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FACTORS AFFECTING THE HIGH EVENT OF LUNG TB IN NAGAN RAYA DISTRICT

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Abstract

Tuberculosis is an infectious disease caused by the bacterium Mycobacterium tuberculosis and is one of the top 10 causes of death worldwide. Indonesia is ranked second with the highest tuberculosis sufferers in the world after India. The survey results in August 2022 recorded 524 TB cases in Nagan Raya Regency, namely 331 men and 193 women. The purpose of this study was to analyze the relationship between the level of residential density, household contacts, and nutritional status on the incidence of pulmonary TB in Nagan Raya Regency. The type of research used is an analytic survey with a cross sectional design. Primary data obtained from the results of measurements and interviews using a questionnaire. The population in this study were 524 people with TB, the sample in this study amounted to 30 people with stratified random sampling. Analysis of research data is univariate and bivariate using Chi-Square test. The results showed that there was a relationship between residential density (Pvalue = 0.03 < 0.05), household contacts (Pvalue = 0.03 < 0.05), and nutritional status (P-value = 0.01 <0.05) with incidence of pulmonary TB.

Keywords: ***Household Contacts, Nutritional Status, Occupancy Density, Pulmonary TB***

INTRODUCTION

Tuberculosis is an infectious disease caused by the bacterium Mycobacterium tuberculosis and is one of the top 10 causes of death worldwide. Indonesia is ranked second with the highest TB sufferers in the world after India, globally it is estimated that 10 million people suffer from TB in 2019. Likewise with deaths from TB, the number of deaths in 2019 is 1.4 million, globally, deaths from TB per year. years has decreased globally but has not reached the strategic target of END TB in 2020 of 35% between 2015-2020, the cumulative number of deaths between 2015-2019 is 14%, which is less than half of the predetermined target (WHO, Global Tuberculosis Report, 2020).

In 2020, the number of Tuberculosis cases was around 351,936 cases, a decrease when compared to all Tuberculosis cases found in 2019 which was around 568,987 cases. The highest number of cases was reported from the provinces of West Java, East Java and Central Java, Tuberculosis cases in the three provinces almost reached half of the total number of Tuberculosis cases in Indonesia (46%). When compared by gender, the number of male cases is higher than that of women nationally and in each province. Even in Aceh, North Sumatra, and North Sulawesi, cases in males are almost twice that of females (Indonesian Health Profile 2020). In 2020, the most TB cases were found in the 45–54-year age group, which was 17.3%, followed by the 25–34-year age group at 16.8% and the 15–24-year age group at 17.7% (Directorate General of P2P, Ministry of Health, Republic of Indonesia 2021).

The government has implemented a Directly Observed Treatment Shortcourse (DOTS) strategy as an effort in the form of TB control. Pulmonary TB treatment is a government program that is relatively complex because of the long-term treatment time associated with the costs required, the risk of transmission increases. From an epidemiological perspective, seeing the occurrence of disease as a result of the interaction between the three components of the host (host), the cause (agent), and the environment (environment) can be observed the risk factors of these nodes. On the host side, susceptibility to Mycobacterium tuberculosis infection is strongly influenced by a person's immune system (Data and Information Center of the Ministry of Health of

the Republic of Indonesia, 2016; Indah, 2018). In epidemiology, factors that can cause health problems are human factors, place and time. Human factors are characteristics of individuals that affect sensitivity to a disease. Human characteristics can be in the form of genetic factors, age, gender, occupation, habits and socioeconomic status (Irwan, 2017). The magnitude of other health problems that can significantly affect the risk of TB such as HIV, poor nutrition, diabetes mellitus, smoking, and other conditions that cause a decrease in body resistance.

Various previous studies also state that there are several factors that can influence the increase in TB disease transmission, such as residential density, household contacts and nutritional status. Based on research conducted by Tri Dewi Kristini (2020) which states that the intensity of the respondent's contact with the patient is more than 8 hours / day as much as 71.4%. All respondents have a good level of occupancy density, meaning that the occupancy is not in the dense category. Respondents who smoked only 14.4%. Room ventilation as much as 97.1% has met health standards. The research conducted by Khaerun Nisa (2017) states that age, gender, education, occupation, population density, and residential lighting have an effect on the incidence of pulmonary TB while nutritional status and smoking have less effect. The results of another study conducted by Andi R, R (2020) also stated that healthy behavior, smoking, history of TB, contact history, comorbidities, and health expenditures were risk factors for an increase in pulmonary TB in the elderly.

