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Relationship of Nutritional Status, Role of Swallowing Drug Supervisors and Family Support with the Successful Treatment of Lung Tuberculosis in Southwest Sumba Distric

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ABSTRACT

Tuberculosis (TB) is one of the infectious diseases caused by the bacterium Mycobacterium tuberculosis and is still a public health problem related to environmental conditions and community behavior. The success of treatment and case detection are indicators used to measure the effectiveness of TB control. Pulmonary TB disease can be cured with regular treatment. The success of treatment is influenced by several factors ranging from patient characteristics including nutritional and immune status, environmental factors, facilities, and infrastructure factors that support regularity of treatment. The cure to be achieved requires regular treatment for each patient. Compliance in taking medication is very important to avoid drug resistance, so direct supervision by the swallowing drug supervisors are needed and also support from the family. The purpose of the study was to determine the relationship between nutritional status, the role of swallowing drug supervisors, and family support with the success of pulmonary TB treatment. This research design used was a case-control method with a retrospective approach. The results of the analysis showed that nutritional status (p = 0.002), the role of swallowing drug supervisors (p = 0.001), family support (p = 0.001) had a significant relationship with the success of pulmonary TB treatment. It was concluded that nutritional status, the role of swallowing drug supervisors, family support were very influential on the success of pulmonary TB treatment this was related to the body's immune system and also helped pulmonary TB patients in carrying out treatment to completion and recovering to avoid transmission and drug resistance.
Keywords: pulmonary TB, treatment success

ABSTRAK

Tuberkulosis (TB) merupakan salah satu penyakit menular yang disebabkan oleh bakteri Mycobacterium tuberculosis dan masih menjadi masalah kesehatan masyarakat terkait kondisi lingkungan dan perilaku masyarakat. Keberhasilan pengobatan dan deteksi kasus adalah indikator yang digunakan untuk mengukur efektivitas pengendalian TB. Penyakit TB paru dapat disembuhkan dengan pengobatan rutin. Keberhasilan pengobatan dipengaruhi oleh beberapa faktor mulai dari karakteristik pasien termasuk status gizi dan kekebalan tubuh, faktor lingkungan, fasilitas, dan faktor infrastruktur yang mendukung keteraturan pengobatan. Obat yang harus dicapai membutuhkan perawatan rutin untuk setiap pasien. Kepatuhan dalam minum obat sangat penting untuk menghindari resistensi obat, sehingga diperlukan pengawasan langsung oleh pengawas obat menelan dan juga dukungan dari keluarga. Tujuan dari penelitian ini adalah untuk menentukan hubungan antara status gizi, peran menelan pengawas obat, dan dukungan keluarga dengan keberhasilan pengobatan TB paru. Desain penelitian yang digunakan adalah metode case-control dengan pendekatan retrospektif. Hasil analisis menunjukkan bahwa status gizi (p = 0,002), peran pengawas obat menelan (p = 0,001), dukungan keluarga (p = 0,001) memiliki hubungan yang signifikan dengan keberhasilan pengobatan TB paru. Disimpulkan bahwa status gizi, peran pengawas obat menelan, dukungan keluarga sangat berpengaruh terhadap keberhasilan pengobatan TB paru ini terkait dengan sistem kekebalan tubuh dan juga membantu pasien TB paru dalam melakukan pengobatan hingga tuntas dan pulih untuk menghindari penularan dan resistensi obat.
Kata kunci: TB paru, keberhasilan pengobatan

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by the bacterium Mycobacterium tuberculosis and is still a public health problem related to environmental conditions and behavior. public. Effective TB treatment is available but until now TB is still a major world health problem. In 1993 the World Health Organization (WHO) declared TB as a global health emergency because it is a major world health problem that causes morbidity in millions of people every year, recommending the Directly

Observed Treatment Shortcourse (DOTS) strategy as a strategy in TB control. This disease remains a global public health problem even though efforts to control the DOTS strategy have been implemented since 1995 [(1)].

The success of treatment and case detection are indicators used to measure the effectiveness of TB control over time with impact indicators of incidence, prevalence, and mortality. TB treatment success is one of the essential performance indicators in evaluating the performance of the national TB control program. This important indicator is not only useful for ensuring the achievement of TB control programs but also for comparing the achievement of targets from each region.

