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Research Article

The Nutritional Status And The Role Of Supervisor In Swallowing Drugs In Pulmonary Tuberculosis Patients

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Abstract

Pulmonary tuberculosis is a contagious infectious disease that is commonly found in society. Pulmonary tuberculosis patients can experience worsening conditions due to risk factors that can affect the patient's condition, namely nutritional status and the role of the Medication Swallowing Supervisor. This study aimed to describe the nutritional status and the role of supervisors in swallowing drugs in pulmonary tuberculosis patients at the Community Health Center in Semarang. The method used is descriptive quantitative with crossectional approach. Purposive sampling technique with a total sample of 43 pulmonary tuberculosis patients and 43 supervisors swallowed the drug. The results showed that the nutritional status of pulmonary tuberculosis patients in the toddler group was in a balanced category between good nutrition and malnutrition, namely 50% each, the highest nutritional status for the group of school-age children and adolescents was in the category of good nutrition and malnutrition, respectively 40%. The nutritional status of adult pulmonary tuberculosis patients is mostly in the normal nutrition category as much as 53,3%. The nutritional status of pre-elderly pulmonary tuberculosis patients is the highest category, 66.7%. The nutritional status of elderly pulmonary tuberculosis patients is mostly in the normal category 66.7%. Supervisors swallowing drugs mostly have a good role 53.5%. Good roles include the role of implementing the DOTS short-term treatment strategy and the role of encouraging. The roles that are still poor include the role of ensuring the availability of drugs according to needs and the role of ensuring the accuracy of sputum for examination.

INTRODUCTION

Indonesian government institutions are trying to accelerate programs to control the infectious disease pulmonary tuberculosis to date. Tuberculosis is a widespread disease that is often found in the lung parenchyma and other organs (extra pulmonary) caused by Mycobacterium tuberculosis in the form of rods and has an acid-resistant nature.[1] SITB (TB Information System) data in 2022, the number of pulmonary tuberculosis cases reached 661,784 cases.[2] There were 190 cases of pulmonary tuberculosis at the Semarang

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Regional Public Health Center from 2019 to 2022.[3] Pulmonary tuberculosis patients can experience worsening conditions due to risk factors that can affect the patient's condition. Certain conditions can trigger a person to be easily infected with Mycobacterium tuberculosis, both by exposure to external agents and mechanisms within the body. Risk factors originating from individuals include age, immune system, nutritional status, special circumstances (pregnant women, children and the elderly).[4]

Low nutritional status factors can cause an imbalance between nutrient needs and intake in the body, causing a decrease in immunity which can change Mycobacterium tuberculosis in the human body to develop into active pulmonary tuberculosis quickly so that it can prolong the risk of reactivity of pulmonary tuberculosis disease.[4] Based on previous research, in adults the risk of developing pulmonary tuberculosis due to poor nutritional status can increase by 33 times.[5] This is confirmed by previous research that pulmonary tuberculosis can affect a person's nutritional status.[6] Poor nutritional status is caused by internal factors such as nausea, vomiting, reduced appetite, while external factors can come from the side effects of OAT consumed by the patient during the treatment period.[1] Some FDC drugs in the intensive and advanced phases, such as rifampicin, pyrazinamide and ethambutol, can cause gastrointestinal side effects such as nausea and vomiting which can affect clinical conditions and reduce nutritional status.[4] Poor nutritional status can influence failure in the treatment process for pulmonary tuberculosis patients.[7]

The success of the OAT treatment program, apart from being influenced by nutritional status, is also influenced by the role of supervisor of drug ingestion as based on previous research that the success of the pulmonary tuberculosis treatment process is correlated with the role of supervisor of drug ingestion.[8] A medication swallowing supervisor is someone appointed to accompany the patient during the initial period of treatment until completion who has been trained and selected with the patient. Monitoring medication swallowing is part of the government recommended program, namely DOTS (Directly Observed Treatment Short Course) in achieving the treatment success target of 85%.[1] The role of a drug swallowing supervisor includes supervising, encouraging, reminding and providing education to tuberculosis patients during treatment.[9] The increasing rate of pulmonary tuberculosis has attracted the interest of researchers, supported by data from previous research which can be used as a basis for research, so research needs to be carried out to capture the picture of nutritional status and the role of drug swallowing supervisors in pulmonary tuberculosis patients at the Semarang Regional Community Health Center.

