PHSAJ - Public Health Sebelas April Journal
Volume 3, No. 1, May 2024

https://ejournal.unsap.ac.id/index.php/phsaj

Factors Associated with the Incidence of Pulmonary Tuberculosis at Cimalaka Community Health Center in 2023

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Article Info

Article history:

Received May 12, 2024
Revised May 20, 2024
Accepted May 26, 2024

Keywords:

Pulmonary Tuberculosis
Education
Occupation
Knowledge

ABSTRACT

Pulmonary TB is one of the top 10 leading causes of death globally. The Ministry of Health detected 717,941 cases of Lung TB in Indonesia in 2022, Lung TB is one of the health problems both in the world and in Indonesia with a high number of cases and deaths. The purpose of this study was to determine the relationship between the factors of Education, Occupation, Knowledge, with the incidence of Pulmonary TB at the Cimalaka Health Center in 2023. This study used a quantitative design with a cross sectional approach. The population in this study were patients who were recorded and data to the DOTS clinic at the Cimalaka Health Center from January to May 2023, namely 490 patients and the sampling technique was carried out by accidental sampling technique. The sample in this study amounted to 84 patients. Data analysis used is univariate and bivariate analysis using the chi-squere test. The results of this study showed that patients with low education amounted to 42 patients (50%), who did not have a job amounted to 58 patients (69%), and who had insufficient knowledge amounted to 39 (46.4%). It is known that there is a relationship between education and the incidence of pulmonary TB with a value (p value 0.006), there is a relationship between employment and the incidence of pulmonary TB with a value (p value = 0.001), and there is a relationship between knowledge and the incidence of pulmonary TB with a value (p value = 0.000). The statement is interpreted based on the value of the correlation coefficient and the probability of the chi squere method with alpha 0.05 means the p value <alpha then hypotheses alternative is accepted. From the results of this study, it is expected that health institutions and the community pay special attention by minimizing the causes of pulmonary TB disease.

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A. INTRODUCTION

Pulmonary TB is a potentially serious infectious disease that commonly affects the lungs. The cause of Pulmonary TB is an infection from the Mycobacterium Tuberculosis bacteria that can spread through the lymph nodes and bloodstream to human organs. Tuberculosis is transmitted through the air. Most people with TB never show symptoms, as the bacteria can live in a dormant form in the body and can become active when the immune system declines. A patient with TB, especially pulmonary TB, when he or she talks, coughs, and sneezes, may expel sputum containing M.tb. People around the TB patient can be exposed by inhaling the sputum droplets. Infection can occur when a susceptible person inhales microbial droplets containing TB germs through the mouth or nose, upper respiratory tract, bronchus until they reach the alveoli. Treatment of tuberculosis usually takes months with strict medication rules, to prevent the risk of antibiotic

resistance. If not treated immediately, TB disease can be fatal. However, TB is a curable and preventable disease (Kemenkes, 2022).

The World Health Organization (WHO) calls Pulmonary TB an epidemic. WHO reports that Pulmonary TB is one of the 10 leading causes of death globally and the leading cause of death from a single infectious agent. WHO estimates that in 2018 almost 10 million people worldwide had Pulmonary TB and 1.5 million people died from the disease including 251,000 people who also had HIV (WHO, 2021). The Ministry of Health (MOH) detected 717,941 cases of tuberculosis (TB) in Indonesia in 2022. This number jumped 61.98% compared to the previous year which amounted to 443,235 cases. Looking at the trend, TB cases had recorded a decline in 2020. However, the findings of the disease have increased again in the last two years. Furthermore, the Ministry of Health noted that as many as 608,947 TB cases in the country had been successfully treated in 2022. This number increased by 51.04% compared to 2021, which amounted to 403,168 cases. However, the success rate of treatment for TB cases recorded a decrease to 85% in 2022. A year earlier, the success rate of treatment for this disease reached 86%. On the other hand, there are four provinces in Indonesia that managed to meet the target of TB case notification because it was above 90% in 2022, namely West Java, Banten, Gorontalo, and Jakarta. Meanwhile, 30 other provinces did not meet this target last year (Ministry of Health, 2022).

