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RELATIONSHIP BEHAVIORAL FACTORS WITH PREVENTION
OF PULMONARY TB DISEASE
(Case Study in the Working Area of Sedati Public Health Center,
Sidoarjo Regency in 2022)

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ABSTRACT

Pulmonary TB is an infectious disease caused by *Mycobacterium tuberculosis* that attacks the lungs. In 2021, the Sedati Health Center became the health center with the highest cases in Sidoarjo Regency with 115 patients. The lack of efforts to prevent the transmission of pulmonary TB disease is the cause of the high incidence of pulmonary TB in the working area of the Sedati Health Center. This study aims to determine the relationship between behavioral factors and efforts to prevent the transmission of pulmonary TB disease. This type of research was analytical research with a Cross-Sectional. The research sample taken was BTA⁺ patients using simple random sampling. Data analysis uses *exact Fisher* to determine the relationship between variables and the dependent variable. The result of 45 respondents shows that 68.9% had good knowledge, and 31.1% less. The attitude of the respondents with the results of positive attitude was 73.3% and a negative 26.7%. Adequate facilities and infrastructure to prevent transmission are 68.9% and the inadequate ones are 31.1%. Family support was supported by 77.8% and was not supported by 22.2%. Efforts to prevent transmission of pulmonary TB were good at 66.7%, and 33.3% less. This research concludes that there is a relationship between relationship knowledge, attitudes, facilities and infrastructure, and family support with efforts to prevent transmission of pulmonary TB disease. It is recommended to facilitate air exchange in a home environment by adding ventilation to keep the house from being humid.

Keywords: attitude, knowledge, prevention of pulmonary TB disease transmission

BACKGROUND

Tuberculosis, abbreviated as TB, is an infectious disease caused by *Mycobacterium tuberculosis*, which can attack the lungs and other organs (Permenkes, 2017). Indonesia in 2020 ranks second with the highest cases of pulmonary TB patients in the world. Data on pulmonary TB cases in Indonesia for 3 consecutive years show 566,623 people in 2018, 843,000 people in 2019, and 845,000 people in 2020 (Global Tuberculosis Report, 2020). East Java is included in the three provinces with the highest number of pulmonary TB cases in Indonesia with 54,863 cases in 2018, 57,731 cases in 2019, and 64,764 cases in 2020 (Dinas Kesehatan Provinsi Jawa Timur, 2020). Sedati Health Center for 3 consecutive years from 2019 to 2022 occupies the health center with the highest pulmonary TB cases in Sidoarjo Regency. In 2019 it is known that the number of pulmonary TB patients is 133 (Dinkes Sidoarjo, 2019), 2020 with 105 patients (Dinas Kesehatan Kabupaten Sidoarjo, 2020), and in 2021 it will increase to 115 patients.

In breaking the chain of disease transmission, it is necessary to prevent the transmission of pulmonary TB disease by patients and family members. These behaviors include drying the mattress, practicing a healthy lifestyle, applying cough etiquette, not using the same eating utensils as the patient, and always wearing a mask. According to *Lawrence Green* in Notoadmojo (2014) 3 factors cause a person to behave, namely predisposing factors, enabling factors, and reinforcing factors. Predisposing factors include attitudes and knowledge. The level of community knowledge is very influential in preventing the transmission of pulmonary TB disease. The reinforcing factor from the cause of the behavior is family support, the role of the family is very important in breaking the chain of transmission of pulmonary TB disease. Lack of family support is the main factor causing the high incidence of pulmonary TB in Indonesia (Nugroho, 2016). Based on a preliminary study conducted at the Sedati Health Center, efforts to prevent disease transmission were lacking, where there were still patients who used the same eating utensils as other family members and rarely dried their mattresses and pillows. Family support is also not optimal in preventing the transmission of pulmonary TB disease. In addition, residential sanitation and low behavior to prevent disease transmission make the incidence of pulmonary TB high in Sedati District...

RESEARCH METHODS

This type of research was analytical research with a Cross-Sectional. The research sample taken was BTA⁺ patients using simple random sampling. Data analysis uses *exact Fisher* to determine the relationship between variables and the dependent variable.