METHODS

The research used a descriptive quantitative design using a survey with a cross-sectional approach with variables of nutritional status and the role of supervisor of medication swallowing. The population in the study were 46 pulmonary tuberculosis patients and 45 family medicine swallowers. The samples used were 43 pulmonary tuberculosis patients and 43 supervisors who swallowed medication. The technique used in the research is purposive sampling technique, namely by taking samples that meet the inclusion criteria. The research was carried out at the Semarang Regional Health Center using an instrument measuring nutritional status and a questionnaire on the role of drug swallowing supervisor which had previously been tested for validity with a score of 0.568, meaning the instrument had been declared valid, then a reliability test with a result of 0.933 so that the

instrument could be said to be reliable.

Inclusion criteria include: 1) Pulmonary tuberculosis patients and supervisors swallowing family medicines who are willing to take part in the study; 2) Pulmonary tuberculosis patients who are still undergoing FDC OAT treatment, both intensive and advanced phases; 3) Adult patients diagnosed with pulmonary tuberculosis from TCM examination results; 4) Pediatric patients diagnosed with pulmonary tuberculosis from positive TCM examination results, negative TCM, TB scoring results ≥ 6; 5) Supervisors ingesting medication for families of pulmonary tuberculosis patients with the following criteria: Nuclear family living in one house, Minimum age 21 years, Minimum elementary school education (can read and write).

The initial step begins with conducting a preliminary study to see the picture of the population in the Semarang Regional Health Center before conducting research, preparing a proposal and testing the validity of the instrument at RSUD K.R.M.T Wongsonegoro. The next step was to conduct research at the Semarang Regional Health Center by collecting primary data from the results of interviews, measurements and filling out questionnaires with pulmonary tuberculosis patients and drug swallowing supervisors. The data that has been obtained is then examined, coded, tabulated and data entered in SPSS.

This study uses univariate analysis to describe each variable presented in the research. Data analysis is presented in the form of distribution and percentages in variables. Univariate analysis produces a description of the characteristics of tuberculosis patients in the form of age, gender, education, and occupation. The description of the characteristics of drug swallowing supervisors includes age, gender, education, occupation. The general nutritional status description is then broken down based on the categories of toddlers 0-5 years, school age children and teenagers >5-18 years, adults >18-45 years, pre-elderly >45-59 years, elderly ≥60. The description of the role of monitoring medication swallowing includes a description of the role of supervising pulmonary tuberculosis patients, the role of providing encouragement to pulmonary tuberculosis patients, the role of reminding patients to re-examine their phlegm, and the role of an educator.

All data provided by respondents will be processed based on ethical principles, namely informed consent, anonymity and confidentiality. The research has received ethical permission from the ethics committee of K.R.M.T. Wongsonegoro District Hospital, Semarang with permit number (B/10799/070/XII/2022).

RESULTS

The results of the study showed that adults were the group that experienced the highest pulmonary tuberculosis at 34.9%. The majority were male, 62.8%, with a history of high school education, 30.2% and not yet working, dominating the sample at 32.6%. The highest drug swallowing supervisory age group was in the adult age group at 72.1%. Most of them are female, 69.8% with 44.2% high school education and 39.5% housewives.

Nutritional status of pulmonary tuberculosis patients. Nutritional status of pulmonary tuberculosis patients in the group that the toddler age group has a nutritional status that is balanced between good and poor, namely 50% each, the group of school age children and teenagers has the highest nutritional status score with a balanced score between good and poor nutrition. namely 40%, the adult age group has a normal nutritional status of 53.3%, the nutritional status of the pre-elderly group is mostly in the thin category

66.7% and the elderly group is in the normal category 66.7%.

The role of monitoring medication swallowing has almost equal value between good and bad roles but there are more good roles at 53.5%. Roles that have been good include the role of direct supervision in the short term through the DOTS strategy 69.8%, the role of providing encouragement for patient recovery 90.7%, the role of accuracy in sputum examination schedules 55.8%, and the role of understanding treatment rules 72.1 %. Bad roles include the role of ensuring the availability of drugs according to needs 58.1%, the role of encouraging pulmonary tuberculosis patients to be willing to seek regular treatment 34.9%, the role of providing moral support to pulmonary tuberculosis patients 34.9%, the role of ensuring the accuracy of sputum for examination 67.4%, and the role of understanding the symptoms suspicious for pulmonary tuberculosis 39.5%.

