http://ejournal.seaninstitute.or.id/index.php/InfoSains
Jurnal Info Sains : Informatika dan Sains, Volume 13, No 02, 2023
E-ISSN.2797-7889, P-ISSN.2089-3329

Analysis of adherence to drug use in patients with pulmonary tuberculosis on the success of therapy at the Sigli City Health Center, Pidie Regency in 2023

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Keywords

Compliance, Age, Gender, Knowledge, Education Level, Occupation, Family Support

Abstract. Pulmonary tuberculosis is an infectious disease of the lower respiratory tract. This disease occurs due to the presence of mycobacterium tuberculosis which can be transmitted through droplets that can occur from one individual to another and form colonization in the bronchioles or alveoli. This disease if left untreated or incomplete treatment can cause dangerous complications up to death. The estimated prevalence of TB in all cases is 660,000 and the estimated incidence is 430,000 new cases per year. The number of deaths from TB is estimated at 61,000 deaths per year according to the National Strategy for Pulmonary Tuberculosis Control. What often happens that can cause failure in treatment is because the patient does not carry out instructions or in determining the right and proper treatment given by health workers to patients, it does not necessarily go well if the patient himself does not take medication properly or according to the procedure for taking the drug for pulmonary TB patients. The formulation of the problem in this study was: "Analysis of adherence to drug use in patients with pulmonary tuberculosis on the success of therapy at the Sigli City Health Center, Pidie Regency in 2023. In this study the type of research used was a descriptive analytic approach with an analytic study design using a retrospective-prospective study observations on the independent and dependent variables at the same time. The sample used in this study was a total sample or total sampling of 72 people. The results in this study obtained data namely; There is a relationship between compliance with pulmonary TB patients and the success of therapy with a ρ-value of 0.000. There is no relationship between the age of patients with pulmonary TB and the success of therapy with a ρ-value of 0.403. There is no relationship between the gender of pulmonary TB sufferers and the success of therapy with a ρ-value. 0.246, There is a relationship between the knowledge of pulmonary TB sufferers and the success of therapy with a ρvalue of 0.016. There is no relationship between the educational level of pulmonary TB sufferers and the success of therapy with a ρ-value of 0.523. There is a relationship between the work of pulmonary TB sufferers and the success of therapy with a ρ-value. 0.002 and There is a relationship between family support for pulmonary TB patients and the success of therapy with a ρ-value of 0.013. the work variable is the most significant variable related to the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023 (p-value 0.005 <α = 0.05) with an Ods Ratio (Exp. B) of 36.075, which means that work has success with treatment 3.6 times more compared to those who do not work.

1. INTRODUCTION

Pulmonary tuberculosis (pulmonary TB) is a chronic lung infection caused by Mycobacterium tuberculosis. This disease has been known by the public for a very long time. It is estimated that about one-third of the world's population has been infected by Mycobacterium tuberculosis. (Aru, W, 2007). Tuberculosis is an infectious disease caused by Mycobacterium tuberculosis, which is acid-resistant and most often attacks the lungs (O'Garra, 2013). Bacteria enter the human body through airborne transmission through the respiratory tract (Arif, 2000).

Pulmonary tuberculosis is an infectious disease of the lower respiratory tract. This disease occurs due to the presence of mycobaceterium tuberculosis which can be transmitted through droplets that can occur from one individual to another and form colonization in the bronchioles or alveolus. The process of transmission is very dependent on the number or number of germs released from the lungs when coughing or sneezing. From the data obtained, it shows that each patient with pulmonary TB can infect an average of 15-20 people. The number of people with pulmonary TB worldwide is estimated to reach 10 million people consisting of 5.6 million men, 3.3 million women and 1.1 million children. In almost every country the disease is found for all ages. However, this disease can be

prevented and cured. In 2020 there were 30 countries with a high number of people affected by pulmonary TB. The largest contributor country is India as a country that has the highest number of pulmonary TB sufferers in the world which is further followed by China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh and South Africa (WHO, 2021).

Cases of tuberculosis disease are not found in many poor and developing countries. Data obtained from the *Sustainable Development Goals* (SDGs) in 2015, the main problem of concern is dangerous infectious diseases such as pulmonary TB. WHO data in 2018 shows that the number of cases of patients with new pulmonary TB is 6.3 million or about 61% of pulmonary TB cases in the world with a value of 10.4 million. (Unicef, WHO, WBG 2018).

