GTPHNJ (GLOBAL TEN PUBLIC HEALTH AND NURSING JOURNAL)
Volume 1, No. 4, Bulan desember 2023 Page 25-36
ISSN: 3025-6283

RELATIONSHIP BETWEEN KNOWLEDGE OF PULMONARY TUBERCULOSIS SUFFERERS AND ADHERENCE TO TAKING MEDICATION AT THE PUSKESMAS BUDURAN SIDOARJO

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Tuberculosis is a disease caused by bacteria or germs Mycobacterium tuberculosis. Tuberculosis in Indonesia ranks third after India and China. One of the factors causing the high number of TB cases is knowledge about TB and medication adherence. The type of research that will be carried out uses quantitative research with analytical observational research and cross sectional design and the population of this study is all pulmonary TB patients who are treated at the Buduran Sidoarjo Health Center totaling 27 people. Data collection using questionnaires and data analysis with the Pearson Chi-Square test, this test aims to test the relationship between knowledge level and treatment adherence of TB patients. It was found that 27 people (100%) respondents had a good level of knowledge. Then it was found that 27 people (100%) respondents had a high level of compliance. The results of the chi square statistical test analysis there was no relationship between knowledge and medication adherence. All respondents have good knowledge and high adherence to taking medication because the study was conducted on respondents who had undergone tuberculosis treatment, patients had obtained information on tuberculosis from health workers at the Puskesmas during the first treatment, patients could access media both online As well as print, patients also have the motivation to recover, support from health workers, family support and the role of PMO are very important for successful treatment. There is no relationship between knowledge and adherence to taking medication can be caused by the small number of respondents and also supported by several TB programs run by Puskesmas.

Keywords : *Pulmonary Tuberculosis, Knowledge, Compliance*

1. INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by rod-shaped bacterial infections, *Mycobacterium tuberculosis* (M.TB) TB disease mostly affects the lung parenchyma (pulmonary TB) but these bacteria also have the ability to infect other organs (extrapulmonary TB).(Minister of Health, 2019)

Tuberculosis is a disease caused by bacteria or germs *Mycobacterium tuberculosis.* This germ is easily transmitted through the air so that this disease is often associated with lung disease even though it actually does not only attack the lung organs.(Sembiring, 2019)

Tuberculosis is one of the diseases with a high number of cases in Indonesia. Most of these cases occur in developing countries, as well as countries with high population densities.(Sembiring, 2019)

Referring to the WHO Global TB Report in 2020, 10 million people in the world suffer from tuberculosis (TB) and cause 1.2 million people to die every year. WHO reported that the estimated number of people diagnosed with TB in 2021 globally was 10.6 million cases, an increase of around 600,000 cases from 2020. Of the 10.6 million cases, there are 6.4 million (60.3%) people who have been reported and undergoing treatment and 4.2 million (39.7%) others have not been found/diagnosed and reported.

The Ministry of Health reported that in 2020 there were 351,936 cases, a decrease of 38% from the previous year which was 568,987 cases. In 2021, TB increased from

the previous year, with 385,295 cases recorded. Tuberculosis in Indonesia ranks third after India and China with 824 thousand suspected cases, but only 393,323 TB patients were found, treated, and reported to the national information system in 2022.

The Ministry of Health noted that the trend of successful treatment rates for TB patients has decreased since 2016. Data shows that the success rate of TB patients treatment was 82.7% in 2020, lower than the previous year which reached 82.9%. From 90%, the success target of new treatments has been achieved by 73% in 2021 and the success rate of TB treatment in 2022 is 74%.

In 2019, the number of discovery and treatment of all TB cases in East Java ranked second in Indonesia at 64,311 cases. Tuberculosis cases found in 2020 were 44,947 cases, the number of cases decreased in 2022 which was found at 43,247 cases.

In 2019, the number of all TB cases who recovered and completed complete treatment was 51,970 cases out of 57,731 cases treated. The success rate of TB treatment in 2021 in East Java has not reached the expected target of only 85%. success rate of treatment of TB cases.