There are three indicators to describe the success of TB control in Indonesia is complete treatment rate (% complete rate), cure rate (% cure rate), treatment success rate (% success rate). The success rate of pulmonary TB treatment in Indonesia in 2016 was 85%, an increase in 2017 by 87.8%, and in 2018 it reached 87.12%. The success rate set by the Ministry of Health of the Republic of Indonesia is 90%. This indicates that the data on the success of treatment in Indonesia has not reached the national target [(2)]. Data from the Service Health East Nusa Tenggara (NTT) Province in 2017 the number of pulmonary TB cases found was 6,236. This has increased in 2018 with a total of 6,833 cases. The success rate for pulmonary TB in NTT Province in 2017 reached 84.05% and the district that occupies the highest treatment success rate is Southwest Sumba Regency. [(3)]

Based on data from the Southwest Sumba District Health Office (2020), the Case Detection Rate (CDR) amount 412 cases and 293 people who have recovered. Patients who failed in treatment amounted to 109 people and 10 people died. There was an increase in treatment success from 2019 by 61% to 71% in 2020, but this data is still far from the national target of 90% [(4)].

Pulmonary TB disease can be cured with regular treatment. The success of treatment is influenced by several factors ranging from patient characteristics including nutritional and immune status, environmental factors, facilities, and infrastructure factors that support regularity of treatment. There is a relationship between nutritional status and the success of tuberculosis treatment. Weight loss, malaise, and anorexia are common in tuberculosis patients. Supariasa state that poor nutritional status can make it easier to get infectious diseases. The condition of Tuberculosis patients can be restored by eating nutritious foods. The higher a person's Body Mass Index (BMI), the higher the albumin level in the body. Albumin in the body of pulmonary TB patients is significantly associated with the ability to convert sputum. Rifampicin and Isoniazid, as TB drugs, have strong binding to albumin. This strong bond can enhance the antimicrobial effect of the drug, thereby accelerating healing [(5)].

Various programs have been launched to solve the problems that arise due to pulmonary TB and one of them is the DOTS strategy. This program has been proven by showing the patient's cure rate to be >85%. One component of the DOTS program is the Drug Drinking Supervisor. The cure to be achieved requires regular treatment for each patient. Compliance in taking medication is very important to avoid Multi Drugs Resistance (MDR) so that direct supervision is needed by the swallowing drug

supervisors. Swallowing drug supervisors are in charge of supervising and accompanying patients until treatment is complete (recovered) to avoid dropouts, relapses, and even death [6]. Research result Amira DA (2018) showed that pulmonary TB patients with a supportive swallowing drug supervisors role had a greater success rate than pulmonary TB patients with a non-supportive swallowing drug supervisors role [7].

Family support plays a very important role in improving medication adherence. The family is the patient's closest unit and also the biggest motivator in achievement behavior recovery pulmonary TB disease [8]. The family has to maintain the health of each family member, namely preventing health problems, making the right decisions when experiencing problems, knowing efforts to prevent the spread of disease, providing support for family members [9]. Healing and health, not only depend on drugs that can be purchased but from the attitude of the patient himself, also from the support of family, friends, and the environment of TB patients [10].

The health of a person or society is influenced by two main factors, namely behavioral factors and non-behavioral factors. Furthermore, the behavior itself is determined by three factors: predisposing factors manifested in knowledge, attitudes, beliefs, beliefs, values, work, and so on, supporting factors such as physical environment, availability or unavailability of health facilities or facilities, for example, the role of swallowing drug supervisors, use of anti-tuberculosis drugs and so on and the driving force is attitudes and behavior of health workers or other officers, families, and communities which are reference groups by community behavior [11]. The purpose of this study was to analyze the relationship of nutritional status, the role of drug swallow supervisors, and family support with the success of pulmonary TB treatment in Southwest Sumba Regency.