Treatment of tuberculosis (TB) with a combination of fixed doses aims to improve adherence to taking anti-tuberculosis drugs (OAT) in TB patients. Tuberculosis treatment uses a combination of fixed doses of drugs in which at least four antibiotics are taken at once (Afidayati, 2020). The onset of side effects is a major factor in the treatment of tuberculosis. One of the successes of tuberculosis treatment is the level of patient compliance in receiving treatment (Seniantara *et al.*, 2018). One of the causes of non-compliance of TB patients for treatment is the time used in this treatment is long-term treatment, possible side effects and low patient awareness of the disease (Ratnasari, 2018). To get a good therapeutic effect, it is necessary to monitor drug side effects (Syaripuddin et al., 2014). At this time health is the most important and invaluable thing for every individual. Everyone has a desire to get a healthy life. However, sometimes many obstacles can interfere with health, one of the causes of health problems that often occur in the lung organs is tuberculosis.

This disease if left untreated or incomplete treatment can cause dangerous complications to death (Ernawati, 2017). The estimated prevalence of TB in all cases is 660,000 and the estimated incidence is 430,000 new cases per year. The number of deaths from TB is estimated at 61,000 deaths per year according to the National Strategy for Control of Pulmonary Tuberculosis (WHO, 2020). There are several factors that can affect the level of compliance of patients, including: supervision, type of drug, drug dosage and counseling from health workers (Sari et al., 2016). Knowledge and attitude become factors in a person's compliance in taking medicine. Health behaviors, responses and actions of a person towards illness and disease, health care systems, food and the environment. A person's quality of life can be affected by his health. The success of treatment in addition to being influenced by the good health services is also influenced by the attitude, ability of health workers, family support and the patient's own lifestyle. Another thing that can support the success of treatment in pulmonary TB patients is adherence and awareness and the desire to heal the patient himself in the treatment program. Patients will not be able to recover if they do not have awareness and desire in treatment. If this happens it is a failure in treatment that will have a very fatal effect that can aggravate the disease suffered which can eventually lead to complications and death. (Aini, 2017).

People with adult age are more infected and then die due to infection from tuberculosis compared to other types of bacterial infections. Based on the *World Health Organization* (WHO) says that it is estimated that tuberculosis infection kills every year as many as two million people. Based on 2020 data, it is estimated that as many as one billion people will be infected if treatment is not carried out properly in patients and this tuberculosis disease will increase by around 56 million every year if not treated immediately (Yudi and Subardin 2021). TB disease is a disease that can be prevented with BCG vaccine and can be treated with anti-tuberculosis drugs (OAT). It's just that TB treatment with OAT takes a long time, which is at least 6 months which is divided into intensive and advanced phases. Prolonged consumption of OAT can cause non-adherence or drop out. Non-adherence of TB patients to treatment can increase the risk of developing multiple drug resistant TB (MDRTB) which is very dangerous. (WHO, 2020). Currently, pulmonary TB cases in Indonesia are still high and are still a national problem that must be overcome. The high cases of pulmonary TB can be influenced by several factors, namely the economy, income, knowledge, level of education, and

environmental sanitation of the community which is still low and is also influenced by population density. All of the above factors can cause higher cases of pulmonary TB. (Kartasasmita, 2016).

The success of treatment in the case of pulmonary TB will be able to run well if the patient can obey and obey to carry out the treatment program that has been set. Health workers will provide appropriate and correct treatment, this will be contrary to the success of treatment if the patient cannot run properly. Things that often happen that can cause failure in treatment are because the patient does not carry out instructions or deepen in determining the good and correct treatment given by health workers to patients does not necessarily run well if the patient himself does not do treatment properly or according to procedures for taking drugs for patients with pulmonary TB. The consistency of patients in becoming TB patients, especially long-term treatment of chronic health problems with a percentage of fifty percent found in developed countries and the percentage of patient compliance in taking drugs of <50% is found in developing countries (Aini et al. 2017). The number of pulmonary TB cases in Indonesia is still high, this is also influenced by several factors, including economic resources, knowledge, low public education is also caused by Indonesia's dense population and poor sanitation. Lack of environmental sanitation factors will affect the growth and spread of *Mycobacterium tuberculosis bacteria.* This is because this type of bacteria is a bacterium that is resistant to acidic situations, can survive for 2 hours and even survive for weeks if environmental sanitation does not get sunlight because these bacteria are not resistant to ultraviolet light, lack of home ventilation, high humidity, temperature (Kartasasmita 2016).