The number of *Case Detection Rate* (CDR) the number of cases declared as patients who have been found compared to the number of patients who are still estimated in a particular region. The CDR coverage of TB cases in Sidoarjo Regency in 2020 was 44.22% of the estimated 5,699 incidents in 2020. In 2021, Sidoarjo ranks third in East Java with the highest tuberculosis cases after Surabaya City and Jember Regency. The large number of declared TB sufferers in Sidoarjo Regency who have been found and treated has been recorded at 5,666 cases.

Based on data from the Buduran Health Center, in 2019 the number of tuberculosis patients reached 97 people. In 2020, it was found that tuberculosis patients were reduced to 70 people. (Sidoarjo &; Buduran, 2020). In 2021, tuberculosis patients decreased to 55 people. In 2022, there are 76 people with tuberculosis. Buduran Health Center ranks 12th in Sidoarjo Regency with high TB cases. The latest data obtained in 2023 recorded 27 tuberculosis patients who were undergoing treatment.

Knowledge is considered very important for the success of TB treatment because patients will get information about the mode of transmission, stages of treatment, treatment goals, drug side effects, and disease complications. The knowledge that a person has will affect how he behaves, plans, and makes decisions.

In addition, the treatment of TB disease has not reached the national target set in the strategic planning (renstra) of the Ministry of Health of 90%. This shows the government needs to improve health services for TB treatment.

Based on the description above, it was found that the incidence of tuberculosis at the Buduran Health Center was still high, prompting researchers to conduct research on the relationship between knowledge of pulmonary tuberculosis patients and adherence to taking medication at the Buduran Sidoarjo Health Center.

2. RESEARCH METHODS

The type of research to be conducted uses quantitative research with analytical observational research and cross sectional design. Observational research is a study that aims to find out how and why a phenomenon occurs through a statistical analysis. Cross sectional research is research conducted at one time and one time, there is no follow-up, to look for relationships between independent variables and dependent variables.

Population and Sample

The case to be studied can be one person, family, one event, another group that is quite limited, so that researchers can internalize, understand, and understand how the object operates or functions in an actual natural setting (Adiputra et al., 2021).

Population

The population is all subjects to be studied and meets predetermined characteristics. The population in this study was all 27 pulmonary TB patients who underwent treatment at the Buduran Sidoarjo Health Center.

Sample

A sample is a portion of the population that is selected in such a way that it is considered representative or representative of the population. The sample used in this study was the entire population of pulmonary TB patients who underwent treatment at the Buduran Sidoarjo Health Center, the sample size in this study amounted to 27 people.

Variable Identification

A variable is something that is used as a characteristic, trait or measure obtained by research about a particular research concept. Where the independent variable or independent variable is the relationship between the resistance of pulmonary tuberculosis patients while the dependent or bound variable is adherence to taking medication at the Buduran Sidoarjo Health Center.(Notoatmodjo, 2018)

Operational Definition

The operational definition is a description of the constraints of the variable in question or what the variable in question measures .(Notoatmodjo, 2018)

Data Collection Techniques and Instruments

The data collection technique in this study used two questionnaires about TB patient knowledge and medication adherence. In the knowledge questionnaire, it consists of 2 parts, namely in section A contains age, level of education and occupation while in part B contains statements with a total of 14 numbers.

The compliance questionnaire, part B, contains questions with a total of 14 numbers. The 3-point Likert scale consists of 3 answers asked by respondents, namely answers a (3), b (2) and c (1). The category of a person's level of compliance into three levels based on percentage values is as follows:

1. It is good if, from 14 answers, the correct number is (29-42) points.
2. Enough if, from 14 answers, the correct number is (15-28) points.
3. Less if, from 14 answers produced the correct number of (1-14) points.

In the compliance questionnaire, section C contains a statement with a number of 8 numbers. *Likert* scale or Likert scale is a research scale used to measure attitudes and opinions. This scale is used to complete questionnaires that require respondents to indicate a degree of consent to a series of questions. The 3-point Likert scale consists of 3 opinions of respondents requested, namely never (3), sometimes (2), always (1). The category of a person's level of compliance into three levels based on percentage values is as follows:

1. High if, out of 8 statements generated the sum (17-24) points.
2. Medium if, from 8 statements produced the number (9-16) points.
3. Low if, out of 8 statements generated the sum of (1-8) points.

