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Clinical profile of drug-sensitive Tuberculosis patients at a Simpang Kawat Public Health Center in Jambi

Fitrianingsih[1], Elisma[1], Muhammad Syukri[2], Yuliawati[1], Uce Lestari[1], Afifah Azzahra[1], Dinda Arum Carolina Dewi[1]

[1] Department of Pharmacy, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia, 36124
[2] Department of Public Health, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia, 36124

*Coressponding Authors: fitrianingsih@unja.ac.id

Abstract

Background: Tuberculosis (TB) remains a major public health burden as an infectious and contagious disease. **Objective:** This study aimed to determine the clinical profile of drug-sensitive TB patients in Jambi City. **Methods:** An observational cross-sectional study was conducted using medical record data from January 2024 to October 2024 at Simpang Kawat Public Health Center, Jambi City. Data were analyzed with SPSS version 30.0. **Results:** A total of 35 TB patients with drug-sensitive status were included. Most were male (57.1%), aged <60 years (68.4%) with a mean age of 49.57 ± 15.31 years (mean ± SD), employed (51.4%), married (80%), and without comorbidities (65.7%). The mean body mass index (BMI) was 19.39 ± 3.88 kg/m² (mean ± SD). The majority were new TB cases (88.6%), non-smokers (62.9%), and received standard therapy (2HRZE/4HR), with most patients (60.0%) in the intensive phase taking three tablets once daily. **Conclusion:** The majority of TB patients in this setting were new cases and drug-sensitive. Strengthening early screening strategies is crucial for optimizing new case detection and ensuring timely management.

Keywords: Clinical profile; drug-sensitive; tuberculosis; public health center

Cite This Article

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INTRODUCTION

Tuberculosis (TB) remains one of the leading infectious diseases worldwide and continues to pose major public health challenges, particularly in developing countries. According to the World Health Organization (WHO), an estimated 10.6 million people developed TB in 2022, with approximately 1.3 million deaths among HIV-negative individuals, making TB the second leading cause of death from a single infectious agent after COVID-19 (1). Despite global efforts to reduce TB incidence, the disease remains endemic in many low- and middle-income countries, including Indonesia.

Indonesia ranks among the top three countries with the highest TB burden globally, accounting for about 10% of global TB cases, after India and before China (1). The prevalence and incidence of TB in Indonesia remain high, largely driven by social determinants such as poverty, overcrowding, malnutrition, and limited access to healthcare services. The National TB Program has made progress through early detection, standardized treatment regimens, and adherence monitoring. However, challenges persist in ensuring case detection, treatment success, and control of transmission at the primary healthcare level.

Tuberculosis is caused by *Mycobacterium tuberculosis*, which primarily affects the lungs (pulmonary TB) but can also involve other organs (extrapulmonary TB). Drug-sensitive TB refers to infection by *M. tuberculosis* strains that are susceptible to first-line anti-tuberculosis drugs, namely isoniazid, rifampicin, pyrazinamide, and ethambutol (1). Early identification and management of drug-sensitive TB cases are essential to prevent the development of drug resistance and to improve treatment outcomes. A comprehensive understanding of the clinical characteristics of patients with drug-sensitive TB can help healthcare providers tailor appropriate interventions, optimize adherence, and evaluate program effectiveness at the local level.

The clinical profile of TB patients covering sociodemographic factors, comorbidities, nutritional status, and treatment patterns varies across regions and healthcare settings. Previous studies have shown that factors such as male sex, productive age, undernutrition, smoking, and comorbidities like diabetes mellitus are associated with poor treatment outcomes (2–5). Understanding these profiles at the community and primary healthcare levels is particularly important because early-stage detection and management predominantly occur at this level, which determines national TB control performance.

In Jambi Province, tuberculosis remains a significant health issue with a high prevalence rate compared to other communicable diseases. The Simpang Kawat Public Health Center, as one of the key primary healthcare facilities in Jambi City, plays a vital role in implementing the Directly Observed Treatment Short-Course (DOTS) strategy. However, local data on the clinical characteristics of drug-sensitive TB patients in this setting are limited. A study by Burhan et al, (2) reported that data from various geographical areas in Indonesia remain highly limited, highlighting the need for updated information and cross-sector collaboration to obtain a more comprehensive national TB profile.

Therefore, this study aimed to determine the clinical profile of drug-sensitive tuberculosis patients at the Simpang Kawat Public Health Center in Jambi. The findings are expected to provide insights into patient characteristics, contribute to regional TB control evaluation, and support the development of more targeted interventions to enhance treatment success and reduce disease transmission.