Based on data from the Sigli City Health Center, the number of people with pulmonary TB from 2021 to 2022 is 118 people. From these data, for 2022, the number of pulmonary TB patients who are undergoing treatment programs is 72 people. Of the sufferers, the number of patients who dropped out or who experienced failure in treatment in 2020 was 14 people and in 2021 there were 8 people. There are still cases of dropping out due to lack of patient knowledge resulting in non-compliance with the treatment program and also due to several factors including age, gender, level of education and employment and economy. In addition, other factors that can affect the success of treatment are also influenced by drug side effects and family support, health workers and health services.

From the results of an initial survey conducted by researchers at the Sigli City Health Center, of the 7 people interviewed there were 2 people who said that they did not understand about the treatment of pulmonary TB, so they often did not regularly consume the drug, 3 people said they forgot because they had to work to meet their daily needs and 2 people who were declared to drop out because they were not resistant to drug side effects.

The hypotheses in this study are:

1. There is a relationship between the compliance of patients with Pulmonary TB with the success of therapy at the Sigli City Health Center, Pidie Regency in 2023.
2. There is a relationship between the age of patients with Pulmonary TB and the success of therapy at the Sigli City Health Center, Pidie Regency in 2023
3. There is a relationship between the sex of patients with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency in 2023
4. There is a relationship between the knowledge of people with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency in 2023.
5. There is a relationship between the level of education of people with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency in 2023
6. There is a relationship between the work of people with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency in 2023
7. There is a relationship between the support of families with Pulmonary TB for the success of therapy at the Sigli City Health Center, Pidie Regency in 2023

2. METHOD

In this study, the type of research used is an analytical descriptive approach, analytical studies with study design using *retrospective-prospective* by making observations on independent and dependent variables at the same time. In this study, it was seen to analyze how the adherence of drug use in patients with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency using instruments in the form of questionnaires and medical records. The study was conducted in the Sigli City Health Center area, Pidie Regency starting from January to July 2023. The population in this study was 72 patients with pulmonary tuberculosis. The respondents are patients with Pulmonary TB found in the working area of the Sigli City Health Center, Pidie Regency in 2023. The sample used in this study was a total sample or *Total Sampling* of 72 people.

The data was obtained based on the results of interviews with pulmonary TB patients regarding how drug use adherence in patients with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency. Primary data are data obtained through direct observation of research subjects using questionnaires on how drug use adherence in patients with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency. Secondary data was taken from medical record data of patients with pulmonary TB at the Sigli City Health Center, Pidie Regency. Data collection was carried out with a questionnaire tool filled out by the author based on answers to interviews with pulmonary TB patients regarding drug use compliance in patients with Pulmonary TB to the success of therapy at the Sigli City Health Center, Pidie Regency. The questionnaire used has been designed in such a way as to be able to answer the objectives of the research that was previously tested for validity and reality.

Table 1 Variables, Operational Definitions

No	Independent Variables	Operational Definition	Measuring instruments	Measurement Results	Nominal scale
1	Compliance	The accuracy of taking medication for patients with pulmonary TB in accordance with the recommended schedule and dose	Questionnaire *Morisky Medication Adherence*	1. The 2. Tidak	Ordinal
2	Age	length of life of respondents calculated from birth	Questionnaire	Grouped into two levels: 1. 15-58 years 2. <15 years or >58 years old	Ordinal
3	Gender	Biologically determined and anatomically determined sexual sex divisions expressed in male sex and female sex	Questionnaire	1. Woman 2. Man	Nominal
5	Knowledge	Everything respondents knew about efforts to prevent transmission of Pulmonary TB	Questionnaire	1. Good (when the answer is correct > 75%) 2. Less (when the answer is correct ≤ 75%)	Ordinal
6	Education	Respondent's formal education level	Questionnaire	1. Tinggi = SMA, PT 2. Low = Kindergarten,	Ordinal

