



The Effect of Drug Swallowing Supervisor Assistance in Improving the Compliance of Drug-Taking Tb Patients in Rantau Prapat in 2021

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Abstract– Tuberculosis is still a global and national public health problem. According to a 2014 WHO report, at the global level, it is estimated that 9.6 million new TB cases will be reported. Official report from the TB Sub-Directorate of the Ministry of Health of the Republic of Indonesia based on the 2014 WHO Report: In Indonesia, it is estimated that there are 1 million new TB cases (399 per 100,000 population) with 100,000 deaths (41 per 100,000 population). The purpose of this study is to determine the effect of drug swallowing supervisor assistance (PMO) in increasing the compliance of TB patients in taking medication in Rantau Prapat. The design of this study uses an analytical observation research method. The population in this study is all TB patients in the Labuhan Batu area which totals 967 people. The sample in this study is TB patients in Labuhan Batu, Rantau Prapat with a total of 15 TB patients. The results of the study showed that of the 9 clients (60%) who received good family support, 7 clients (46.7%) behaved well in preventing the transmission of pulmonary TB and 2 clients (13.3%) behaved poorly in the prevention of pulmonary TB transmission. The results of the study were analyzed using the chi-square test to determine decision-making on the hypothesis tested. The working hypothesis raised is based on H_a , namely there is a relationship between PMO support and patient compliance in taking medication by pulmonary TB clients. The results of statistical analysis using the chi-square test obtained a p value = 0.041, then it can be concluded that H_0 is rejected. The conclusion of this study is that there is a relationship between PMO support and compliance of TB patients in taking medication.

Keywords: pulmonary tuberculosis, medication compliance, Mentoring, Medicine

1. INTRODUCTION

Tuberculosis (TB) remains the main source of morbidity and mortality in low- and middle-income communities (LMICs). In 2008, the World Health Organization (WHO) estimated that there were about 9 million new cases of TB and nearly 2 million deaths. In addition, more than 2 billion people are estimated to be infected with TB worldwide. The TB control program that supports the WHO's current Directly Observed Treatment Short (DOTS) is now well established in most developing countries. However, success with this strategy has not been universal, as many programs have been faced with more serious challenges. The HIV epidemic has dramatically increased the incidence of TB, especially in Africa and Asia, while the development and spread of drug resistance has made TB treatment difficult. Until relatively recently, inadequate funding for TB control made it difficult for DOTS programs to adapt and respond to these challenges.

Tuberculosis is still a global and national public health problem. According to the 2014 WHO report, at the global level, it is estimated that 9.6 million new TB cases with 3.2 million cases including women, 1 million cases of pediatric TB (under 15 years old), 1.5 million deaths/year due to TB (480,000 women, 140,000 children). Of the TB cases, 1.1 million were found. (12%) HIV positive with 320,000 deaths (140,000 were women) and 480,000 Drug-Resistant TB (TB-RO) with 190,000 deaths.

Official report from the TB Sub-Directorate of the Ministry of Health of the Republic of Indonesia based on the 2014 WHO Report: In Indonesia, it is estimated that there are 1 million new TB cases (399 per 100,000 population) with 100,000 deaths (41 per 100,000 population). The Case Notification Rate was reported at 129 per 100,000 population (with a total of 324,539 cases, and 314,965 cases were new cases. An estimated 63,000 are TB+ HIV positive, (25 per 1,00,000 population). The high prevalence of TB in Indonesia encourages the Indonesian Ministry of Health together with its related partners to work even harder. The End TB Strategy, proposed by the World Health Organization (WHO) and approved by member states at the 67th World Health Assembly (WHA) in 2014, targets a reduction in TB incidence and mortality until TB elimination is achieved by 2050.

Data from the Ministry of Health in 2016 is known that of the 34 provinces in Indonesia, the number of new cases of Pulmonary TB with BTA Positive is 156,723 people, consisting of male 95,382 people or 61% of sufferers and 61,341 female patients or 39% of sufferers. The surge in the ranking of Pulmonary TB experienced by Indonesia from fourth to second is clearly a frightening scourge for the spread of infectious diseases in Indonesia.