METHODS

Study design and setting

This retrospective cross-sectional study was conducted at Simpang Kawat Public Health Center, a regional referral facility in Jambi, Indonesia. Data for TB patients were collected from January to October 2024. Thirty-five eligible TB cases were included, and data were obtained from the admission medical record unit and the Tuberculosis Integrated System (SI-TB). Primary and secondary diagnoses of TB were accessed from medical records. Ethical approval was granted by the Ethics Committee of Raden Mattaher General Hospital–Faculty of Medicine and Health Sciences, Universitas Jambi (Ref. No. 3062/UN21.8/PT.01.04/2025).

Population, samples and sampling

The population in this study comprises all TB patients. The inclusion criteria for this study are TB patients from January 2024 to October 2024; aged >18 years;and including all grades of TB with at complete treatment. The exclusion criteria comprise incomplete medical records, those not classified as TB patients, non-Drug-sensitive TB (DS-TB) patients, patients who failed to receive anti-TB medication and incomplete clinical data. Secondary data were obtained from patient medical records, with TB diagnosis based on TB data base patients, molecular rapid test and chest X-ray examination. The prevalence in TB cases (P) is 10%.

Procedure and data collection

Data collection procedures were conducted retrospectively using the national tuberculosis information system (SI-TB) and patients' medical records. The supporting clinical data collected included measurements of body weight expressed as body mass index (BMI). The study variables consisted of sociodemographic data and clinical profiles of patients with drug-sensitive tuberculosis (DS-TB). The classification and treatment of tuberculosis were based on the World Health Organization (WHO) tuberculosis guidelines (6,7).

Sociodemographic data

The sociodemographic variables included age, sex, occupation, education and marital status, while the clinical characteristics comprised TB type, body mass index (BMI), smoking status, comorbidities, standard therapy, drug dosage during the 2-month intensive phase, drug dosage during the 4-month continuation phase. Diabetes mellitus (DM) was diagnosed according to the American Diabetes Association (8) and Indonesian Society of Endocrinology (9) guidelines as fasting plasma glucose ≥126 mg/dL, 2-hour plasma glucose ≥200 mg/dL after an oral glucose tolerance test, or persistent hyperglycemia requiring treatment. BMI was calculated following to European Society for Clinical Nutrition and Metabolism (ESPEN) (10) guidelines and categorized for the Asian population as underweight (<18.5 kg/m^2), normal (18.5–22.9 kg/m^2), overweight (≥23 kg/m^2), or obese (≥25 kg/m^2) (11).

Statistical analysis

Statistical analyses were conducted using IBM SPSS Statistics software, version 30.0 (IBM Corp., Chicago, IL, USA). Sociodemographic characteristics, clinical profiles, and clinical outcomes were summarized descriptively. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as mean ± standard deviation (SD). A p-value of <0.05 was considered statistically significant for all analyses.

*Ethical concideration*s

This study has been registered with the number S.390/RSUD.2.1/X/2025 and approved by the ethical committee of Raden Mattaher General Hospital-Faculty of Medicine and Health Sciences Universitas Jambi No. 3062/UN21.8/PT.01.04/2025.

RESULTS

The sociodemographic characteristics of tuberculosis (TB) patients at the Simpang Kawat Public Health Center are presented in Table 1. The majority of subjects were male (57.1%) and adults aged below 60 years (68.6%), with a mean age of 49.57 ± 15.31 years (mean ± SD). This finding is consistent with a previous study (2), which reported a mean age of 41.3 ± 14.1 years among adult TB patients, and another study (3) showing that 48.6% of patients were within the 45–64-year age range. Similarly, a study conducted in Jambi during 2019–2020 reported a comparable mean age of 45.5 ± 13.8 years (mean ± SD) (5). Most participants were employed (51.4%), married (80.0%), and fully covered by public health insurance (BPJS/Global Fund) (100.0%).