				Elementary, Junior High School	
7	Family Support	Assistance to families of TB sufferers both material and material to their members by reminding them to take medicine	Questionnaire	1. Support (score 11-19) 2. Not Cloudy (score 0-10)	Ordinal
8	Therapeutic Success	The success of patients in following TB therapy by timely taking drugs until cured	Medical Record	1. Recover 2. Not Cured	Ordinal

This study used ordinal and nominal data. The data that has been collected is then processed using computer statistical tests with the following stages:

a. *Editing* (data checking)
b. *Coding*
c. *Entry* (entry of data into the computer)
d. *Data cleaning*

The data that has been collected is processed and analyzed by means of manual calculations and using computerized systems.

a. Univariate: Analysis of all variables to describe each variable studied such as: Compliance, Age, Gender, Occupation, Knowledge, Education, Family support.
b. Bivariate: Bivariate analysis is performed to determine the influence between two variables namely independent variables (Compliance, Age, Gender, Occupation, Knowledge, Education, Family support) with the dependent variable. (Successful treatment of pulmonary TB) using *Chi Square test*. The *Chi Square test* is used to determine whether among the research variables there is an influence / relationship or not (independence test) with a level of significance $p < 0.05$.
c. Multivariate. Multivariate analysis is used to find out the independent variable that most affects the dependent variable. *Logistic Regression* can be used to analyze data sets with more than one nominal/ordinal scale independent variable against one nominally bound variable in a column.

3. RESULTS AND DISCUSSION

Univariate Analysis

Table 2 Frequency Distribution of Successful Therapy of TB Patients at the Sigli City Health Center, Pidie Regency in 2023

No	Therapeutic Success	F	%
1	Recover	45	62.5
2	Not Cured	27	37.5
	Total	**72**	**100**

Based on table 2 shows that the majority of successful therapy of TB patients recovered by 62.5% while those who did not recover by 35.5%.

Table 3 Frequency Distribution of Therapeutic Adherence of TB Patients at the Sigli City Health Center, Pidie Regency in 2023

No	Compliance	F	%
1	Obedient	44	61.1
2	Disobedient	28	38.9
	Total	**72**	**100**

Based on table 3 shows that the majority of therapeutic success of TB patients is 62.1% and non-adherent is 36.9%.

Table 4 Frequency Distribution of TB Patient Knowledge at Sigli City Health Center, Pidie Regency in 2023

No	Knowledge	F	%
1	Good	52	72.2
2	Less	20	27.8
	Total	**72**	**100**

Based on table 4 shows that the majority of therapeutic success of well-informed TB patients is 72.2% and less as much as 27.8%.

Table 5 Age Frequency Distribution of TB Patients at Sigli City Health Center, Pidie Regency in 2023

No	Age	F	%
1	18-40 years	40	72.2
2	41->60 years	32	27.8
	Total	**72**	**100**

Based on table 5 shows that the majority of therapeutic success of TB patients aged 18-40 years as much as 72.2% and those aged 41->60 years as much as 27.8%.

Table 6 Frequency Distribution of Education for TB Patients at the Sigli City Health Center, Pidie Regency in 2023

No	Education	F	%
1	Tall	31	43.1
2	Low	41	56.9
	Total	**72**	**100**

Based on table 6 shows that the majority of successful therapy of TB patients has a low level of education of 56.9 and higher education of 43.1%.

Table 7 Gender Frequency Distribution of TB Patients at Sigli City Health Center, Pidie Regency in 2023

No	Gender	F	%
1	Woman	29	40.3
2	Man	43	59.7
	Total	**72**	**100**

Based on table 7 shows that the majority of successful therapy of TB patients in the sex shows that men as much as 59.7% and women as much as 40.3%.

Table 8 Distribution of Work Frequency of TB Patients at Sigli City Health Center, Pidie Regency in 2023

No	Work	f	%
1	Not Working	36	50.0
2	Work (Civil Servant, Honor, Self-employed)	36	50.0
	Total	**72**	**100**

Based on 8 shows that the success of therapy of TB patients on the job is TB patients who do not work as much as 50.0% and who work as much as 50.0%

Table 9 Frequency Distribution of Family Support for TB Patients at the Sigli City Health Center, Pidie Regency in 2023

No	Patient Family Support	F	%
1	Support	50	69.4
2	Not Supported	22	30.6
	Total	**72**	**100**

