Determinants Of Pulmonary Tuberculosis Incidence In Sintang District

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Abstract.
Pulmonary tuberculosis is an infectious disease that is still endemic in society. The research sites were in the villages of Tanjung Ria, Tanjung Hulu and Sungai Raya, Sepauk District, Sintang District, with a total of 78 cases of tuberculosis, consisting of old cases and new cases.The purpose of this study was to determine the factors causing the incidence of pulmonary tuberculosis in the community. This type of research is quantitative with a case control approach method retrospective. The sample in the study for the case group used the total sampling technique and the accidental sampling control group. Analysis using chi square significance level of 0.05. The results showed that there was a relationship between house ventilation and the incidence of pulmonary tuberculosis (OR=4.521), there was a relationship between the humidity of the house and the incidence of pulmonary tuberculosis (OR=4.343), there was a relationship between the floor of the house and the incidence of pulmonary tuberculosis (OR=4.000), there was a relationship between lighting and the incidence of pulmonary tuberculosis (OR=4.169), there is a relationship between house occupancy density and the incidence of pulmonary tuberculosis (OR=4.640), there is a relationship between work and the incidence of pulmonary tuberculosis (TB) (OR=3.571), there is a relationship between income and the incidence of pulmonary tuberculosis (TB) (OR=9,277). Recommended for Communities in Tanjung Ria, Tanjung Hulu and Sungai Raya Villages, Sepauk District, Sintang District need to maintain compliance with housing sanitation standards and increase their economic level so that they become examples for communities in other villages.

Keywords: *House sanitation, Economic Level and Pulmonary Tuberculosis Incidence.*

I. INTRODUCTION

Tuberculosis is a lung infection disease caused by infection with Mycobacterium tuberculosis. This disease is still a world health problem. In 1992 the World Health Organization (WHO) declared tuberculosis a "Global/Emergency" disease[1]. Tuberculosis is an infectious disease caused by the bacterium Mycobacterium tuberculosis, this bacterium usually attacks the lungs, but tuberculosis bacteria can attack any part of the body such as the kidneys, spine and brain. Tuberculosis is one of the top 10 causes of death and the main killer of HIV sufferers worldwide[2].Globally, in 2017 the highest number of tuberculosis cases occurred in the Southeast Asia and West Pacific regions with 62% of new cases, followed by the African region with 25% of new cases. Tuberculosis cases occur in 30 countries by 87%, eight countries account for two-thirds of new tuberculosis cases, namely India, China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh and South Africa.) for the 3 indicators namely TBC, TBC/HIV and MDR-TB[3].Indonesia has a big problem in dealing with tuberculosis. Tuberculosis cases in Indonesia in the last three years have experienced a trend because cases continue to increase every year. In 2015 the number of tuberculosis cases found was 330,910 cases, in 2016 there were 360,565 cases and in 2017 there were 425,089 cases. Based on the 2013-2014 Tuberculosis Prevalence Survey, the prevalence of tuberculosis with bacteriological confirmation in Indonesia was 759 per 100,000 population aged 15 years and over and the prevalence of positive Acid-resistant Bacterial tuberculosis was 257 per 100,000 population aged 15 years and over[4].
Based on the report of the Infectious Disease Prevention and Control section of the West Kalimantan Provincial Health Office, there were 3,463 new cases of pulmonary TB with an incidence rate of 70.21 per 100,000 population[8].

Pulmonary TB cases in Sintang District in 2018 were 447 cases per 100,000 population[9]. Pulmonary TB sufferers in the working area of the Sepauk Health Center in the fourth quarter of 2018 found 25 pulmonary TB sufferers and in the first quarter of 2019 there were 35 pulmonary TB sufferers, resulting in

an increase in the incidence of pulmonary TB from the previous year[5].The main cause of the increasing burden of problems tuberculosis Lungs include low socio economic burden, social determinant burden, failure of the tuberculosis program, demographic changes, the magnitude of other health problems, the impact of the HIV pandemic, MDR TB (multidrug resistance), and sanitary conditions[6]. Research from Komang and Wayan (2018) says that there is a relationship between home sanitation and incidents tuberculosis pneumonia in West Denpasar II Health Center6, as well as research conducted by Mudana et al (2017) said that home sanitation such as: lighting, humidity, ventilation, occupancy density and floor of the house is one of the factors that play a role in the spread oftuberculosislungs[7].The purpose of this study was to find out the factors that cause the incidence of pulmonary tuberculosis such as house ventilation, house humidity, house floors, house lighting, house occupancy density, work and income.