Based on the results of the survey on the prevalence of tuberculosis in Indonesia conducted by the Ministry of Health of the Republic of Indonesia in 2015, it describes various challenges in TB control and the burden of TB in Indonesia now, among others: First, many hospitals and private services do not report TB cases to the TB control program. Of the 125 participants who reported being treated for TB, only 34 (27%) were treated at the Health Center. Only a small percentage of the data of participants who are undergoing TB treatment can be found in the national register (SITT). The problem of serious under-reporting and mandatory notification of TB cases must be implemented immediately. Second, cases of chronic cough are high in Indonesia and may not be considered a disease. There were



8,377 participants with coughs for 14 days or more (12.3%). The proportion of participants who reported being coughing for 14 days or more or coughing up blood was 12.6%. Among them, 43.1% did not receive treatment, 30.8% self-treated, and 26.1% sought treatment from health workers. Of the participants who experienced the above screening symptoms, only 10.8% went to the Health Center for treatment. The high proportion of symptomatic TB cases indicates a delay in TB diagnosis. In the community, the high number of symptomatic TB cases makes the case discovery system must be improved. Third, the survey found that knowledge about TB services is still lacking and stigma is still high. The proportion of participants who knew the main symptoms of TB was 78.6%, the way TB was transmitted was 69.1%, and TB could be cured was 73.5%. Only a small percentage know that TB drugs are free (21.3%). The stigma shown by the attitude of keeping families affected by TB is still high (11.7%). Increased awareness and knowledge regarding the availability of services can facilitate early diagnosis and appropriate treatment. Fourth, Mycobacterium tuberculosis was only identified in 165 (57%) of 291 participants with positive smears after Xpert MTB/RIF or culture. Infection or contamination by NTM can be the cause of many positive smear specimens that are not TB. The diagnosis of TB is at risk of being inappropriate when only microscopic smears are used in the discovery of active cases. More accurate diagnostic methods are needed in addition to improving the quality of microscopic smears.

Based on data from North Sumatra's basic health research in 2018, the availability of medication supervisors (PMO) in North Sumatra amounted to 68.50 percent. The proportion of TB patients who take routine medication for less than 6 months amounted to 72.6 percent (Risikesdas, 2018). Based on the characteristics of the prevalence of pulmonary TB from the highest age group, which is in the age group of 65-74 years as much as 1.0%. Based on gender, the highest is male at 0.5%. Based on the highest education, which is not / has never been in school as much as 0.6%. The detection rate of pulmonary TB cases (CNR) in Labuhan Batu Utara (Labura) was 75.87% in 2013. In 2018, the number of TB patients in Labuhan Batu amounted to 967 people (BPS North Sumatra, 2020).

The problem of drug withdrawal is still a very difficult problem to face in Indonesia. A case of drug withdrawal (default/drop out) is defined as the discontinuation of TB treatment for ≥ 2 consecutive months before the treatment period is over. Drug withdrawal is a serious problem in TB control. Patients who discontinue medication have a higher risk of TB recurrence as well as an increased risk of mortality from TB. Patients who have withdrawn from medication are also a problem in terms of public health because they can transmit the infection to others and can cause TB germs to be resistant to OAT.

Some of the factors that affect patient compliance are: (1) individual factors (drug abuse, male gender, presence of other comorbid diseases, HIV positive, low socioeconomic status, lack of TB knowledge, OAT side effects), (2) health facility factors (access to health facilities is difficult, treatment of medical workers), (3) social factors (community stigma). Other challenges that are still faced in Indonesia are limited evidence-based information on TB MDR, access to diagnostic support examinations for TB MDR, TB-HIV, TB in children, extrapulmonary TB which is difficult and causes delays in diagnosis and treatment, limited human resources to work on TB programs with large coverage in Indonesia, and the large financial gap to work on the program.

2. RESEARCH METHODOLOGY

The research in this study uses an analytical observation research method which aims to research in trying to find a relationship between variables. With a cross sectional research design, namely research for cause or risk variables and consequences or cases that occur in the research object are measured and collected by stimulant.

