Determinants of tuberculosis health service utilization in primary healthcare facilities in Perbaungan, North Sumatra, Indonesia

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ABSTRACT

Indonesia ranks third worldwide in terms of Tuberculosis (TB) cases, after China and India. In 2016, North Sumatera recorded 23,097 TB cases with 5,714 deaths. One of the regencies in this province, Serdang Bedagai particularly in Perbaungan district reported that TB patients with positive smear results did not fully utilize healthcare services or follow the standard treatment protocols provided by primary healthcare centers, according to TB center data from 2016–2017. This study aimed to assess the prevalence and identify factors associated with the utilization of TB health services in primary care. A cross-sectional design was employed with proportionate stratified random sampling among TB patients in Perbaungan. Associations were analyzed using the chi-square test. Inclusion criteria required respondents to be permanent residents aged 20–70 years, both male and female, who agreed to complete the questionnaires. Among 184 respondents, 41.8% showed low utilization of services, while 58.2% demonstrated high utilization. Most respondents had only primary education and were unemployed. The study found significant associations between service utilization and education level, employment status, knowledge, attitudes, and accessibility. In conclusion, nearly half of respondents had low utilization of TB health services in primary health care in Perbaungan, North Sumatera Indonesia.

Keywords: Utilization, Primary Healthcare, Tuberculosis

1. Introduction

Tuberculosis (TB) remains a major public health concern in Indonesia, which continues to be one of the countries with the highest TB burden globally. Significant challenges persist in case detection, reporting, and control efforts. Over the past five years, the trend of TB cases in Indonesia has shown notable fluctuations. In 2019, there were 562,049 new TB cases reported, but by 2021, only about 47% of cases were documented, indicating a persistently high rate of under-reporting (Lestari et al., 2022). The COVID-19 pandemic further disrupted the progress of the national TB program, although subsequent years have seen some improvement in case reporting and treatment success. In 2020, the estimated TB incidence reached 301 cases per 100,000 population or approximately 824,000 new cases annually placing Indonesia third among countries with the highest TB incidence (Iskandar et al., 2023). Despite ongoing control efforts, it is estimated that at least one in

four people with TB remain undiagnosed or unreported, leaving over 140,000 individuals undetected in 2023. According to the WHO Global TB Report 2024, Indonesia records an estimated 1,090,000 new TB cases each year, with approximately 125,000 TB-related deaths, highlighting a persistent gap between the actual and reported cases.

The WHO End TB Strategy aims to reduce TB incidence by 50% and TB deaths by 75% by 2025 compared to 2015, and to reduce incidence by 90% and deaths by 95% by 2035. Globally, the decline in TB incidence between 2015 and 2020 was only about 9%, and the decline in deaths was 14% far below the targets of 20% (incidence) and 35% (deaths) for 2020. Indonesia has made notable progress in tuberculosis (TB) control, achieving several key milestones under the Sustainable Development Goals (SDGs) framework. However, despite these achievements, TB remains a major public health challenge, with continued efforts needed to close the gap in case detection, treatment coverage, and prevention. Meanwhile, the government of Indonesia needs to be aware because there are still some major challenges that must be achieved so as not to hamper the rate of achievement of the next programme targets. One of the biggest challenges is that there are still many cases of TB lost or not reported to the programme. By 2012 it is estimated that there are approximately 130,000 cases of tuberculosis that are thought to exist but have not been reported. WHO targets the achievement of a number of new tuberculosis cases finding (Case Detection Rate/ CDR) by 70 %, while CDR TB in Indonesia 2016 has reached 60.59%. Overview of TB case proportions based on type of diagnosis in 2020-2022 A total of 413,835 TB patients were found in 2020, 49.0% of whom were clinically diagnosed with TB and 51.0% were bacteriologically confirmed TB patients. In 2021, 473,145 TB patients were identified, 44.6% of whom were clinically diagnosed TB patients and 55.4% were bacteriologically confirmed TB patients. Meanwhile, in 2022, a total of 722,694 TB patients were identified (Zaenab, 2024).