The results of the preliminary survey in August 2022 in Nagan Raya district, there were 524 TB cases, namely 331 men and 193 women, the highest TB cases were in Darul Makmur sub-district as many as 185 people, and the lowest TB cases were there were in the district of Beutong Ateuh as many as 3 people. TB patients in Nagan Raya Regency generally have a secondary level of education up to basic education, this is also related to TB patients in Nagan Raya Regency who have low knowledge of TB on the basis of educational referrals. This case is also suffered by many agricultural workers and entrepreneurs, but some are also found in residents who work in the government or civil servants. There are many TB sufferers in the population who have a low economic level based on the level of education, knowledge, and non-permanent work.

Based on the description above, the researcher wants to conduct a study that aims to determine the factors that influence the incidence of pulmonary TB in Nagan Raya Regency based on the level of Occupancy Density, Household Contact and Nutritional Status.

RESEARCH METHODS

The type of research used is an analytic survey with a cross sectional design, which aims to determine the factors that influence the incidence of pulmonary TB in Nagan Raya Regency based on the level of Occupancy Density, Household Contacts and Nutritional Status. The research was carried out in three sub-districts in Nagan Raya Regency, namely Darul Makmur sub-district, Kuala sub-district and Seunagan sub-district in August-September 2022. The reason why this study was chosen is because in Nagan Raya district there are still high cases of pulmonary TB. Primary data collection was obtained from results of measurements, observations, and surveys. The instrument in this study used a questionnaire with the research population being all patients with pulmonary TB who were recorded at the Nagan Raya district health office as many as 524, the sample in this study amounted to 30 respondents, the sample was taken randomly with the stratified random sampling method. Data analysis using Chi-square test and Odds Ratio, data presentation is presented in the form of frequency distribution table and narrated.

DATA ANALYSIS METHOD

The methods of data analysis in this study are as follows:

1. Univariate Analysis

   Univariate analysis aims to describe the characteristics of each independent variable (occupancy density, household contacts, and nutritional status) and the dependent variable (pulmonary TB patients). The data is displayed in the form of a frequency distribution table.

2. Bivariate Analysis

   Bivariate analysis aims to determine the relationship between two variables, namely the independent variable (occupancy density, household contacts, and nutritional status) and the dependent variable (pulmonary TB patients) using the Chi-Square test. This statistical test uses a significant level with $p = 0.05$. Where if the value ($p < 0.05$) then Ha is accepted, and Ho is rejected indicating that there is an influence between the independent variable and the dependent variable.

RESULTS AND DISCUSSION

Characteristics of Respondents

1. Age

Table 1. Frequency distribution of respondent characteristics by age in Nagan Raya district

Respondent Age	Frequency	Percentage%
23-44 Year	12	40 %
45-66 Year	18	60%
Total	30	100%

Table 1 shows that the highest number of respondents was 18 people (60%) aged 45-66 years, and the lowest number of respondents was 12 people (40%) aged 23-44 years.

2. Gender

Table 2. Frequency distribution of respondent characteristics by gender in Nagan Raya district

Gender	Frequency	Percentage%
Male	18	60%
Female	12	40%
Total	30	100%

Table 2 shows that the highest number of respondents was 18 people (60%) male, and the lowest number of respondents was 12 people (40%) female.

3. Education

Table 3. Frequency distribution of respondent characteristics by education in Nagan Raya district

Education	Frequency	Percentage%
Elementary School	14	46,7%
Junior High School	10	33,3%
Senior High School	6	20%
Total	30	100%

Table 3 shows that the highest number of respondents is 14 people (46.7%) with elementary school education, and the lowest number of respondents is 6 people (20%) with high school education.

4. Profession

Table 4. Frequency distribution of respondent characteristics by occupation in Nagan Raya district

Profession	Frequency	Percentage%
Doesn't Work	8	26,7%
Farmer	14	46,7%
Entrepreneurs/Traders	8	26,7%
Total	30	100%

From the results of table 4 shows that the highest number of respondents as many as 14 people (46.7%) work as farmers, and the lowest number of respondents as many as 8 people (26.7%) work as entrepreneurs/traders and 8 people (26.7%) others doesn't work.

