COMMUNITY KNOWLEDGE REGARDING PULMONARY TUBERCULOSIS IN THE WORKING AREA OF SANGGENG PRIMARY HEALTH CENTER, MANOKWARI, WEST PAPUA, INDONESIA

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ABSTRACT

Pulmonary tuberculosis remains a major global public health challenge and continues to be one of the leading causes of mortality due to infectious diseases worldwide. Indonesia ranks among the countries with the highest tuberculosis burden globally, with approximately one million new cases reported annually. In West Papua Province, tuberculosis continues to pose substantial challenges to healthcare services and disease control programs. This study aimed to describe the level of community knowledge regarding pulmonary tuberculosis in the working area of Sanggeng Primary Health Center, Manokwari, West Papua, Indonesia. This study employed a descriptive quantitative design using a cross-sectional approach. The study population consisted of patients and accompanying family members visiting Sanggeng Primary Health Center during the data collection period. Samples were selected using accidental sampling techniques, resulting in a total of 30 respondents. Data were collected using a structured questionnaire regarding community knowledge of pulmonary tuberculosis. Data processing included editing, coding, data entry, cleaning, and tabulation procedures. Univariate analysis was conducted using relative frequency distribution to determine the percentage distribution of respondents' knowledge levels. The findings demonstrated that good knowledge regarding pulmonary tuberculosis was predominantly observed among respondents aged 17–25 years (55.56%). Based on educational attainment, respondents with senior high school education constituted the largest proportion of participants with good knowledge levels (61.11%). Female respondents demonstrated a slightly higher proportion of good knowledge (52.63%) compared with male respondents. Regarding occupational status, respondents who were not employed represented the largest proportion of individuals with good knowledge levels (47.37%). Community knowledge regarding pulmonary tuberculosis in the working area of Sanggeng Primary Health Center was generally categorized as good, particularly among younger adults, females, respondents with senior high school education, and individuals who were not employed. Continuous and community-based health education programs are essential to improve public awareness and support tuberculosis prevention and control efforts at the primary healthcare level.

Keywords: community knowledge; health literacy; pulmonary tuberculosis; primary healthcare

INTRODUCTION

Tuberculosis (TB) remains one of the most significant public health challenges worldwide and continues to be a leading cause of mortality resulting from a single infectious disease. The disease is caused by *Mycobacterium tuberculosis*, which primarily affects the lungs but may also involve other organs. Transmission occurs through airborne droplets released when individuals with active pulmonary tuberculosis cough, sneeze, speak, or sing. This airborne transmission mechanism contributes to the high transmissibility of tuberculosis, particularly in densely populated settings characterized by inadequate ventilation, poor nutritional status, and limited access to healthcare services (World Health Organization [WHO], 2024).

Despite being a preventable and curable disease, tuberculosis continues to impose a substantial burden on low- and middle-income countries. According to the latest report published by the World

Health Organization, approximately 10.8 million new tuberculosis cases and 1.25 million TB-related deaths occurred globally in 2023, making tuberculosis once again the leading cause of death from infectious diseases worldwide (WHO, 2024). Furthermore, approximately 30 high-burden countries account for nearly 87% of all tuberculosis cases globally, indicating that TB control remains a major challenge, particularly in resource-limited settings.

Indonesia is consistently recognized as one of the countries with the highest tuberculosis burden globally and remains among the priority countries within the global TB elimination initiative. Together with India, China, the Philippines, and Pakistan, Indonesia contributes substantially to the worldwide tuberculosis burden (WHO, 2024). This situation highlights the necessity for comprehensive tuberculosis control strategies that encompass not only curative interventions but also promotive and preventive approaches through community empowerment and health literacy enhancement. The Indonesian government has established a national target for tuberculosis elimination by 2030, in alignment with the WHO End TB Strategy. This strategy aims to reduce tuberculosis incidence by 80% and tuberculosis-related mortality by 90% compared with the 2015 baseline (WHO, 2015). However, achieving these targets remains challenging due to underdiagnosis, delayed treatment initiation, inadequate active case-finding coverage, and persistent social stigma surrounding tuberculosis.