According to WHO (2024), Indonesia accounted for 10% of the global TB burden, with an estimated 1.06 million people developing TB in 2022 (95% UI: 0.92–1.21 million. In 2016 the number reached 23,097 TB cases with a death rate of 5,714 people in North Sumatera. Another hand, based on data TB center Perbaungan from 2015 to 2017, there was an increase in cases of tuberculosis in the Perbaungan areas with the death and the target of achieving a low success rate (40%) was not in accordance with the standards set (at least 70%) by the Ministry of Health (Puskesmas Perbaungan, 2017). Most of the tuberculosis patients did not use the available health facilities for the treatment of tuberculosis. Although the health care in the treatment of tuberculosis is usually subsidized by the government, utilization of the center is still very low.

Knowing the factors that cause low utilization of health services will help to plan strategies to change health seeking behavior of a society. But in fact, still there is lower in use of health services of tuberculosis center among the patients or community. Therefore, to find the factors that contribute to low utilization of health services among TB patients in Perbaungan Indonesia is really important. Problems with low utilization at of center in Perbaungan North Sumatera, Indonesia, so that still low percentage of utilization of in tuberculosis health services. The burden of tuberculosis remains to be a serious issue in Perbaungan North Sumatera, Indonesia. Although, directly observed treatment short-course (DOTS) strategy has been implemented gradually in the area. This condition reflecting the phenomenon of TB patient behavior towards the use of health services facility. The objectives of this study to measure the prevalence of utilization and the determine factors related of utilization of Tuberculosis health services in primary health care in Perbaungan, North Sumatera, Indonesia. The hypothesis of this study was high utilization of tuberculosis center among Female TB patients compared to male TB patients.

2. Methods

Target respondents are TB patients at the TB center who were registered in the data list who went to the TB center from 2016-2017. The list of names of TB patients was obtained from the tuberculosis database of the TB center (Puskesmas Perbaungan, North Sumatera). A cross-sectional study was conducted among TB patients at the TB Center. Proportionate stratified random sampling was performed to select the respondents for their attributes. Inclusion criteria: permanent residents aged 20–70 years. Exclusion criteria: patients with TB who are unwilling to participate, difficult to contact or have passed away.

This method is different strata in a population and identified in which the number of elements drawn from each stratum is proportionate to the relative number of elements in each stratum. The selection of the sample was based on classification or grouping of populations based on certain characteristics (age and gender). There category ages were adult, middle age and elderly while gender whether female or male. Purposive sampling was used to select villages based on high TB caseloads. This study was approved by the Research Ethics Committee of Universiti Kebangsaan Malaysia and conducted in accordance with the ethical principles of the Declaration of Helsinki at Puskesmas Perbaungan, Deli Serdang, North Sumatera.The data was analyzed using SPSS 23 software (License No. 4-2D534). Analytical tool used is logistic regression this is to measure the

magnitude of the influence of independent variables to the dependent variable. Chi-square was regarded as significant when $p < 0.05$.

3. Results

The total of TB Patients was 184 where contribute in this study. All of TB patients surveyed were from rural areas. The ages of study participants were divided into 3 groups: adults, aged 64 people (34.8 %), middle-aged, aged 82 people (44.6 %), and elderly, aged 38 people (20.7%), and the majority of the respondents were male, 126 (68.5%), while 58 respondents (31.5 %) were female. Respondent characteristics based on occupation showed that the majority of respondents were unemployed 95 people (51.6%) while 48.4 % were employed. Monthly income is a regular income of respondents in one month. Indicating that the distribution of respondents was low income 118 people (64.1%) while 35.9 % was high income.

3.1 Descriptive Statistics

Tabel 1.1 Distribution of Respondents Based on Socio-Demographic Characteristics

Characteristics	n=184	Frequency (%)
Age Group		
Adult	64	34.8
Middle age	82	44.6
Elderly	38	20.7
Gender		
Male	126	68.5
Female	58	31.5
Ethnicity		
Java	116	63.0
Batak	31	16.8
Chinese	6	3.3
Malay	31	16.8
Marital status		
Married	159	9.7
Unmarried	19	10.3
Religion		
Muslim	165	89.7
Non- Muslim	19	10.3
Education level		
Illiterate	80	43.5
Primary	23	12.5
Secondary	70	38.0
Diploma and above	11	6.0
Occupation		
Unemployed	95	51.6
Employed	89	48.4
Income		
Low income	118	64.1
High income	66	35.9

3.2 Frequency Patients Visit

The table shows the results of frequency on Patients Visit of tuberculosis patients in Perbaungan. Based on the table below that those who visit health service by patients within 6 months, where ≥ 12 visits as much as 41.8% while those of patient who less than 12 visited as 58.2%.

