Factors Related to the Incidence of Tuberculosis in Garuda Health Center Bandung, West Java Province, Indonesia

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Abstract

Background: Tuberculosis is an infectious disease caused by Mycobacterium tuberculosis that has infected nearly a third of the world's population. Puskesmas Garuda is the Puskesmas with the highest number of tuberculosis cases in the city of Bandung. Efforts have been made, but have not been able to overcome the incidence of tuberculosis..

Objectives: This study aims to look at the influence of knowledge, nutritional status and smoking habits on the incidence of tuberculosis..

Methods: The method in this study is a quantitative method with Cross Sectional design. The population in this study was patients who visited and registered in the patient register at Garuda Health Center. A sample of 95 respondents was taken using a large sampling technique of varying proportions. The sampling technique in this study is using simple sandom sampling techniques. The statistical test used is the chi square test.

Results: Variables that have been shown to affect the incidence of tuberculosis are knowledge (p=0.018), nutritional status (p=0.012), and smoking (p=0.000). (p=0,000).

Conclusion: The prevalence of tuberculosis is 41.1%. Factors of the risk of tuberculosis are knowledge, nutritional status and numbness of smoking. People who are knowledgeable about tuberculosis. It is recommended that health workers are advised to increase preventive and promotive efforts through counseling about the risk factors of tuberculosis incidence to the public to increase public knowledge in order to reduce the risk of tuberculosis infection.

Keywords: *Tuberculosis, knowledge, nutritional status, smoking*

Introduction

Tuberculosis is an infectious disease caused by Mycobacterium tuberculosis that has infected nearly a third of the world's population and is the ninth leading cause of death in the world. In 2016 there were 10.4 million cases of tuberculosis, 90% of cases occurred in adults, 65% occurred in men, and 10% with cases of TB-HIV.[1]

In Indonesia in 2016 there were 156,723 new cases of tuberculosis, with the most cases in men at 61%, and the most cases occurring in the age group of 45-54 years as many as 19.82%. The highest number of reported cases was in West Java province with a new number of cases of tuberculosis as many as

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23,774 cases. While the success rate of tuberculosis treatment as much as 74.5%, while in West Java as much as 64.3%. In 2018 the first highest tuberculosis cases were in west Java Province with 99,398 cases, Central Java 67,063 cases and in East Java 56,445 cases. CDR (case detection rate) West Java 77.7%, CNR (Case Notification Rate) West Java 204/100,000 population.[2]

Tuberculosis cases in the city of Bandung are as many as 10,003 cases. The high number of tuberculosis cases due to lack of public awareness in how to cope with tuberculosis cases so that there are still many people affected by pulmonary tuberculosis and the discovery of cases every year continues to increase. A person with high positive levels of tuberculosis has the potential to transmit tuberculosis, because each positive will transmit to 10-15 other people, so the possibility of closest contact such as family home will be twice as risky as regular contact.[3]

The epidemiological perspective looks at the incidence of disease as the result of interactions between the three components of the host, the cause (agent), and the environment (environment) can be examined the risk factors of the nodes. On the devotee side, susceptibility to Mycobacterium tuberculosis infection is greatly affected by a person's endurance at the time.[4] Tuberculosis germ infection will occur when others breathe air that contains sputum sprinkles of people infected with tuberculosis. Some factors that affect the transmission of tuberculosis in general include the proximity of contact with the source of transmission, the length of time of contact with the source of transmission and the concentration of germs in the air.[3]

Based on the results of preliminary studies that have been conducted that there are still many people infected with tuberculosis in the working area of Garuda Health Center due to several factors such as many people who think tuberculosis disease is not dangerous, so prevention in the community is very low. Efforts made in tackling the emergence of tuberculosis cases, namely health center officials conduct a direct review to the community to find and prevent the occurrence of tuberculosis. However, these activities are still not able to cope with the number of new cases in the working area of Garuda health center. Garuda is the health center with the highest number of tuberculosis cases in the city of Bandung, which is 276 cases of tuberculosis sufferers with a male sex of 48 people and women 40 people. This study aims to look at the influence of knowledge, nutritional status and smoking habits on the incidence of tuberculosis.