RESULTS

Knowledge

Table 1. Frequency Distribution of Respondents' Knowledge Level in the Working Area of the Sedati Health Center in 2022

Knowledge Level	Sample	%
Good	31	68,9%
Less	14	31,1%

TOTAL	45	100%
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Based on Table 1. it is known that in 45 respondents studied, There are 31 respondents (68.9%) with good knowledge, and 14 respondents (31,1%) with less knowledge.

Attitude

Table 2. Frequency Distribution of Respondents' Attitude Level in the Working Area of the Sedati Health Center in 2022

Attitude Level	Sample	%
Positive	33	73,3%
Negative	12	26,74%
TOTAL	45	100%

Based on Table 2. it is known that in 45 respondents studied, there are 33 respondents (73.3%) with a positive attitude, and 12 respondents (26.74%) with a negative attitude.

Facilities and Infrastructure

Table 3. Frequency Distribution of Facilities and Infrastructure Level of Respondents in the Working Area of Sedati Health Center in 2022

Facilities and Infrastructure Level	Sample	%
Adequate	31	68,9%
Inadequate	14	31,1%
TOTAL	45	100%

Based on Table 3. it is known that in 45 respondents studied, there are 31 respondents (68.9%) with adequate facilities and infrastructure, and 14 respondents (31.1%) with inadequate facilities and infrastructure.

Family Support

Table 4. Frequency Distribution of Respondents' Family Support Level in the Work Area of Sedati Health Center in 2022

Family	Sampel	Persentase
Support	35	77,8%
did not support	10	22,2%
TOTAL	45	100%

Based on Table 4. above it can be seen that in 45 respondents studied, the level of family support there are 35 respondents (77.8%) supported, and 10 respondents (22.2%) did not support.

Prevention of Transmission of Pulmonary TB

Table 5. Frequency Distribution Prevention of Transmission of Pulmonary TB in Respondents in the Working Area of the Sedati Public Health Center in 2022

Prevention of Transmission of Pulmonary TB Level	Sample	%
Good	30	66,7%
Less	15	33,3%
TOTAL	45	100%

Based on Table 5. it is known that 45 respondents studied, to prevent TB disease transmission, there are 30 respondents (66.7%) in the good category, and 15 respondents (33.3%) in the less category.

Relationship between Knowledge and Prevention of Pulmonary TB Disease Transmission

Table 6. Results of Bivariate Analysis between Knowledge and Prevention of Pulmonary TB in the Working Area of the Sedati Public Health Center in 2022

No	Knowledge Level	Prevention of Transmission of Pulmonary TB				F	%	P Value
		Less		Good				
		N	%	N	%			
1	Less	10	22,2%	4	8,9%	14	31,1%	0,001
2	Good	5	11,1%	26	57,8%	31	68,9%	
	F	15	33,3%	30	66,7%	45	100%	

Based on Table 6. it is known that the level of respondents with a lack of knowledge and less effort on pulmonary TB disease transmission prevention is 22,2% (10 respondents) and the level of respondents with a lack of knowledge and good effort is 4 respondents (8.9%). In addition, the level of good knowledge with efforts to prevent transmission of pulmonary TB disease is less than 5 respondents (11.1%), and the level of good knowledge with efforts to prevent transmission of pulmonary TB disease is good there are 26 respondents (66.7%). Based on the statistical test, a p-value of 0.001 was obtained, so there was a relationship between the level of knowledge and efforts to prevent the transmission

Relationship of Attitude with Efforts to Prevent Pulmonary TB Disease Transmission

Table 7. Results of Bivariate Analysis between Knowledge and Prevention of Pulmonary TB in the Working Area of the Sedati Public Health Center in 2022

No	Attitude Level	Prevention of Transmission of Pulmonary TB				F	%	P Value
		Less		Good				
		N	%	N	%			
1	Negative	8	17,8%	4	8,9%	12	26,7%	0,01
2	Positive	7	15,6%	26	57,8%	33	73,3%	
	F	15	33,3%	30	66,7%	45	100%	

Based on Table 7. it is known that the level of negative attitude toward efforts to prevent transmission of pulmonary TB disease is less than 8 respondents (17.8%), and the level of negative attitude toward efforts to prevent transmission good pulmonary TB disease as many as 4 respondents (8.9%). In addition, the level of a positive attitude toward efforts to prevent transmission of pulmonary TB disease is less than 7 respondents (15.6%), and the level of a positive attitude toward efforts to prevent transmission of pulmonary TB disease is good as many as 26 respondents (66.7%). Based on the statistical test obtained p-value of 0.01 then there is a relationship between the level of attitude with efforts to prevent transmission of pulmonary TB disease.