The population in this study is all TB patients in the Labuhan Batu area which totals 267 people. The sample in this study is 15 TB patients in Labuhan Batu, Rantau Prapat. The inclusion criteria in this study are as follows: Willing to be a respondent, Respondents who can read and write in Indonesian, Cooperative and TB Sufferers.

Primary data is the collection of data obtained directly from respondents through questionnaires conducted by direct interviews with respondents. Secondary data is data obtained from reports and records or documents at the Labuhan Batu Health Office. The research tertiary data was obtained from journals, other research results from the internet related to this study. The independent variable in this study is the drug swallowing supervisor (PMO) and the dependent variable in this study is the increase in compliance of TB patients in taking OAT.

The data analysis technique carried out by the researcher with a closed questionnaire questionnaire to the respondents was 24 questions, namely 12 questions for independent variables and 12 questions for dependent variables, then the variable answer interval was formulated using the Sturgers formula to determine the respondents' answer criteria.

The design of the data analysis of the research results was formulated by taking steps starting from: Editing, Coding, Sorting, Data Entry, and Cleaning. The data was processed statistically using SPSS (Statistical System Processing Standard) version 18. by using the chisquare test analysis to find out the



frequency of the percentage influence of PMO assistance in increasing the compliance of TB patients in taking medication and to find data on whether or not there is an influence of PMO assistance in increasing the compliance of TB patients in taking medication in Labuhan Batu, Rantau Prapat. The measurement results were compared to test the research hypothesis so that the relationship between independent variables and dependent variables could be known. The alternative hypothesis (H_a) is accepted if there is an effect of PMO assistance in increasing the compliance of TB patients in taking medication in Labuhan Batu, Rantau Prapat, which is obtained from the results of the statistical test calculation less than 0.05 and the H_0 hypothesis is rejected if there is no effect of PMO assistance in increasing the compliance of TB patients in taking medication in Labuhan Batu, Rantau Prapat, which is obtained from the results of the statistical test calculation greater than $p = 0.05$.

3. RESULTS AND DISCUSSION

3.1 Univariate Analysis

Univariate analysis on numerical data (age, length of treatment, family support and transmission prevention behavior) used mean values, standard deviations, minimums, and maximums. Univariate analysis on categorical data (gender, last education, occupation, information about pulmonary TB, and sources of pulmonary TB information).

Distribution of Clients by Age and Length of Pulmonary TB Treatment in 2021 ($n=15$) was obtained that the youngest age of pulmonary TB clients was 18 years and the oldest age of pulmonary TB clients was 54 years. The average age of pulmonary TB clients was 33.60 years, the median age of pulmonary TB clients was 31 years with a standard deviation of 13.136 years. The average age of pulmonary TB clients (33.60 years) in the study results showed that the average age of regional pulmonary TB clients was included in the young adult age category, with the average age interval of pulmonary TB clients ranging from 26.33 years to 40.87 years.

The results of the study on the distribution of pulmonary TB clients according to the length of treatment were obtained that the shortest length of treatment for pulmonary TB clients was 1 month and the longest length of treatment was 12 months. The average length of treatment for pulmonary TB clients was 4.27 months, the median value of treatment was 3 months, with a standard deviation of 3.494 months. The average length of treatment in pulmonary TB clients (4.27 months) in the results of the study showed that the average value of the time of undergoing pulmonary TB treatment was still close to the minimum value of the time of treatment, which was 1 month, so it can be concluded that pulmonary TB clients in the working area of the Patrang Health Center, Jember Regency have not been undergoing pulmonary TB treatment for a long time, with the average interval of time lung TB clients undergoing treatment is between 2.33 months to 6.20 months.

The distribution of clients by gender showed that most of the pulmonary TB clients were male as many as 10 clients (66.7%) and the number of female clients was 5 clients (33.3%). The data showed that the highest percentage at the high school/vocational school (SMA/SMK) education level was 8 clients (53.3%), junior high school (SMP) was 5 clients (33.3%), and the lowest percentage was 2 clients (13.3%). The results of the study showed that none of the clients had an elementary school (SD) level and a tertiary education.

