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Overview Of Behaviors To Prevent Transmission Of Pulmonary Tuberculosis In Families In The Sokaraja 1 Community Health Center Working Area

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Abstract

Pulmonary tuberculosis remains a major health problem in Indonesia, particularly in high-prevalence areas such as Sokaraja 1 Community Health Center, Banyumas, where families play a crucial role in preventing transmission. This study aims to describe the behavior of preventing pulmonary tuberculosis transmission in families of sufferers. Using a quantitative descriptive cross-sectional design with a univariate approach, a population of 89 families was sampled via total sampling. A 10-item Likert questionnaire instrument (validity r=0.582-0.734; reliability α=0.817) was analyzed univariately using SPSS (frequency, mean, table). The results showed that the majority of respondents were female (73%), aged 36-45 years (34.8%), had junior high school education (38%), and were housewives (49.4%), with negative (76.4%) versus positive (23.6%) prevention behaviors. The conclusion suggests that suboptimal behavior indicates the need for intensive education to improve household compliance to reduce TB transmission.

Keywords: Behavior, Family, Prevention, Pulmonary Tuberculosis, Transmission.

INTRODUCTION

Pulmonary tuberculosis (pulmonary TB) is caused by Mycobacterium tuberculosis, which produces acid-fast bacilli (AFB) (Rahmadani et al., 2023; Azzahra Mauliani, 2025). This disease affects the lungs and can spread to other organs through droplets released when an infected person coughs or sneezes. (Wirakhmi et al., 2025). The lungs, as the primary respiratory organ, exchange oxygen and carbon dioxide, with an adult breathing 17,000–30,000 times per day, making lung damage life-threatening (Rasyid Heryawan, 2023; Pai et al., 2022). Globally, WHO (2024) reported 10.8 million cases in 2023, including 6 million men, 3.6 million women, and 1.3 million children, while Southeast Asia recorded 4.85 million new cases and 600,000 deaths in 2022 (World Health Organization Regional Office for South-East Asia, 2023).

In Indonesia, prevalence is high with 969,000 new cases and an incidence of 354/100,000 population in 2021 (Ministry of Health of the Republic of Indonesia, 2022), Central Java 87,074 cases in 2023 (Central Java Health Office, 2023), and Banyumas 210 sufferers with Sokaraja 1 Community Health Center as many as 89 cases in 2024 (Banyumas Health Profile, 2024). The lifetime risk of infection is 10%, higher in HIV, diabetes, malnutrition, and smoking; mild symptoms such as cough, fever, night sweats, and weight loss are often overlooked (Latif et al., 2023; Centis et al., 2024). Respondent demographics are often young adults (26-35 years), female, high school graduates, and housewives (Meo et al., 2024).

Early detection improves treatment and reduces transmission, but subjective diagnosis via X-ray and 6-9 months of treatment with at least three medications are often delayed because chronic cough is considered normal (Rasyid Heryawan, 2023; Dheda et al., 2022). Family is key to prevention, but behavior is suboptimal: Meo et al. (2024) found 55.22% good, 44.03% sufficient, 0.75% inadequate; Mujahidin et al. (2015) reported low levels of cough covering (64.5% inadequate), expectoration (51.6%), pillow drying (64.5%), separating belongings (67.7%), nutrition (58.1%), and ventilation (74.2%).

A July 2025 Sokaraja pre-survey confirmed a red zone with poor ventilation, cramped housing, no masks, and communal eating; a risky environment that can trigger lung damage, drug resistance, and death (Nugroho et al., 2020; Chakaya et al., 2021). Rapid response improves quality of life, but a lack of family understanding prolongs transmission (Hara et al., 2023; Wongchana & Songthap, 2024).

This study aims to describe the behavior of preventing pulmonary TB transmission in Sokaraja 1 Community Health Center in general and specifically (respondent characteristics: age, gender, occupation, education; family behavior), via a quantitative descriptive cross-sectional design with a total sampling of 89 respondents. The urgency of the local high burden and the need for household education are in line with WHO; novelty in the focus of Sokaraja 2025-2026, valid adaptation instruments, different from Mujahidin (2015), Meo (2024), Hara (2023), Wongchana (2024) via location/sample/univariate analysis (Theoretical/practical benefits: increasing insight, respondent education, researcher development, UHB reference).