Material and Methods

The method in this study is a quantitative method with Cross Sectional design. The independent variables in the study were age, education, socioeconomic, smoking habits. The population in this study was patients who visited and registered in the patient register at Garuda Health Center. A sample of 95 respondents was taken using a large sampling technique of varying proportions. The sampling technique in this study is using simple sandom sampling techniques.

The data was collected using questionnaires. The data analysis used is a descriptive analysis to look at the distribution of frequency and percentage characteristics of respondents (age, gender, education, and occupation), incidence of tuberculosis, knowledge, nutritional status and smoking habits. Subsequent analyses used chi-square tests to look at the influence of knowledge, nutritional status and smoking habits on the incidence of tuberculosis.

Findings

Table 1. Characteristics of Respondents

Characteristics of Respondents	n	Percentage
Age		
10-20	3	3,2
21-30	7	7,4
31-40	20	21,1
41-50	25	26,3
51-60	35	36,8
> 60	5	5,3
Gender		
Man	55	57,9
Woman	40	42,1
Education		
Elementary school	24	25,3
Middle School	36	37,9
High school	26	27,4
College	9	9,5
Work		
Not	30	31,6
Yes	65	68,4
Total	**95**	**100**

Table 1 above explains that more respondents in the age group of 51-60 years (36.8%), Most of the male sex (57.9%), more respondents with junior high school education (37.9%), and most work (68.4%).

Table 2. Overview of tuberculosis, Knowledge, Nutritional Status and Smoking Habits in Garuda Health Center, Bandung City

Variable	n	Percentage
Tuberculosis		
Yes	39	41,1
Not	56	58,9
Knowledge		
Low	40	42,1
Tall	55	57,9
Nutritional Status		
Thin	76	80,0
Normal	18	20,0
The habit of smoking		
Smoke	53	55,8
No smoking	42	44,2
Total	95	100

Table 2 above explains that most respondents do not have tuberculosis (58.9%), low knowledge levels (57.9%), nutritional status in the skinny category (80%), and more than half of respondents are active smokers (55.8%).

Table 3. The Effect of Knowledge, Nutritional Status and Smoking Habits on the Incidence of Tuberculosis

Risk Factors	Incidence of Tuberculosis				Total		P-Value	PR (95% CI)
	Yes		Not					
	n	%	n	%	n	%		
Knowledge								
Low	22	55,0	18	45,0	40	100	0,018	1,779 (1,096-2,889)
Tall	17	30,9	38	69,1	55	100		
Nutritional Status								
Thin	36	47,4	40	52,6	76	100	0,012	1,600 (1,199-2,136)
Normal	3	15,8	16	84,2	19	100		
The habit of smoking								
Smoke	31	58,5	22	41,5	53	100	0,000	1,950 (1,372-2,772)
No smoking	8	19,0	34	81,0	42	100		

Table 3 above explains that the risk factors that affect the incidence of tuberculosis are knowledge (p =0.018), nutritional status (p=0.012), and smoking (p=0.000).

Discussion

To overcome high cases of tuberculosis in Indonesia, the government has launched various health programs to help prevention and treatment, one of which is by immunization bacillus calmette guerin (BCG) in infants, counseling on tuberculosis prevention, early tuberculosis examination in health centers to the provision of anti-tuberculosis drugs for free which is an implementation of the World Health Organization (WHO) program which is primarily aimed at the world health organization (WHO). People with less economic.[5]