Table 1.2 Patient visits to the TB center for 6 months in the treatment of tuberculosis

Visit within 6 months	n	Frequency (%)
<12	77	41.8
≥ 12	107	58.2

3.3 Bivariate Analysis

The table shows the results of Bivariate Analysis on socio demographic and socio-economic of tuberculosis patients in Perbaungan

Table 1.3 Factors associated with socio demographic and socioeconomic with utilization of tuberculosis health services in Perbaungan.

Socio Demographic characteristics	Utilization of TB health services						P	CI 95%
	Low		High		Total			
	n	%	n	%	n	%		
Age								
Adult	29	37.7	35	32.7	64	34.8	0.250	
Middle Age	29	37.7	53	49.5	82	44.6		0.379-1.335
Elderly	19	24.7	19	17.8	38	20.7		
Gender								
Male	50	64.9	76	71	126	68.5	0.380	0.331-1.679
Female	27	35.1	31	29	58	31.5		
Ethnicity								
Chinese	3	3.9	3	2.8	6	3.3		
Batak	12	15.6	19	17.8	31	16.8	0.821	0.583-2.188
Java	47	61	69	64.5	116	63		
Malay	15	19.5	16	15	31	16.8		
Marital status							0.524	
Married	68	88.3	91	85	159	86.4		0.280 - 4.639
Unmarried	9	11.7	16	15	25	13.6		
Religion								
Muslim	68	88.3	97	90.7	165	89.7	0.606	0.065 – 1.475
Non - Muslim	9	11.7	10	9.3	19	10.3		
Education level								
Illiterate	42	54.5	38	35.5	80	43.5		
Primary	15	19.5	8	7.5	23	12.5	0.000	1.279 -3.017
Secondary	17	22.1	53	49.5	70	38		
Diploma and above	3	3.9	8	7.5	11	6		
Occupation							0.030	0.893 – 1.817
Unemployed	40	61	48	44.9	95	51.6		
Employed	30	39	59	55.1	89	48.4		
Income							0.039	0.275-0.972
Low income	56	72.7	62	57.9	118	64.1		
High income	21	27.3	45	42.1	66	35.9		

3.4 Multivariate Analysis

Table 1.4: Multivariate analysis for Factors Associated with Utilization of Tuberculosis Health Services in Perbaungan 2017

Variable	Utilization of TB Health Services				Adjusted OR	95 % CI	p-value
	Low		High				
	n	%	n	%			
Socio Demographic and Economic							
Education							
Illiterate	42	54.5	38	35.5	2.082	(0.424 – 10.218)	
Primary	15	19.5	8	7.5	1.620	(0.273 – 9.603)	0.000
Secondary	17	22.1	53	49.5	8.700	(1.693 – 44.718)	
Diploma and above	3	3.9	8	7.5			
KAP							
Knowledge							
Poor	25	32.5	55	51.4	3.231	(1.493 – 6.992)	0.011
Good	52	67.5	52	48.6			
Attitude							
Negative	55	71.4	49	45.8	0.377	(0.178 – 0.798)	0.001
Positive	22	28.6	58	54.2			
Socio cultural							
Negative	56	72.7	57	53.3	0.438	(0.201 – 956)	0.007
Positive	21	27.3	50	46.7			
Health services Accessibility							
Not Easy	75	97.4	56	52.3	0.117	(0.40 - 0.348)	0.000
Easy	2	2.6	51	47.7			