II. METHODS

The type of research used in this research is researchThis research is a quantitative research. The design of this research is an analytic survey.The data collection method in this study iscase control (case control) retrospective approach.In this researchcase control (case control) retrospective approachdone for knowing the relationship between house ventilation, house humidity, house floors, house lighting, house occupancy density, work and income on the incidence of pulmonary tuberculosis, with collect and analyze the secondary data obtainedfrom patient medical recordstuberculosisLung Health Center Sepauk Sintang District and primary data obtained by researchers in filling out the questionnaire. Data analysis technique isdata were analyzed univariate, bivariate using the help of the IBM SPSS Statistics 21 application. The univariate analysis aims to see variations in exogenous variables and endogenous variables which are displayed in the form of frequency tables. Bivariate analysis aims to see the relationship between the independent variable and the dependent variable. To see the relationship between X1 (house sanitation) and Y (incidenttuberculosislungs) and X2 (economic level) against Y (eventtuberculosislungs) using the chi square test with a significance level of $\alpha = 0.05$.

III. RESULTS AND DISCUSSION

Based on table 1. Regarding the characteristics of respondents according to gender, age, education, occupation and income as follows:

Table 1. Distribution of Respondent Characteristics According to Gender, Age, Education, Occupation and income

Variable		Frequency	Percentage (%)
Gender			
	Man	37	47,4
	Woman	41	52,6
	Total	78	100
Work	Doesn't work	40	51,3
	Work	38	51,3
	Total	78	100
Income	Under UMK	49	62,8
	Above UMK	29	37,2
	Total	78	100
Age			
	< 30 Years	16	20.5
	> 30 Years	62	79.5
	Total	78	100
Education			
	Never went to school	13	16,7
	Not completed in primary school	4	5,1
	Graduated from elementary school	22	28,2
	Middle school graduate	25	32,1
	Graduated from high school	14	17,9
	Total	78	100

Based on table 1, the distribution of the characteristics of respondents according to gender can be seen by the number of male respondents, namely 37 people or 47.4% and female respondents, namely 41 people or 52.6%. The distribution of characteristics of respondents aged <30 years amounted to 16 people or 20.5% and respondents aged > 30 years amounted to 62 people or 79.5%. While the characteristics of respondents who had never attended school were 13 people or 16.7%, respondents who did not finish elementary school were 4 people or 5.1%, respondents who had graduated from elementary school were 22 people or 28.2%, respondents who were junior high school graduates were 25 people or 32.1%, and respondents who graduated from high school were 14 people or 17.9%, respondents who did not work were 40 people or 51.3% and respondents who were working were 38 or 48.

Based on table 2 about the condition of the respondent's residence according to house ventilation, house humidity, house floors, house lighting and house occupancy density.

Table 2. Frequency distribution of respondents' residence according to house ventilation, house humidity, house floors, house lighting, house occupancy density

Variable	Frequency	Percentage (%)
Home ventilation		
Not eligible	49	62,8
Qualify	29	37,2
Total	78	100
house humidity		
Not eligible	52	66,7
Qualify	26	33,3
Total	78	100
House floor		
Does not meet the requirements	45	50.0
Qualified	39	50,0
Total	78	100
Home lighting		
Does not meet the requirements	45	57.7
Meets the requirements	33	42.3
Total	78	100
Residential density		
Does not meet the requirements	44	55.4
Qualified	34	43,6
Total	78	100

Based on table 2 obtainedthe number of ventilation that does not meet the requirements is 49 or 62.8% and ventilation that meets the requirements is 29 or 37.2%, the humidity of the house that does not meet the requirements is 52 or 66.7% and ventilation that meets the requirements is 26 or 33.3 %, house floors that do not meet the requirements are 39 or 50.0% and house floors that meet the requirements are 39 or 50.0%, house lighting that does not meet the requirements is 45 or 57.7% and lighting that meets the requirements is 33 or 42.3%, most of them have a density of occupancy that does not meet the requirements with a frequency of 44 or 55.4% and the density of occupancy that meets the requirements is 34 or 43.6%.

Based on table 3 to determine the relationship of independent variables (house ventilation, house humidity, house floors, house lighting, house occupancy density, employment and income) with the dependent variable (pulmonary tuberculosis incidence).

