition based on clinical and personal factors is known as "appropriate drug selection." Administering medication according to the patient's needs based on relevant clinical factors is referred to as appropriate dosage. The correct administration interval refers to the optimal schedule for administering the drug so that the concentration of the drug in the body is at an effective level for treating the disease and eliminating the risk of side effects.

The study population consisted of 41 medical record data entries from January to December 2022 at the Katobengke Community Health Center which were classified as pulmonary TB cases treated with a combination of OAT. The sample in this study was 41 patients.

The inclusion criteria are the criteria for research subjects representing research samples that meet the requirements as samples, while the inclusion criteria in this study are patients diagnosed with TB with clinical symptoms, physical examination, radiographic examination (X-ray), bacteriological examination (analysis of sputum and fluid from organs suspected of suffering from extra pulmonary TB), and other supporting examinations, can all be used to diagnose TB. Clinical signs of tuberculosis (TB) include coughing up blood or phlegm, coughing for three weeks or more, and chest discomfort when coughing or breathing. Other inclusion criteria are patient age 15>65 years, Tuberculosis patients seeking treatment at the Katobengke Community Health Center, Baubau City, TB patients with BPJS, patients who meet complete RM data.

Exclusion criteria are criteria used to identify potential research participants who should not be included in the research. Exclusion criteria are used to determine whether samples can be used in research or not. Exclusion criteria in the study were patients diagnosed with pulmonary TB who were under or exactly 14 years old, patients with medical record data that did not meet the inclusion criteria, pregnant patients with pulmonary TB, pulmonary TB patients with HIV, pulmonary TB patients on complete treatment who did not meet the criteria for cure, pulmonary TB patient who died.

Medical record data, such as patient identification, patient type, indication, disease history, and treatment history, is a research instrument. This information also contains the type of medication given, along with the dosage, volume and instructions for use. Researchers from the Katobengke Community Health Center in Baubau City obtained data directly from medical records. The data obtained was evaluated descriptively, the percentages were calculated, and the results were arranged into a table according to the attributes of the research subjects and the effectiveness of using antituberculosis drugs.

## RESULTS & DISCUSSION

This research was conducted at the Katobengke Community Health Center in 2023 involving 41 respondents consisting of patients suffering from TB. Data taken from medical record services. Data collection was carried out through the officer in charge of TB at the Katobengke Community Health Center.

**Table 1** Characteristics of Respondents Based on Gender

Gender	Amount(n)	Percentage (%)
Man	20	48,8
Woman	21	51,2
Total	41	100

(Source: Primary Data, 2024)

According to the results of research conducted at the Katobengke Community Health Center, the majority of pulmonary TB patients were women, with 21 medical record data and a percentage of 51.22%. Meanwhile, men recorded 20 medical record data with a percentage of 48.8

**Table 2** Characteristics of Respondents Based on Age.

Age (Years)	Number of People	Percentage%
15	1	2,43
16 – 25	6	14,63
26 – 35	6	14,63
36 – 45	11	26,82
46 – 55	9	21,95
56 – 65	3	7,31
>66	5	12,2
Total	41	100

(Source: Primary Data, 2024)

The description of respondents based on age shows that there are seven age groups, starting from 15 years to over 65 years, according to the research results shown in Table 2. There is one respondent in the 15 year age group with a percentage of 2.43%. Six respondents aged 16 to 25 years had a percentage of 14.63%, while six respondents aged 26 to 35 years had the same percentage, namely 14.63%. Eleven respondents, or 26.82% of the sample, were in the 36-45 year age group, while nine respondents, or 21.95% of the sample, were in the 45-55 year age group. Furthermore, at the age of 56-65 years there were three respondents with a percentage of 7.31%, and in the age group 66 years and over, there were five respondents with a percentage of 12.2%. From this table, the highest number of pulmonary TB sufferers at the Katobengke Community Health Center are in the 36-45 year age group with a percentage of 26.82%, while the fewest are aged 15 years with a percentage of 4.88%.

**Table 3** Characteristics of Pulmonary TB

Type of responden	Amount	Percentage%
New Patient	39	95,12
Patient Relapses	2	4,9
Total	41	100

(Source: Primary Data, 2024)

Based on Table 3, it can be seen that at the Katobengke Community Health Center, there were 39 respondents (95.12%) who were pulmonary TB patients with a new type of case. Meanwhile, there were only 2 respondents (4.9%) who were included in the recurrence case category. Relapse patients are those who have previously been declared cured of TB after undergoing complete treatment, but are diagnosed with TB again, either due to a recurrence or new infection.