RESEARCH METHODS

This study used a quantitative descriptive design with a univariate and cross-sectional approach to describe the phenomenon of pulmonary tuberculosis transmission prevention behavior in families factually and currently without testing the relationship of variables. This approach is suitable for frequency, percentage, and trend analysis of single data, allowing generalization from the sample to the population through objective and bias-free numerical data (Widodo et al., 2023; Waruwu et al., 2025; Sugiyono, 2021; Creswell & Creswell, 2023). The research location was in the working area of the Sokaraja 1 Community Health Center, Banyumas Regency, and was implemented from October to December 2025 with data collection in December 2025, ensuring contextual relevance and time efficiency (Sembiring et al., 2023).

The population consisted of 89 families with pulmonary tuberculosis in the region in 2025, with a total non-probability sampling sample of 89 primary respondents (aged ≥18 years, responsible for care such as administering medication, check-ups, and meals); priority selection was based on frequency of involvement, physical contact, decision-making, age, or simple random sampling if equal. This technique represents the entire population without selection bias, ideal for comprehensive descriptive studies (Salsabillah et al., 2020; Sumargo, 2020; Sudaryono, 2021).

The main instrument is a 10-item closed questionnaire (5 positive, 5 negative) Likert 4 scale (always-often-rarely-never; positive score 4-1, negative 1-4), adapted by Izzudin with contextual additions, tested for validity (r count 0.582-0.734 > r table 0.361, p = 0.001) and reliability (Cronbach's $\alpha = 0.817 > 0.70$) on 28 respondents of Sokaraja II Health Center via SPSS. The questionnaire measures preventive behavior (positive if the score > mean), complete, clear, relevant, consistent; primary data via self-report, secondary from the health center (Widodo et al., 2023; Rukhmana, 2021; Emzir, 2021).

Primary data collection techniques through direct questionnaires: informed consent, explanation, self-completion (reading assistance if needed), completeness check; secondary data from medical records. Descriptive univariate analysis via SPSS: editing (complete/clear/relevant/consistent), coding, entry, cleaning, scoring, tabulating frequencies/tables/graphs, mean classification (positive/negative), cumulative scale (100%-0%). Procedures: ethical approval (respect, beneficence, justice), health center coordination, trials, distribution, data processing, interpretation for behavioral descriptions (Nasir, 2011; Sukma Senjaya et al., 2022; Sugiyono, 2021; Sudaryono, 2021).

RESULTS AND DISCUSSION

Research result

Research Results on "Description of Pulmonary Tuberculosis Transmission Prevention Behavior in Families in the Sokaraja 1 Community Health Center Work Area" which was conducted in December 2025 in the Sokaraja 1 Community Health Center work area with a total of 89 respondents with a questionnaire filling process carried out directly.Based on the research that has been carried out, the following results were obtained:

Respondent Characteristics Overview

Table 1. Overview of Respondent Characteristics

Age Characteristics	Frequency (n)	Presentation (%)
Late teens (17-25)	5	5.6%
Early adulthood (26-35)	23	25.8%
Late adulthood (36-45)	31	34.8%
Early elderly (46-55)	16	18.0%
Late elderly (56-65)	14	15.7%
Total	89	100%
Gender		
Woman	65	73.0%
Man	24	27%
Total	89	100%
Education		
Elementary School	24	27.0%
JUNIOR HIGH SCHOOL	34	38.0%
SENIOR HIGH SCHOOL	25	28.1%
College	6	6.7%
Total	89	100%
Work		
Housewife	44	49.4%
Laborer	20	22.5%
Teacher	6	6.7%
Trader	15	16.9%
Doesn't work	4	4.5%
Total	89	100%

Table 1 shows that the majority of respondents were in the productive to elderly adult age group. Based on gender, 65 respondents (73.0%) were female, while 24 respondents (27.0%) were male.

