

# Relationship Between Age and Gender Characteristics and Tuberculosis at Pandanaran Health Center

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## ABSTRACT

**Abstract:** Tuberculosis (TB) remains a public health issue that requires serious attention, especially at the primary health care level. The Pandanaran Community Health Center in Semarang recorded 66 cases of TB among the community in its service area in 2025. The characteristics of the patients show that most of them are adults (55 patients) and 11 are children, with a relatively balanced gender distribution, namely 34 male patients and 32 female patients. In addition, there were 3 cases of patients who stopped taking their medication and 10 deaths. This study aims to determine the relationship between age and gender with tuberculosis diagnosis at the Pandanaran Community Health Center in Semarang City. The study used an analytical quantitative method with a cross-sectional design. The data used was secondary data sourced from the medical records of TB patients in 2025. The sampling technique was total sampling, so that the entire population of 66 TB patients was used as the research sample. Data analysis was performed using the Chi-Square test with the help of the SPSS program. The results of the analysis showed that the relationship between TB diagnosis and age had a p-value of 0.294, while the relationship between TB diagnosis and gender had a p-value of 0.237. These p-values indicate that there is no significant relationship between age and gender and the diagnosis of tuberculosis. The conclusion of this study is that age and gender are not significantly related to TB diagnosis at the Pandanaran Community Health Center in Semarang City.

Keywords: Tuberculosis, Age, Gender, TB Diagnosis

## INTRODUCTION

Tuberculosis (TB) is a contagious disease that can infect everyone, from infants and children to adolescents and the elderly, causing illness and death in over 1 million people each year. In most people, TB infects the lungs, but it can also affect almost any organ in the body, including the brain, spine, and kidneys (1). According to the World Health Organization (WHO), tuberculosis is caused by the bacillus *Mycobacterium tuberculosis*. In 2024, an estimated 10.7 million people will develop tuberculosis and 1.23 million will die from the disease. TB is one of the top 10 causes of death worldwide and the leading cause of death from a single infectious agent. Of the total number of people who develop TB each year, approximately 90% are adults, with more cases among men than women. (2)

Based on Indonesia's 2024 health profile, the number of TB cases reached 856,420 a significant increase compared to the 821,200 cases found in 2023. The highest number of cases was reported in the most populous provinces: West Java, East Java, and Central Java. Three provinces have achieved the target of  $\geq 90\%$  TB case detection coverage: Banten, West Java, and Jakarta. Nationally, the number of cases in men was 57.9% and in women 42.1%. (3)

According to the 2024 Central Java Provincial Health Profile, the TB detection coverage rate in Central Java was able to exceed the national target of 90.5% of the national target of 90%. (4). Meanwhile, based on the 2024 Semarang City Health Profile, there were 6,805 TB cases in Semarang, with 55% of men and 45% of women suffering from all types of TB. This is because men are more exposed to risk factors and less concerned about individual health maintenance than women (5)

Based on 2024 data from the Pandanaran Community Health Center in Semarang City, the number of TB patients receiving standardized care was spread across all sub-districts: 9 in Barusari, 8 in Bulustalan, 7 in Mugassari, 4 in Pleburan, 19 in Randusari, and 21 in Wonodri. More TB cases were found in males than females, and there were still TB cases in children aged 0–14 years, namely 2 cases in Barusari, 2 cases in Bulustalan, 3 cases in Mugassari, 1 case in Randusari, and 5 cases in Wonodri. (6). Based on TB patient data from Pandanaran Community Health Center in 2025, 66 TB patients were recorded undergoing treatment. The most common type of TB found was pulmonary TB, with 51 cases, compared to extrapulmonary TB and other clinical forms. This finding indicates that pulmonary TB remains the dominant form of TB and has a high potential for transmission in the community. In terms of age characteristics, the majority of patients were adults (55 patients), while the remainder were children (11 patients). Based on gender, TB cases were relatively balanced between men and women. There were 34 men and 32 women. This indicates that TB affects both groups almost equally. Based on the final results of treatment, some patients have completed treatment with complete status and recovered, but there were still cases of discontinuation of treatment (3 patients) and 10 deaths. This

condition reflects that the challenges to successful TB treatment remain quite significant, which can be influenced by medication adherence, comorbid conditions, and support for treatment supervision.