Research Ethics

Ethical issues that must be considered in this study are as follows:

1. *Informed Consent* (Consent sheet) Consent sheet is given before the research is conducted by providing a consent sheet to become a respondent. The goal is that the subject understands the purpose and purpose of the study, knows the impact. If the respondent is willing, then they must sign the sheet and if they refuse to be scrutinized will not force and still respect it.
2. *Assonimity Consent sheet is* given before the research is conducted by providing a consent sheet to become a respondent. The goal is that the subject understands the purpose and purpose of the study, knows the impact. If the respondent is willing, then they must sign the sheet and if they refuse to be scrutinized will not force and still respect it.
3. *Confidentiality* Information that has been collected from respondents is guaranteed confidentiality. Therefore, all research results that have been carried out are guaranteed confidentiality and researchers keep secrets as well as possible (Nursalam 2015).

3. RESULTS AND DISCUSSION

Result

General Data

Table 1. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center by sex in March 2023

Gender	Frequency	Percentage
Man	13	48.1%
Woman	14	52.9%
Total	27	100%

Table 2. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center by age in March 2023

Age	Frequency	Percentage
12-25 years	3	11%
26-45 years	14	52%
46-65 years old	9	33%
>65 years old	1	4%
Total	27	100%

Table 3. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on length of treatment in March 2023

Duration of Treatment	Frequency	Percentage
3-6 months	19	70.4%
< 3 months	6	22.2%
> 6 months	2	7.4%
Total	27	100%

Table 4. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on living together in March 2023

Living Together	Frequency	Percentage
child	3	11.1%
wife	1	3.7%
husband	2	7.4%
mother	1	3.7%
husband, children	6	22.2%
husband, child, mother	2	7.4%
wife, children	7	25.9%
father, mother, brother, sister	1	3.7%
father, mother, sister	2	7.4%
sibling	1	3.7%
father, mother	1	3.7%
Total	27	100%

Table 5. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on PMO in March 2023

PMO	Frequency	Percentage
Husband	7	25.9%
Wife	8	29.6%
Mother	5	18.5%
Child	4	14.8%
Nephew	1	3.7%
Sibling	1	3.7%
None	1	3.7%
Total	27	100%

Table 6. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on TB patients at home in March 2023

TB Patients at Home	Frequency	Percentage
Yes	2	7%
Not	25	93%
Total	27	100%

Table 7. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on comorbidities in March 2023

Comorbidities	Frequency	Percentage
DM	7	26%
DM, Hypertension	1	4%
Not	19	70%
Total	27	100%

Table 8. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on repeated treatment in March 2023

Repeated Treatment	Frequency	Percentage
Yes	2	7%
Not	25	93%
Total	27	100%

Table 9. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on education in March 2023

Education	Frequency	Percentage
Graduated from elementary school	3	11.1%
Graduated from junior high school	7	25.9%
Graduated from High School	13	48.1%
College	4	14.8%
Total	27	100%

Table 10. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center by occupation in March 2023

Work	Frequency	Percentage
Does not work	14	52%
Self employed	3	11%
Private	8	30%
Civil servants	2	7%
Total	27	100%

Table 11. Distribution of tuberculosis respondents at the Buduran Sidoarjo Health Center based on vaccination in March 2023

Income	Frequency	Percentage
Below Rp. 500.000	2	7%
IDR 500,000-IDR 1,500,000	8	30%
IDR 1,500,000-IDR 2,500,000	10	37%
Above Rp. 2.500.000	7	26%
Total	27	100%

Table 12. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on BTA examination in March 2023

Duration of Treatment	BTA	Frequency	Percentage
3-6 months	1+	6	22.2%
	2+	6	22.2%
	3+	5	18.5%
	-	2	7.4%
< 3 months	1+	3	11.1%
	2+	2	7.4%
	3+	1	3.7%
> 6 months	1+	2	7.4%
	Total	27	100%

Custom Data

Table 13. Distribution of Tuberculosis Respondents at Buduran Sidoarjo Health Center Based on Knowledge in March 2023

Knowledge	Frequency	Percentage
Good	27	100%
Enough	0	0%
Less	0	0%
Total	27	100%

Table 14. Distribution of tuberculosis respondents at Buduran Sidoarjo Health Center based on compliance in March 2023

Compliance	Frequency	Percentage
Tall	27	100%
Keep	0	0%
Low	0	0%
Total	27	100%

Table 15. Cross-table of the relationship between knowledge of pulmonary

tuberculosis patients and medication adherence at the Buduran Sidoarjo Health Center in March 2023