Table 9 shows that the majority of successful therapy of TB patients is supportive at 69.4 and unsupportive at 30.6%

Bivariate Analysis

The results of bivariate analysis through the *chi-square* test of each variable can be seen in the following explanation:

Table 10. Tabulation of the Relationship between Adherence and the Success of TB Patient Therapy at the Sigli City Health Center, Pidie Regency in 2023

NO	Compliance	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	Yes	37	51,4	7	9,7	52	61,1		
2	No	8	11,1	20	27,8	20	38,9		
	Total	45	62,5	27	37,5	72	100		

Table 10 shows that most patients are adherent and successful in TB therapy as much as 61.1%. Based on *Chi-square* analysis, *ρ-value of* 0.000 < α = 0.05 can be concluded that Ha is accepted, meaning that there is a relationship between compliance history and the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023.

Table 11. Tabulation of the Relationship between Knowledge and the Success of TB Patient Therapy at the Sigli City Health Center, Pidie Regency in 2023

NO	Amount of Knowledge	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	Good	37	51,4	7	9,7	52	61,1		
2	Not Good	8	11,1	20	27,8	20	38,9		
	Total	45	62,5	27	37,5	72	100		

Table 11 shows that most patients are well informed and successful in TB therapy as much as 72.2%. Based on *Chi-square analysis,* ρ-value is obtained 0.016 *< α = 0.05 so that it can be concluded that Ha is accepted, meaning that there is a relationship between knowledge and the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023.*

Table 12. Tabulation of the Relationship between Age and the Success of TB Patient Therapy at the Sigli City Health Center, Pidie Regency in 2023

NO	Age	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	18-40 years	26	36,1	14	19,4	50	55,6	0,05	0,403
2	41->60 years	19	26,4	13	18,1	62	55,4		
	Total	45	62,5	27	37,5	72	100		

Table 12 shows that most patients aged 18->40 years and successfully treated TB as much as 55.6%. Based on Chi-square analysis, ρ-value is 0.403 < α = 0.05 so it can be concluded that Ha is rejected meaning that there is no age relationship with the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023.

Table 13. Tabulation of the Relationship between Education and the Success of TB Patient Therapy at the Sigli City Health Center, Pidie Regency in 2023

NO	Education	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	Tall	26	36,1	14	19,4	50	55,6	0,05	0,403
2	Low	19	26,4	13	18,1	62	55,4		
	Total	45	62,5	27	37,5	72	100		

Table 13 shows that most patients are poorly educated and successful in TB therapy as much as 36.1%. Based on Chi-square analysis, ρ-value is obtained 0.523 < α = 0.05 so that it can be concluded that Ha is rejected meaning that there is no relationship between education and the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023.

Table 14. Tabulation of Sex Relationship with Successful Therapy of TB Patients at Sigli City Health Center, Pidie Regency in 2023

NO	Gender	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	Man	20	27,8	9	12,5	29	40,3	0,05	0,246
2	Woman	25	34,7	18	25,0	43	59,7		
	Total	45	62,5	27	37,5	72	100		

Table 14 shows that most patients are male and successfully do TB therapy as much as 34.7%. Based on Chi-square analysis, ρ-value is obtained 0.246 < α = 0.05 so that it can be concluded that Ha is rejected meaning that there is no sex relationship with the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023.

Table 15. Tabulation of the Relationship between Work and the Success of TB Patient Therapy at the Sigli City Health Center, Pidie Regency in 2023

NO	Work	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	Not Working	29	40,3	7	9,7	36	50,0	0,05	0,002
2	Work	16	22,2	20	27,8	36	50,0		
	Total	45	62,5	27	37,5	72	100		

Table 15 shows that most patients did not work and successfully did TB therapy as much as 42.3%. Based on the Chi-square analysis, it was obtained ρ-value of 0.002 < α = 0.05 so that it can be concluded that Ha is accepted, meaning that there is a job relationship with the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023.

