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The Effect of Self Management Education on Knowledge and Self Efficacy of Pulmonary TB Clients in Timor Tribal Community



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Abstract

Background: Pulmonary Tuberculosis (TB) disease is still the main cause of death among the poor with low knowledge. Knowledge and self efficacy are the keys to the successful management of pulmonary TB. **Objective:** The purpose of this study was to investigate the effect of self management education (SME) by emphasizing the five pillars of TB management on knowledge and self efficacy of pulmonary TB clients in the Timor tribal community in Kupang, Indonesia. **Methods:** This quasi-experimental study was conducted on 30 primary pulmonary tuberculosis patients who undergoing treatment for 6 months with self-management educational interventions that had never been obtained before. The research was conducted from January to October 2020 in the working area of the Naibonat Community Health Center, Kupang Regency. The data were collected using a questionnaire on demographic data, knowledge and self efficacy which had been tested for validity and reliability. The data were analyzed by the Paired T-test with SPSS 21. **Results:** The mean score of pre test knowledge and self efficacy of clients with pulmonary TB, respectively, 5.23 ± 1.04 and 4.77 ± 1.07 increased significantly to 6.33 ± 1.18 , and 7.13 ± 0.94 on the post test ($P < 0.001$) with a large difference of increase of 1.10 ± 1.18 for knowledge and 2.37 ± 1.27 for self-efficacy. **Conclusion and Recommendation:** giving SME by emphasizing the five pillars of pulmonary TB management increases the knowledge and self-efficacy of pulmonary TB clients in the Timor tribal community. The recommendation of this study is that SME interventions can be used as one of the nursing interventions in the public health center in community empowerment based pulmonary TB management.

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INTRODUCTION

Pulmonary tuberculosis (TB) is a disease that attacks the lung parenchyma (WHO, 2020a). Until now, pulmonary TB disease is still the 10th cause of death in the world. It is estimated that 10 million people are infected with tuberculosis (TB) worldwide in 2018 which affects 5.7 million men, 3.2 million women, and 1.1 million children with 1.5 million people dying from this disease (WHO, 2018).

Eight countries Accounted for 87% of the world's total new TB cases in 2018 with India leading the tally, followed by China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa. Treatment adherence is a major factor in the failure of the pulmonary TB treatment program (WHO, 2020 & Yakhelef et al., 2020).

The prevalence of pulmonary TB in Indonesia is 420,994 cases in 2017 (data as of May 17, 2018). Based on gender, the number of new TB cases in 2017 in men was 1.4 times greater than in women. Based on the Tuberculosis Prevalence Survey, the prevalence in men is 3 times higher than in women. This is probably because men are more exposed to TB risk factors such as smoking and lack of adherence to taking medication. (KEMENKES RI, 2018a).

Based on the data from the global TB report 2020, the prevalence of TB in Indonesia is known to be 570,289 cases in 2018 and decreased to 543,784 cases in 2019. This figure is not significant, because many cases of resistant TB are due to non-adherence to taking medication (WHO, 2020b).

The province of East Nusa Tenggara (NTT) is one of the provinces with high TB cases. Based on the results of basic health research (2018), it is known that the number of patients diagnosed with TB is 0.27% of the national figure, namely 0.42% (KEMENKES RI, 2018b). Kupang is one of the districts with a high incidence of TB in NTT. In 2015, there were 162 cases, decreasing to 31 cases in 2016 and then increasing to 230 cases in 2017 and 461 cases in 2018 (NTT Provincial Statistics Agency, 2020).

One of the biggest contributors to the increase in pulmonary TB cases in Kupang is the Timorese who live in the working area of the Naibonat Public Health Center. In 2017 there were 69 cases and increased to 76 cases in 2018 (Puskesmas Naibonat Medical Record, 2020).

Based on the results of interviews with the person in charge of the TB program at the Naibonat

Public Health Center, it is known that the Timorese are a community at risk because they are known for their lack of concern for their health. Several things cause this indifference, namely, ignorance, unwillingness, and stubbornness. This condition causes the health education provided to have no impact on increasing knowledge of attitudes and actions in pulmonary TB management. Many incidents of multiple drug resistance (MDR) TB are problems that arise due to non-compliance with taking medication. This makes the level of complexity of the TB problem even higher.