Data from the Sumedang Regency Health Office in 2020 there were 1,389 patients infected with Lung TB in Sumedang, in 2021 the number of Lung TB patients decreased, totaling 1,367 patients with Lung TB in Sumedang, while in 2022 it increased, totaling 2,504 patients infected with Mycobacterium Tuberculosis bacteria or Lung TB in Sumedang district (Sumedang Regency Health Office, 2020-2022). From the data obtained at the Cimalaka Puskesmas, the Cimalaka Puskesmas is one of the Puskesmas that has a high number of pulmonary TB cases with the second place in Sumedang district. From January to December 2022, there were 144 patients with Pulmonary TB at the Cimalaka Health Center, divided into several villages, Cimalaka Village with fifteen patients, Galudra Village with nine patients, Cibereum Kulon Village with eight patients, Naluk Village with nine patients, Nyalindung Village with eleven patients, Trumanggala Village with thirteen patients, Cikole Village as many as nine patients, Cibereum Wetan Village as many as nine patients, Mandalaherang Village as many as eight patients, Licin Village as many as eighteen patients, Citimun Village as many as twelve patients, Serang Village as many as nine patients, Padasari Village as many as seven patients and Cimuja Village as many as seven patients (Data Puskesmas Cimalaka, 2022).

Pulmonary TB disease is one of the health problems both in the world and in Indonesia with a high number of cases and deaths. By 2022, Indonesia ranks third globally. The global Tuberculosis report in 2021 estimates that 824,000 new cases of Tuberculosis will recur per year in Indonesia. West Java is the first contributor to the highest number of pulmonary TB cases. In January - August 2022, there were 75,296 reported cases or 59% of the target until August 60% and the annual target of 90%. However, of the 90% target, West Java has successfully treated the largest number of patients with Pulmonary TB at 72%. (West Java Provincial Health Office, 2022). Based on preliminary studies conducted by researchers at Poli Dots Puskesmas Cimalaka Sumedang Regency to 10 patients with Pulmonary TB at the Cimalaka health center, the results showed that there were several factors that resulted in Pulmonary TB disease including educational factors, occupational factors, and knowledge factors. Seven Lung TB patients occurred due to low education, eight Lung TB patients did not work, and eight Lung TB patients had low knowledge.

Based on the data and description above, it can be concluded that the incidence of pulmonary tuberculosis can be minimized by knowing and applying factors that can cause the incidence of pulmonary tuberculosis. Researchers are interested in conducting research with the title "Factors Associated with the Incidence of Pulmonary Tuberculosis at the Cimalaka Health Center, Sumedang Regency in 2023".

B. METHOD

The type of research used is quantitative research with Cross Sectional approach used to determine whether or not there is a relationship between education, occupation and knowledge with the incidence of Pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023. Data analysis with univariate and bivariate analysis using the chi-squere test. The population in this study were 490 patients who were registered and came to the Dots poly at the Cimalaka Health Center from January to May 2023 and obtained a sample of 84 patients using the 2021 slovin formula. The sampling technique used was accidental sampling. Data collection tools in this study using a questionnaire. The data obtained was then analyzed using the chi-square statistical test.

C. RESULTS AND DISCUSSION

3.1. Results

A. Univariate Analysis

1. Education

Table 1 Overview of Education

Category	Frequency	Percentage %
Low	42	50%
Medium	37	44%
High	5	6%
Total	**84**	**100%**

Source: Primary Data, 2023

It can be seen with a total of 84 patients showing that patients with low education amounted to 42 patients (50%), patients with moderate education amounted to 37 patients (44%), and patients with higher education 5 patients (6%).

2. Occupation

Table 2 Overview of Occupation

Category	Frequency	Percentage (%)
Not working	58	69%
Work	26	31%
Total	**84**	**100%**

Source: Primary Data, 2023

It can be seen with a total of 84 patients showing that patients who do not work amounted to 58 patients (69%), and patients who worked amounted to 26 patients (31%).

3. Knowledge

Table 3 Overview of Knowledge

Category	Frequency	Percentage (%)
Less	39	46,4%
Simply	33	39,3%
Good	12	14,3%
Total	**84**	100%

Source: Primary Data, 2023

It can be seen with a total of 84 patients showing that patients with poor knowledge amounted to 39 patients (46.4%), patients with sufficient knowledge amounted to 33 patients (39.3%), and patients with good knowledge amounted to 12 patients (14.3%).

4. Incidence of Pulmonary TB

Category	Frequency	Percentage (%)
Yes, Pulmonary TB patients	73	86,9%
No, Not a Pulmonary TB patient	11	13,1%
Total	**84**	**100%**

Source: Primary Data, 2023

It can be seen with a total of 84 patients showing that Yes, pulmonary TB patients totaled 73 patients (86.9%), and No, not pulmonary TB patients totaled 11 patients (13.1%).