Table 1. Baseline characteristics of the TB patients

Characteristic	Value (N=35)	%
Sex		
Male, n (%)	20	57.1
Female, n (%)	15	42.9
Age, (Mean ± SD)	49.57 ± 15.307	
Adult (> 18 years), n (%)	24	68.6
Elderly (≥ 60 years), n (%)	11	31.4
Occupation		
Employee, n (%)	18	51.4
Unemployed, n (%)	17	48.6
Family Status		
Married, n (%)	28	80.0
Widow/Widower/Unmarried, n (%)	7	20.0
Insurance		
National Health Insurance (JKN), n (%)	35	100.0
Private/Individual, n (%)	0	0.0

The clinical profile of the subjects, as presented in Table 2, were predominantly classified as new TB cases (88.6%). Patients were categorized according to the World Health Organization (WHO) classification system (6,7), as shown in Table 2. The mean body mass index (BMI) was within the normal range (19.39 ± 3.88 kg/m^2). Most subjects were non-smokers (62.9%) and had comorbidities such as diabetes mellitus (28.6%) and HIV infection (5.7%), while 65.7% had no comorbid conditions. All patients received the standard first-line anti-tuberculosis regimen (2HRZE/4HR). The drug dosage during the 2-month intensive phase and the 4-month continuation phase was three tablets once daily (60.0%).

Table 2. Clinical profile of the TB patients

Characteristics	Value (N=35)	%
TB type		
New Cases, n (%)	31	88.6

Characteristics	Value (N=35)	%
Relaps, n (%)	2	5.7
Treated after failure, n (%)	1	2.9
Treated after loss to follow-up, n (%)	1	2.9
Body Mass Index (Kg/m²), (Mean ± SD)	19.39 ± 3.88	
Smoking Status		
Smoker, n (%)	13	37.1
Non smoker, n (%)	22	62.9
Commorbidities, n (%)		
HIV	2	5.7
Diabetes Mellitus (DM)	10	28.6
No commorbid	23	65.7
Standard therapy (2HRZE/4HR)	35	100.0
Drug dosage during the 2-month intensive phase		
2 tab, once daily, n (%)	5	14.3
3 tab, once daily, n (%)	21	60.0
4 tab, once daily, n (%)	8	22.9
5 tab, once daily, n (%)	1	2.9
Drug dosage during the 4-month continuation phase		
2 tab, once daily, n (%)	5	14.3
3 tab, once daily, n (%)	21	60.0
4 tab, once daily, n (%)	8	22.9
5 tab, once daily, n (%)	1	2.9

DISCUSSION

The sociodemographic characteristics of tuberculosis (TB) patients in this study as seen in table 1, indicate that most were male (57.1%) and in the adult age group (<60 years; 68.6%), with a mean age of 49.57 ± 15.31 years. This finding is consistent with previous studies in Indonesia and other developing countries, which report a higher prevalence of TB among men of productive age (1). The predominance of male patients is often attributed to greater exposure to environmental pathogens, occupational factors, and behavioral risks such as smoking or alcohol consumption (12–14). In contrast, women generally exhibit better health-seeking behavior, contributing to earlier diagnosis and treatment adherence. The mean age showed that TB continues to affect individuals in their productive years, posing socioeconomic consequences due to reduced work capacity and income loss. Similar findings have been reported in studies across Asia and sub-Saharan Africa, where TB disproportionately impacts the working population and contributes to poverty cycles (14,15).

Regarding employment status, slightly more than half of the patients were employed (51.4%), while 48.6% were unemployed. Employment can serve as both a protective and a risk factor—those with steady jobs may have better access to healthcare, yet occupational exposure in crowded environments may facilitate TB transmission. Conversely, unemployment may result from disease-related fatigue or stigma associated with TB (14,15). Most patients were married (80%), suggesting possible intrahousehold transmission due to prolonged close contact. Household clustering is recognized as a major factor in TB spread, particularly in urban settings.

Nonetheless, marital stability and family support may also enhance adherence to anti-TB therapy and improve recovery outcomes (16).

All patients were covered by Indonesia's National Health Insurance (JKN), showing the strong reach of universal health coverage in facilitating TB diagnosis and treatment. This aligns with the Programmatic Management of Tuberculosis (PMDT) under the Ministry of Health, which ensures that diagnostic and treatment services are accessible through the national scheme (1,17). The absence of private insurance users implies that public facilities remain the main access points for TB care, especially at the primary healthcare level (Puskesmas).

Clinical profile

As shown in Table 2, most TB patients were new cases (88.6%), while relapse (5.7%), treatment after failure (2.9%), and loss-to-follow-up cases (2.9%) were minimal. The predominance of new cases suggests that drug-sensitive TB remains the most frequent presentation, indicating ongoing community transmission rather than recurrence or drug resistance (18–20). These results are consistent with national TB surveillance data and reflect the importance of strengthening early case detection and contact tracing at the community level (21–23).