4. Discussion

The data for this study was collected in 2016–2017, as the study aimed to describe the baseline conditions and initial trends during that period. Although the data is several years old, the phenomena studied, namely the factors influencing the utilization of health services are still relevant today, as there have been no significant changes in policy or population characteristics. The results of this study can also serve as an important comparison with the current conditions. Recent national and global reports continue to highlight similar challenges in TB case detection and service utilization, suggesting that the determinants identified in this study remain highly relevant to current TB control efforts (*Global Tuberculosis Report 2025*, 2025). This study on the prevalence and factors associated with the utilization of TB health services was discussed and compared with other published literature, which assessed knowledge, attitude, practice, and the factors that could be due to socio-demographic, socio-economic, and health services factors contributing to the utilization of tuberculosis health services. Based on other study show that low levels of knowledge and negative attitudes toward TB contribute to delays in seeking health care and low utilization of TB services, especially among groups with low levels of education and low economic status (Craciun et al., 2023). Other study show that low economic status, informal employment, and lack of social protection increase the risk of treatment failure and discontinuation (Nidoi et al., 2021).

Primary health care is a health center that has a low percentage of cured in treatment so there are still dropouts and MDR TB that have been declared positive for TB. Nearly half of TB patients are low in the utilization of TB health services due to various factors which of course will affect the recovery of these patients and also not achieving the targets set by the health office Serdang Bedagai to the health center in the success of TB treatment in primary healthcare.The novelty of this study lies in its comprehensive assessment of tuberculosis health service utilization using historical baseline data from 2016–2017, which allows for the identification of long-term patterns that continue to influence current TB control efforts. This research integrates socio-demographic, socio-economic, and health service factors to provide a multidimensional understanding of the determinants of TB service utilization at the primary health care level. The findings offer unique insights into the persistent challenges faced by TB programs, especially in areas with low treatment

success rates, and contribute valuable evidence for strengthening contemporary policy and intervention strategies.

4.1 Prevalence of Utilization of Tuberculosis Health services

Based on all data samples of patients who have been registered in the TB center, the prevalence of utilization of tuberculosis health services was around high utilization at 58.2% of the 184 samples studied while around 41.8% of patients were low utilization of the TB center and attended medical appointment in the 2 last year. Several factors could be compared to estimates from other sites. In particular, traditional physicians also contribute during treatment within 6 months to become one of the factors that influence the prevalence of utilization of tuberculosis health services. According other study, 186 (24.4%) missed ≥1 clinic visit(s), 342 (44.9%) resided in the same sub-county as the TB clinic, 61 (8.0%) had died, and 687 (90.2%) were successfully treated for TB (Izudi et al., 2024).

4.2 Determinant of Utilization of Tuberculosis Health Services
4.2.1 Socio-Demographic Characteristics

Past studies have empirically tested and reported the significance of age as a determinant for health care usage. Respondents of those aged 35 – 55 years constituted 49.5% of the sample size and dominants of the TB patients. Middle age was one age most of respondents who were positive for TB recorded during 2016-2017. Other researcher stated that range middle age found that 26.5% of respondents had used health service (Alema et al., 2019). The results of this study show that male TB patients utilize health services more than female patients. Previous studies have found similar results, namely that more males are diagnosed with TB each year, and that males face specific barriers in seeking diagnosis/treatment due to their social gender roles (Muttamba et al., 2024).

Race from the community in the area divided by four were namely Malay, Batak, Chinese and Javanese. Of the total respondents who had high utilization of health services were Javanese race with 64.5% of them. Another study showed that most TB patients registered at the health service center originated from areas predominantly inhabited by Javanese ethnic groups (Wiem et al., 2020).

High education will affect the pattern and way of thinking of someone who ultimately affects someone in acting and decision making. The study showed that majority of the respondents indicated that low education level was a factors utilization of tuberculosis health services. The majority of respondents were who had 43.5% illiterate and 12.5% primary education. People with higher education were more likely to opt for healthcare services as compared to their less educated counterparts. Other studies have found that lower education levels are associated with lower knowledge about TB, and participants with lower education levels experience greater barriers in using TB services and accessing diagnosis and treatment (Abejew et al., 2022).