B. Analisis Bivariat

1. Relationship between Educational Status and the Incidence of Pulmonary TB

Tabel 1
Relationship between Educational Status and the Incidence of Pulmonary TB

Educational Status	Incidence of Pulmonary TB				Total		p-Value
	Yes, Pulmonary TB Patient		No, not a pulmonary TB patient				
	F	%	F	%	F	%	
Low	38	36,5%	4	5,5%	42	42%	0,006
Medium	33	32,2%	4	4,8%	37	37%	
High	2	4,3%	3	7%	5	5%	
Total	73	73%	11	11%	84	84%	

Source: Primary Data, 2023

From the results of statistical calculations, the chi-squere test value was obtained with a p-value = 0.006 with alpha (a) 0.05 *p-value* < alpha means Ha is accepted so it can be concluded that there is a significant relationship between education and the incidence of Pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023.

2. Relationship between Occupational Status and the Incidence of Pulmonary TB

Table 2
Relationship between Occupational Status and the Incidence of Pulmonary TB

Occupational Status	Incidence of Pulmonary TB				Total		P Value
	Yes, Pulmonary TB Patient		No, not a pulmonary TB patient				
	F	%	F	%	F	%	
Not Working	55	50,4%	3	7,6%	58	58%	0,001
Work	18	22,6%	8	3,4%	26	26%	
Total	73	73%	11	11%	84	84%	

Source: Primary Data, 2023

From the results of statistical calculations, the chi-squere test value was obtained with a p-value = 0.001 with alpha (a) 0.05 *p-value* < alpha means Ha is accepted so it can be concluded that there is a significant relationship between work and the incidence of Pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023.

3. Relationship between Knowledge and the Incidence of Pulmonary TB

Tabel 3
Relationship between Knowledge and the Incidence of Pulmonary TB

Knowledge	Incidence of Pulmonary TB				Total		P Value
	Yes, Pulmonary TB Patient		No, not a pulmonary TB patient				
	F	%	F	%	F	%	
Less	38	33,9%	1	5,1%	39	39%	0,000
Simply	29	28,7%	4	4,3%	33	33%	
Good	6	10,4%	6	1,6%	12	12%	
Total	73	73%	11	11%	84	84%	

Source: Primary Data, 2023

From the day of statistical calculation, the chi-squere test value was obtained with a p-value = 0.000 with alpha (a) 0.05 p-value < alpha means Ha is accepted so it can be concluded that there is a significant relationship between knowledge and the incidence of Pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023.

3.2. Discussion

A. The relationship between education and the incidence of pulmonary TB at the Cimalaka Health Center, Sumedang Regency, 2023

It shows that there is a relationship between education and the incidence of pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023 with a p-value of 0.006 (less than the alpha value = 0.05), which means that Ha is accepted so that there is a significant relationship between education and the incidence of pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023. Research conducted by Ridwan, showed that there was a relationship between education level and the incidence of pulmonary tuberculosis at Palembang Lung Hospital in the January-December 2010 period, with a p-value of 0.005, (Ridwan, Yanti, & Sahfitri, 2012).

Another study conducted by Octavia showed a significant relationship between education and the incidence of pulmonary tuberculosis (p-value of 0.002). A low level of education has a risk of 3, 94 times of developing tuberculosis disease (OR = 3, 94). (Oktavia, Mutahar, & Destriatania, 2016). This study is not in line with the research of Prananda et al in 2017 which states that education level has no relationship with the incidence of pulmonary TB. The results of bivariate analysis obtained a p-value of 0.405 which means that there is no significant relationship between education and patients with BTA pulmonary TB, (Prananda et al, 2017). The level of education in this study was one of the characteristics tested for its association with the incidence of pulmonary TB at the Cimalaka Health Center. According to Notoatmodjo (2010), which states that behavior develops as a result of the previous education process through various stages until a behavior pattern is formed, supports the significance of this study. This shows how education indirectly affects a person's health.

In this study the majority of patients had a low education <MP, it can be interpreted that those with low education have less knowledge in the health sector, both directly and indirectly can affect and harm health and ultimately affect the high cases of Pulmonary TB. According to Ridwan et al, (2012), Patients who have low education are at risk of developing Pulmonary Tuberculosis disease 1.390 times greater than those with higher education. This proves that Pulmonary Tuberculosis does not only attack productive age groups, but can also attack people who have low education, and low socio-economic groups because the level of education itself can affect knowledge of Pulmonary tuberculosis.