Univariate Analysis

Table 5. Frequency distribution of respondents based on occupancy density. Household contacts and nutritional status in Nagan Raya district

Variable	Frequency	Percentage%
Occupancy Density		
Congested	17	56,7%
Not Solid	13	43,3%
Total	**30**	**100%**
Household Contact		
Positive	17	56,7%
Negative	13	43,7%
Total	**30**	**100%**
Nutrional Status		
Normal	11	36,7%
Abnormal	19	63,3%
Total	**30**	**100%**
Pulmonary TB		
Pulmonary TB	16	53,3%
No Pulmonary TB	14	46,7%
Total	**30**	**100%**

From the results of table 5 we can see that the occupancy density of the total number of respondents who have dense occupancy is 17 people (56.7%) and those who have non-dense occupancy are 13 people (43.3%). Respondents who had positive household contacts were 17 people (56.7%) and 13 people had negative household contacts (43.3%). Respondents who have normal nutritional status are 11 people (36.7%) and those who have abnormal nutritional status are 19 people (63.3%). Respondents who had pulmonary TB were 16 people (53.3%) and 14 people did not have pulmonary TB (46.7%).

Bivariate Analysis

Table 6. Relationship of respondent occupancy density with the incidence of pulmonary TB in Nagan Raya district

Occupancy Density	Pulmonary TB		Total	P_{value}	RP Ci 95%
	Pulmonary TB	No Pulmonary TB			
Congested	**12(40%)**	**5(16,7%)**	**17(56,7%)**	**0,03**	**5,4 (1,12-26,04)**

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Not Solid	**4(13,3%)**	**9(30%)**	**13(43,3%)**
Total	**16(53,3%)**	**14(46,7%)**	**30(100%)**

From the results of table 6 shows that respondents who have dense housing with pulmonary TB as many as 12 people (40%), respondents who have dense housing and do not have pulmonary TB as many as 5 people (16.7%), respondents who have non-dense housing with 4 people have pulmonary TB (13.3%), 9 people (30%). The results of research conducted using the Chi-Square Test got a P-value of 0.03, so that the p-value <0.05, so it can be concluded that there is a significant relationship between occupancy density and the incidence of pulmonary TB. Respondents who have dense housing have a 5.4 times higher risk of pulmonary TB transmission than those who do not have dense housing.

Table 7. Relationship of household contacts with the incidence of pulmonary TB in Nagan Raya district

Household Contact	Pulmonary TB		Total	P_{value}	RP CI 95%
	Pulmonary TB	No Pulmonary TB			
Positive	**12 (40%)**	**4(13,3%)**	**16 (53,3%)**	**0,03**	**5,4 (1,12-26,04)**
Negative	**5(16,7%)**	**9(30%)**	**14 (46,7%)**		
Total	**17(56,7%)**	**13(43,3%)**	**30 (100%)**		

From the results of table 7 shows that respondents who had positive household contacts with pulmonary TB were 12 people (40%), respondents who had positive household contacts with no pulmonary TB were 4 people (13.3%), respondents who had negative household contacts with had Pulmonary TB as many as 5 people (16.7%), respondents who had negative household contacts and did not have pulmonary TB as many as 9 people (30%). The results of research conducted using the Chi-Square Test got a P-value of 0.03, so that the p-value <0.05, so it can be concluded that there is a significant relationship between household contacts and the incidence of pulmonary TB. Respondents who had positive household contacts had a 5.4 times higher risk of pulmonary TB transmission than those who had negative household contacts.

Table 8. The relationship between the nutritional status of respondents and the incidence of pulmonary TB in Nagan Raya district

Nutrional Status	Pulmonary TB		Total	P_{value}	RP Ci 95%
	Pulmonary TB	No Pulmonary TB			
Normal	**9(30%)**	**2(6,7%)**	**11(36,7%)**	**0,01**	**7,7 (1,28-46,36)**
Abnormal	**7(23,3%)**	**12(40%)**	**19(63,3%)**		
Total	**16(53,3%)**	**14(46,7%)**	**30(100%)**		

From the results of table 8 shows that respondents who have normal nutritional status by having pulmonary TB are 9 people (30%), respondents who have normal nutritional status and do not have pulmonary TB are 2 people (6.7%), respondents who have nutritional status abnormal with having pulmonary TB as many as 7 people (23.3%), respondents who have abnormal nutritional status and do not have pulmonary TB as many as 12 people (40%). The results of the research conducted using the Chi-Square Test got a P-value of 0.01, so that the p-value <0.05, so it can be concluded that there is a significant relationship between nutritional status and the incidence of pulmonary

TB. Respondents who have abnormal nutritional status are at risk of 7.7 times higher for pulmonary TB transmission than those who have normal nutritional status.

DISCUSSION

The relationship between respondents' residential density and the incidence of pulmonary TB in Nagan Raya District

The results showed that respondents who had dense housing with pulmonary TB were 12 people (40%), respondents who had solid housing and did not have pulmonary TB were 5 people (16.7%), respondents who had non-dense housing had TB. lung as many as 4 people (13.3%), respondents who have non-dense housing with no pulmonary TB as many as 9 people (30%). The results of the research conducted using the Chi-Square Test got a P-value of 0.03, so that the p-value <0.05, so it can be concluded that there is a significant relationship between occupancy density and the incidence of pulmonary TB in Nagan Raya district.