Community knowledge represents one of the most important determinants influencing the success of tuberculosis prevention and control programs. Knowledge is shaped by education, previous experiences, environmental influences, access to information, and exposure to health promotion interventions (Notoatmodjo, 2012). Adequate understanding of tuberculosis transmission, symptoms, prevention strategies, and treatment adherence may encourage early healthcare-seeking behavior, reduce diagnostic delays, and minimize disease transmission within households and communities.
In contrast, inadequate knowledge regarding tuberculosis may contribute to delayed diagnosis, delayed treatment initiation, increased transmission risk, and the persistence of stigma and discrimination against individuals affected by TB. Consequently, improving community knowledge constitutes a fundamental component of effective tuberculosis control programs (Landudjama & Noviana, 2024).

Previous studies have demonstrated that sociodemographic characteristics, including age, sex, educational attainment, and occupational status, are associated with tuberculosis-related knowledge levels. Younger individuals generally have greater access to digital information and social media, whereas higher educational attainment is associated with improved health literacy and information processing abilities. Similarly, gender and occupational status may influence healthcare utilization patterns and access to health information resources. Tuberculosis remains a priority public health concern in West Papua Province. Geographical challenges, unequal healthcare accessibility, variations in educational attainment, and socioeconomic disparities may influence the effectiveness of tuberculosis control programs in the region. Manokwari Regency, as one of the major governmental and economic centers in West Papua, continues to experience challenges in increasing case detection and improving treatment outcomes.
According to internal reports from Sanggeng Primary Health Center, 57 new pulmonary tuberculosis cases initiated treatment between January and March 2026, indicating ongoing community transmission within the health center's catchment area. Therefore, strengthening

community knowledge and awareness regarding tuberculosis is essential to promote early symptom recognition, increase treatment-seeking behavior, and enhance community participation in disease prevention and control activities.

Furthermore, information regarding community knowledge levels provides valuable insights for community nursing practice. Community nurses play critical roles in health education, family counseling, contact tracing, and community empowerment initiatives aimed at supporting tuberculosis elimination programs. Therefore, this study aimed to describe community knowledge regarding pulmonary tuberculosis in the working area of Sanggeng Primary Health Center, Manokwari Regency, West Papua Province, Indonesia.

METHODS

This study employed a quantitative descriptive design using a cross-sectional approach to describe the level of community knowledge regarding pulmonary tuberculosis in the working area of Sanggeng Primary Health Center, Manokwari Regency, West Papua Province, Indonesia. The study was conducted at Sanggeng Primary Health Center, one of the major primary healthcare facilities providing tuberculosis prevention and treatment services in Manokwari Regency. Data collection was undertaken during the study period in 2026.

The target population consisted of community members visiting the health center, including patients and accompanying family members who met the inclusion criteria. Participants were selected using an accidental sampling technique, whereby respondents who attended the health center during the data collection period and agreed to participate were included in the study. A total of 30 respondents were recruited.

Data were collected using a structured questionnaire designed to assess respondents' knowledge regarding pulmonary tuberculosis. The questionnaire included items related to the definition of tuberculosis, causes of the disease, modes of transmission, signs and symptoms, preventive measures, treatment adherence, and available health services for tuberculosis management. Prior to data collection, respondents received explanations regarding the study objectives and procedures and were asked to provide informed consent. Participation was voluntary, and confidentiality and anonymity were maintained throughout the study process.

Data processing involved editing, coding, data entry, cleaning, and tabulation procedures. Univariate analysis was performed using frequency distribution and percentage calculations to describe respondents' characteristics and levels of knowledge regarding pulmonary tuberculosis. Knowledge levels were categorized into three groups based on respondents' total scores, namely good, sufficient, and poor knowledge, according to predetermined classification criteria.

RESULT AND DISCUSSION

This study involved a total of 30 respondents consisting of patients and patients' companions who visited Sanggeng Primary Health Center, Manokwari Regency, during the data collection period. The level of knowledge was analyzed according to respondents' characteristics, including age, educational attainment, gender, and employment status.