The limitation of this study is that participants were diagnosed with tuberculosis by health workers, based

only on interview results alone. So the possibility of misclassification bias or information bias. The results of the study found that there is an effect of knowledge on the incidence of tuberculosis. People who are low knowledgeable about tuberculosis and its prevention are at 1.7 times the risk of developing tuberculosis compared to people with high knowledge. These results are in line with previous research that stated that knowledge is associated with the incidence of tuberculosis.[6,7,8,9]

The results of the study found most respondents low knowledge suffering from tuberculosis which is 55%. This is because respondents who are low knowledge and suffer from tuberculosis are those who are in low education. In addition, based on the statements of some respondents when done wawancana, they still do not know how to transmit tuberculosis, such as the environment in the house that is moist preferred mycobacterium tuberculosis bacteria.

The level of knowledge can affect a person for the prevention of transmission of tuberculosis disease. In this case a good level of knowledge can affect a person in the prevention of tuberculosis transmission. A person who has less knowledge will cause a person unable to prevent so as to increase the incidence of tuberculosis disease.[10]

This study proves that nutritional status affects the incidence of tuberculosis. People who are undernourished or underweight are at risk of 1.6 times more tuberculosis than people with normal nutritional status. The results illustrate that respondents with more or less nutritional status experienced the incidence of tuberculosis, it is in accordance with Achmadi's theory that explains that less nutritional intake can result in low endurance, making it susceptible to tuberculosis germ attacks.[11]

It is also in line with research in Indonesia that the variable that most affects the incidence of tuberculosis disease is the variable nutritional status. A person with poor nutritional status is at risk for tuberculosis than people who do not have these risk factors.[12] These results are also supported by the results of research in Banjar City, that respondents with undernutrition have a 4 times greater risk of tuberculosis than people with good nutritional status.[13]

The state of malnutrition or lack of calories, protein, vitamins, iron and others, will affect the endurance of a person so vulnerable to diseases including tuberculosis. This situation is an important factor that affects poor countries, both in adults and children. Therefore, the state of a person's nutritional status determines a person's endurance to diseases that arise, one of which is tuberculosis.[14]

This study also proves that smoking has an effect on the incidence of tuberculosis. Active smoking people are at 1.9 times risk of developing tuberculosis compared to nonsykers. The results of this study are consistent with some previous studies that state smoking is one of the risk factors for tuberculosis incidence.[15,16,17]

The smoking behavior of tuberculosis sufferers has been going on for years, and there are some respondents who tested positive for tuberculosis, not quitting to smoke due to dependence on smoking. The results of interviews with respondents where some respondents had stopped smoking after being declared tuberculosis positive results of sputum examination at the health center. In accordance with the results of observations at the study site, at the time of the interview with respondents there were several respondents who smoked in the house and in the house there were children aged < 10 years.

The longer a person smokes, the more dangerous the consequences. This is because the toxins contained in cigarettes will accumulate in the body. Smoking with tuberculosis is a double problem because it helps in the spread of infection, converts latent tuberculosis in the active stage, and worsens the severity of tuberculosis disease.[18]

Conclusion

The conclusion of this study is the prevalence of tuberculosis at 41.1%. Factors of the risk of tuberculosis are knowledge, nutritional status and numbness of smoking. People who are low knowledgeable about tuberculosis and its prevention are at 1.7 times the risk of developing tuberculosis compared to people with high knowledge. People who are undernourished or underweight are at risk of 1.6 times more tuberculosis than people with normal nutritional status. Active smoking people are at 1.9 times risk of developing tuberculosis compared to nonsykers. It is recommended that health workers are advised to increase preventive and promotive efforts through counseling about the risk factors of tuberculosis incidence to the public to increase public knowledge in order to reduce the risk of tuberculosis infection.

Conflict of Interest: No conflicts of interest to declare.

