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The Relationship Between Community Role and Environment on the Incidence of Pulmonary Tuberculosis

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ABSTRACT

Tuberculosis (TB) is one of the infectious diseases and the main cause of death worldwide. Pulmonary TB is caused by the bacterium *Mycobacterium tubercoluss. Itian* Based on data on pulmonary TB disease from the Magetan Regency Health Office in 2021, the incidence of pulmonary TB in the work area of the Panekan Health Center is the highest compared to other health centers in Magetan Regency, which is 260 patients (2020-2022). This study aims to analyze the role of society (knowledge, attitude and action) and environment (physical condition of the house) on the incidence of pulmonary TB disease. This type of research is analytical with *a case control* approach. The sampling technique uses *fixed disease sampling*, namely patients who have been determined by medical personnel and recorded in the medical records of the Health Center. The population of this study is 260 patient homes and 260 non-patient homes. The sample size of this study was obtained by 113 respondents. Data collection was carried out by survey, interview, observation using questionnaires and physical measurements of respondents' homes. Data analysis using Chi square. The results of the study showed that statistical analysis obtained a p value for knowledge *(p=0.095), attitude (p=0.335) and action (p= 0.445), the value was greater than 0.05 (p > 0.05)*, it can be concluded that there is no relationship between knowledge, attitude and action and the incidence of pulmonary TB. While the condition of the house showed a value of $p = 0.000 < 0.05$, it can be concluded that there is a relationship between the condition of the house and the incidence of pulmonary TB. The condition of the house is related to the incidence of pulmonary TB, while knowledge, attitude and actions are not related to the incidence of pulmonary TB. It is necessary to improve the condition of the house so that in the future it will reduce the incidence of pulmonary TB.

Keywords: Pulmonary TB BTA+, Community role, Housing conditions, Case control

INTRODUCTION

Indonesia is listed as a country with a tropical climate, where health problems are dominated by infectious diseases. The causative factors of infectious diseases are environments that have high humidity and biological growth supporting high biodiversity including pathogens, vectors, and hospes. Tuberculosis is the 13th leading cause of death in the world as well as the 2nd leading cause of death after COVID-19 (World Health Organization, 2021). In 2020, it is estimated that 824 thousand sick people and 93 thousand people died due to tuberculosis. Of this total, in 2020 there were 384,025 cases or around 47%. From these estimates, there are still Tuberculosis patients who have not been found, this can be a source of transmission of Tuberculosis disease in the community so that it becomes a challenge for the Tuberculosis control program in Indonesia (Mulyawan, 2023).

According to the World Health Organization, Tuberculosis is currently the main public health problem in the world. There are around 10 million people with Tuberculosis worldwide in 2020, including 5.6 million men, 3.3 million women, and 1.1 million children. There are 30 countries with a large number of Tuberculosis dependents accounting for 86% of new

problems (World Health Organization, 2021). Indonesia is the 3rd country with the most pulmonary TB patients in the world after India and China with the number of problems of 824 thousand and 93 thousand deaths per year, equivalent to 11 deaths per hour. Based on data from the Global Tuberculosis Report 2022, the most Tuberculosis problems occur in the productive age group, aged 25 to 34 years. (Anonymous, 2023b).

The incidence of Tuberculosis in 2021 was 969,000 or 354 per 100,000 population with deaths estimated at 144,000 or 52 per 100,000 population. From the data from 2000-2020, there was a decrease in the incidence of Tuberculosis, although in 2020-2021 there was a fairly drastic increase. The incidence of Tuberculosis in 2021 increased by 18% and the death rate increased by 55% (Anonymous, 2021).

Based on data from the Indonesian Ministry of Health in 2020, Tuberculosis cases reached 845 thousand cases. Java Island is the dominant contributor in this regard. Some areas on the island of Java have penetrated more than 100 thousand cases. The provinces on Java Island that have the highest cases of Tuberculosis in order are West Java; East Java; and Central Java (Anonymous, 2021).