Table 16. Tabulation of the Relationship between Family Support and the Success of TB Patient Therapy at the Sigli City Health Center, Pidie Regency in 2023

NO	Family Support	Success of Therapy				Total		α	p-value
		Recovered		Not Recovered					
		n	%	n	%	n	%	0,05	0,000
1	Support	29	40,3	7	9,7	36	50,0	0,05	0,002
2	Does not support	16	22,2	20	27,8	36	50,0		
	Total	45	62,5	27	37,5	72	100		

Tabel 16 menunjukan sebagian besar pasien mendapat dukungan keluarga dan berhasil melakukan terapi TBC sebanyak 50.0%. Berdasarkan analisis Chisquare didapatkan ρ-value 0.013 < α = 0.05 sehingga dapat disimpulkan Ha diterima artinya ada hubungan dukungan keluarga dengan keberhasilan terapi pasien TB di Puskesmas Kota Sigli Kabupaten Pidie tahun 2023.

Multivariate analysis

To determine the Analysis of Drug User Adherence in TB Patients to the Success of Therapy simultaneously carried out multivariate analysis using multiple logistic regression tests. The use of statistical significance of 0.25 in multiple logistic regression tests allows variables that are covertly important to be substantially important to be included in multivariate models.

Table 17. Selection of Model Candidate Variables in Multiple Logistic Regression Test Based on Bivariate Analysis

Variable	P value	Information
Knowledge	0.000	Candidate
Age	0.016	Candidate
Education	0,403	Not a Candidate
Gender	0,523	Not a Candidate
Work	0,248	Not a Candidate
Family Support	0,002	Candidate

Table 18 Logistic Regression Test Results

	B	**df**	**Sig.**	**OR**	**95,0% CI**	
					Lower	**Upper**
Compliance	2.842	1	0,000	0,633	4,119	71,357
Work	2.138	1	0,004	0,501	1,996	36,075
Family Support	1,254	1	0,081	0,347	0,857	14,324

Based on table 18, it is known that the occupational variable is the most significant variable related to the success of therapy for TB patients at the Sigli City Health Center, Pidie Regency in 2023 (p-value 0.005 < α = 0.05) with an ODS Ratio (Exp. B) of 36.075, which means that work has 3.6 times more success in treatment than those that do not work.

Discussion

The Relationship of Adherence to the Success of TB Patient Therapy

Table 10 shows that most patients are adherent and successful in TB therapy as much as 61.1%. Based on Chi-square analysis, ρ-value of 0.000 < α = 0.05 can be concluded that Ha is accepted, meaning that there is a relationship between compliance history and the success of TB patient therapy at the Sigli City Health Center, Pidie Regency in 2023. The results of this study are also supported by the theory of the Ministry of Health of the Republic of Indonesia that TB treatment compliance is very important, because if treatment is not carried out regularly and not in accordance with a predetermined time, TB germ immunity to Anti-TB drugs will arise widely or called Multi Drugs Resistance (MDR). Generally, patients take medication for 6 months to ensure recovery, but in some circumstances it can take longer (Depkes, 2016).

This research is supported by the theory of (Seniantara, Ivana, and Adang 2018) that adherence to TB treatment therapy is very important, because if treatment is not carried out regularly and not in accordance with a predetermined time, TB germ immunity will arise against Anti-TB Drugs widely or called Multi Drugs Resistance. Generally, patients take medication for 6 months to ensure recovery, but in some circumstances it can take longer. According to the assumption of researchers that adherence is the main factor that is closely related to the success of therapy of TB patients, this is because if the patient does not comply or only 1 time leaves not to take drugs then this will repeat the patient's initial treatment so that patient compliance during treatment certainly determines the success of patients doing TB therapy.

The Relationship of Knowledge with the Success of TB Patient Therapy

Table 11 indicates that the majority of patients, 72.2%, possess good knowledge and have successfully undergone TBC therapy. Based on the Chi-square analysis, a ρ-value of 0.016 was observed, which is less than α = 0.05. This leads to the conclusion that there is a significant relationship between knowledge and the success of TB therapy for patients in the Puskesmas of Sigli City, Pidie District in 2023.

In line with this finding, another study by Tambunan in 2019 titled "The Relationship of Knowledge and Attitude Towards the Compliance of TBC Patients at UPT Puskesmas Belawan" supports the same. In this study involving 71 respondents, predominantly male and aged between 15-

44, the Chi-square test found that 91% of them (or 40 individuals) had knowledge related to pulmonary TB patient compliance with a p-value of 0.000, and 77% (or 47 individuals) had an attitude associated with compliance, registering a p-value of 0.003. Notoadmojo (2016) posits that knowledge is an individual's indicator to act towards something. A person grounded in robust health knowledge would understand the importance of health and is more likely to apply what they know. This correlates with the researcher's assumption: those with a better grasp of knowledge are more compliant with treatments. They recognize that pulmonary TB is curable with disciplined and regular treatment, even if it requires a prolonged period. They also understand the risks of non-compliance, which could lead to drug-resistant strains necessitating even lengthier treatments.