The mean BMI was 19.39 ± 3.88 kg/m², indicating that most patients were underweight. Malnutrition is a major risk factor and consequence of TB infection with low BMI impairs immune response and increases susceptibility to active disease (24). Nutritional deficiencies may also delay sputum conversion and prolong recovery (25). Similar findings have been reported in Southeast Asian populations, where nutritional supplementation has been shown to improve treatment outcomes (26).

Regarding lifestyle behavior, 37.1% of patients were smokers. Smoking is a well-established risk factor for TB infection, disease progression, and poor treatment outcomes due to its immunosuppressive effects (27). Although smoking prevalence among TB patients in this cohort was lower than in some national surveys, the finding underscores the importance of integrating smoking cessation interventions into TB programs (28). In terms of comorbidities, 28.6% of patients had diabetes mellitus, 5.7% had HIV, and 65.7% had no comorbid conditions. The coexistence of DM and TB is an emerging global challenge, as DM triples the risk of developing active TB and is associated with delayed treatment response (29,30). The relatively low HIV prevalence aligns with Indonesia's national data, where HIV-TB coinfection contributes less than 10% of total TB cases (17). However, even at low prevalence, HIV-positive individuals remain at higher risk for atypical and severe disease presentations (25,31).

All patients in this study were treated with the first-line standard regimen (2HRZE/4HR), following WHO and national guidelines (1,31). The consistent use of this regimen suggests good programmatic adherence and availability of fixed-dose combination drugs. Most patients received three tablets daily (60%) during both intensive and continuation phases, consistent with standard weight-based dosing recommendations (32). This reflects effective implementation of the DOTS strategy at the primary care level.

In line with the study by Burhan et al. (2), the demographic and clinical findings in this study indicate that drug-sensitive TB predominantly affects adult males of productive age, with relatively low BMI and notable comorbidities such as diabetes and smoking history. The high proportion of new cases reflects ongoing transmission within the community, emphasizing the need for enhanced early detection strategies and implement more comprehensive preventive measures at the community level.

From a health system perspective, universal JKN coverage supports equitable access to TB services, yet nutritional and lifestyle factors remain inadequately addressed. Integrating nutrition rehabilitation, glycemic control, and smoking cessation into routine TB care may significantly improve outcomes. Furthermore, the low incidence of relapse and treatment failure reflects effective adherence to national TB management protocols at the primary healthcare level. The findings reinforce that a comprehensive approach combining clinical management, social protection, and health promotion is vital to achieving Indonesia's target for TB elimination by 2030.

This study has several limitations that should be acknowledged. First, the study utilized a retrospective cross-sectional design based on medical records, which may lead to incomplete or missing data, particularly regarding patients' nutritional intake, socioeconomic variables, and long-term treatment outcomes. Second, the sample size was relatively small (N=35) and derived from a single primary healthcare facility, which may limit the generalizability of findings to other populations or regions in Indonesia. Third, microbiological confirmation and drug susceptibility testing were not included; therefore, differentiation between drug-sensitive and latent TB relied on clinical and programmatic data rather than molecular confirmation.

Finally, behavioral and environmental risk factors such as household ventilation, occupational exposure, or adherence to therapy were not quantitatively assessed, which could have provided a more comprehensive understanding of determinants influencing TB outcomes. Future studies should adopt multicenter prospective designs with larger samples and integrate laboratory confirmation, nutritional assessment, and socioeconomic determinants to strengthen causal inference and public health relevance.

CONCLUSIONS

The findings of this study indicate that drug-sensitive tuberculosis predominantly affects adult males in their productive years, with a substantial proportion of patients being underweight and presenting with comorbidities such as diabetes mellitus and smoking history. Most cases were newly diagnosed and successfully managed with the standard 2HRZE/4HR regimen under the National Tuberculosis Program. The full coverage of National Health Insurance (JKN) demonstrates the effectiveness of universal access to TB care at the primary healthcare level. However, the persistence of new cases underscores the ongoing transmission within the community, emphasizing the need for integrated public health strategies combining early detection, nutritional rehabilitation, diabetes management, and smoking cessation interventions. Strengthening cross-sector collaboration between healthcare providers, social welfare programs, and community-based surveillance systems is crucial to accelerate Indonesia's progress toward the End TB 2030 target.

CONFLICT OF INTEREST

The Author(s) declare(s) that there is no conflict of interest.

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