METHOD

The type of research used in *case-control* is survey research that concerns how risk factors are studied using the approach retrospective. This research was conducted in Southwest Sumba Regency from March 1 – March 31, 2021. The population in this study were all pulmonary TB patients in 2020 as many as 412 people. The sample in this study used a ratio of 1:1. The case samples in this study were 105 people who underwent complete treatment for pulmonary TB and had been declared cured and the control sample in this study were 105 people who failed to undergo pulmonary TB treatment (failed, dropped out). Thus, the total number of samples is 210 people. Determination of the sample using a simple random sampling technique. Collecting data in this research through direct interviews and patient medical record data. Data processing is carried out in four stages, namely editing, coding, entry, and cleaning. The data analysis technique used was univariate and bivariate analysis with statistical tests using the *chi-square test* (X^2) and to see the risk used the *Odds Ratio* (OR) test. This research has passed the *ethical review* of the Faculty of Public Health, the University of Nusa Cendana with the number 2020238-KEPK.

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RESULTS AND DISCUSSION

Characteristics of Respondents

Table 1. Distribution of Respondents by Age, Gender, Education, Occupation, Relationship of Swallowing Drug Supervisors and Gender of Swallowing Drug Supervisors in Southwest Sumba Regency

Characteristics of respondents	Frequency	Percentage (%)
Age		
20-26	36	17.1
27-33	33	15.7
34-40	35	16.7
41-47	28	13.3
48-54	18	8.6
55-61	21	10.0
62-68	18	8.6
69-75	16	7.6
76-82	5	2.4
Gender		
Man	131	62.4
Woman	79	37.6
Education		
No school	7	3.3
SD	183	87.1
Junior High School	9	4.3
Senior High School	11	5.2
Occupation		
Farmer	196	93.3
Entrepreneur	11	5.2
Other	3	1.4
Swallowing Drug Supervisors Relationship		
Not Family	195	92.9
Family	15	7.1
Presence Of Swallowing Drug Supervisors		
There is	210	100
There is not any	0	0
Swallowing Drug Supervisors gender		
Man	104	49.5
Woman	106	50.5
Total	210	100

The table above describes the characteristics of respondents from 210 pulmonary TB patients, most of whom are aged 20-26 where this age is classified as a productive age which is an age group at

risk of developing pulmonary TB due to lifestyle. The majority of patients with pulmonary TB were male, as many as 131 people. Most of the pulmonary TB patients had elementary school education, as many as 183 people with jobs as farmers as many as 196 people. The relationship between patients with swallowing drug supervisors are mostly non-family and most of them are female.

Bivariate analysis to determine the relationship between nutritional status, the role of swallowing drug supervisors, and family support with the success of pulmonary TB treatment in Southwest Sumba Regency.

Table. 2. Analysis of the Relationship between Nutritional Status, Role of Swallowing Drug Supervisors and Family Support with Successful Treatment of Pulmonary TB in Southwest Sumba District

Variable	Treatment success						ρ-value	OR
	Case		Control		Amount			
	n	%	n	%	n	%		
Nutritional status								
Well	53	25.2	30	14.3	37	39.5	0.002	2,548
Not enough	52	24.8	75	36.7	173	60.6		
Swallowing Drug Supervisors's Role								
Role	96	45.7	77	36.7	37	39.5	0.001	3,879
No role	9	4.3	28	13.3	173	60.6		
Family support								
Support	94	44.8	74	35.2	37	39.5		
Does not support	11	5.2	31	14.8	173	60.6	0.001	3,580
Total	105	50	105	50	210	100		

The table above shows that there is a significant relationship between nutritional status ρ-value = 0.002), the role of swallowing drug supervisors (ρ-value= 0.001) and family support (ρ-value= 0.001) with successful pulmonary TB treatment. Based on OR value, patients with good nutritional status tend to experience treatment success 2,548 times greater than patients who are malnourished. Patients who had supervisors swallowing drugs and playing a role during treatment were 3,879 times greater than patients who had supervisors swallowing the drug but played no role during the treatment period. Patients who received family support were 3,580 times greater than patients who did not get support from their families.