The distribution of pulmonary TB clients' work is uneven across each type of work. The highest percentage is private employees, which is 9 clients (60.0%), 4 clients are not working (26.7%), and the lowest percentage is trade and housewives as many as 1 client (6.7%). Distribution of clients based on information about pulmonary TB. Distribution based on information about pulmonary TB from 15 clients, all clients have received information about pulmonary TB, which is as many as 15 clients (100%). Most of the clients got information about pulmonary TB from health workers, namely 13 clients (86.7%) and from electronic media as many as 2 clients (13.3%).

Table 1. Client Distribution According to PMO Support in Pulmonary TB Clients in 2021 ($n=15$)

Family Support	Frequency	Percentage %
Lackof support	6	60
Good support	9	60
Total	15	100

PMO support variables are categorized based on cut of point data which refers to mean values. The researcher categorized the PMO support variable into PMO support is less if the score obtained is <30.53 and PMO support is good if the score obtained is ≥ 30.53 . The higher the value obtained, the better the PMO support obtained by pulmonary TB clients. PMO support is included in the good category if the PMO support value is close to the highest PMO support



score of 33 and PMO support is included in the poor category if the PMO support value is close to the lowest PMO support score of 26. Table 1 shows that most of the pulmonary TB clients received good PMO support, which was as many as 9 clients (60%) and received less PMO support as many as 6 clients (40%). PMO support in pulmonary TB clients tends to have good PMO support. The PMO support variable consists of 4 indicators, namely emotional support, assessment support, instrumental support, and informational support.

Table 2. Distribution of Pulmonary TB Clients by PMO Support Indicators in 2021 (n=15)

Emotional Support	Frequency	Percentage (%)
Total	15	100
Assessment Support		
Lackof support	12	20
Good support	3	80
Total	15	100
Dukungan Instrumental		
Lackof support	11	26,7
Good support	4	73,3
Total	15	100
Informational Literature		
Lackof support	12	20
Good support	3	80
Total	15	100

Table 2 shows that the emotional support obtained by pulmonary TB clients has various values, namely pulmonary TB clients who receive less emotional support as many as 7 clients (46.7%) and pulmonary TB clients who receive good emotional support as many as 8 clients (53.3%). Researchers concluded that the emotional support that pulmonary TB clients get is lacking emotional support.

Table 2 shows that most of the pulmonary TB clients received good assessment support, namely 12 clients (80%) and the rest received less assessment support as many as 3 clients (20%). The researcher concluded that the assessment support obtained by pulmonary TB clients was good assessment support. Table 4.4 shows that most of the pulmonary TB clients received good instrumental support, namely 11 clients (73.3%) and the rest received less instrumental support as many as 4 clients (26.7%). The researchers concluded that the instrumental support obtained by pulmonary TB clients was good instrumental support.

Table 2 shows that most of the pulmonary TB clients received good informational support, namely 12 clients (80%) and the rest received insufficient informational support as many as 3 clients (20%). The researcher concluded that the informational support obtained by pulmonary TB clients was good informational support.

The results of the study were seen from the average score with the maximum value obtained that the highest value of family support was emotional and informational support which was 0.94 and the lowest value of family support was assessment support of 0.91, while the value of instrumental support was 0.92.

3.2 Bivariate Analysis

The analysis of the relationship between PMO support and transmission prevention behavior by pulmonary TB clients used a chi-square statistical test because both variables are categorical data and based on the results of the normality test of PMO support variable data and pulmonary TB transmission prevention behavior, it was found that the data was not normally distributed.

Table 3. Distribution of Clients by PMO Support with Transmission Prevention Behavior by Pulmonary TB Clients 2021 (n=15)

No	PMO Support	Behavior to Prevent Pulmonary TB Transmission				95%	P Value
		Less		Good			
		F	%	F	%	F	%
1	Less	5	33,3	1	6,7	6	40,0
2	Good	2	13,2	7	46,7	9	60,0
	Total	7	46,7	8	53,3	15	100