B. The relationship between work and the incidence of pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023

There is a relationship between work and the incidence of pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023 with a p-value of 0.001 (less than the alpha value = 0.05), which means that Ha is accepted so that there is a significant relationship between work and the incidence of pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023.

This study is in line with the results of research by Dwi Santy Damayanti (2018), that there is a relationship between not working and the incidence of pulmonary TB with a p-value of 0.39, the results showed that the majority of case respondents were not working, (Dwi Santy Damayanti, 2018).

This study is also in line with the research of Faris Muaz, 2014 that the relationship between pulmonary TB disease and not working. The results of multivariate analysis obtained a p-value of 0.000 which indicates that there is an association between not working with the incidence of pulmonary TB, (Faris Muaz, 2014).

This study is not in line with research conducted by Loihala in 2015 which states that there is no relationship between the patient's work and the incidence of pulmonary tuberculosis with a probability value of p-value 0.793 these results indicate that work has no significant relationship with the incidence of pulmonary tuberculosis, (Loihala, 2015).

In this study, the majority of people with Lung TB are not working, people with Lung TB who do not work will have a poor economy or their economy tends to be down and will have difficulty getting treatment compared to people who work and have a good economy will try to immediately seek treatment information and try to consume good nutritional intake. According to Faris Muaz (2014), people with Lung TB who do not work have a chance to increase the incidence of BTA + Lung TB disease by 3.2 times compared to people who work.

C. Relationship between Knowledge and the incidence of Pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023

There is a relationship between knowledge and the incidence of Lung TB at the Cimalaka Health Center in 2023 with a p value of 0.000 (less than the alpha value = 0.05), which means that Ha is accepted so that there is a significant relationship between knowledge and the incidence of Lung TB at the Cimalaka Health Center, Sumedang Regency in 2023.

This study is in line with research conducted by Dwi Santy Damayanti (2018), which shows that there is a relationship between the level of knowledge and the incidence of pulmonary tuberculosis with a p-value of 0.026, which means that Ha is accepted so that there is a significant relationship between knowledge and the incidence of tuberculosis, (Dwi Santy Damayanti, 2018). This study is also in line with research conducted by Faris Muaz in 2014 which shows the results of bivariate analysis obtained a p-value of 0.022 there is a significant relationship between knowledge and patients with BTA + pulmonary TB, (Faris Muaz, 2014).

This study is not in line with research from Melisa Siregar, et al, (2012), on the relationship between knowledge and the incidence of Tuberculosis, the p-value of 0.617 means that there is no relationship between knowledge and the incidence of tuberculosis disease (Melisa Siregar, et al, 2012). This research is supported by Green's theory from Notoadmojo 2010 which states that knowledge can act as an initial motivator of behavior, behavior will last longer than behavior that is not based on one's knowledge.

The majority in this study were people with Lung TB who had low knowledge, which means that people with low levels of knowledge will increase the risk of developing Lung TB greater than people who have high levels of knowledge. The level of education of respondents is a determining factor of all health education processes. If the level of education is high, it will help patients to understand educational messages. Knowledge is the basic capital for a person to behave. According to Ade Heru Sutomo (2011), people with a low level of knowledge will increase the risk of developing TB by 1.857 times greater than people who have a high level of knowledge.

4. CONCLUSION

Based on the results of the research that has been carried out and has analyzed the data and discussed the factors associated with the incidence of Pulmonary TB at the Cimalaka Health Center, Sumedang Regency in 2023, the following conclusions can be drawn:

1. The results showed that educational factors in the incidence of pulmonary tuberculosis with a low education category were 50%.
2. The results showed that work factors in the incidence of pulmonary tuberculosis with the category not working 69%.
3. The results showed that the knowledge factor in the incidence of pulmonary tuberculosis with the category of less knowledge was 46.4%.
4. The results showed that the incidence of Pulmonary TB at the Cimalaka Health Center in 2023 was 86.9%.
5. There is a significant relationship between educational factors and the incidence of Pulmonary TB at the Cimalaka Health Center in 2023 with a *p* value of 0.006 ($p < 0.05$).
6. There is a significant relationship between work factors and the incidence of Pulmonary TB at the Cimalaka Health Center in 2023 with a p value of 0.001 ($p < 0.05$).
7. There is a significant relationship between knowledge factors and the incidence of Pulmonary TB at the Cimalaka Health Center in 2023 with a p value of 0.000 ($p < 0.05$).

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