**Table 4** Suitability of giving OAT to pulmonary TB patients based on treatment category

Categori	Accuracy	Percentage	Total
In Accordance	41	100	100%
It is not in accordance with	0	0	0

(Source: Primary Data, 2024)

Table 4 shows that OAT is given as recommended for all pulmonary TB patients at the Katobengke Community Health Center, which shows that this technique is in accordance with TB prevention guidelines.

**Table 5** Accuracy of Indications for Pulmonary TB Drugs

Exact indicationt	Amount	Percentage
Appropriate	41	100
Not exactly	0	0

Total	41	100
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(Source: Primary Data, 2024)

Based on Table 5, it can be concluded that the prescribing of TB drugs by doctors at the Katobengke Community Health Center is in accordance with tuberculosis control guidelines, with 41 respondents recording a percentage of 100%.

**Table 6** Accuracy of Selection of Pulmonary TB Drugs

Medication Accuracy	Amount (N)	Percentage%
Appropriate	41	100
Not exactly	0	0
Total	41	100

(Source: Primary Data, 2024)

Based on the results of research on the appropriateness of pulmonary tuberculosis drug selection at the Katobengke Community Health Center, which is reported in Table 6, the antituberculosis drugs prescribed to patients are in accordance with tuberculosis treatment guidelines. Of the 41 respondents, all, or 100%, had received the right medication. The drugs used include Isoniazid, Rifampicin, Pyrazinamide, Ethambutol, and Stertomcin.

**Table 7** Suitability of Doses Given to Pulmonary TB Patients

Dosage Accuracy	Amount	Percentage (%)	Total
In Accordance	41	100	100
It is not in accordance with	0	0	0

(Source: Primary Data, 2024)

Based on the research results shown in Table 7, it can be concluded that the doses given to pulmonary TB patients at the Katobengke Community Health Center during the period January to December 2022 were in accordance with the guidelines for controlling tuberculosis, namely 41 respondents with a percentage of 100%. Based on the Regulation of the Minister of Health of the Republic of Indonesia No. 67 of 2016 concerning tuberculosis control, the dosage for adult TB treatment is as follows: The recommended dose for isoniazid (INH) is 300 mg once a day or 900-1200 mg three times a week; 600 mg once daily for Rifampicin (RIF); 15-30 mg/kg body weight once daily for Pyrazinamide (PZA); 15-25 mg/kg body weight once daily for Ethambutol (EMB); and 15 mg/kg body weight once daily or 25-30 mg/kg body weight twice or three times weekly for Streptomycin.

**Table 8** Medication Administration Interval

Exact interval	Amount	Percentage (%)	Total
Appropriate	41	100	100
Not exactly	0	0	0

(Source: Primary Data, 2024)

Based on the research results shown in Table 8, it is known that 100% of the drug administration intervals to TB patients at the Katobengke Community Health Center are in accordance with tuberculosis control guidelines, namely three times a week.

**Table 9** Drug Use Based on Duration of

Length of treatment	Amount	Percentage %
< 6 Month	0	0
lasted 6 Month	40	97,6
> 6 Month	1	2,44
Total	41	100

(Source: Primary Data, 2024)

Table 9 shows that, at 0%, no patients received less than six months of therapy. In contrast, 40 respondents received the full six months of therapy, resulting in a response rate of 97.6%. Apart from that, there was 1 respondent who received treatment for more than 6 months, with a percentage of 2.44%, due to the patient's indiscipline in taking the TB medication that had been prescribed by the doctor.

## CONCLUSION

The right patient, the right indication, the right drug selection, the right dose, and the right administration interval are the characteristics that influence the rational use of antituberculosis drugs at the Katobengke Community Health Center, Baubau City, based on studies conducted there. The obstacle to this research is that difficulties in accessing patient medical record data or comprehensive and appropriate drug use information can be an obstacle in research analysis.

## ACKNOWLEDGMENT

The author would like to thank the supervisor, Mrs. Apt. Ratih Nurwanti, S.Farm., M.Si and Mrs. Hasty Hamzah, S.Si., M.Si for their invaluable support during the research process until this journal was published. Apart from that, the author also would like to thank all parties who have supported this research, especially the family.

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