The high number of TB cases is influenced by the low level of public understanding about prevention and proper treatment. Lack of knowledge about transmission, delayed early detection, and non-compliance with therapy are major challenges in TB control. The public does not yet understand basic preventive measures. This lack of knowledge affects the public's perception of risk (perceived susceptibility) and the severity of the disease (perceived severity), resulting in suboptimal preventive behavior (Kusumawati et al., 2025). Based on the Health Belief Model (HBM) theory, individuals will only take preventive measures if they have sufficient perceptions of vulnerability, severity, benefits, and motivators for action (7).

Based on research (Setyowati, M., & Setiyadi, 2025) using an analytical observational research method that aims to analyze the relationship between the characteristics of tuberculosis patients including age and gender with the health history of tuberculosis patients including the type of tuberculosis, history of tuberculosis, and tuberculosis health status. This study uses an observation-based data collection method by observing data input on the SPK-TB by TB program officers at the Sukoharjo Regency Health Center in 2018-2020. The instrument used is the observation guideline for identifying TB patients in Sukoharjo Regency in 2018-2020. The study population consisted of all TB cases in Sukoharjo District from 2018 to 2020. The sample was obtained based on TB patient data input into the Decision Support System (SPK-TB) application for TB treatment from 2018 to 2020. A total of 142 TB patients were included in this study. The SPSS statistical program was used to analyze TB patient characteristics and to test the correlation between factors. Based on the results of non-parametric statistical tests conducted using the SPSS program, the correlation between age and type of TB produced a p-value of 0.03. The correlation between age and sputum examination produced a p-value of 0.10. The correlation between patient age and TB history produced a p-value of 0.35. The correlation between age and health status produced a p-value of 0.41. Furthermore, the correlation between gender and TB type, sputum examination results, and patient TB history produced p-values of 0.001, 0.62, and 0.034, respectively. In addition, the correlation between gender and health status had a p-value of 0.03. This study analyzed the relationship between patient characteristics and TB history. The correlations observed were between age and TB type, gender and TB type, gender and TB history, and age and patient health status. This study provides a clear picture of the correlation between TB patient characteristics and health history. TB cases are more prevalent among men of productive age.

Based on this background, this study aims to determine the relationship between the characteristics of tuberculosis patients, including age and gender, and the type of tuberculosis in tuberculosis patients at the Pandanaran Community Health Center in Semarang City.

## METHOD

This study used a quantitative analytical approach with a cross-sectional design and utilized secondary data sourced from the medical records of tuberculosis patients at the Pandanaran Community Health Center in Semarang City in 2025. The population and sample size was 66 patients, which were taken using the total sampling method. The independent variables in this study were age and gender, while the dependent variable was the incidence of tuberculosis. Data analysis was performed through univariate and bivariate analysis using the Chi-Square test with a significance level of  $\alpha = 0.05$ .

## RESULT AND DISCUSSION

Table 1. Frequency Distribution of TB Cases

TB Diagnosis	Frequency	Percentage (%)
Pulmonary TB	51	77,3
Pulmonary TB (DR)	2	3,0
Pulmonary Extra TB	2	3,0
Lymph node TB	3	4,5
Clinical TB	2	3,0
Clinical TB (Pulmonary Extra)	1	1,5
Clinical TB Pulmonary Extra	1	1,5
Clinical TB, pleural effusion	1	1,5
TB Skin	1	1,5
Total	66	100

Based on Table 1 above, it can be seen that most TB cases at the Pandanaran Community Health Center are dominated by pulmonary TB, with 50 cases or 77.3%, followed by 3 cases (4.5%) of lymph node TB, pulmonary TB (RO), clinical TB, and extrapulmonary TB, each with 2 cases (3.0%), and other cases with 1 case each. This situation indicates that there is still a need for more intensive attention and control efforts, particularly in terms of early detection, appropriate treatment, and public education on TB prevention and transmission.