DISCUSSION

This chapter will describe the results of research on the relationship between knowledge of pulmonary tuberculosis patients with adherence to taking medication at the Buduran Sidoarjo Health Center with a total of 27 respondents. The presentation of data starts from general data on respondents' characteristics including gender, age, length of treatment, co-living, PMO, TB sufferers at home, comorbidities, repeated treatment, education and work. Specific data presented based on the variables measured include the level of patient knowledge about tuberculosis and medication adherence in the Buduran Health Center work area. The study was conducted on 27 patients aged 16-71 years at the Buduran Sidoarjo Health Center.

1. Based on table 1, it is known that the number of female respondents was 14 people (52.9%) while the number of male respondents was 13 people (48.1%). It was found that TB sufferers at the Buduran Health Center were the most gender, namely women, not in line with the statement of the Ministry of Health (2018) that 1.4 times greater tuberculosis cases occurred in men than in women. This can occur due to the higher level of male mobilization so that the possibility of exposure to TB bacteria is greater. In addition, habits such as consuming alcohol and consuming cigarettes can make it easier to be infected with pulmonary TB (Prihantana and Wahyuningsih, 2016).
   However, in this study, the number of respondents who are male is less than female because it is caused by several factors such as the target of the study is only TB patients in March 2023 so that there are only 27 respondents.
2. Table 2 shows 3 (11%) respondents aged 12-25 years, 14 people (52%) adults aged 46-65 years (52%), 9 people (33%) and 1 person (4%) aged >65 years (4%).
   From the analysis, it was found that most respondents were adults aged 26-45 years (52%), elderly aged 46-65 years (33%), then at the age of adolescents 12-25 years (11%), and seniors aged >65 years (4%). The data is in accordance with the theory that as many as 67.1% of TB cases occur in productive age, the productive age according to (Ministry of Health, 2020), which is 15-64 years. This is also supported by Sarmen (2017) who states that at productive age people tend to do activities outside the home in addition, high interaction and mobility outside the home can also cause the risk of exposure to TB disease.

Knowledge Level	Treatment Adherence						Percentage
	Tall		Keep		Low		
	N	%	N	%	N	%	
Good	27	100 %	0	0 %	0	0 %	100 %
Enough	0	0 %	0	0 %	0	0 %	0%
Less	0	0 %	0	0 %	0	0 %	0%
Total	27	100 %	0	0 %	0	0 %	100 %

Uji chi Square no statistics are computed because Knowledge and Compliance are constants.

3. Table 3 shows the duration of treatment ranging from 3-6 months as many as 19 people (70.4%), then respondents with a duration of treatment < 3 months as many as 6 people (22.2%) and treatment > 6 months as much as (7.4%). It was found that the most respondents were at the Buduran Health Center with a duration of treatment between 3-6 months. Then in second place respondents with a duration of treatment < 3 months. Respondents with a duration of treatment of < 3 months are respondents who undergo first-line or intensive stage treatment, while respondents with a duration of treatment of 3-6 months are respondents who undergo second-line or advanced stage treatment.
   Thus the above analysis is in accordance with (Permenkes no.67 of 2016) that Treatment is given within a sufficient period of time, divided into two (2) stages, namely the early stage and the advanced stage, as adequate treatment to prevent recurrence.
4. From table 4, the most data shows that 7 people (25.9%) of respondents live

with their wives and children, then in second place as many as 6 people (22.2%) of respondents live with their husbands and children. In residential research, it has a relationship with the onset of TB symptoms in contacts of patients with BTA + pulmonary TB. Contacts who live in the same house tend to have a frequency of meeting and communicating with sufferers much more often than contacts who do not live in the same house. Therefore, household contacts will have a higher risk of contracting pulmonary TB when compared to someone who does not live in the same house with the patient. (Sari, 2014)

It is likely that those who have symptoms of TB get exposure from patients who live in the same house with them. In addition, contacts who live in the same house will tend to get exposure to tuberculosis because of the intensity of communication and the difficulty of avoiding TB patients.