East Java is the second province in the number of Tuberculosis patients by accounting for more than 50% of Tuberculosis cases in 2018 of all Tuberculosis cases in Indonesia (Anonymous, 2020). According to data from the East Java Provincial Health Office, there was an increase in Tuberculosis cases from 128 cases per 100,000 population in 2015 to 173 cases per 100,000 population in 2019 (Pratama, 2023).

Magetan Regency is one of the areas in East Java Province where people with Tuberculosis in East Java Province are affected. Tuberculosis patients in the Magetan Regency area in 2020 amounted to 459 patients, in 2021 there were 451 patients, in 2022 there were 899 patients. The Magetan Regency area is divided into several health center work areas, the Panekan Health Center ranks first in Magetan Regency in 2022, namely 168 patients (Anonymous, 2023a).

The level of knowledge is very influential for attitudes and actions to prevent pulmonary TB. A person who has a high knowledge of Pulmonary TB can try to take better preventive measures for Pulmonary TB disease (Rahmawati, 2017). Factors that are a risk for Pulmonary TB are ventilation, house floors, occupant density, and others, where factors from population such as age, gender, nutritional status, health services, and socio-economic are also risk factors for the occurrence of Pulmonary TB. A healthy physical condition of the house can cause the community to be healthy (Butarbutar, 2018).

Based on data on pulmonary TB disease from the Magetan Regency Health Office in 2021, the incidence of pulmonary TB in the work area of the Panekan Health Center is the highest compared to other health centers in Magetan Regency. In the preliminary study, there were cases of pulmonary TB in the working area of the Panekan Health Center, which always got the top 3 in Magetan Regency. During interviews with data holders of the Pulmonary TB program, it was obtained that the factors for the occurrence of Pulmonary TB were caused by factors in house conditions that were not good/not yet qualified, and the public did not know about Pulmonary TB disease, how not to contract Pulmonary TB and preventive measures. In addition, there is a lack of public awareness to seek treatment if there are symptoms of pulmonary TB. Data on pulmonary TB obtained from the Panekan Health Center fluctuates from year to year, but in 2022 there is a very significant increase. The data on pulmonary TB patients from 2019 amounted to 51 cases, in 2020 amounted to 64 cases, in 2021 amounted to 45 cases, and in 2022

amounted to 151 cases.

The purpose of this study is to analyze the role of society (knowledge, attitudes and actions) and the environment (physical condition of the house) on the incidence of pulmonary TB disease. Based on the description above, it is necessary to carry out research because pulmonary TB disease is an environment-based disease. The role of society (knowledge, attitude and action) and the environment which includes physical conditions which include aspects of lighting (direct sunlight), ventilation, windows, temperature, humidity, floors, walls, roofs/ceilings and house occupancy density are a problem in this study.

RESEARCH METHOD

This type of research is analytical with a case control approach. The purpose of this study is to determine the role of the community (knowledge, scares and actions) and the environment (physical condition) of homes of Pulmonary TB patients and non-Pulmonary TB patients in the working area of the Panekan Health Center. The variables of this study are behavioral factors which include knowledge, attitudes and actions as variables of the role of the community as well as the physical condition of the house which includes lighting (direct sunlight), ventilation, bedroom windows, temperature, humidity, occupancy density, wall conditions, floor conditions, ceiling/roof conditions as environmental variables.

The sampling technique uses fixed disease sampling , namely patients who have been determined by medical personnel and recorded in the medical records of the Health Center. The population in this study is all patient homes and non-patient homes (1:1), namely a total of 260 homes for patients and 260 non-patient homes. The sample size of this study using the Slovin formula was obtained from 160 respondents / house with a ratio of 80 sufferers: 80 non-

sufferers. Data collection was carried out by survey, interview, observation using questionnaires and physical measurements of respondents' homes. Data analysis using Chi square.