There are several factors related to the success of pulmonary TB treatment such as nutritional status, the role of supervisors in swallowing drugs, and family support. Nutritional status is a measure of success in fulfilling nutrition in patients as indicated by weight and height. Agustin stated that TB is associated with nutritional deficiencies and decreased immunity. Improved nutrition can help prevent and speed up recovery [(12)]. One indicator of determining nutritional status is BMI. A person's low BMI generally affects the body's immune response, making it more susceptible to infectious diseases [(13)].

1. Relationship between Nutritional Status with Successful Treatment of Pulmonary TB

Based on the results of the study, it is known that there is a relationship between nutritional status and the success of pulmonary TB treatment. On average, pulmonary TB patients have poor nutritional status. This is because the appetite decreases as a result of an infectious disease suffered by the patient so that the patient does not feel hungry but the body continues to carry out the catabolism process by using fat and protein in the body so that the patient is getting thinner [(14)]. It was found that 81 (71.1%) respondents with poor nutritional status failed to undergo pulmonary TB treatment. Respondents with good nutritional status tend to experience pulmonary TB treatment success 2 times greater than respondents with less nutritional status. Because nutritional status plays an important role in the body's immune response and the success of pulmonary TB treatment. Good nutritional status is determined by the food consumed by pulmonary TB patients. The results also showed that patients with good nutritional status were due to the availability of sufficient and varied food. So not only consume carbohydrate foods but also foods that contain protein, both animal and vegetable.

This research is in line with research Rider, (2019) which states that there is a significant relationship between nutritional status and the success of pulmonary TB treatment, most of the patients who fail to treat pulmonary TB are underweight patients and the results of the study obtained that there is a significant relationship between nutritional status and the success of pulmonary TB treatment. The results of this study are also in line with research conducted by Puspitasari et. al (2017) which states that there is a significant relationship between nutritional status and the success of pulmonary TB treatment. Nutritional status can affect the healing of pulmonary TB treatment because good nutritional status can increase the body's immunity so that the body is more resistant to pulmonary TB disease [(15)].

2. Relationship between Swallowing drug supervisors with Successful Treatment of Pulmonary TB

Swallowing drug supervisors are the person in charge of supervising TB patients in ensuring that TB drugs can be taken properly by patients. The role of the swallowing drug supervisors are not only to monitor patients taking medication but also everything related to TB such as encouraging patients to want to undergo treatment to completion, reminding patients to check sputum according to a predetermined schedule, and providing information related to TB to patients and their families so that if If you experience symptoms that refer to pulmonary TB, immediately go to the health care unit [(12)].

The results showed that there was a relationship between the role of swallowing drug supervisors and the success of pulmonary TB treatment. The study found that 96 patients were declared successful in treatment because they had swallowing drug supervisors which played a role in the treatment of pulmonary TB. Most of the swallowing drug supervisors are not family members of the respondents but are health workers and neighbors. This is because the patient is more obedient if the swallowing drug

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supervisors are not a family member and also low family knowledge is the reason that the family cannot be used as a swallowing drug supervisors. Determination of swallowing drug supervisors are not done just like that but must be chosen by people who understand and can be invited to work with health workers and patients. There were 74 patients whose swallowing drug supervisors played a role but still failed to receive treatment. This is due to poor nutritional status and low level of education which have an impact on respondents' lack of knowledge about pulmonary TB disease and also about its treatment. This is evidenced by the fact that 61 patients did not undergo treatment properly based on the specified time because they felt good after taking several drugs in a short period. Patients do not realize that if they do not take the drug according to the prescribed time, it will continue to MDR pulmonary TB and can even cause death. Health workers must periodically control so that all swallowing drug supervisors apart from health workers can further enhance good monitoring efforts. This is evidenced by the fact that 61 patients did not undergo treatment properly based on the specified time because they felt good after taking several drugs in a short period. Patients do not realize that if they do not take the drug according to the prescribed time, it will continue to MDR pulmonary TB and can even cause death. Health workers must periodically control so that all swallowing drug supervisors apart from health workers can further enhance good monitoring efforts. This is evidenced by the fact that 61 patients did not undergo treatment properly based on the specified time because they felt good after taking several drugs in a short period. Patients do not realize that if they do not take the drug according to the prescribed time, it will continue to MDR pulmonary TB and can even cause death. Health workers must periodically control so that all swallowing drug supervisors apart from health workers can further enhance good monitoring efforts. Pulmonary TB will continue in MDR and can even cause death. Health workers must periodically control so that all swallowing drug supervisors apart from health workers can further enhance good monitoring efforts. Pulmonary TB will continue in MDR and can even cause death. Health workers must periodically control so that all swallowing drug supervisors apart from health workers can further enhance good monitoring efforts.