In terms of education level, most respondents had a junior high school education (34 people) (38.0%), indicating that the majority of respondents had a secondary or lower education level. Based on occupation, most respondents worked as housewives (44 people) (49.4%), with the characteristics of respondents' jobs dominated by non-formal work and domestic work. Overall, respondents in this study were predominantly female, in adulthood, had a secondary or lower education level, and most of them acted as housewives. These characteristics are expected to provide a representative picture of the research population studied.

Overview of Prevention Behavior for Transmission in Families

Table 2. Prevention of Transmission in the Family

Criteria	Frequency	Presentation
Positive	21	23.6%
Negative	68	76.4%
Total	89	100%

Based on Table 2, Based on the results of data processing regarding respondents' preventive behavior, a frequency distribution was obtained which shows that of the total of 89 respondents, the majority were in the negative preventive behavior category. Respondents with negative preventive

behavior numbered 68 people or 76.4%, while respondents who had preventive behavior in the positive category numbered 21 people or 23.6%.

Discussion

Description of Behavior to Prevent Transmission of Pulmonary Tuberculosis in Families in the Working Area of Sokaraja 1 Health Center.

Respondents in this study were families with family members suffering from Pulmonary Tuberculosis.

Age

ResultsThe study showed that the most common age characteristics of respondents were late adulthood, aged 36 to 45 (34.8%). This finding indicates that these two age groups were the most dominant in this study. Most respondents were middle adults, who generally have life experience, family responsibilities, and a level of maturity in decision-making, including regarding health behaviors.

ResultsThis research is in line with the findings(Indarjo et al., 2021)This indicates that the 26–45 age group is the age group with the highest prevalence of tuberculosis transmission prevention behavior within the family environment, at 41.3%. This age group is included in the productive age category, which generally has a greater role and responsibility in decision-making and family health management. At this age, individuals tend to have a higher level of mental maturity, a better ability to understand health information, and a higher awareness of the importance of preventing infectious diseases, including tuberculosis. According to(Meyrinda & Candra, 2025), Productive age has higher motivation and ability to participate in social activities, including health activities.

Gender

ResultsThe study showed that the majority of respondents were female, namely 65 people (73.0%), while male respondents numbered 24 people (27.0%). The predominance of female respondents in this study indicates that women have a greater role in the implementation and application of preventive behaviors, especially in the context of family health. This can be attributed to the role of women who are generally more involved in domestic activities and managing the health of family members, such as caring for sick family members, maintaining a clean home environment, and ensuring the implementation of clean and healthy living behaviors.

WomanWomen generally have greater involvement in family health management, such as caring for sick family members, maintaining a clean home environment, and ensuring the implementation of clean and healthy lifestyles. This means that women tend to be more active and responsive in implementing disease-preventing behaviors.(Rossalina & Tamara, 2023).

This research is also in line with research conducted by(Hasanah et al., 2025)In RW 01, Sawangan Baru Village, Depok City, the majority of respondents were female, at 64.1%. The predominance of female respondents in the study indicates that women are more involved in health-related activities, particularly in implementing pulmonary tuberculosis prevention behaviors. This can be attributed to the role of women in the family, who are generally closer to care efforts, monitoring the health of family members, and implementing clean and healthy living behaviors. Therefore, the high proportion of female respondents in the study supports the findings of this study that women have a greater role in disease prevention behaviors within the family environment.

Education

ResultsThe study showed that the characteristics of respondents based on education level show that the majority of respondents had a junior high school education, namely 34 people (38.0%).

These findings indicate that the majority of respondents in this study had a secondary or lower education level, which may influence their understanding and implementation of disease prevention behaviors. Educational level plays a role in shaping an individual's knowledge, attitudes, and ability to receive and apply health information, including tuberculosis prevention efforts within the family.

This finding differs from research conducted by(Meo et al., 2024)which reported that the majority of respondents had a high school education. The differences in respondents' education levels between the two studies may be influenced by the characteristics of the research areas, socioeconomic

backgrounds, and differing access to education. As a person's education increases, their way of thinking also evolves, ultimately leading to increased awareness of personal and family health.