Table 1

The Frequency Distribution of Characteristics of Pulmonary Tuberculosis Patients and Drug Swallowing Supervisors Based on Age, Gender, Education, Occupation in the Semarang Regional Community Health Center (n=43)

Indicator	F(n)	%
Pulmonary Tuberculosis Age		
Toddlers (0-5 Years)	8	18,6
School Age Children and Adolescents (>5-18 Years)	5	11,6
Adults (>18-45 Years)	15	34,9
Pre-Elderly (>45-59 Years)	6	14
Elderly (≥60 Years)	9	20,9
Gender of Pulmonary Tuberculosis		
Man	27	62,8
Woman	16	37,2
Pulmonary Tuberculosis Education		
No School	11	25,6
Elementary School	11	25,6
Junior High School	4	9,3
Senior High School	13	30,2
Diploma	1	2,3
Bachelor	3	7
Pulmonary Tuberculosis Jobs		
Doesn't work	14	32,6
Private	7	16,3
Employee	6	14
Laborer	4	9,3
Housewife	4	9,3
Trader	4	9,3
Farmer	2	4,7
Teacher	1	2,3
Sailor	1	2,3
Age of Supervisors to Ingest Drugs		
Adults (>18-45 Years)	31	72,1
Pre-Elderly (>45-59 Years)	296	14
Elderly (≥60 Years)	6	14
Gender of Drug Ingestion Supervisor		
Man	13	30,2
Woman	30	69,8
Drug Swallowing Supervisor education		
Elementary School	8	18,6
Junior High School	9	20,9
Senior High School	19	44,2
Diploma	4	9,3
Bachelor	3	7
Drug Ingestion Supervisor job		
Private	10	23,3
Employee	4	9,3
Laborer	3	7
Housewife	17	39,5
Trader	3	7
Farmer	1	2,3
Teacher	2	4,7

Table 2
Frequency Distribution of Nutritional Status of Pulmonary Tuberculosis Patients in Regional Health Centers (n=43)

Category*)	Toddlers 0-5 Years		School Age Children and Adolescents >5-18 Years		Adults >18-55 Years		Pre-Elderly >45-59 Years		Elderly ≥60 years	
	F(n)	%	F(n)	%	F(n)	%	F(n)	%	F(n)	%
BMI/A (0-60 month)*)										
Malnutrition	4	50								
Good Nutrition	4	50								
BMI/A(6-18 year)*)										
Malnutrition			1	20						
Malnutrition			2	40						

Category*)	Toddlers 0-5 Years		School Age Children and Adolescents >5-18 Years		Adults >18-55 Years		Pre-Elderly >45-59 Years		Elderly ≥60 years	
	F(n)	%	F(n)	%	F(n)	%	F(n)	%	F(n)	%
Good Nutrition			2	40						
BMI (>19 year)*)										
Thin					6	40	4	66,7	3	33,3
Normal					8	53,3	2	33,3	6	66,7
Obesity					1	6,7				

*) Source: Minister of Health Regulation No.2 of 2020, WHO 2017, PMK No.25 of 2016

Table 3
Frequency Distribution of the Role of Drug Swallowing Supervisors in the Semarang Regional Community Health Center (n=43)

The Role of Monitoring Drug Ingestion	**Pera**		**Peran Buruk**	
	f (n)			**%**
The role of supervising pulmonary tuberculosis patients	21	48,8	22	51,2
Supervise and ensure that tuberculosis patients swallow medication regularly until completion of treatment	28	65,1	15	34,9
Ensure that medications are swallowed according to established procedures	27	62,8	16	37,2
DOTS strategy short-term treatment with direct supervision	30	**69,8**	13	30,2
Availability of medicines according to needs	18	41,9	25	**58,1**
Monitor for side effects	20	46,5	23	53,5
The role of providing encouragement to pulmonary tuberculosis patients	28	65,1	15	34,9
Providing encouragement to pulmonary tuberculosis patients to seek regular treatment	28	65,1	15	**34,9**
Providing moral support to pulmonary tuberculosis patients	28	65,1	15	**34,9**
Provide enthusiasm for patient recovery	39	**90,7**	4	9,3
The role of reminding patients to re-examine sputum	16	37,2	27	62,8
Remind patients to re-examine sputum at the specified time	23	53,5	20	46,5
The accuracy of the sputum examination schedule	24	**55,8**	19	44,2
Ensure the accuracy of sputum for examination	14	32,6	29	**67,4**
Role as an educator	27	62,8	16	37,2
Understanding of the suspicious symptoms of pulmonary tuberculosis	26	60,5	17	**39,5**
Understanding of treatment regimen	31	**72,1**	12	27,9
The Role Of The Overall Medication Ingestion Monitor	**23**	**53,5**	**20**	**46,5**