RESULT AND DISCUSSION

The Role of the Community with the Incidence of Pulmonary Tuberculosis
1. Knowledge

The results of the cross-tabulation between knowledge and the incidence of pulmonary tuberculosis in Panekan District can be seen in the following table:

Table 1. Distribution of Community Knowledge Frequency with Disease Incidence Pulmonary Tuberculosis, Panekan District

The Role of the Community		Incidence of Pulmonary Tuberculosis		Total	p-value
		Cases	Control		
Knowledge	Less	10 (8,8%)	6 (5,3%)	16 (14,2%)	
	Good	39 (34,5%)	58 (51,3%)	97 (85,8%)	0,095
Total		49 (43,4%)	64 (56,6%)	113 (100%)	

The results of the study found that most of the respondents had good knowledge by not having a history of pulmonary tuberculosis, namely 58 respondents (51.3%) and most of the respondents had poor knowledge by having a history of pulmonary tuberculosis, namely 10 respondents (8.8%). It can be seen that most of the respondents' knowledge in Panekan District is good. The results of the statistical test were obtained *with p-values* (0.095) > α (0.050) so that H1 was rejected and it can be concluded that there is no relationship between public knowledge and the prevalence of BTA+ Pulmonary TB disease in Panekan District.

This study is in line with the research

of Saleha et al., 2024, where the results of statistical tests showed that there was no relationship between knowledge and the incidence of Pulmonary TB in Sungai Kunjang Village. The results of this study are also in line with research conducted by Kaka et al., 2021, which stated that there was no significant relationship between the level of family knowledge and practices to prevent TB transmission with a value (p = 0.051, r = -0.359). However, the results of this study are not in line with the research conducted by Siregar *et al.*, 2020, which stated that there was a significant relationship between knowledge and preventive measures for tuberculosis transmission in Padang Matinggi with a p value of 0.009 (< 0.05).

Knowledge and awareness of the risks of TB encourage people to seek health care when experiencing TB symptoms. Lack of knowledge about TB, its transmission, and its effects tends to lead to poor behavior in seeking treatment (Salame *et al.*, 2017). Delays in TB examination and diagnosis are currently still high. This condition is caused by low public knowledge and awareness in utilizing service facilities. Therefore, increased understanding and improvement of prevention practices are urgently needed (Teo *et al.*, 2020). Everyone wants to live a healthy life and avoid various health problems. Health workers must provide health promotion and direct practice on tuberculosis prevention to family members, especially those at risk of contracting TB. Good support from health workers will improve TB prevention attitudes and practices (Pakpahan *et al.*, 2021). Factors that affect healthy living attitudes and actions include experiences, beliefs, social facilities, and motivation. Action is also a form of fulfilling desired needs. A person who has knowledge is not necessarily willing and able to behave well. Many factors influence a person in making decisions, especially in terms of behavior.

2. Attitude

The results of the cross-tabulation between attitudes and the incidence of pulmonary tuberculosis in Panekan District can be seen in the following table:

Table 2. Distribution of Frequency of Community Attitudes with Disease Incidence Pulmonary Tuberculosis, Panekan District

The Role of the Community		Incidence of Pulmonary Tuberculosis		Total	p-value
		Cases	Control		
Attitude	Less	22 (19,5%)	23 (20,4%)	45 (39,8%)	
	Good	27 (23,9%)	41 (36,3%)	68 (60,2%)	0,335
Total		49 (43,4%)	64 (56,6%)	113 (100%)	

The results of the study found that most of the respondents had a good attitude by not having a history of pulmonary tuberculosis, namely 41 respondents (36.3%) and most of the respondents had a poor attitude by having a history of pulmonary tuberculosis, namely 22 respondents (19.5%). It can be seen that most of the respondents' attitudes in Panekan District are good. The results of the statistical test were obtained *with p-values* (0.335) > α (0.050) so that H1 was rejected and it can be concluded that there is no relationship between public attitudes and the prevalence of BTA+ Pulmonary TB disease in Panekan District.