The results of this study are in line with the results of the study Napitupulu et al., (2020) which states that the role of swallowing drug supervisors are very necessary to assist patients in completing treatment because if they are not assisted, it will harm themselves and other family members. This research is also in line with research Doki, (2019) which states that there is a significant relationship between the role of swallowing drug supervisors and the success of pulmonary TB treatment. The role of swallowing drug supervisors are very important in the success of patient treatment. The study also stated that there was a relationship between the role of swallowing drug supervisors and patient compliance in taking tb drugs where the role of swallowing drug supervisors was needed to support the success of pulmonary TB treatment [18].

3. Relationship between Swallowing drug supervisors with Successful Treatment of Pulmonary TB

The family plays an important role in the decision to seek and adhere to treatment. Family can also be a very influential factor in determining individual health beliefs and values such as providing support and making decisions about the care of sick family members [(19)]. Family support is an attitude of action and acceptance of the family towards their supportive family members who are always ready to provide help and assistance if needed [(20)]. Family support supports the success of treatment for pulmonary TB patients by always reminding patients to take medication, having a deep understanding of patients who are sick, and encouraging them to stay diligent in treatment. Family support is needed to encourage pulmonary TB patients by showing concern and sympathy and caring for patients. Family support that involves emotional concern, assistance, and affirmation will make pulmonary TB patients not lonely in facing the situation and family support can empower pulmonary TB patients during the treatment period by providing continuous support, such as reminding patients to take medicines and being sensitive to TB patients. Lungs if they experience side effects from TB drugs.

The results showed that there was a relationship between family support and the success of pulmonary TB treatment. Family support is needed in the pulmonary TB treatment process, because the higher the family support provided, the better for the recovery of pulmonary TB patients. Based on the research, it was found that family support was needed in the success of pulmonary TB treatment. A total of 93 respondents successfully underwent pulmonary TB treatment. However, there were 74 respondents whose families were supportive but still failed to undergo treatment. This is due to other factors, such as gender, because male respondents have higher mobility, such as farmers, drivers, motorcycle taxi drivers, so they forget to take their medicine [(21)]. An approach to the family needs to be carried out by health workers in the form of regular counseling so that families can understand that their support is very important for the patient's recovery.

The results of this study are in line with research conducted by Puspitasari (2015) which states that family support affects the success of pulmonary TB treatment because if the family provides support to TB patients, they will feel relieved, comfortable, more cared for, and loved, feel their needs are met by the family and motivated to comply with TB treatment as recommended by health workers. This research is also in line with research conducted by Siregar et al., (2019) showed that there was a relationship between family support and patient success in pulmonary TB treatment. Family support supports the success of treatment for pulmonary TB patients by always reminding patients to take medicine, having a deep understanding of patients who are sick, and encouraging them to stay diligent in taking treatment [(22)].

This study has limitations that need to be considered. Researchers are not able to control confounding variables such as education, gender so that it can affect the results of the study. Thus, future researchers are expected to be able to investigate further the success of pulmonary TB treatment in

Southwest Sumba Regency with different variables and methods. It is also hoped that this research can be used as an evaluation material for health workers and also for the community.

CONCLUSION

Nutritional status, swallowing drug supervisors role, and family support are related to the success of pulmonary TB treatment. Nutritional status plays a role in a person's immune system so that good nutritional status can support the success of pulmonary TB treatment. The role of the swallowing drug supervisors are not only to monitor patients taking medication but also everything related to TB such as encouraging patients to want to undergo treatment to completion. Family support supports the success of treatment for pulmonary TB patients by always reminding patients to take medication, having a deep understanding of patients who are sick, and encouraging them to stay diligent in treatment.

CONFLICT OF INTEREST

This article is guaranteed not to have a conflict of interest, cooperation and other interests with any party.

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