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THE EFFECT OF DRUG INGESTION SUPERVISORS (PMO) AND MEDICINE BOX PROVISION ON MEDICATION ADHERENCE AMONG TUBERCULOSIS PATIENTS AT KARANG TALIWANG HEALTH CENTER IN 2024

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Abstrack

Treatment of Tuberculosis patients requires medication adherence, but there are still many patients who are non-compliant and negligent in medication adherence. Non-compliance in swallowing medicine can worsen and aggravate the patient's condition. PMOs play an important role in improving medication adherence. The medicine box is useful as a reminder for Tuberculosis patients to take medicine on time. The purpose of this study was to determine whether there is an effect of giving a drug swallowing supervisor (PMO) with the provision of a medicine box on drug swallowing compliance. This study used Pre Experimental research design with One Group Pretest-Posttest approach. The number of samples was 32 people using the proportionte stratified random sampling technique. Data were collected by observing compliance with swallowing medicine before and after the intervention conducted 3 times. Analysis using the Wilcoxon Signed Rank Test research design using the SPSS program obtained the results of Asymp. sig. (2-tailed) $p < 0.001$. The results of this study indicate that before being given most of the low compliance as many as 19, and a small portion of high compliance as many as 2 respondents. After being given treatment, most of the high compliance was 20 and a small proportion of low compliance was 3 respondents. The conclusion shows that, there is an effect of drug swallowing supervisors (PMO) with the provision of medicine boxes on adherence to patients ($\rho = 0.000$) in the working area of Karang Taliwang Health Center in 2024. It is hoped that this study will improve compliance with swallowing anti-tuberculosis medicine and family support as a Drug Swallowing Supervisor (PMO).

Keywords: Medication swallowing supervisor (PMO), medicine box, adherence, tuberculosis

1. INTRODUCTION

One of the infectious diseases that is still a health problem in the world today is tuberculosis. Tuberculosis or TB is a disease caused by infection of the Myocobacterium Tuberculosis bacteria in the lungs. Tuberculosis bacteria that invade the lungs can cause respiratory problems such as chronic cough and shortness of breath. (Ministry of Health, 2022).

Treatment for tuberculosis usually takes months with strict medication regimens to prevent the risk of antibiotic resistance. If not treated promptly, TB can be fatal. Treatment of TB patients requires adherence of medication, but there are still many patients who are non-compliant and negligent in adherence of medication. Non-compliance in taking medication can worsen and aggravate the patient's condition. (Wartonah et al., 2019).

Based on data from the World Health Organization, in 2020 the number of MDR TB patients reached 437 thousand, in 2021 it was stated that MDR TB had increased to 450 thousand cases, and in 2022 MDR TB cases reached 539 thousand. Thus, the number of TB deaths in 2023 amount 14.100 and 2024 is 14.500 (one person every 36 minutes) with TB death rate 34 per 100.000 population (increase 3% in a year)

Meanwhile in Indonesia, in 2020 there were 24 thousand MDR-TB cases, in 2021 it increased to 28 thousand MDR cases, and in 2022 MDR TB cases amounted to 36 thousand. And in NTB in 2020 MDR TB cases were 272 cases, an increase in 2021 MDR TB cases reached 392 cases, and in 2022 it increased to 412 cases. And especially in Mataram City in 2022 there was 1 person for MDR patient cases and was in the Karang Taliwang Health Center working area.

For Tuberculosis patient medicine non-adherence data from (WHO, 2018) there are as many as 335 thousand TB patients who are not compliant in taking drugs. Meanwhile, data from the Ministry of Health in 2022 has increased there are 509 thousand cases of non-compliance of TB patients. And data from the Mataram City Health Office in 2020 there were 44 patients. In 2021 there were 39 patients who dropped out of treatment, and in 2022 there was an increase, there were 61 cases of drug non-compliance in TB patients. And at the Karang Taliwang Health Center there were 12 cases of drug non-compliance in Tuberculosis patients.

Based on the results of an interview with one of the TB program holders at the Karang Taliwang Health Center said that every new patient who undertakes the Tuberculosis treatment program will get 7 tablets of medicine every week for 6 months and the efforts that have been made at the Karang Taliwang Health Center, namely, the Karang Taliwang Health Center has a program to provide education about Drug Swallowing Supervisors (PMO) to families of TB patients, but in reality the role of families as medicine Swallowing Supervisors (PMO) in this case is still very low.