The results of the presentation in table 3 were obtained that from 15 pulmonary TB clients, it was known that clients had pulmonary TB transmission prevention behaviors based on PMO support had various values, namely clients who had good transmission prevention behaviors as many as 8 clients (53.3%) of whom most received good family support as many as 7 clients (46.7%) and the rest only 1 client (6.7%) received poor family support. and clients who had less transmission prevention behaviors as many as 7 clients (46.7%) consisting of 5 clients (33.3%) received poor family support and 2 clients (13.3%) received good family support. The results of data analysis using the chi-square test obtained the result that the p value = 0.041 with a significant level of 0.05. The p-value is smaller than the significant value ($0.041 < 0.05$), thus H_0 is rejected, which means that there is a relationship between family support in family members' health care and transmission prevention behavior by pulmonary TB clients. In the table, it is also written that the Odd Ratio (OR) value is 17.5 which means that clients who have good family support will have 17.5 times the opportunity to behave well in the prevention of pulmonary TB transmission, while clients who have less family support will have 17.5 times the opportunity to behave poorly in the prevention of pulmonary TB transmission.

3.3 Discussion

The results of the client's characteristics obtained in this study include age, gender, last education, occupation, information about pulmonary TB, sources of pulmonary TB information and length of pulmonary TB treatment. The results of the data presentation show that the average client is 33.60 years old. The results of the study showed that the age of the client was a young adulthood group. According to Santrock (1999), the young adult group is included in the transition period (physical, intellectual, and social role transition) (Dariyo, 2004). Havighurst (1995) stated that the task of developing young adult individuals includes finding and finding potential life partners, fostering family life, setting up a career in strengthening the household economic life, and becoming a responsible citizen (Dariyo, 2004). The age of 33 years is the age range in the productive age category. The Guidelines for Pulmonary TB Control states that around 75% of pulmonary TB patients are in the productive age group (Ministry of Health of the Republic of Indonesia, 2009). Research conducted by Murfikin (2013) obtained the results that as many as 48.5% of pulmonary TB patients are in young adulthood and productive age. Age is a variable that is always considered in epidemiological studies. The figures of illness and death in almost all circumstances show a relationship with age (Notoatmodjo, 2007). Productive age is more at risk of experiencing the incidence of pulmonary TB, because productive age plays an important role in meeting economic needs and has very high mobility so that the possibility of exposure to *Mycobacterium pulmonary tuberculosis* is greater. The second client characteristic is gender, the results of the study show that out of 15 clients, most have a male gender as many as 10 clients (66.7%). Research by Sembiring (2012), shows that the most common gender is male at 69%, while female gender is 31%. The results of this study are different from the research conducted by Asiah (2014) which stated that the female sex was more affected by pulmonary TB, which was 53% more than the male gender. The third client characteristic is the last education, with the results of the study showing that of the 15 clients had a diverse last education. Research by Murfikin (2013) on the Relationship between Smoking Habits and the Incidence of Pulmonary TB in the Working Area of the Sidomulyo Health Center stated that some of the patients had a high school education background, which was 54.5%. Education is the most important thing to provide development assistance from the individual as a whole, in order to develop the potential that exists in the individual himself as much as possible. The low level of education will make it difficult for individuals to understand the problems that occur, relatively high education will provide ease of understanding and ease of receiving the knowledge obtained (Notoatmodjo, 2003). The characteristics of the client's work are mostly private employees, namely as many as 9 clients (60%). The results of this study are in accordance with research conducted by Muniroh (2012) which stated that most of the clients work as private employees, which is 80%. Work is an individual activity that aims to earn income to meet the needs of daily life. Work is also related to the fulfillment of individual health costs. Working pulmonary TB patients have financial maturity so that it will be easier to obtain health services (Notoatmodjo, 2003).

The next characteristic of the client is information about pulmonary TB, showing the results of the study that all clients have received information about pulmonary TB, namely as many as 15 clients.



Information according to Anton M. Meliono is data that has been processed for a specific purpose, namely to produce a decision, while according to Gordon B. Davis information is data that has been processed into a form that has meaning for the recipient and is useful for current and future decision-making. The researcher draws conclusions from several definitions of information according to the experts that information is a data or object that has been processed in advance so that it is well arranged, so that it has meaning for the recipient about a certain thing that helps to make the right decision. Information is important to an individual's life, with information that individuals who initially do not know about something become aware and individuals who initially do not understand become understanding. Researchers assume that information has an influence on individual knowledge, even though individuals have low education, but if they get good information from various media such as TV, radio or newspapers, then it will be able to increase a person's knowledge. The ease of obtaining information can help accelerate a person to acquire new knowledge (Notoadmodjo, 2007).