Age is one of the characteristics of pulmonary tuberculosis patients, most of which are dominated by the adult group. This study is in line with research that shows that more adults suffer from pulmonary tuberculosis compared to other age groups.[10] Another study also revealed that cases of pulmonary tuberculosis often occur in the adult category because they have high activity and mobility so they are prone to exposure to tuberculosis germs from various external environments.[11] A similar study in 2021 also said that a person's maturity in making the best decisions based on the latest insight and experience is highest in the adult age group.[12] This is because pulmonary tuberculosis patients are

usually accompanied by a mother or father or someone who is considered capable of understanding the optimal absorption of information.

The male gender tends to experience pulmonary tuberculosis. Previous research stated that men are susceptible to pulmonary tuberculosis because they experience a decrease in antibodies due to their workload, history of smoking and alcohol consumption. This means that smoking can easily cause pulmonary tuberculosis and increase the risk of tuberculosis. The gender of drug swallowing supervisors is dominated by women.[13] Kusumaningsih et al. research states that women play more of the role of monitoring medication swallowing compared to men. Women are associated with their main role as mothers who care for the family and have more time to take care of household needs compared to men whose majority role is work.[14]

The education of pulmonary tuberculosis patients in this study was dominated by high school. The same results were found in previous studies that pulmonary tuberculosis patients were able to absorb information well if they had a secondary or upper education level. The education of the drug swallowing supervisor in this study was at the middle school level.15 This research is in line with Febrianto et al., that good thinking skills and optimal insight exploration about roles are found in many drug swallowing supervisors with high school education.16

Most of the pulmonary tuberculosis patients in this study were unemployed. This study is in line with previous research that pulmonary tuberculosis patients who do not have jobs tend to socialize less and receive less information about the disease and the use of health services. The job of supervising drug swallowers is the highest that a housewife has on a daily basis.11 (Gunawan et al., 2020) said that housewives are the dominant group monitoring the administration of medication for pulmonary tuberculosis patients because they can accompany pulmonary tuberculosis patients at any time.17

The nutritional status of toddlers in this study was balanced between good nutrition and malnutrition. The nutritional status of toddlers in the good category is in line with previous research that normal nutritional status is often found in pulmonary tuberculosis patients aged one to five years.18 The majority of toddlers with pulmonary tuberculosis have body mass index values below normal.19 Nausea, vomiting, decreased appetite and side effects of the drug Rifampicin can also cause a decrease in the nutritional status of pulmonary tuberculosis patients.1 Apart from that, another cause of decreased nutritional status is the process of disease infection.20

The nutritional status of pulmonary tuberculosis patients in school-age children and adolescents is in the categories of undernutrition and good nutrition and a small number are malnourished. This research is in line with previous research that children who suffer from tuberculosis have lower BMI values.21 Tuberculosis germ infection can affect a child's nutritional status, whereas if the nutritional status is normal, they can experience pulmonary tuberculosis through close contact with previous pulmonary tuberculosis sufferers. Poor nutritional status was still found in groups of children who experienced pulmonary tuberculosis on a small scale.22 Poor nutritional status makes it easier for tuberculosis bacteria to infect T lymphocytes which can reduce the body's immunity.5 Tuberculosis germ infection can affect a child's nutritional status, whereas those with normal nutritional status can experience pulmonary tuberculosis through close contact with previous pulmonary tuberculosis sufferers.

The nutritional status of adult pulmonary tuberculosis patients is mostly in the normal category. This study is in line with previous research stating that pulmonary tuberculosis patients of productive age have normal BMI values.23 Adult pulmonary tuberculosis patients are in the productive age category so they are able to manage the body's need for adequate nutrition when exposed to pulmonary tuberculosis.24 Most of the productive age have jobs so it will be easy to meet food needs to improve tuberculosis nutrition.

The nutritional status of pre-elderly pulmonary tuberculosis patients mostly has a thin BMI value. This study is in line with previous studies that underweight nutritional status is often suffered by pulmonary tuberculosis patients in the pre- elderly group.25 Thin nutritional status results from decreased body weight so that if this is not addressed immediately it can worsen the patient's condition, the severity of the disease and make recovery difficult.26 This indicates that the low nutritional status of the elderly is caused by internal factors, namely decreased immune system.