Relationship of Facilities and Infrastructure with Efforts to Prevent Pulmonary TB Disease Transmission

Table 8. Results of Bivariate Analysis between Facilities and Infrastructure on Efforts to Prevent Pulmonary in the Working Area of the Sedati Public Health Center in 2022

No	Facilities and Infrastructure Level	Prevention of Transmission of Pulmonary TB				F	%	P Value
		Less		Good				
		N	%	N	%			
1	Inadequate	8	17,8%	6	13,3%	14	31,1%	0,03
2	Adequate	7	15,6%	24	53,3%	31	68,9%	
	F	15	33,3%	30	66,7%	45	100%	

Based on Table 8. it is known that inadequate facilities and infrastructure with efforts to prevent transmission of pulmonary TB disease are lacking as many as 8 respondents (17.8%), inadequate facilities and infrastructure with efforts to prevent transmission of pulmonary TB disease are good as many as 7 respondents (15.6%). In addition, adequate facilities and infrastructure with efforts to prevent the transmission of pulmonary TB disease are lacking for as many as 6 respondents (13.3%), and adequate facilities and infrastructure with efforts to prevent transmission of pulmonary TB disease are good for as many as 24 respondents (53.3%%). Based on statistical tests obtained a p-value of 0.03. then there is a relationship between facilities and infrastructure with efforts to prevent the transmission of pulmonary TB disease

Relationship of Family Support with Efforts to Prevent Pulmonary TB Disease Transmission

Table 9. Results of Bivariate Analysis between Family Support and Efforts to Prevent Pulmonary TB Transmission in the Working Area of the Sedati Public Health Center in 2022

No	Family Support Level	Prevention of Transmission of Pulmonary TB				F	%	P Value
		Less		Good				
		N	%	N	%			
1	Did notSupport	7	15,6%	3	6,7%	10	22,2%	0,009
2	Support	8	17,8%	27	60%	35	77,8%	
	F	15	33,3%	30	66,7%	45	100%	

Based on Table 9. it is known that family support does not support efforts to prevent transmission of pulmonary TB disease, as many as 7 respondents (17.8%), family support does not support the transmission of pulmonary TB disease prevention as many as 3 respondents (6.7%). In addition, family support that does not support the transmission of pulmonary TB disease prevention is less than as many as 8 respondents (33.3%), and family support that supports efforts to prevent transmission of pulmonary TB disease is good as many as 27 respondents (60%). Based on statistical tests obtained a p-value of 0.009 then there is a relationship between family support with efforts to prevent transmission of pulmonary TB disease.

DISCUSSION

Knowledge

The results of the study in the Working Area of the Sedati Health Center, Sidoarjo Regency in 2022 show that the majority of respondents had good knowledge. Knowledge is the result of knowing and occurs after a person performs sensing through the five human senses of an object. Knowledge or cognition is a very important domain in shaping one's actions. Knowledge in this study is the ability or understanding of pulmonary TB patients including definitions, signs and symptoms, disease transmission, and prevention of pulmonary TB disease transmission. Factors that affect the level of knowledge of respondents, namely the level of education. Education aims to combat ignorance, which can affect a person's ability to prevent disease, and increase the ability to maintain and improve health (Notoatmodjo, 2014). Based on research on 45 patients with pulmonary TB in the working area of the Sedati Public Health Center, the majority were high school students with a total of 24 respondents (53.3%). The higher a person's education, the easier it is to accept new things and adapt to new ones. Respondents easily received information related to pulmonary TB disease and efforts to prevent transmission of pulmonary TB disease.

Attitude

The results of the study in the working area of the Sedati Public Health Center, Sidoarjo Regency in 2022 show that the majority of respondents had a positive attitude. Attitude is a closed reaction of a person to an object or stimulus. Attitude is an action that has not yet been formed but a special tendency that leads to behavioral action. Attitude is how the opinion or assessment of people or respondents on matters related to health, health and illness, and factors related to health risks (Notoatmodjo, 2014). Attitudes in this study were respondents' opinions on the definition, signs and symptoms, disease transmission, and prevention of pulmonary TB disease transmission. One of the factors that influence a person's attitude is the knowledge he has. The higher the knowledge possessed will contribute to the formation of a good attitude. Respondents and their families should form a positive attitude in dealing with pulmonary TB disease and its mode of transmission.