Table 3. Relationship between house ventilation, house humidity, house floor, house lighting, house occupancy density, employment and incomewith pulmonary tuberculosis

Research variable	Tuberculosis incident Lungs				Total		OR 95% (CI)	P-value
	Case		Control					
	n	%	n	%	n	%		
Home Ventilation								
Not eligible	31	79.5	18	46,2	49	62,8	4,521 (1,663-12,292)	0.002
Qualify	8	20.5	21	53,8	29	37,2		
Total	39	100	39	100	78	100		

Home Humidity								
Not eligible	32	82,1	20	51,3	52	66,7	4,343	0.004
Qualify	8	17,9	19	48,7	26	33,3	(1,549-12,178)	
Total	39	100	39	100	78	100		
House floor								
Not eligible	26	66,7	13	33,3	39	50.0	4,000	0.003
Qualify	13	33,3	26	66,7	39	50.0	(1.560-10.256)	
Total	39	100	39	100	78	100		
Home Lighting								
Not eligible	29	74,4	16	41.0	45	54,7	4,169	0.003
Qualify	10	25,6	23	59.0	33	42,3	(1,594-10,900)	
Total	39	100	39	100	78	100		
Residential Density								
Not eligible	26	74,4	15	38.5	44	56,4	4,640	0.001
Qualify	10	25,6	24	61.5	35	43,6	(1,766-12,189)	
Total	39	100	39	100	78	100		
Work								
Doesn't work	20	51,3	11	28,2	31	39,7	3,571	0.007
Work	19	48,7	28	71.8	47	60,3	(1,404-9,083)	
Total	39	100	39	100	78	100		
Income								
Under UMK	20	51,3	33	84.6	53	67,9	9,277	0.002
Above UMK	19	48,7	6	15,4	25	32,1	(1,663-12,292)	
Total	39	100	39	100	78	100		

This research is in line with research from Made, Nyoman and Pujaastawa (2017) entitled The Relationship between Home Sanitation and Pulmonary Tuberculosis in Kuta District. The results showed that there was a significant relationship between home ventilation and the incidence of TB in Kuta District as indicated by the OR value of 11. According to the results of Made, Nyoman and Pujaastawa research, respondents who had home ventilation that did not meet the requirements were at risk of 11 times suffering from pulmonary TB compared to respondents who had have house ventilation that meets the requirements. Home ventilation is a means of air exchange so that the air in the room remains clean and fresh. In addition, ventilation also functions as a place to free the air in the room from pathogenic bacteria. Lack of ventilation can cause the humidity level in the room to rise. Mycobacterium tuberculosis bacteria can survive longer in a damp place[7].To get good ventilation and ventilation for a house or room, there are several conditions that must be met, namely: (1) The ventilation area is 10% of the floor area of the room, (2) the incoming air must be clean (not polluted by smoke from garbage, factory, vehicle exhaust, dust and others), (3) do not place the bed directly on the air stream, for example in front of a window or door.Discussion of home ventilation also plays an important role in improving public health status because the more houses that have ventilation that meets health requirements, the higher the health status. Poor house ventilation can increase the incidence of pulmonary tuberculosis (TB), so that the villages of Tanjung Ria, Tanjung Hulu and Sungai Raya have higher incidence rates of pulmonary tuberculosis (TB) than other villages.This research is in line with research from I Nyoman Gede (2014) entitled "The Relationship Between Home Sanitation and Pulmonary Tuberculosis in Bangli Regency in 2012".

The results of this study say that there is a relationship between room humidity and the incidence of pulmonary tuberculosis as indicated by the value of OR = 5.808. Respondents who have high levels of room humidity are at risk of suffering from pulmonary tuberculosis 5,808 times[11].Home humidity is closely related to home ventilation because air circulation that is not smooth will affect room temperature and cause high humidity in the room. High room humidity will be a good medium for the growth and multiplication of pathogenic bacteria including mycobacterium tuberculosis. Room humidity standards according to the standards of RI Minister of Health No.829/Menkes/SK/VII/1999 range between 40% -70%. Or more precisely, healthy humidity, namely 18˚-30˚ C.Home humidity also plays an important role in improving people's health status because the more houses that have low humidity, the higher the health status. High

humidity at home can increase the incidence of pulmonary tuberculosis, so that the villages of Tanjung Ria, Tanjung Hulu and Sungai Raya have higher incidence rates of pulmonary tuberculosis than other villages.This research is in line with research from Anggie M. Rosdiana (2013) entitled The Relationship between the Physical Conditions of the House and the Incidence of Pulmonary Tuberculosis. The results of the study found that there was a relationship between the physical condition of the house and the incidence of pulmonary tuberculosis with OR = 4.792. Respondents who have a floor that does not meet the requirements have a 4,782 times the risk of suffering from pulmonary tuberculosis[12].The floor of the house is a component that must be met by a healthy home with the condition that the floor is waterproof, not damp and easy to clean. A damp floor will be a good place for germs to breed pulmonary tuberculosis germs. Types of floors of various kinds of houses depending on the level of economy owned.The floor of the house also plays an important role in improving the health status of the community because the more houses that have floors that are watertight and dust free, the higher the health status.