Table 2. Relationship between Age and TBC

TB Diagnosis	1-16 years old	%	17-25 years old	%	26-45 years old	%	46-80 years old	%	Total	%	<i>P-value</i>
Pulmonary TB	8	80	5	55,6	10	76,9	27	84,4	51	77,3	
Pulmonary TB (DR)	0	0,0	1	11,1	0	0,0	1	3,1	2	3,0	
Pulmonary Extra TB	0	0,0	1	11,1	1	7,7	0	0,0	2	3,0	
Lymph node tb	1	10,0	0	0,0	0	0,0	1	3,1	3	4,5	
Clinical TB	1	10,0	0	0,0	1	7,7	1	3,1	2	3,0	0,294
Clinical TB (Pulmonary Extra)	0	0,0	0	0,0	0	0,0	1	3,1	1	1,5	
Clinical TB Pulmonary Extra	0	0,0	1	11,1	0	0,0	0	0,0	1	1,5	
Clinical TB, pleural effusion	0	0,0	1	11,1	0	0,0	0	0,0	1	1,5	
TB Skin	0	0,0	0	0,0	0	0,0	1	0,0	1	1,5	
Total	10	100	9	100	13	100	32	100	66	100	

Based on Table 2, it is known that the relationship between age category and tuberculosis obtained a p-value of 0.294. This p-value is greater than  $\alpha = 0.05$ , so it can be concluded that there is no significant relationship between age and tuberculosis diagnosis. This means that age group differences do not have a significant effect on tuberculosis diagnosis in respondents. These results indicate that tuberculosis can occur in various age groups, so efforts to prevent and control tuberculosis need to be carried out evenly without distinguishing between specific ages.

Table 3. Relationship between Gender and TBC

TB Diagnosis	Male	%	Female	%	Total	%	<i>P-value</i>
Pulmonary TB	28	82,4	23	71,9	51	77,3	0,237
Pulmonary TB (DR)	0	0,0	1	3,1	1	1,5	
Pulmonary Extra TB	0	0,0	1	3,1	1	1,5	
Lymph node TB	2	5,9	0	0,0	2	3,0	
Clinical TB	1	2,9	2	6,3	3	4,5	
Clinical TB Pulmonary Extra	0	0,0	1	3,1	1	1,5	
Clinical TB Pulmonary Extra	0	0,0	1	3,1	1	1,5	
Clinical TB, pleural effusion	0	0,0	1	3,1	1	1,5	
TB Skin	0	0,0	1	3,1	1	1,5	
Total	34	100	32	10	66	100	

Based on Table 3, it is known that the relationship between gender categories and tuberculosis obtained a p-value of 0.237. This indicates that there is no relationship between gender and tuberculosis diagnosis. Thus, gender has no significant effect on tuberculosis diagnosis, indicating that this disease can occur in both men and women.

The characteristics of respondents in this study show that most tuberculosis patients are in the elderly age group, followed by adults, adolescents, and children. This distribution indicates that TB cases are still commonly found in the productive to elderly age groups, thus impacting quality of life and potential loss of productivity. In general, adults and the elderly have a higher risk of contracting TB due to longer exposure to risk factors, the possibility of comorbidities (such as diabetes or chronic lung disease), and a decline in immune system function with age (8). This is in line with the results of research conducted by Abrori and Ahmad (2018), which shows that as a person ages, their level of personal satisfaction tends to decline. This decline is influenced by illness, because at an older age, the hope of recovery is generally lower than for individuals in younger age groups (9)

In terms of gender, TB cases in this study were relatively balanced between men and women, although the proportion of men was slightly higher. This condition is consistent with national and global epidemiological patterns, which show that men tend to have a greater risk of exposure to TB than women. Several factors are thought to play a role, including smoking habits, exposure to risky work

environments, and delays in seeking health services among men. In this study, although the proportion of men was higher, statistical tests did not show a significant relationship between gender and TB diagnosis, suggesting that biological factors alone are insufficient to explain the difference in case distribution. (10).