Facilities and Infrastructure

The results of the study in the working area of the Sedati Public Health Center, Sidoarjo Regency in 2022, it was found that the majority of respondents had adequate facilities and infrastructure. According to Lawrence Green, which influences a person to do something in addition to predisposing factors, there are also enabling factors. This factor includes the availability of health facilities or facilities for the community. To behave healthily, people need supporting facilities and infrastructure. These health care facilities essentially support or enable the realization of health behaviors. Economic ability is also a supporting factor in healthy behavior (Notoatmodjo, 2014). Accessibility to health facilities in this study is the ease with which patients can go to health care facilities and take treatment. Respondents already have a decent vehicle to go and do not mind the distance traveled to go to the puskesmas. The availability of access to treatment will affect the patient's recovery and reduce the risk of disease transmission to other family members. In line with the results of research conducted in Klaten Regency, the results showed that the level of difficulty in accessing health facilities had a greater risk of pulmonary TB transmission when compared to respondents who had easy access to health facilities (Suhendrik *et al*, 2019).

In this study, the availability of facilities in improving the quality of the home environment is still lacking. A person's economic ability is also an enabling factor in healthy behavior. The statement with the lowest score is about the cost of making good ventilation of the house and glass tile. The function of ventilation in the house in addition to maintaining airflow also frees the room air from bacteria, especially pathogenic bacteria. Therefore, it is important for air and light to enter the house through windows and glass tiles (Tria Meriyanti dan Sudiadnyana, 2018).

Family Support

The results of the study in the working area of the Sedati Public Health Center, Sidoarjo Regency in 2022, it was found that the level of support for the majority family was supportive. According to Lawrence Green, one of the reinforcing factors that influence a person's behavior is family support. Healthy behavior does not only require good knowledge, a positive attitude, and support for facilities but also requires exemplary behavior (reference) from the community and support from the family (Notoatmodjo, 2014). Family support is a process of relationship between the family and its social environment that can be accessed by the family that can be supportive and assists family members (Friedman dan Jones, 2012). On the family support questionnaire, the statement with the highest score was about the family reminding them to always wear masks. Pulmonary TB is transmitted through droplets when coughing and sneezing, therefore it is

important to wear a mask for sufferers to prevent transmission of *Mycobacterium tuberculosis* bacteria. The family knows that when the patient does not use a mask, it can release 210 particles in which there are *Mycobacterium tuberculosis* bacteria which are ready to be free from contamination in the air at any time and infect other family members (Tsadik *et al.*, 2020).

Family support includes support from the husband or wife, children, and siblings. Pulmonary TB patients who get good family support will feel the benefits of improving their physical and preventing the transmission of pulmonary TB disease (Puspita, 2016). Support from a good family can help in the healing process of patients with pulmonary TB and have an active role in preventing the transmission of pulmonary TB disease to other family members.

Prevention of Pulmonary TB Disease Transmission

The results of the study in the working area of the Sedati Public Health Center, Sidoarjo Regency in 2022, the majority of respondents in the good category. Skinner states that health maintenance behavior is a person's behavior or efforts to maintain or maintain health so as not to get sick, and efforts to heal when sick. One aspect of health maintenance is disease prevention behavior (Notoatmodjo, 2014). In this study, efforts to prevent transmission of pulmonary TB disease include cough etiquette and how to dispose of phlegm, consumption of nutritious food, the use of separate eating utensils, separate rooms for patients and other family members, and modification of the home environment.

The habit of having their eating utensils will reduce the risk of transmission to families living with pulmonary TB patients. always cleaning the house and opening windows aims to let in sunlight to reduce the spread of bacteria and kill bacteria. If the conditions are humid due to a lack of sunlight and less than optimal air change in the home environment, there is a risk of the transmission of pulmonary TB (Nugroho *et al.*, 2020). According to Mujahidin, washing eating, and drinking utensils that have pulmonary TB patients with laundry soap alone is not enough to kill the *Mycobacterium tuberculosis*. Another effort that can be done is to boil cutlery (Mujahidin *et al.*, 2019).

In carrying out efforts to prevent disease transmission, it is influenced by good knowledge, information, attitudes, facilities and infrastructure, and good family support. These respondents understand what is meant by pulmonary TB disease and know how to prevent its transmission.