The non-compliance medicine in Tuberculosis patients can occur due to long treatment and lack of patient awareness also causes non-compliance in swallowing drugs. Because the treatment is long, many patients are still negligent and forget to swallow medicine every day. The purpose of the Drug Swallowing Supervisor (PMO) is to ensure and supervise Pulmonary Tuberculosis patients to swallow drugs completely and regularly and prevent Pulmonary Tuberculosis patients from failing or dropping out of treatment. Thus, with the presence of a drug swallowing supervisor (PMO), the compliance of drug swallowing of Tuberculosis patients will increase. In addition to PMO, the provision of medicine boxes can overcome patient negligence in swallowing medicine, and can improve patient drug swallowing compliance. (Yulianti Hohedu et al., 2021).

2. RESEARCH METHOD

This study used a pre-experimental design with a one group pretest-posttest approach (Notoadmodjo, 2012). Sampling using proportionate stratified random sampling technique (Savitri, 2018). The research instrument used to measure adherence is the Morisky Medication Adherence Scale (MMAS-8) questionnaire which consists of 8 question items. (Zhang et al., 2021). The results of the study were analyzed using non-parametric statistical tests, namely the Wilcoxon test to determine the effect of Medication Swallowing Supervisors (PMO) with the Provision of Medicine Boxes on Adherence to Swallowing Medication for Tuberculosis Patients.

The inclusion criteria in this research is PMO is the closest family member or health care provider who are lives close to patient , willing and able to spend time to supervise the patient taking medication every day, has knowledge about TB and is willing to be educated about TB treatment, and willing to be a respondent or become an official PMO and sign an informed consent .Thus, the exclusion criteria is PMO who refuses to participate or refuses to be registered as a PMO and PMO who is often outside the working area of the health center/hospital where the patient is treated, so that supervision does not take place. This research was conducted in February – April 2024. The population in this study was 80 cases of Tuberculosis at the Karang Taliwang Community Health Center with a sample of 32 people

3. RESULTS AND DISCUSSION

Based on the results of the research that has been carried out, the results of the study will be discussed in the form of an overview of the characteristics of the respondents and an overview of the research results.

A. Overview of Respondent Characteristics

The following will present a general description of the respondents:

***Table* 1** Distribution of Respondents Based on Age, Gender, Education and Occupation of Tuberculosis Patients at Karang Taliwang Community Health Center in 2024 (n=32)

No.	Age (Years)	Frequency	Percentage (%)
1.	17 - 25	3	9,4
2.	26 - 35	6	18,7
3.	36- 45	5	15,6
4.	46 - 55	5	15,6
5.	56 - 65	10	31,3
6.	> 65	3	9,4
	Total	**32**	**100**

Table 2 Distribution of Respondents Based on Gender of Tuberculosis Patients at Karang Taliwang Community Health Center in 2024 (n=32)

No.	**Gender**	**Frequency**	**Percentage (%)**
1.	Male	21	65,7
2.	Female	11	34,3
	Total	**32**	**100**

Table 3 Distribution of Respondents Based on Education of Tuberculosis Patients at Karang Taliwang Community Health Center in 2024 (n=32)

No.	Education	Frequency	Percentage (%)
1.	Basic Education	8	25,0
2.	Secondary Education	2	6,2
3.	Higher Education	22	68.8
	Total	**32**	**100**

Table 4 Distribution of Respondents Based on Jobs of Tuberculosis Patients at Karang Taliwang Community Health Center in 2024 (n=32)

No.	Jobs	Frequency	Percentage (%)
1.	Work	24	75,0
2.	Not Working	8	25,0
	Total	**32**	**100**

Based on table shows that the largest age group in the age group 56 - 65 years as many as 10 respondents (31.3%). The gender of most respondents was male, namely 21 respondents (65.7%). The last education of most respondents was secondary education, namely 22 respondents (68.8%). The employment status of most respondents was working with a total of 24 respondents (75%).

B. Overview of Research Results

1. Identification of adherence before and after the PMO intervention with the provision of medicine boxes

Table 5 Results of the study based on adherence to swallowing drugs of Tuberculosis patients before and after being given PMO intervention with the provision of medicine boxes at Karang Taliwang Health Center in 2024 (n=32)

Compliance score	Frequency		Percentage
	Before	After	
Low compliance	19	3	9,4
Medium compliance	11	9	28,1
High compliance	2	20	62,5
Total	32		100

Based on Table 5, it can be seen that before being given PMO intervention with the provision of medicine boxes (pre-test) most respondents experienced low compliance with 19 respondents (59.3%) and it can be seen that after being given PMO intervention with the provision of medicine boxes (pre-test) most respondents experienced high compliance with 20 respondents (62.5%).