Table 1
Respondent Characteristics

No	Characteristics	frekuensi (f)	Persentase (%)
A	**Age (years)**		
1	17-25	18	60,0 %
2	26-35	8	26,7 %
3	36-45	4	13,3 %
4	46-55	0	0
	Total	30	100 %
B	**Education**		
1	SD	5	16,7%
2	SMP	4	13,3 %
3	SMA	18	60 %
4	Perguruan Tinggi	3	10 %
	Total	30	100 %
C	**Gender**		
1	Male	11	37,9 %
2	Female	19	62,1 %
	Total	30	100 %
D	Occupational status		
1	Working	11	36,7%
2	Not working	19	63,3%
	Total	30	100 %

A total of 30 respondents participated in this study. Based on age distribution, the majority of respondents were within the productive age group of 17–25 years. Smaller proportions were observed among respondents aged 26–35 years, 36–45 years, and above 45 years. Regarding educational attainment, most respondents had completed senior high school education, followed by junior high school and higher education levels. Female respondents constituted a slightly larger proportion of the study population than males. In terms of occupational status, respondents were predominantly unemployed, homemakers, students, or engaged in informal employment sectors.

Table 2
Respondents' Knowledge Level by Age

No	Age (years)	Knowledge Level						Total	
		Good		Sufficient		Less			
		f	%	f	%	f	%	f	%
1	17 - 25	10	55,56	7	38,89	1	5,55	18	60,0
2	26 - 35	4	50,00	4	50,00	0	0	8	26,7
3	36 – 45	2	50,00	2	50,00	0	0	4	13,3
4	46 – 55	0	0	0	0	0	0	0	0
	Total	16	53,33	13	43,33	1	3,34	30	100

The findings demonstrated that respondents aged 17–25 years showed the highest proportion of good knowledge regarding pulmonary tuberculosis, accounting for 55.56% of respondents within this category. Younger adults generally demonstrated better understanding of tuberculosis symptoms, transmission mechanisms, prevention strategies, and treatment adherence compared with older respondents

Table 3
Respondents' Knowledge Level by Education

No	Pendidikan	Knowledge Level						Total	
		Good		Sufficient		Less			
		f	%	f	%	f	%	f	%
1	SD	2	40,00	3	60,00	0	0	5	16,7
2	SMP	1	25,00	2	50,00	1	25,00	4	13,3
3	SMA	11	61,11	7	38,89	0	0	18	60,0
4	Perguruan Tinggi	2	66,67	1	33,33	0	0	3	10,0
	Total	16	53,33	13	43,33	1	3,34	30	100

Respondents with senior high school education represented the largest proportion of participants with good knowledge regarding pulmonary tuberculosis (61.11%). This finding suggests that educational attainment contributes positively to individuals' ability to access, understand, and apply health information related to tuberculosis prevention and managemen

Table 4
Respondents' Knowledge Level by Gender

No	Gender	Knowledge Level						Total	
		Good		Sufficient		Less			
		f	%	f	%	f	%	f	%
1	Male	6	54,55	5	45,45	0	0	11	36,7
2	Female	10	52,63	8	42,11	1	5,26	19	63,3
	Total	16	53,33	13	43,33	1	3,34	30	100

Female respondents demonstrated slightly higher levels of good knowledge regarding pulmonary tuberculosis compared with male respondents. Approximately 52.63% of women were categorized as having good knowledge, indicating a greater tendency among women to seek health information and participate in health promotion activitie.

Table 5
Respondents' Knowledge Level by Occupational Status

No	Occupational status	Tingkat Pengetahuan						Total	
		Good		Sufficient		Less			
		f	%	*f*	%	*f*	%	*f*	%
1	Working	7	63,64	4	36,36	0	0	11	36,7
2	Not working	9	47,37	9	47,37	1	5,26	19	63,3
	Total	16	53,33	13	43,33	1	3,34	30	100

Based on occupational characteristics, respondents who were not employed demonstrated the highest proportion of good knowledge regarding pulmonary tuberculosis (47.37%). Greater availability of time to participate in health education activities and easier access to health information may explain this finding.

Community Knowledge Level Based on Age

The present study demonstrated that respondents aged 17–25 years exhibited the highest proportion of good knowledge regarding pulmonary tuberculosis compared with older age groups. Specifically, more than half of participants within this age category demonstrated good knowledge

levels, suggesting that younger individuals possess greater opportunities to access, process, and utilize health information related to tuberculosis prevention and control.
Age has long been recognized as an important determinant of health literacy and information-seeking behavior. Younger adults generally have greater familiarity with digital technologies, social media platforms, and internet-based health resources, enabling them to obtain health information more rapidly and efficiently than older populations (Norman & Skinner, 2006). The increasing penetration of smartphones and social media usage in Indonesia has substantially transformed health information acquisition patterns, particularly among adolescents and young adults.