5. From table 5, it can be seen that the most PMOs are wives, namely 8 people (29.6%), then husbands as many as 7 people (25.9%), mothers as many as 5 people (18.5%), children as many as 4 people (14.8%), nieces and nephews as many as 1 person (3.7%), relatives as many as 1 person (3.7%), and do not have PMO 1 person (3.7%). The purpose of holding PMO (Drug Swallowing Supervisor) is to prevent drug resistance. PMO requirements are someone who is known, trusted and approved, both by health workers and patients, besides that they must be respected and respected by patients, someone who lives close to patients, willing to help patients voluntarily, willing to be trained and or receive counseling together with patients (Permenkes no.67 of 2016).
6. Based on table 6, it was found that as many as 2 respondents (7%) had lived in the same house with a family infected with TB, while 25 people (93%) respondents had no TB sufferers at home. It is likely that respondents who do not live with TB sufferers can be infected due to age, smoking habits, gender, occupation, economic status and environmental factors (Mar'iyah &; Zulkarnain, 2021).
7. From table 7, data were obtained that the most comorbidities were diabetes militus as many as 7 people (26%), 1 person (4%) with diabetes militus and hypertension and 19 respondents (70%) others did not have comorbidities. One of the risk factors for tuberculosis is diabetes mellitus. Diabetes mellitus has an effect on reducing endurance in the body, one of which is the lungs. In the study conducted, the relationship between type 2 diabetes mellitus and pulmonary tuberculosis status of extensive lesions was not so strong. This may be caused by the severity and disease of controlled and uncontrolled DM. Due to uncontrolled diabetes mellitus, the body's resistance can be lower. The incidence of lung infection in patients with DM is the result of a failure of the body's defense system, in this case the lungs experience impaired function in the respiratory epithelium and also ciliary motility. Impaired function of the pulmonary vascular capillary endothelium, stiffness of the corpus of red blood cells, changes in the oxygen dissociation curve due to prolonged hyperglycemia conditions are factors in the failure of defense mechanisms against infection.(Radityo Utomo, 2016)

   There is no change in blood pressure when the patient suffers from tuberculosis, expressed increased blood pressure if there are comorbidities.(Maretha Puspa Nuraili, 2020)
8. In table 8 it can be seen that from 27 respondents there were 2 people (7%) undergoing repeated treatment, from the data obtained respondents were adherent to the treatment undertaken, but had a history of living with family members affected by TB. The remaining 25 respondents (93%) underwent intensive and advanced treatment.
9. In table 9, it was found that most of the respondents of the last education were high school graduates as many as 13 people (48.1%). Education is related to a person's behavior that can affect healthy living behavior. Where healthy living behavior is a direct cause of Pulmonary TB events such as spitting behavior, covering the mouth when

coughing, the dangers of smoking, environmental hygiene.

10. Table 10 shows that out of 27 respondents, 14 (52%) are not employed. The group of respondents who do not have jobs are women and the elderly. Followed by 8 people (30%) respondents working in the private sector, 3 people (11%) respondents self-employed, and 2 people (7%) as civil servants.

    The type of work determines what risk factors each individual must face. Chronic exposure to polluted air can increase morbidity, especially the occurrence of symptoms of respiratory tract diseases and generally pulmonary TB. This type of manual work has the opportunity to be exposed to TB germs compared to other types of work such as civil servants, TNI, and employees.

    Employment relates to a person's income level which can affect socioeconomic status. Where socio-economic can be an indirect cause of the incidence of Pulmonary TB such as insufficient family nutrition.

11. From table 11, 10 people (37%) respondents with incomes ranging from Rp. 1,500,000-Rp. 2,500,000, 8 people (30%) respondents with incomes ranging from Rp. 500,000-Rp. 1,500,000, 7 people (26%) respondents with incomes above Rp. 2,500,000 and 2 people (7%) with incomes below Rp. 500,000.

    Research shows that socioeconomic status with a low category is very influential on the incidence of pulmonary TB. The increase in Pulmonary TB is closely related to low socioeconomic status, but not only socioeconomic status, many other factors also influence, namely nutritional status, environment and comorbidities. There is a relationship between socioeconomic status and the incidence of pulmonary TB(Muhammad Rizkar Saputra, 2021).