The results of the study show that of the 66 cases of tuberculosis recorded at the Pandanaran Community Health Center, pulmonary TB dominated with 51 cases (77.3%), followed by lymph node TB with 3 (4.5%) cases, pulmonary TB (RO), clinical TB, and extrapulmonary TB with 2 cases each with a percentage of 3.0%, and other cases with 1 case each. The dominance of pulmonary TB in this study is in line with global epidemiological data showing that pulmonary TB is the most common form of tuberculosis, accounting for approximately 80-85% of all TB cases.

The high prevalence of pulmonary TB can be explained by the transmission mechanism of this disease. *Mycobacterium tuberculosis*, the causative agent of TB, spreads most efficiently through droplet nuclei produced when a person with pulmonary TB coughs, sneezes, or talks. The lungs, as the primary target organ, provide optimal conditions for the growth of this bacterium, namely high oxygen levels, which are required by *M. tuberculosis* as an obligate aerobic bacterium. The low number of extrapulmonary TB cases (a total of 8 cases or 12.5%) is also consistent with the literature, which states that extrapulmonary TB generally occurs as a complication of untreated pulmonary TB or in immunosuppressed conditions. Lymph node TB, skin TB, and tuberculous pleural effusion are extrapulmonary manifestations that require hematogenous or lymphogenous spread from the primary focus in the lungs (11).

Analysis of TB case distribution by age group shows that the elderly group ( $\geq 60$  years) had the highest number of cases, namely 32 people (50%), followed by the adult group with 13 people (20.3%), children with 10 people (15.6%), and adolescents with 9 people (14.1%). However, statistical testing shows a p-value of 0.294 ( $p > 0.05$ ), which means that there is no statistically significant relationship between age and the incidence of tuberculosis. Although there is no statistically significant relationship, the high number of cases in the elderly group has important clinical and epidemiological implications. The results of this study are in line with the research conducted by Nurkumalasari (2017) (12), which found no significant relationship ( $p=0.0001$ ) between age and the incidence of pulmonary TB (Nurkumalasari et al., 2016). Adulthood (productive age) is very dangerous in terms of transmission rates because people of this age interact easily with others, have high mobility, and are likely to transmit the disease to other people and their surrounding environment (13)

The distribution of TB cases based on gender shows that there were 34 males (51.5%) and 32 females (48.5%). Pulmonary TB was the most common diagnosis, found in 28 males and 23 females. However, statistical test results show a p-value = 0.237 ( $p > 0.05$ ), which means there is no significant

relationship between gender and tuberculosis diagnosis. Therefore, a community-based approach is needed that involves the role of families and local community leaders in order to reach at-risk groups and reduce stigma against TB patients, especially among immature age groups. Meanwhile, the high number of cases among men is thought to be related to behavioral factors, such as smoking and exposure in the workplace. Prevention efforts need to be tailored to age groups and gender through active screening in families, schools, and workplaces, expanding BCG immunization coverage in early childhood, and providing health education that involves families and communities (14) Factors Associated with the Incidence of Pulmonary TB. Analysis of the gender variable showed that there was no association with the incidence of pulmonary TB. This was indicated by a p-value of  $>0.999$ . The absence of an association between gender and the incidence of pulmonary TB was due to the fact that the proportion of male and female respondents in this study was almost equal (15)

## **CONCLUSION**

Based on this study, it can be concluded that tuberculosis cases at the Pandanaram Community Health Center are still dominated by pulmonary tuberculosis. There is no relationship between age and gender characteristics and tuberculosis at the Pandanaram Community Health Center. Therefore, tuberculosis control efforts need to focus on strengthening early detection, increasing treatment compliance, and educating the entire community about prevention of transmission. Additionally, health centers are expected to continue strengthening active pulmonary TB surveillance and screening programs to reduce transmission rates.

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