This research is in line with the research conducted by Siregar *et al.*, 2020, which stated that there was no significant relationship between attitudes and preventive measures for tuberculosis transmission in Padang Matinggi with a p value of 0.317 (< 0.05). Based on the results of the analysis conducted by the researcher regarding the relationship between the attitude of pulmonary TB patients towards the prevention of pulmonary TB disease transmission at the Panekan Health Center,

Magetan Regency, the researcher concluded that the attitude of pulmonary TB patients is inversely proportional to the existing theory. Researchers assume that this is due to several factors that may inhibit patients from taking preventive measures against pulmonary TB transmission, including because some patients are indifferent to the risk of pulmonary TB transmission so they do not take preventive measures. This can be seen based on the results of observations and interviews conducted by researchers with patients, where the researchers found that patients do not feel the need to separate from other family members at home, such as separating beds, dining areas, toiletries, and others, because it is considered difficult for the patient and his family. Researchers also found that there were still patients who traveled without masks, plus the patient's surroundings did not feel bothered by this condition. Based on the above factors, this is the reason why there is no relationship between the attitude of pulmonary TB patients towards the prevention of pulmonary TB transmission at the Panekan Health Center, Magetan Regency.

3. Action

The results of the cross-tabulation between the action and the incidence of pulmonary tuberculosis in Panekan District can be seen in the following table:

Table 3. Distribution of Community Action Frequency by Disease Incidence Pulmonary Tuberculosis, Panekan District

The Role of the Community		Incidence of Pulmonary Tuberculosis		Total	p-value
		Cases	Control		
Action	Less	34 (30,1%)	40 (35,4%)	74 (65,5%)	
	Good	15 (13,3%)	24 (21,2%)	39 (34,5%)	0,445
Total		49 (43,4%)	64 (56,6%)	113 (100%)	

The results of the study found that most of the respondents acted well by not having a history of pulmonary tuberculosis, namely 24 respondents (21.2%) and most of the respondents acted poorly by having a history of pulmonary tuberculosis, namely 34 respondents (30.1%). It can be seen that most of the respondents' actions in Panekan District are lacking. The results of the statistical test were obtained *with p-values* (0.445) > α (0.050) so that H1 was rejected and it can be concluded that there is no relationship between community actions and the prevalence of BTA+ Pulmonary TB disease in Panekan District.

According to Gil *et al.*, 2018 TB patients' actions related to transmission prevention practices are often not in accordance with health guidelines. Even though the public is aware of the transmission of TB disease through the air, there are still inappropriate measures such as not separating tableware or bedding, and not wearing masks when leaving the house. In addition, social stigmatization also affects the behavior of patients and their environment, which causes some patients not to fully follow the necessary preventive measures.

Environment (Home Conditions) with Incidence of Pulmonary Tuberculosis Disease

The results of the cross-tabulation between the environment and the incidence of pulmonary tuberculosis in Panekan District can be seen in the following table:

Table 4. Distribution of Environmental Frequency (Home Conditions) with Disease Incidence Tuberculosis Paru Kecamatan Panekan

Environment		Incidence of Pulmonary Tuberculosis		Total	p-value
		Cases	Control		
Physical Condition of	Not Eligible	38 (33,6%)	21 (18,6%)	59 (52,2%)	
	Qual	11	43	54	0,0

the House	ify	(9,7%)	(38,1%)	(47,8%) 00
Total		49 (43,4%)	64 (56,6%)	113 (100%)

The results of the study found that most of the respondents' wards were eligible by not having a history of pulmonary tuberculosis, namely 43 respondents (38.1%) and most of the respondents were not qualified by having a history of pulmonary tuberculosis, namely 38 respondents (33.6%). It can be seen that most of the respondents' neighborhoods in Panekan District are not eligible.

The results of the statistical test were obtained *with p-values* (0.000) < α (0.050) so that H1 was accepted and it can be concluded that there is a relationship between the environment and the prevalence of BTA+ Pulmonary TB disease in Panekan District.

Based on the results of research by Windarti, Ismarina and Ikhlasiah, 2024 concluded that the results of statistical analysis of variables related to the incidence of TB in the Rangkasbitung Health Center work area were air humidity and education (p<0.05). Furthermore, the disturbing variables were occupation and smoking habits (p>0.05) and the most dominant factor was air humidity because it had the largest OR (OR=28.579).

CONCLUSION

The condition of the house is related to the incidence of pulmonary TB, while knowledge, attitude and actions are not related to the incidence of pulmonary TB. It is necessary to improve the condition of the house so that in the future it will reduce the incidence of pulmonary TB.

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