The Relationship of Age with Patient Therapy Success TBC

Table 12 shows that the majority of patients, aged between 18 and 40, successfully completed TBC therapy at a rate of 55.6%. However, based on the Chi-square analysis, with a ρ-value of 0.403 being higher than α = 0.05, it can be concluded that there is no significant relationship between age and the success of TB therapy in Puskesmas of Sigli City, Pidie District in 2023.

This study is consistent with prior research indicating that there is no connection between a patient's age and the duration of recovery in tuberculosis treatment. In an on-site study, it was found that 62.5% of the tuberculosis patients, who either took more than six months to recover or were treated right on schedule (6 months), were elderly (aged 45-64) or senior (≥65 years). Patients between the ages of 18 and 40 constituted 33.9% of the study group. Studies by Susanti et al. (2015) and Kurniawan et al. (2015) have shown that age does not influence treatment outcomes, and a well-nourished body can fight infections at any age. However, this research contrasts with Niviasari et al. (2015), who posited that age indeed correlates with recovery status. The apparent inconsistency in this research is due to the fact that out of 56 respondents, 62.5% were elderly or senior. Still, consistent treatment ensured that age did not impact the duration of their treatment.

The Relationship of Education with Patient Therapy Success TBC

Table 13 reveals that a significant portion of patients, accounting for 36.1%, had a low level of education but successfully underwent TBC therapy. The Chi-square analysis yielded a ρ-value of 0.523, which is higher than α = 0.05, leading to the conclusion that there is no correlation between educational level and the success of TB therapy at the Puskesmas in Sigli City, Pidie District, in 2023.

This finding aligns with a 2019 study by Yuda titled "The Relationship Between Education Level and Medication Compliance in Pulmonary Tuberculosis Patients." The research found that the largest group of pulmonary tuberculosis patients, 43%, had only primary school education. Of these, 76% were compliant with their medication regimen. However, there was no discernible link between educational level and medication adherence (X2: 0.306, df: 4, α: 0.01). While education facilitates knowledge acquisition and can influence thought patterns, not all highly educated individuals possess broad knowledge across various fields. As Notoadmodjo (2016) posits, education doesn't automatically lead to better behavior or actions without foundational knowledge. The researcher's assumption is that most respondents view pulmonary TB as a dangerous and daunting disease. Regardless of their education level, be it only up to primary school or through high school and beyond, they are motivated to seek medical care and undergo the recommended 6-8 month treatment. This suggests that a person's educational level doesn't directly influence the success of pulmonary TB treatment. The specific treatment regimen for tuberculosis, with its multiple medications and a minimum duration of 6 months, can become burdensome or monotonous for patients. This might lead some to prematurely cease their medication, posing a global health threat due to the potential emergence of drug-resistant strains.

Sex Relationship with Successful Therapy of TB Patients

Table 14 indicates that a majority of patients, 34.7%, are male and have successfully completed TBC therapy. Based on the Chi-square analysis, with a ρ-value of 0.246 which is higher than α = 0.05, it is concluded that gender has no significant relationship with the success of TB therapy in

Puskesmas of Sigli City, Pidie District, in 2023. This aligns with a 2019 study by Indriati titled "Factors Affecting the Success of Pulmonary Tuberculosis Treatment," which found no association between gender and microscopic sputum examination results post-treatment, with males being 0.19 times less likely to achieve negative sputum results compared to females. The higher prevalence of TB cases in males could reflect exposure to infection risks, including lifestyle choices like smoking and exposure to indoor and outdoor pollutants. Treatment success can be influenced by factors such as limited healthcare access, healthcare-seeking behavior, and stigma. Women with TB might face challenges accessing treatment due to concerns about the implications of a TB diagnosis, further compounded by constraints like information accessibility, transportation, healthcare costs, and financial dependence (Andarwati, Masrah, and Fauzi, 2020).