2. Statistical Analysis of Medication Adherence of Tuberculosis Patients

The results of the study were analyzed with the Wilcoxon test as follows:

Table 4 Wilcoxon test results of adherence to swallowing drugs of Tuberculosis patients

	Compliance			Total	Max Value	Min Value	P value
	High	Medium	Low				
Pre-Test	2	11	19	32	2	8	0,00
The post-Test	20	9	3	32	3	8	

Based on the Wilcoxon Sign Rank Test results, it shows that the Asymptotic Significance 2 Tailed or P value is <0.01 < alpa = 0.05. Hypotesis 0 (H0) is rejected and Working Hypothesis (H1) is accepted. This shows that there is an effect of Drug Swallowing Supervisors (PMO) with the provision of medicine boxes on adherence to swallowing drugs in tuberculosis patients at the Karang Taliwang Health Center in 2024.

DISCUSSION

A. Adherence to drug swallowing in tuberculosis patients before being given a drug swallowing supervisor (PMO) with the provision of a medicine box

Based on the results of the study, it was found that most respondents experienced low compliance as many as 19 respondents (59.3%). Judging from the characteristics of age, it can be seen that most of the respondents who experienced non-compliance in swallowing drugs in Tuberculosis patients were aged 56-65 years as many as 10 respondents with a percentage of 31.3%. The results of this study are in line with the results of Pradana's research (2015), the level of compliance with taking medication can be influenced by age factors, the higher the age of the patient, the more disobedient to pharmacological treatment.

Natalia's 2014 research in (Agustine et al., 2018)According to the researcher, the elderly cannot adapt to their decline will be frustrated and a rejection attitude towards the conditions they experience results in not caring about their condition so that they are not compliant with the recommendations for taking medication. According to the researcher, the older a person gets, the memory will decrease. Patients are not compliant with medication because they forget to swallow the medicine. In addition, due to a decrease in endurance in old age, the side effects of anti-tuberculosis drugs make the body weaker, so patients choose not to take medication.

Judging from the gender characteristics of Tuberculosis patients, most of them were male with 21 respondents (65.7%). The results of the above research are supported by the theory (Sitorus, 2019) the level of compliance with swallowing drugs for women is higher than men because patients experience a lack of motivation which results in a negative impact on following treatment. According to Sailan, M. Z. 2017 women are more obedient and more aware of the diseases they suffer than men. In terms of maintaining health, women usually pay more attention to their health than men. According to the researchers, women are more compliant in treatment than men, because women are more obedient to taking drugs according to the instructions given given the availability of more time at home compared to men who sometimes do not bring drugs while working.

Judging from the characteristics of education, most respondents with tuberculosis have secondary education, namely 22 respondents (68.8%). The results of the above research are supported by the theory AlifArditaYuda 2018The higher the patient's level of education, the more

knowledge they have to obey in taking drugs. In theory according to Lawrence Green in (Sentana & Pratama, 2021)According to Lawrence Green in (Sentana & Pratama, 2021), obedient behavior is influenced by predisposing factors, one of which is education. According to the researcher, someone who is educated will tend to want to know more about a disease they suffer from. Tuberculosis treatment patterns have their own rules regarding the types of drugs that are more than one and the length of treatment is at least 6 months. By knowing these rules, patients will not feel bored or burdened in the middle of treatment. If the patient stops (drop out) in treatment, he will understand the risks that occur, which can trigger the emergence of resistant germs that can worsen his health.

Judging from the characteristics of employment, most respondents carry out daily activities by working, namely 24 respondents (75%). This is supported by Claudia, R. O (2018) work affects economic function, patients try to make money for medical expenses because all patients want to recover and live healthy. According to Pujasari Ajeng, et al 2015 in (Sentana & Pratama, 2021) patients who work tend to be less compliant than patients who do not work, this is because patients who work do not have time to go to health services. According to the researcher, when conducting an interview with the respondent, the respondent said that while working he forgot to bring medicine so that he did not take anti-tuberculosis drugs routinely as recommended by the doctor. In addition, the respondent also said that due to the side effects of taking the medicine, her body felt weak so she was unable to work to fulfill her survival, so she chose not to take the medicine.