12. From Table 12 that respondents with a duration of treatment of 3-6 with the results of BTA 1+ examination as many as 6 people (22.2%), BTA 2+ as many as 6 people (22.2%), BTA 3+ as many as 5 people (18.5%), BTA - as many as 2 people (7.4%). Respondents with a duration of treatment of < 3 months were found to have BTA 1+ examination as many as 3 people (11.1%), BTA 2+ as many as 2 people (7.4%), BTA 3+ as many as 1 person (3.7%). Respondents with a duration of treatment > 6 months found BTA 1+ examination as many as 2 people (7.4%).

    This disease is transmitted by BTA positive patients who spread through droplet nuclei that come out when patients cough or sneeze. Bacteria that spread in the air can be inhaled by healthy people so that they can cause infection (Anggraeni &; Rahayu, 2018). So that the results of the analysis were obtained that there were still many respondents who had a high level of transmission. It can be seen from the examination that shows that there are still many patients with positive BTA results.

13. Based on table 13 of the research results, data were obtained that 27 people (100%) respondents had a good level of knowledge. The results of the analysis showed that TB patients at the Buduran Health Center had a good level of knowledge.

    Researchers assume that this can be caused because the study was conducted on respondents who had undergone tuberculosis treatment, the number of respondents was small, patients had obtained information on tuberculosis which included the definition of TB, causes of TB, signs and symptoms of TB, modes of transmission, prevention, complications and treatment of TB from health workers at the Puskesmas for the first time treatment, besides that patients can access various media both *online* as well as print and the small number of respondents that affect the results of the study.

    The results of this study are in accordance with (Suprayogi, 2021) stating that someone who has a good level of knowledge will explore information about health that will be obtained and will also filter information that reaches the individual about the disease experienced. Individuals who have good knowledge have high awareness so that they can motivate themselves to heal.

So it can be concluded that all respondents have a good level of knowledge (100%). From the description above, suggestions can be made, namely increasing counseling about tuberculosis to families, POM and even the community. This aims to suppress the increasing number of tuberculosis sufferers and individuals who have good knowledge have high awareness.

14. Based on table 14 From the analysis, it was found that 27 people (100%) respondents had a high level of compliance. The data shows that TB patients at Buduran Health Center have a high level of adherence.

    Researchers assume that this could be because people with TB have good knowledge. In addition, motivation to recover also affects the adherence of taking medication with routine treatment at the Puskesmas. Most respondents who have just started treatment feel bored, in contrast to respondents who have almost finished their treatment feel used to it. In this case health workers, family support and the role of PMO are critical to successful treatment.

    According to (Ningrum, 2021), the factors that affect adherence to taking medication in tuberculosis patients are knowledge, community stigma, health workers, duration of treatment, education, family support. In addition to these things, patients or families of patients who take TB drugs are educated by health workers about TB treatment with anti-tuberculosis drugs, side effects and consequences if not compliant with treatment, so that TB patients will be more compliant with treatment.

    In line with research stating that high adherence in treatment can provide therapeutic success. The role of PMO in the use of anti-tuberculosis drugs and the role of the family is very important, important in the intensive and advanced phases, and under direct supervision to prevent all anti-tuberculosis drug resistance.(Herlina Sirait, 2020)

    It can be concluded that the compliance of TB patients at the Buduran Health Center all has high compliance (100%). So that suggestions were generated, namely for families of TB sufferers, motivation and support from families to TB sufferers are needed as parties who are around patients to continue to improve compliance in treatment. For health care workers, puskesmas officers should accompany TB cadres in controlling the status and course of TB treatment because of the long treatment (6 months).

15. Based on table 1, 5 The results of the analysis using the *chi square* correlation statistical test of the relationship of knowledge with medication adherence found that all respondents (100%) had good knowledge with high adherence to taking medication. No statistics are counted because knowledge and compliance are constants. This shows that the better the knowledge of TB patients about pulmonary tuberculosis, the patient will be able to understand the explanation given and be able to receive and explore the information obtained or received so that they are expected to also be obedient in TB treatment.