House floors that are not watertight and difficult to clean can increase the incidence of pulmonary tuberculosis, so that Tanjung Ria, Tanjung Hulu and Sungai Raya villages have a higher incidence of pulmonary tuberculosis than other villages.This research is in line with research from Anggie M. Rosdiana (2013) entitled The Relationship between the Physical Conditions of the House and the Incidence of Pulmonary Tuberculosis. The results of the study found that there was a relationship between room lighting and the incidence of pulmonary tuberculosis as indicated by the value of OR = 3.889. Respondents who have less lighting levels are at risk of suffering from pulmonary tuberculosis 3,889 times[12].A healthy home requires sufficient light, not too little and not too much. Lighting is very closely related to the level of humidity in the house. Sunlight is very important to enter the house, because it can kill pathogenic bacteria, especially mycobacterium tuberculosis. Lack of light entering the room, especially sunlight, is a medium or a good place for the development of germs. Based on the Decree of the Minister of Health No. 829/menkes/SK/VII/1999 concerning housing requirements, the house must have sufficient lighting both day and night. The minimum intensity of sunlight entering the house is 60 lux, provided that it is not dazzling.Room lighting also plays an important role in improving public health status because the more houses that have sufficient lighting, the less the incidence of pulmonary tuberculosis so that the level of health can be increased.This research is in line with research from I Nyoman Gede (2014) entitled "The Relationship Between Home Sanitation and Pulmonary TB Incidence in Bangli Regency in 2012". The results of this study say that there is a relationship between the occupancy of the house and the incidence of pulmonary tuberculosis in Bangli Regency which is indicated by the value of OR = 3.361.

Respondents who have residential density that does not meet the requirements have a risk of 3,889 times suffering from pulmonary tuberculosis.Occupancy density plays a very important role in terms of disease transmission, especially diseases that are transmitted through the air. Residential density is the ratio between the floor area and the number of family members in one house. The density of occupants in one residence will have an effect on the occupants. The denser the occupants of the house, the faster the air in the house will be polluted. Residential density that meets health requirements is based on the quotient between the floor area and the number of occupants, which is >10 m^2/person. Residential density also plays an important role in improving public health status because the more houses that have sufficient lighting, the less the incidence of pulmonary tuberculosis so that the health status can increase.This research is in line with research from Risto, Imam and Naharaini (2013) entitled The Relationship between Socio-Economic Level and the Incidence Rate of Positive Acid-resistant Bacteria Lung Tuberculosis in the Work Area of the Peterongan Jombang Health Center in 2012. The results of this study, there is a significant relationship between work and the incidence Positive smear pulmonary TB indicated by a p-value of 0.002. So that it can be said that someone who works eats his economic needs will be fulfilled[13].Work is an activity to produce goods and services. Work will determine socio-economic status because by working all needs will be fulfilled. Someone works to meet their basic needs which consist of clothing, clothing, shelter, as well as meeting primary needs. Occupation also plays an important role in improving public health status because the higher the economic level of the community, the lower the incidence of pulmonary tuberculosis so that the degree of health can be increased.

This study is in line with research from Faris Muaz (2014) entitled Factors Influencing the Incidence of Acid-Positive Basil Lung Tuberculosis at Community Health Centers in the District of Serang City in 2014. The results of multivariate analysis, the variable that most influences the incidence of positive acid-resistant bacterial pulmonary tuberculosis is income. (OR=6.575), gender (OR=4.772), occupation (OR=3.272) and immunization (OR=3.041)[14].Work and income are two things that are interrelated. Income is money or wages received for work performed. Income can be categorized in the form of money and in kind. For Sintang District/City Minimum Wage, namely Rp.2,392,864. Income also plays an important role in improving the health status of the community because the higher the economic level of the community, the lower the incidence of pulmonary tuberculosis so that the health status can be increased.

IV. CONCLUSION

That there is a relationship between house ventilation and the incidence of pulmonary tuberculosis (OR=4.521), there is a relationship between house humidity and the incidence of pulmonary tuberculosis (OR=4.343), there is a relationship between the floor of the house and the incidence of pulmonary tuberculosis (OR=4.000), there is a relationship between lighting and the incidence of pulmonary tuberculosis (OR=4.169), there is a relationship between occupancy density and the incidence of pulmonary tuberculosis (OR=4.640), there is a relationship between work and the incidence of pulmonary tuberculosis (TB) (OR=3.571), there is a relationship between income and the incidence of pulmonary tuberculosis (TB) (OR= 9.277). Recommended for Communities in Tanjung Ria, Tanjung Hulu and Sungai Raya Villages, Sepauk District, Sintang District need to maintain compliance with housing sanitation standards and increase their economic level so that they become examples for communities in other villages.

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