The results of the research on the sixth client characteristic are the source of obtaining pulmonary TB information. Most of the pulmonary TB clients received information about pulmonary TB from health workers, namely 13 clients (86.7%). Information is needed by pulmonary TB clients to know and understand the definition, causes, transmission process, prevention and treatment of pulmonary TB. Information about pulmonary TB can be obtained from health workers, print or electronic media, family and relatives. Information is useful to increase the knowledge and insight of individuals who get information. The researcher assumes that if he knows where the pulmonary TB client gets information about pulmonary TB, it can be known how much knowledge or insight the individual has obtained. Characteristics of long-term clients undergoing pulmonary TB treatment The average length of pulmonary TB treatment is 4.27 months. Pulmonary TB clients require long treatment to determine the right diagnosis and need to be treated properly so that it does not become a chronic disease (Anggraeni, 2011). The time required for pulmonary TB clients to undergo treatment and until they are declared cured is 6-8 months. If the client of pulmonary TB does not regularly take medication, then the pulmonary TB bacteria will become immune and the disease will be more difficult to treat, the client will take longer to recover, and the treatment period will be longer (Laban, 2008). Pulmonary TB disease requires long-term treatment to achieve cure. The type of long-term treatment will cause pulmonary TB clients to not comply with treatment. Non-compliant behavior in undergoing this treatment will make pulmonary TB bacteria resistant to the client's body. Clients who do not comply with treatment are one of the causes of the high incidence of pulmonary TB disease.

PMO Support in Pulmonary TB Clients

The results showed that most of the value of PMO support in pulmonary TB clients tended to be good family support. The PMO support obtained by pulmonary TB clients was mostly good PMO support, but the PMO support obtained by pulmonary TB patients was not perfect. This imperfect PMO support can be seen from some indicators of PMO support that have been met, but there are still indicators of PMO support that have not been met.

PMO support is a process of relationship between the family and its social environment that can be accessed by the family which can support and provide help to family members (Friedman, 2010). Pulmonary TB clients who receive good PMO support will feel the benefits, namely it can help improve and maintain the physical condition of pulmonary TB clients. The study of PMO support conceptualizes social support has proven to be very useful as a family coping, external and internal supports have proven to be very useful.

External PMO support includes friends, jobs, neighbors, schools, extended families, social groups, recreation groups, places of worship, health practitioners. Internal PMO support includes support from husband or wife, from siblings or support from children (Setiadi, 2008). PMO support in this study consists of 4 indicators which include emotional support, assessment support, instrumental support, and informational support. All aspects of PMO support are closely interrelated. Informational support is useful in providing information to pulmonary TB clients about pulmonary TB treatment, treatment schedules, and advice on treating pulmonary TB disease so that it does not become severe. The provision of suboptimal informational support can be caused by several factors, including lack of information received by families regarding



pulmonary TB disease, families are not skilled in conveying information to pulmonary TB clients and because the clients themselves do not want to carry out the information received from their families.

The role of nurses is urgently needed in handling these cases. Nurses have the potential as care providers, namely nurses play a role in monitoring or supervising the treatment of pulmonary TB clients, conducting early detection of drug side effects and re-recording pulmonary TB clients who have not undergone treatment for a long time. The role of educators, nurses provide health education to the public about the symptoms of pulmonary TB in order to increase the discovery of pulmonary TB suspects. In the role of a counselor, nurses provide alternative solutions faced from diagnosis to treatment of pulmonary TB.

4. CONCLUSION

The description of pulmonary TB clients shows an average age of 34 years, more males, most of them have high school/vocational education, most of them are private employees, all clients have received pulmonary TB information, most of them get pulmonary TB information from health workers, the average patient undergoing pulmonary TB treatment is 4.27 months. Most or most of the value of family support in pulmonary TB clients is good support. Transmission prevention behavior by pulmonary TB clients is good behavior. There is a significant association between PMO support in medication adherence by pulmonary TB clients.

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