    Researchers assume that this is also supported by several TB programs run by the Buduran Health Center, namely Contact Investigation (IK) is a tracing and investigation activity aimed at people who are in close contact with TB patients (case index) to find suspected TB. IK is carried out every 2 weeks along with drug monitoring to TB patients, monitoring is carried out to determine patient compliance with treatment. Home visits of TB patients are also carried out 2 times at the beginning of treatment and after 4 months of treatment to see if there are changes in the environment as recommended by the given. The next program, namely tracking absentee TB, is a series of investigation activities or investigations of TB patients who do not come to take drugs to the Puskesmas. Tracking is done to patients who have not taken the drug for more than 3 weeks. Then the Puskesmas also conducts TB Prevention Therapy (TPT) to families who are in close contact with TB patients for 3 months with 3HP guidance (isoniazid, rifapentine), especially in children. Counseling is

also carried out every 1 month in conjunction with posyandu and elderly posbidu activities.

According to (KBBI, 2023) Education is the process of changing the attitudes and behaviors of a person or group of people in an effort to mature humans through teaching and training efforts. In this study, most of the respondents were 13 people (48%) with the highest level of education, namely graduating from high school. The better the knowledge of TB patients about pulmonary tuberculosis, the patient will be able to understand the explanation given and be able to receive and explore the information obtained or received so as to improve the quality of one's health.

High knowledge or objects that are often seen and heard by sufferers greatly affect their knowledge and will be easier to understand or directly proportional to attitudes and actions in medicine. People with a higher level of education generally act more specifically on a disease. The increasing the rate of patient education, the better the receipt of information about the treatment received so that the patient will have a great desire to recover quickly so that the patient is obedient in taking medicine. The higher a person's level of understanding, the higher the level of motivation a person has to complete a treatment program and treatment to be compliant in treatment. The increasing level of knowledge of patients about tuberculosis will be more obedient to taking medication and living a clean and healthy life.

When viewed from the results of BTA examination of respondents with a duration of treatment of 3-6 with the results of BTA 1+ examination as many as 6 people (22.2%), BTA 2+ as many as 6 people (22.2%), BTA 3+ as many as 5 people (18.5%), BTA - as many as 2 people (7.4%). Respondents with a duration of treatment of < 3 months were found to have BTA 1+ examination as many as 3 people (11.1%), BTA 2+ as many as 2 people (7.4%), BTA 3+ as many as 1 person (3.7%). Respondents with a duration of treatment > 6 months found BTA 1+ examination as many as 2 people (7.4%). This disease is transmitted by BTA positive patients who spread through droplet nuclei that come out when patients cough or sneeze. Bacteria that spread in the air can be inhaled by healthy people so that they can cause infection (Anggraeni &; Rahayu, 2018).

More positive counts indicate a greater number of bacteria. Thus, TB people with positive BTA test results have a high transmission rate according to the number of bacteria. Although respondents with high compliance levels do not rule out the possibility that positive BTA test results remain high.

It can be concluded that the relationship of knowledge with adherence to taking medication all respondents (100%) have good knowledge with high adherence to taking medication. From the *chi square* test no statistics are calculated because knowledge and compliance are constants From the description above, suggestions are obtained for further researchers, if they have sufficient time and energy, the research should be carried out in a large scope so that it is expected to get varied results and allow for different results from this study.

4. CONCLUSION AND SUGGESTION

Conclusion

Based on the results of a study entitled "The Relationship of Knowledge of Pulmonary Tuberculosis Patients with Adherence to Taking Medication at the Buduran Sidoarjo Health Center" can be concluded as follows:

1. The results of data analysis found respondents had a good level of knowledge as many as 27 people (100%).
2. The results of the analysis were obtained in general respondents had high medication adherence as many as 27 people (100%). The results of the chi square statistical test analysis of the relationship of knowledge with medication adherence all respondents (100%) have good knowledge with high adherence to taking medication, no statistics were calculated so there was no

relationship between knowledge and medication adherence.

Suggestion

1. Increase counseling about tuberculosis to families, POM and even the community. This aims to suppress the increasing number of tuberculosis sufferers and individuals who have good knowledge have high awareness so as to motivate themselves to obey the treatment and have the desire to recover.
2. For families, motivation and support from family to TB sufferers are needed as those who are around patients to continue to improve adherence in treatment. For health care workers, puskesmas officers should accompany TB cadres in controlling the status and course of TB treatment because of the long treatment (6 months).
3. For future researchers, if they have sufficient time and energy, the research should be carried out in a large scope so that it is expected to get varied results and the possibility for different results to occur from this study.

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