The nutritional status of elderly pulmonary tuberculosis patients is dominated by the normal category. This study is in line with previous research that pulmonary tuberculosis patients aged ≤ 60 years have normal nutritional status.27 The nutritional status of the elderly is worsened due to the bad habits of the elderly who consume fatty and high salt foods which can cause other comorbid diseases.28 Worsening conditions in pulmonary tuberculosis can be triggered by nutritional status and comorbidities. Comorbidities can worsen the condition of pulmonary tuberculosis which attacks the elderly, but because this research only focuses on pulmonary tuberculosis patients without comorbidities, many nutritional status categories are normal.4

The role of drug swallowing supervisors at the Semarang Regional Community Health Center for pulmonary tuberculosis patients is almost balanced between good and bad roles but the good role is more dominant. This study is in line with previous research that most drug swallowing supervisors have a good role.29 The drug ingestion supervisor actively carries out his role for pulmonary tuberculosis patients during the treatment period.30 Medicine swallowing supervisors always care about pulmonary tuberculosis patients coupled with good education to make knowledge and application of the role optimal.31 This research is in contrast to other research which states that as many as seventy percent of drug swallowers have a bad role.32 drug ingestion supervisors are not active in carrying out their role in pulmonary tuberculosis patients.33 Being careful about swallowing medication and rarely spending time together can cause pulmonary tuberculosis patients to not recover due to poor functioning, especially if they live far away.34 Medicine swallowing supervisors are considered based on several factors to realize the maximum role, including the location of the supervisor close to the patient so that he can help at any time and is well known to health workers and families.9

The good role in this research includes the role of implementing short-term supervision directly using the DOTS strategy. This research is in line with previous research that drug swallowing supervisors have a good role in implementing the DOTS program as evidenced by the increased cure rate.35 The role of providing encouragement for the patient's recovery is that PMO has an important meaning for pulmonary tuberculosis patients because support is more effective if it comes from the family where the family has a close relationship with the patient.36 The role of accurate sputum examination schedules is that tuberculosis patients have medication swallowers who always remind them of sputum examinations.35 The role of

understanding medication rules is that the

role of the drug swallowing supervisor is not only related to understanding the medication rules but also providing information regarding medication rules, side effects of drugs, preventative behavior, and repeated phlegm checks. Therefore, drug swallowing supervisors must be based on a good level of knowledge and willingness. the strong one.37

Bad roles include the role of ensuring the availability of medicines according to needs where the supervisor of taking medicines does not have time to provide insight to pulmonary tuberculosis patients because they are busy at work.38 The role of encouraging pulmonary tuberculosis patients to be willing to undergo regular treatment compared to the fact that supervisors who take medication do not provide full encouragement for the treatment process of pulmonary tuberculosis patients, especially from the family.36 The role of providing moral support to pulmonary tuberculosis patients is that moral support is very poorly implemented by drug ingestion supervisors for pulmonary tuberculosis patients.39 The role of ensuring the accuracy of sputum for examination is still poor because sputum examination at the Semarang Regional Community Health Center is carried out on patients starting at the age of 10 years so that patients under 10 years of age do not undergo sputum examination therefore the role score is low. This can cause the role of ensuring the accuracy of sputum for examination to be poor. The role of understanding the suspicious symptoms of pulmonary tuberculosis is that drug ingestion supervisors do not understand pulmonary tuberculosis in depth.[36]

CONCLUSION

This research shows that the nutritional status of toddler pulmonary tuberculosis patients has balanced results between good nutrition and malnutrition. The nutritional status of pulmonary tuberculosis patients in school-age children and adolescents is the highest and also has balanced results between the good and poor categories, but there is still a small number who experience poor nutrition. The nutritional status of adult pulmonary tuberculosis patients is highest in the normal category. The nutritional status of pre-elderly pulmonary tuberculosis patients is mostly in the thin category and the nutritional status of elderly pulmonary tuberculosis patients is dominated by the normal category.

The role of monitoring medication swallowing is mostly good. Based on the results obtained, it is hoped that Balkesmas can increase cross-program collaboration in the field of monitoring the nutritional status of pulmonary tuberculosis sufferers. Increase the provision of nutritional education and counseling for patients who experience worsening conditions. Provide a diet list for pulmonary tuberculosis patients. Increase formative evaluation of drug swallowing supervisors to ensure the effectiveness of the role carried out.

CONFLICTS OF INTEREST

The author declares that none of them had any conflict of interests.

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