Through the educational process, a person will acquire a variety of knowledge that leads to an understanding of many aspects. According to researchers, the lower a person's education level, the lower their ability to receive and understand health information, thus limiting their knowledge and impacting suboptimal disease prevention behaviors. The higher the level of education, the higher the healthy lifestyle behaviors and the quality of the home environment. This includes aspects such as knowledge, understanding, awareness, actions, and responsibility.(Ariga, 2022).

Work

ResultsThe study showed that the majority of respondents were housewives (IRT), namely 49.4%, which shows that almost half of the respondents have main activities in the home environment.

This finding is in line with research(Tanumihardja et al., 2025)which also reported that housewives were the largest respondent group. The predominance of housewives as respondents reflects this group's high involvement in household and environmental activities, thus providing them with a greater opportunity to obtain health information. The role of housewives in maintaining and managing family health also influences the formation of daily health behaviors.

Overview of Preventive Behavior

Results the study showed that the majority of families with pulmonary tuberculosis patients had negative transmission prevention behaviors, namely 68 respondents (76.4%), while only 21 respondents (23.6%) had positive behaviors. These results indicate that efforts to prevent pulmonary tuberculosis transmission within the family environment have not been optimally implemented.

The prevalence of these negative behaviors is evident in the low level of implementation of basic preventative behaviors within the home. Some families fail to consistently maintain a clean living environment, which should be a key factor in preventing the spread of TB germs. An unclean and damp home environment can contribute to the survival of the TB germs.

Apart from that, there are still families who do not wear masks when doingDirect contact with a person with pulmonary TB. This condition has the potential to increase the risk of transmission, given that pulmonary TB is a contagious disease spread through airborne droplets when an individual coughs, sneezes, or speaks. Negative behavior is also evident in the lack of family involvement in supporting the treatment process for patients with pulmonary TB. Some families do not routinely assist patients with check-ups at health care facilities and do not always accompany them in taking their medication according to the prescribed schedule. This lack of support can result in non-compliance with medication, risking treatment failure and increasing the chance of transmission to other family members.

Regarding nutritional needs, families are still found to allow TB patients to consume excessive amounts of low-nutrient foods, such as instant foods and fried foods, and not providing nutritious food regularly. Adequate and balanced nutrition is essential to boost the immune system and aid the healing process. Furthermore, other preventative behaviors that are not consistently practiced include drying mattresses, pillows, and bedding for TB patients in the sun, and washing hands with soap after direct contact with the patient. These habits should be practiced routinely to reduce the presence of germs in the home environment. However, a small portionFamilies have demonstrated good preventive behaviors, such as adjusting ventilation and lighting at home to maintain air circulation and encouraging the use of personal eating utensils for TB patients. However, the number of families implementing these behaviors is still relatively small, so they have not had a significant impact on reducing the risk of transmission. Overall, the high proportion of negative TB prevention behaviors indicates that families still need to improve their understanding and awareness of the important role of families in preventing TB transmission.

CONCLUSION

This study found that the majority of respondents were late-adult women (36-45 years, 34.8%), junior high school graduates (38%), and housewives (49.4%), with behaviors related to preventing pulmonary tuberculosis transmission being predominantly negative (68 respondents, 76.4%) compared to positive (21 respondents, 23.6%). This indicates that the implementation of prevention efforts such as home ventilation, mask use, separation of eating utensils, and nutritious nutrition is still less than optimal in the Sokaraja 1 Community Health Center area, although some families are aware of the risk of household transmission. This finding is consistent with previous studies that highlighted low adherence to basic behaviors in families of TB sufferers.

Limitations include the cross-sectional design, which cannot capture long-term behavioral changes, the potential for self-report bias in the questionnaire, and the specific context of Banyumas, which limits national generalizability. Suggestions for further research include longitudinal designs, educational interventions, and multivariate analysis of influencing factors such as income. Practically, these results imply the need for intensive community health center education programs for families, training of TB PHBS cadres, and collaboration with the Health Office to improve compliance, reduce transmission, and achieve the 2030 TB elimination target.

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