This study is in line with research conducted by Andi Mauliyana et al, which states that from the results of statistical tests there is significance, and the Odds Ratio is a relationship between occupancy density and the incidence of pulmonary TB with P value < 0.05 (P value = 0.027 and OR = 2.544). This study is also in line with research conducted by Samuel et al, the results of his research stated that occupancy density is a risk factor for pulmonary TB with the most dominant variable on the incidence of pulmonary TB with an OR value of 0.328 Ci 0.154-0.695 with a P-value of 0.006 <0.05

Based on the results of the study, the researchers assumed that respondents who have dense and non-dense housing have a relationship with the incidence of pulmonary TB, it can be stated that the process of transmission of pulmonary TB will occur quickly if they are or live in crowded or crowded housing.

Relationship of household contacts with the incidence of pulmonary TB in Nagan Raya district

The results showed that respondents who had positive household contacts with pulmonary TB were 12 people (40%), respondents who had positive household contacts with no pulmonary TB were 4 people (13.3%), respondents who had negative household contacts with had pulmonary TB as many as 5 people (16.7%), respondents who had negative household contacts with no pulmonary TB were 9 people (30%). The results of the research conducted using the Chi-Square Test got a P-value of 0.03, so that the p-value <0.05, so it can be concluded that there is a significant relationship between household contacts and the incidence of pulmonary TB in Nagan Raya district.

This study is in line with research conducted by Mardiah et al, which stated that more than half (64.4%) of household contacts had tuberculosis in children, there was a relationship between household contacts and the incidence of pulmonary TB with a p-value of 0.00 < 0.05.. This study is also in line with research conducted by Dinar which states that the results of the Chi-Square test have a relationship between contact history and the incidence of TB in children of p-value 0.000 <0.05.

Based on the results of the study, the researchers assumed that respondents who had positive and negative household contacts had a relationship with the incidence of pulmonary TB, the process of transmitting pulmonary TB would be more easily infected if we were exposed to pulmonary TB patients, resulting in the incidence of pulmonary TB increasing rapidly.

The relationship between the nutritional status of respondents and the incidence of pulmonary TB in Nagan Raya district

The results showed that respondents who had normal nutritional status by having pulmonary TB were 9 people (30%), respondents who had normal nutritional status and did not

have pulmonary TB were 2 people (6.7%), respondents who had abnormal nutritional status by having pulmonary TB as many as 7 people (23.3%), respondents who have abnormal nutritional status and do not have pulmonary TB as many as 12 people (40%). The results of the research conducted using the Chi-Square Test got a P-value of 0.01, so that the p-value <0.05, so it can be concluded that there is a significant relationship between nutritional status and the incidence of pulmonary TB in Nagan Raya district.

The research is in line with the research conducted by Nabilla et al, the results of the study state that there is a relationship between nutritional status and the incidence of pulmonary tuberculosis in children aged 1-5 years in Indonesia. This study is also in line with research conducted by Yudi et al. The results showed that there was a relationship between nutritional status and the incidence of pulmonary TB in the work area of the Kawatuna Public Health Center, Palu City.

Based on the results of the study, the researcher assumes that respondents who have normal and abnormal nutritional status have a relationship with the incidence of pulmonary TB, someone who has abnormal nutritional status can affect the body's resistance so that it can easily be attacked by infectious diseases, one of which is pulmonary TB.

CONCLUSION

Based on the results of research on the relationship between residential density, household contacts and nutritional status with the incidence of pulmonary TB in Nagan Raya district, it can be concluded that there is a significant relationship between residential density and pulmonary TB with a P value < (0.05). There is a significant relationship between household contacts with pulmonary TB with a P value < (0.05). There is a significant relationship between nutritional status and pulmonary TB with a P value < (0.05) in Nagan Raya district.

SUGGESTION

1. For respondents
   1) Due to the fact that in Nagan Raya district there are still many cases of pulmonary TB, it is hoped that further research on cases of pulmonary TB can be found in order to find cases that have not been identified by the relevant parties.
2. For health workers
   1) For health workers at puskesmas and at the health office, it is necessary to provide counseling to the community, especially in Nagan Raya district about the causes of occurrence and the process of transmission of pulmonary TB
   2) There is an increase in health programs by evaluating the programs that have been implemented, which aims to see whether the programs that have been implemented are running well or not, especially in the pulmonary TB program.

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