This finding is consistent with the national cross-sectional study conducted by Kaaffah et al. (2023), which reported significantly higher tuberculosis-related knowledge scores among younger Indonesian adults compared with older populations. Similar findings have also been reported in other low- and middle-income countries where younger individuals demonstrated better awareness regarding TB symptoms, transmission routes, and treatment availability due to greater exposure to digital health information (Boah et al., 2021).

However, age alone does not fully determine knowledge acquisition. Health literacy is influenced by multiple interacting factors, including educational attainment, socioeconomic status, previous exposure to tuberculosis cases, participation in health promotion programs, and accessibility of healthcare services (Nutbeam, 2000). Older individuals with frequent interactions with healthcare providers or previous family experiences with tuberculosis may possess knowledge levels comparable to younger adults despite limited digital literacy. From a community nursing perspective, these findings suggest the importance of implementing age-specific health education strategies. Digital media campaigns and social media interventions may effectively target younger populations, whereas face-to-face counseling, community meetings, and home visits may be more appropriate for older adults who have limited access to digital technologies (Asria et al., 2022).

Community Knowledge Level Based on Educational Attainment
Educational level is widely recognized as one of the strongest predictors of health literacy and disease-related knowledge. In this study, respondents with senior high school education represented the largest proportion of participants with good tuberculosis knowledge. Interestingly, although respondents with university education demonstrated the highest percentage of good knowledge proportionally, the largest absolute number of knowledgeable respondents originated from the senior high school group because this category constituted the majority of the sample.

These findings support the theory proposed by Notoatmodjo (2012), which states that formal education improves an individual's cognitive ability to receive, process, and interpret health-related information. Higher educational attainment generally enhances critical thinking skills, information analysis, and decision-making capacities regarding health behaviors.

The findings are also consistent with research conducted by Alfaray et al. (2021), which identified educational attainment as one of the most influential determinants of tuberculosis knowledge and perception among Indonesian populations. Similarly, studies conducted in Ethiopia, Ghana, and China have consistently demonstrated positive associations between educational level and TB-related knowledge (Wang et al., 2008; Boah et al., 2021).

Nevertheless, the current digital era has altered traditional assumptions regarding education and knowledge acquisition. Access to health information is no longer solely dependent upon formal education because individuals can obtain health information through social media, online educational videos, governmental health campaigns, and community health programs. Consequently, individuals with moderate educational backgrounds but high motivation to seek information may possess knowledge levels comparable with university graduates.

The relatively high knowledge level among respondents with senior high school education in this study may reflect greater exposure to community health education activities conducted by healthcare workers at Sanggeng Primary Health Center, as well as increased utilization of internet-based health resources. This phenomenon emphasizes that health promotion programs should prioritize accessibility and engagement rather than relying exclusively on educational background.

Community Knowledge Level Based on Gender

The study revealed that female respondents demonstrated slightly higher levels of good tuberculosis knowledge than male respondents. Women represented more than half of respondents with good knowledge, suggesting greater exposure to health information and stronger engagement in family health management activities.

Gender differences in health information-seeking behaviors have been widely documented in the literature. Women are generally more proactive in seeking health information, utilizing healthcare services, and participating in preventive health activities compared with men (Wang et al., 2008). Women often assume primary caregiving responsibilities within households, making them more attentive to health-related issues affecting family members. This finding aligns with the study conducted by Wang et al. (2008) in rural China, which reported that women possessed better knowledge regarding tuberculosis transmission mechanisms and early treatment-seeking behaviors compared with men. Similarly, Boah et al. (2021) found significant gender disparities in knowledge regarding TB transmission and curability among Ghanaian populations, with women demonstrating superior understanding of disease prevention and treatment outcomes.

Despite these advantages, women frequently encounter social and economic barriers that delay access to tuberculosis diagnosis and treatment services. Gender-related stigma, financial dependency, caregiving responsibilities, and limited decision-making autonomy may contribute to delayed healthcare utilization among women in certain cultural settings (Krishnan et al., 2014). Within the context of Sanggeng Primary Health Center, the relatively high knowledge level among women may be attributed to their active participation in maternal and child health services, community health posts, family welfare programs, and health promotion activities organized by community health workers. Therefore, women may serve as effective agents of change in disseminating tuberculosis information and promoting preventive behaviors within families and communities. Community nurses should capitalize on this opportunity by involving women in family-centered tuberculosis education programs, contact tracing activities, and community empowerment initiatives aimed at improving TB awareness and reducing disease-related stigma (Setiyadi et al., 2025).