B. Adherence to drug swallowing in tuberculosis patients after being given a drug swallowing supervisor (PMO) with the provision of a medicine box

Based on the results of the study, it was found that most respondents experienced high compliance with a score of 8 as many as 20 respondents (62.5%). In this study after being given the intervention there were still low compliance as many as 3 respondents and moderate compliance as many as 9 respondents. This is because there are still respondents who are not aware of the importance of routinely swallowing anti-tuberculosis drugs so that they do not use the medicine box as a reminder to take the medicine on time according to the dose given by the doctor. In addition, the drug swallowing supervisor (PMO) also did not perform his role properly, did not supervise and did not remind respondents to take medicine.

The results of research by Amelda Lisu Pare et al. (2013) the role of PMO, family support and discrimination are risk factors for the treatment behavior of pulmonary TB patients. This means that if the PMO does not carry out its role properly, it can affect the patient's treatment behavior which then has an impact on the success of therapy. According to Suare Marcillo, (2012). With the presence of a drug swallowing supervisor (PMO), the patient does not bear the responsibility for compliance with drug use.

Based on theory Yulianti Hohedu et al., 2021 Medication swallowing adherence can also be improved by providing a medicine box to overcome patient negligence in swallowing medication, and can improve patient medication swallowing adherence. This is reinforced by Morisky & Muntner in 2009 in (Sentana & Pratama, 2021) said that a device called a pill box has been created, which is quite effective in overcoming the problem of adherence to routine drug consumption. In addition to being effective, pill boxes are considered to be able to help elderly people who have complaints of hypertension, diabetes, or other diseases that require daily consumption of drugs.

Based on the facts and theories above, the researcher argues that drug swallowing compliance can increase because of the support of the Drug Swallowing Supervisor (PMO) so that Tuberculosis patients do not feel heavy in taking drugs with large doses and in a long period of time. The provision of a medicine box is a form of reminder in taking medicine so that there is no wrong dose every day. In addition, the medicine box can also be a safe container in storing anti-tuberculosis drugs.

C. Analysis of the Effect of Drug Ingestion Supervisors (PMOs) with the Provision of Medicine Boxes to Tuberculosis Patients on Adherence to Drug Ingestion at

Karang Taliwang Health Center in 202 4

This study proves that there is an effect of Drug Swallowing Supervisors (PMO) with the Provision of Medicine Boxes for Tuberculosis Patients on Adherence to Drug Swallowing. The results of the Wilcoxon test obtained ρ value 0.001 < α = 0.05 which means Hypothesis 0 (H0) is rejected and Working Hypothesis (H1) is accepted. According to Suare Marcillo in 2012, which states that with the presence of a drug swallowing supervisor (PMO) the patient does not bear the responsibility for compliance with drug use. According to Yulianti Hohedu et al., 2021 Medication swallowing compliance can also be improved by providing a medicine box to overcome patient negligence in swallowing medication, and can improve patient medication swallowing compliance.

As for the factors that affect compliance according to Suare Marcillo in 2012, among others, the length of treatment and side effects of drugs become obstacles in treatment compliance of pulmonary tuberculosis patients, communication factors between patients and health workers affect compliance. Lack of information and supervision, dissatisfaction in the emotional relationship between patients and health workers, knowledge of health education related to the treatment of pulmonary tuberculosis and the impact that arises if non-compliance with treatment. Health facilities are important facilities, where patients can get health services directly. The availability of health facilities and the ability of patients to reach health facilities can affect patient compliance. If the patient cannot reach the health facility how does he know the information related to his illness.

Based on the facts and theories above, the researcher argues that drug swallowing compliance can increase due to the support of the Drug Swallowing Supervisor (PMO) so that Tuberculosis patients do not feel heavy in taking drugs with large doses and in a long period of time. With the provision of a medicine box as a form of reminder in taking medicine and can be a safe container for storing anti-tuberculosis drugs.

4. CONCLUSION

1. Most of the respondents before being given the intervention of Medication Swallowing Supervisor (PMO) with the provision of medicine boxes were low compliance as much as 59.3% and after being treated most of the respondents were in high compliance, namely 62.5%.
2. There is an Influence of Medication Swallowing Supervisor (PMO) with the Provision of Medicine Boxes on Adherence to Medication Swallowing in Tuberculosis Patients at the Karang Taliwang Health Center in 2024. The result of *Asymp. sig. (2-tailed*) 0.00 < α = 0.05 so that H1 is accepted and H0 is rejected.

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