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Ethical Clearance: All subjects are fully informed about the procedures and objectives of this study, each subject before the study signs an informed consent form

Reference

1. Organization WH. Global tuberculosis report 2017. Geneva. World Health Organization. 2017;
2. Kurniawan R. Indonesia's health profile in 2018. Ministry of Health; 2019.
3. Widoyono MPH. Tropical Diseases Epidemiology, Transmission, Prevention, and Eradication. Jakarta: Erlangga. 2008;
4. Darmawansyah D, Wulandari W. Knowledge Level Relationship With Lung Tb Incidence In The Working Area Of Padang Serai Health Center In Bengkulu City. Journal of Nursing and Public Health. 2021;9(2):18–22.
5. Wenas AR, Kandou GD, Rombot D v. Behavioral Relationship With The Incidence of Pulmonary TB Disease Didesa Wori District Wori North Minahasa Regency. Journal of Community and Tropical Medicine. 2015;3(2).
6. Ibrahim I. Factors That Affect Lung TB Incidence in Tidore City Area. Global Health. 2017;2(1).
7. Setiarni SM, Sutomo AH, Hariyono W. The relationship between knowledge level, economic status and smoking habits with the incidence of pulmonary tuberculosis in adults in the working area of the health center of the ketapang regency of West Kalimantan. Kes Mas: Journal of the Faculty of Public Health, Ahmad Dahlan University. 2011;5(3):25008.
8. Mardjoen MM, Kepel BJ, Tumurang MN. Factors Related to the Incidence of Pulmonary Tuberculosis (TB) in Tuminting Health Center in Manado City. Graha Medika Nursing Journal. 2019;2(1):45–53.
9. Ayaturrahmi S, Lestari DI. Risk Factors for BTA Positive Lung TB Incidence in Kramat Jati District Health Center in East Jakarta. Jurnal Untuk Masyarakat Sehat (JUKMAS). 2019;3(2):112–9.
10. Loihala M. The Factors Which Associate To The Occurrence Of Pulmonary Tuberculosis For The In-Patient In Schoolo Keyen Hospital The Southern Of Sorong District In 2015. Jurnal Kesehatan Prima. 2018;10(2):1665–71.
11. Sari RP. Factors Related to the Incidence of

Pulmonary TB Disease in the Working Area of Walantaka Health Center. Journal of Public Health Sciences. 2018;7(01):25–32.

12. Widyastuti NN, Nugraheni WP, Wahyono TYM, Yovsyah Y. Relationship of Nutritional Status and Incidence of Pulmonary Tuberculosis in Children Aged 1-5 Years in Indonesia. Health Systems Research Bulletin. 2021;24(2):89–96.
13. Sriagustini I. Factors Related To The Incidence Of Pulmonary TB In Children In The Working Area Of Pataruman Ii Health Center In Banjar City. Active Independent Health Journal. 2018;1(1):28–33.
14. Novita E. Influence of Fe tablets to Increase Hemoglobin Levels of TB Patients in District of Seberang Ulu I Palembang City. Sriwijaya Journal of Medicine. 2018;1(2):95–100.
15. Tandang F, Amat ALS, Pakan PD. Relationship of Smoking Habits in Active and Passive Smokers with The Incidence of Pulmonary Tuberculosis in Sikumana Health Center in Kupang City. Cendana Medical Journal (CMJ). 2018;6(3):382–90.
16. Darmin D, Akbar H, Rusdianto R. Factors Related to the Incidence of Pulmonary Tuberculosis in the Working Area of Inobonto Health Center. MPPKI (Media Publikasi Promosi Kesehatan Indonesia): The Indonesian Journal of Health Promotion. 2020;3(3):223–8.
17. Ediana D, Sari N. Factors Related To Smoking Habits In The House. Journal of Endurance: Scientific Studies of Health Problems. 2021;6(1):150–61.
18. Katiandagho D, Fione VR, Sambuaga J. Smoking Relationship With Lung TB Incidence In The Working Area of Tatelu Health Center Dimembe Subdistrict. In: PROCEEDINGS National Seminar 2018 ISBN: 2549-0931. 2018. p. 582–93.