The results of the study, it was found that tuberculosis patients who worked were 48.4% lower than 51.6% for non-working TB patients. These results indicate that majority of TB patients at TB center in 2016-2017 are not working such as housewife, being unable to work, farmer, private. The total of TB patients who worked 66.3%, utilizing health services in TB center while the number of TB patients who did not work was 50.5% utilizing that only the utilization of tuberculosis health services was lower in patients who worked. Another study found that participants who were unemployed were more likely to visit clinics regularly, while those working in the informal or formal sectors reported difficulties in leaving their jobs to seek care (George et al., 2023).

Based on the results of the study, income from most respondents around 52.5% of low-income respondents used health services. Low income is related to the use of health services in this study. Other research results also show that respondents who had an association with low family income between utilization of health services were 28.0% and then low income and TB incidence are implicitly related to barriers to accessing health services (Choi et al., 2023).Viewed from the results of research by Alema et al. (2019) showed the majority of respondents were low-income farmers, half of whom had no formal education.

4.2.2 Knowledge, Attitudes, Practice

Only 58.2% of the respondents were who had high knowledge about information of tuberculosis disease before. There were not received about information tuberculosis as much as 27.2%. About 33.7% of the respondents answered don't know about PTB can transmitted with other person through the air when a person with TB coughing, similar with previous study that less than half of the respondents had knowledge of TB being an airborne disease and that it could be transmitted from person to person during coughing or sneezing (Rahman, 2015). Other study explained that Approximately 50.7% of participants had "good knowledge" of TB. However, those who had moderate levels of knowledge observed at 44.3%. (Maidatuz Zulfa & Dewi

Yunitasari, 2025). In comparison, a cross-sectional survey conducted in 34 provinces in Indonesia in 2022 also showed that 56.4% of participants had a good level of knowledge about TB (Kaaffah et al., 2023). These consistent findings reinforce the need to increase public knowledge about TB as part of national efforts to end the disease. The results of this study indicate that there is a relationship between knowledge and utilization of tuberculosis health services among TB patients with p value = 0.011. The level of individual knowledge will greatly influence the awareness to participate and in an activity and has an impact on behavior.

Patient's attitude towards tuberculosis that more than half of respondents 74.5% gave agree answer the TB disease were serious disease until now and 25.5 % of the respondents disagree. Similar other researcher that was also found out those participants from the current study area most of the participants (65%, $n = 130$) opined that TB is a severe illness (Mohd et al., 2022)The majority (approximately 47–50%) had a moderate attitude. A significant relationship was found between those with good knowledge and a tendency to have a better attitude and lower stigma (Ehsanul Huq et al., 2018).

Overall, of the attitude regarding associated with utilization of health services was significant association shows that p value = 0.001 with negative attitude towards TB 51.9% of them low utilization of tuberculosis health service.

4.2.3 Practice towards Tuberculosis (Health Seeking behavior)

Health care seeking behavior can provide insights into why some people out of certain services, why people are late in attending services and / or health facilities are bypassed by intended users. Studies show that the cost and distance are separate from attending to a health facility. Based on study from several large field studies show a similar pattern: cost/distance contribute, but other factors such as stigma, knowledge, provider preference (traditional vs formal), multiple visits before diagnosis, and quality of service often determine whether patients ultimately access TB services (Ehsanul Huq et al., 2018).

The practice of respondents to health seeking behavior has been as good as 60.9% of them still having good practice regarding utilization of health services while 40% of them poor practice. It can be concluded that not all of respondents of good practice during health-seeking behavior towards tuberculosis treatment. Similar results were found in other studies, about 282 of TB patients, 45% first sought services at a primary health center, 33% at a private clinic, 11% at a public hospital, 7% at a private hospital, and 4% at a pharmacy or alternative provider. Patients who started at a private clinic faced more pre-diagnosis visits and higher costs than those who went directly to a primary health center (Fuady et al., 2020).

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5. Conclusion

This study shows that TB health service utilization in Perbaungan is still low. Several key factors influence this condition, including education level, knowledge, attitudes, cultural perceptions, income, and accessibility to health facilities. Individuals with lower education, lack of knowledge, negative attitudes, and economic constraints were less likely to use TB services. Difficult access to facilities also contributed to low utilization.

These findings emphasize the need to strengthen health education, improve service accessibility, and develop targeted interventions to reduce socio-economic barriers and enhance TB service utilization in the region.

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