Occupational Relationship with Successful Therapy of TB Patients

Table 15 shows that the majority of patients, accounting for 42.3%, are unemployed and have successfully undergone TBC therapy. Based on the Chi-square analysis, with a ρ-value of 0.002 being less than α = 0.05, it's concluded that there's a significant relationship between employment status and the success of TB therapy in Puskesmas of Sigli City, Pidie District, in 2023. Prior research by Sari in 2016 titled "Evaluation of Adherence to Successful Pulmonary Tuberculosis Therapy in Outpatients at RSUD. Dr. R.M. Djoelham Binjai" indicated a moderate compliance rate (48.8%) among pulmonary tuberculosis patients, with 63.4% achieving negative sputum results. This study found a significant influence of factors like compliance, occupation, and income on the success of pulmonary tuberculosis treatment. Furthermore, a 2022 study by Deddy titled "The Relationship Between Occupation and the Role of Medication Supervisors on the Success of Tuberculosis Treatment in Kupang City" supports this finding, indicating a relationship between employment and the role of medication supervisors in successful TB treatment. Various factors, including employment, economic status, knowledge level, multidrug resistance, treatment compliance, the role of health workers and facilities, distance, and family support, can influence TB treatment success. The study found that employment status impacts treatment success as working patients sometimes forget their medication, leading to prolonged treatments (Wahyuni and Cahyati, 2020).

The Relationship of Family Support with the Success of TB Patient Therapy

Table 16 shows that a majority of patients, 50.0%, received family support and successfully completed TBC therapy. The Chi-square analysis resulted in a ρ-value of 0.013, which is less than α = 0.05, indicating a significant relationship between family support and the success of TB therapy in Puskesmas of Sigli City, Pidie District, in 2023. Several studies reinforce the importance of family support in TB therapy success. For instance, research by Afriani (2016) found 82.9% of patients received good family support, while 17.1% had limited support. Similarly, studies by Maulidia (2014) and Mongi, Rottie, & Torar (2017) reported that 60.9% and 64.4% of patients respectively experienced substantial family support. Such support extends beyond emotional reinforcement, encompassing informational, appreciative, and instrumental assistance. Research by Mando, Widodo, & Sutriningsih (2018) and Fitria & Febrianti (2016) highlighted the considerable emotional, appreciative, informational, and instrumental backing patients received. In contrast, a study by Paradise (2014) suggested that while many patients received good instrumental, informational, and emotional support, only 40.8% experienced appreciative support.

The Most Dominant Factor in the Success of TB Patient Therapy

Based on Table 18, it is evident that employment status is the most significant variable associated with the success of TBC therapy in the Puskesmas of Sigli City, Pidie District, in 2023, with a p-value of 0.005, which is less than α = 0.05. The Odds Ratio (Exp. B) stands at 36.075, implying that those who are employed have 3.6 times higher success in their TB treatment compared to those unemployed. The prolonged nature of TB treatment strongly influences therapeutic outcomes. Many patients who are unsuccessful in their treatment tend to be non-compliant with their medication visits, often because they start feeling better and, therefore, see no need to continue their treatment. As

per Amalia (2020), many patients are inconsistent with their medication during the intensive phase due to inadequate motivation and the perception of recovery at the end of this phase, thinking further treatment unnecessary. While compliance is a significant factor in therapy success, other elements like the healthcare system, environmental factors, and family support play crucial roles too. Among these, family support is pivotal in ensuring the patient's compliance, offering motivation for successful treatment, and preventing isolation due to the disease. Hence, it's essential for healthcare professionals to actively implement the pharmaceutical care concept to boost adherence and consequently, enhance the success rate of pulmonary TB therapy. As posited by Pamungkas (2021), TB can be completely cured if patients consistently follow medical advice, take prescribed medications regularly and correctly, and maintain a nutritious diet to bolster their immunity.

4. CONCLUSION

In a study conducted in the Puskesmas of Sigli City, Pidie District in 2023, several factors were analyzed regarding their relationship with the success of therapy for pulmonary TB patients. The findings indicate that there is a significant relationship between the patient's adherence to therapy, their knowledge, their occupation, and the support from their family with successful therapy outcomes, with ρ-values of 0.000, 0.016, 0.002, and 0.013 respectively. On the other hand, the age, gender, and education level of the patients showed no significant relationship with therapy success, as evidenced by ρ-values of 0.403, 0.246, and 0.523 respectively.

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