Relationship between Knowledge and Prevention of Pulmonary TB Disease Transmission

The results of the analysis using Fisher's Exact test stated that if the p-value were 0.05 then H₀ was rejected and H₁ was accepted, so there was a relationship between the two variables. Based on the test, the p-value was 0.000 < 0.05, which means that there is a relationship between the level of knowledge and efforts to prevent the transmission of pulmonary TB disease. The existence of human knowledge can answer the problems and solve the problems faced. Someone with good and high knowledge will be able to think critically and understand everything (Notoatmodjo, 2014). Before someone behaves, they must know the benefits for themselves or their families. Knowledge is needed as an encouragement or stimulus to grow behavior every day, so that knowledge can influence behavior (A. Wawan dan Dewi M., 2012).

In the working area of the Sedati Health Center, it is known that the majority of knowledge is good and the efforts to prevent the transmission of pulmonary TB disease are good. This

shows that respondents who have good knowledge will carry out good and maximum efforts to prevent disease transmission according to the information they get regarding pulmonary TB disease and the p-value of 0.05 then H0 is rejected and H1 is accepted, so there is a relationship between the two variables. Based on the test, the p-value of 0.02 <0.05, means that there is a relationship between attitude and efforts to prevent the transmission of pulmonary TB disease. According to Lawrence Green, the formation of a good and positive attitude cannot be separated from the existence of influencing factors such as personal experience, culture, other people who are considered important, mass media, and emotional factors of the individual (Notoatmodjo, 2014). In the working area of the Sedati Health Center, it is known that the majority of respondents have a positive attitude and good disease prevention efforts. This shows that the more positive the attitude of the patient in responding to pulmonary TB disease and its prevention, the better the efforts made in preventing the transmission of pulmonary TB disease.

Relationship of Facilities and Infrastructure with Efforts to Prevent Pulmonary TB Disease Transmission

The results of the analysis using Fisher's Exact test stated that if the p-value were 0.05 then H0 was rejected and H1 was accepted, so there was a relationship between the two variables. Based on the test, the p-value was 0.01 <0.05, which means that there is a relationship between facilities and infrastructure and efforts to prevent the transmission of pulmonary TB disease.

The facilities and infrastructure referred to in this study are the availability of adequate health service facilities, accessibility from home to health facilities, and material support for home modifications to make efforts to prevent the transmission of pulmonary TB disease. The better the facilities and infrastructure that are owned and adequate, the better the efforts to prevent the transmission of pulmonary TB disease.

Relationship between Family Support and Prevention of Pulmonary TB Disease

The results of the analysis using Fisher's Exact test stated that if the p-value were 0.05 then H0 was rejected and H1 was accepted, so there was a relationship between the two variables. Based on the test, the p-value was 0.003 <0.05, which means that there is a relationship between family support and efforts to prevent the transmission of pulmonary TB disease.

Family support includes emotional, appraisal, instrumental, and informational support. Family support in efforts to prevent the transmission of pulmonary TB disease in daily life such as providing information on the schedule for taking medication, taking patients to health facilities, and practicing a clean and healthy lifestyle to reduce the spread of Mycobacterium tuberculosis bacteria (Puspita, 2016). In the working area of the Sedati Health Center, the majority of respondents with supportive family support and good prevention of pulmonary TB disease transmission. If patients with pulmonary TB benefit from family support, then the patient will get a positive stimulus to take actions that can prevent the transmission of pulmonary TB and actions that can accelerate the healing process of the disease.

CONCLUSION AND RECOMMENDATION

This study in the working area of the Sedati Public Health Center, Sidoarjo Regency in 2022 which get results that the level of knowledge of the majority is good, the level of attitude of the majority is positive, and the majority of facilities and infrastructure are adequate, the level of family support is the majority of families are supportive, the majority of efforts to prevent the transmission of pulmonary TB disease are good. In addition, there is a relationship between knowledge, attitudes, infrastructure, and family support with efforts to prevent the transmission of pulmonary TB disease.

Sedati Public Health Center should provide good counseling using print media such as posters, leaflets, and others to increase knowledge and information for sufferers and their families. It is expected that health workers will provide education to the public about the importance of paying attention to the physical condition of the home environment and knowing the procedures for transmission of pulmonary TB disease so that they know what actions can be taken to prevent transmission of pulmonary TB disease.

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