Community Knowledge Level Based on Employment Status

Unexpectedly, this study found that unemployed respondents demonstrated relatively higher proportions of good tuberculosis knowledge compared with employed participants. This finding differs from several previous studies suggesting that employment status is positively associated with access to health information and healthcare services (Alfaray et al., 2021). One possible explanation is that unemployed individuals may have greater flexibility and available time to attend health education sessions, community health activities, and healthcare visits. They may also spend more time consuming health-related information through television, social media, and internet platforms compared with employed individuals who face occupational time constraints.

The rapid expansion of digital health communication has fundamentally changed patterns of information dissemination. Health information can now be accessed independently through social networking platforms, online videos, governmental websites, and mobile applications without requiring workplace exposure or formal institutional channels (Norman & Skinner, 2006). Therefore, occupational status alone may no longer serve as a reliable predictor of health knowledge in contemporary society. Instead, motivation to seek information, digital literacy, healthcare accessibility, and exposure to health promotion interventions may play more significant roles in determining knowledge levels regarding tuberculosis. These findings highlight the importance of flexible and adaptive health promotion strategies that accommodate varying occupational schedules. Community nurses may consider utilizing digital health education materials, online campaigns, and mobile health technologies to reach employed populations who experience difficulties attending traditional health education sessions.

Implications for Community Nursing Practice, The findings of this study have important implications for community nursing practice and tuberculosis control programs in primary healthcare settings. Community nurses play central roles in health promotion, early case detection, contact investigation, treatment adherence support, and community empowerment initiatives aimed at achieving tuberculosis elimination targets (Firjatullah & Ati, 2023). Improving community knowledge regarding tuberculosis contributes directly to earlier symptom recognition, reduced diagnostic delays, improved treatment adherence, and decreased disease transmission within households and communities (WHO, 2024). Consequently, educational interventions should become integral components of tuberculosis control programs at primary healthcare facilities.

Community-based approaches involving health cadres, religious leaders, and community organizations have demonstrated effectiveness in improving TB awareness and increasing case detection rates in Indonesia (Dewi et al., 2016). The empowerment of community health volunteers can substantially enhance health promotion coverage and support active case-finding activities, particularly in remote and underserved areas (Setiyadi et al., 2025). Furthermore, family-centered nursing interventions are essential because tuberculosis management extends beyond individual patients and requires support from family members and social networks. Nurses should strengthen family education programs focusing on treatment adherence, infection prevention practices, nutritional support, and stigma reduction (Asria et al., 2022). These findings also support the implementation of innovative digital health promotion strategies, including social media campaigns, short educational videos, and mobile health applications tailored to local community characteristics and cultural contexts.

Public Health Implications, Indonesia remains one of the countries with the highest tuberculosis burden globally, contributing substantially to worldwide TB incidence (WHO, 2024). The achievement of the national target for tuberculosis elimination by 2030 requires comprehensive interventions addressing not only clinical management but also social determinants and community engagement. Knowledge improvement constitutes one of the most cost-effective interventions for strengthening community participation in tuberculosis prevention and control. Adequate community knowledge may reduce stigma, increase early healthcare-seeking behavior, and improve acceptance of contact investigation and treatment programs (Goletti et al., 2025).
The findings from Sanggeng Primary Health Center indicate that although overall knowledge levels were relatively favorable, knowledge gaps remain among older adults, males, and individuals with lower educational attainment. Therefore, future health promotion initiatives should prioritize these vulnerable groups to achieve more equitable health outcomes and contribute to national tuberculosis elimination efforts.

CONCLUSIONS

Respondents' knowledge level based on age, the knowledge category is good dominated by the 17–25 age group with 10 respondents (55.56%). Based on education level, the good category is dominated by high school education with 11 respondents (61.11%). Based on gender, the good category is dominated by women, with 10 respondents (52.63%). And based on employment status, the good category is dominated by unemployed people with 9 people (47.37%).

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