Various efforts have been made to overcome the problem of pulmonary tuberculosis in the working area of the Naibonat Public Health Center including Directly Observed Treatment, Short-course (DOTS) which has been implemented since 1995, and health education. Health officers also activated the role of the Public Health Nurse, a program knock on the door of TB and TOSS TB (Find Treat until Cured) to reduce the incidence of pulmonary TB, but these efforts have not yielded maximum results. The low awareness of TB clients (Self-efficacy) is thought to be the most determining factor in the management of pulmonary TB in the Timor tribe community.

Self-efficacy is defined as an individual's belief in his or her abilities which is necessary for self-motivation (Moradi, Nasiri, Jahanshahi, Hajiahmadi, 2019 & Bahtiar, Nursasi, 2019). Lack of efficacy is one of the causes of lack of adherence to treatment protocols and negative health behaviors in pulmonary TB clients. Self-efficacy can be increased by providing information to clients (Bahtiar & Nursasi, 2019) (Maula, Nursasi, & Wiarsih, 2019).

According to Masyfahani, (2019) pulmonary tuberculosis is a disease that is difficult to overcome even with the DOTS strategy. This is because the treatment takes a long time, and the sufferers need compliance. Handling TB clients apart from its emphasis on treatment, we need to focus on empowering clients to be actively involved in pulmonary TB care. One effort that can be given is to provide self-management education (SME).

SME is a method, guidelines, counseling, and behavioral intervention to increase knowledge and self-efficacy regarding tuberculosis and improve individual and family skills in managing pulmonary TB disease (Wei, Omar, 2017 & Masyfahani, 2019).

The effectiveness of SME both in clients with pulmonary TB and in other diseases separately has

been widely studied. SME can improve the quality of life, medication adherence behavior, seeking medical assistance, blood pressure control and self-efficacy in pulmonary TB clients, obstructive pulmonary disease and hypertension (Benzo et al., 2013; Wang, Lang, Xuan, Li, & Zhang, 2017; Masyfahani, 2019; Jauhar, Nursasi, & Wiarsih, 2019; Li et al., 2019; Moradi et al., 2019)

This study aims to determine the effect of SME on knowledge and self-efficacy of pulmonary TB clients in Timorese tribal communities in Kupang, NTT province by emphasizing the five pillars of pulmonary TB management, namely increasing knowledge, taking medication behavior, fulfilling nutrition, physical activity, and preventing TB disease transmission.

METHODS

Type of Research, Population, Sample, Research Setting

This research was a quasi-experimental study with a one group pre-test and post-test design without a control group by giving SME intervention to 30 pulmonary TB clients. The first 1-3 months) recorded in the medical records of the Naibonat Health Center with the age of 20-60 years. This design does not involve randomization in assigning subjects to treatment units (Boswell, C., & Cannon, S., 2020)

SME intervention was given for 12 weeks in 6 months of research, starting from April-September 2020 with emphasizing on the five pillars of pulmonary TB management, namely increasing knowledge, taking medication behavior, fulfilling nutrition, physical activity, and preventing TB disease transmission.

Ethical Clearance and Measurement Tools

This research protocol has passed the ethical test of health research at the Health Research Ethics Commission of the Buleleng Bali College of Health Sciences with number 081 / SK-KEPK-SB / III / 2020. The measuring instrument used in this study was a knowledge questionnaire about pulmonary tuberculosis and self-efficacy of TB clients which had been tested for validity and reliability by Masyfahani, (2019).

The knowledge questionnaire used in this study consisted of 10 questions consisting of 1 question about the meaning of pulmonary tuberculosis, 1

question about signs & symptoms of pulmonary tuberculosis, 1 question about pulmonary TB disease examination, 1 question about pulmonary TB treatment, 1 question about side effects. Pulmonary TB treatment, 2 questions about TB treatment support, 2 questions about pulmonary TB transmission, 1 question about pulmonary TB prevention. All questions are favorite questions.

Self-efficacy questionnaire related to the ability to deal with pulmonary tuberculosis which consists of 10 questions using the Guttman scale as follows; 1 = sure and 0 = not sure. Everything is a favorable question. The highest score is 10 and the lowest is 0. The higher the value, the better self-efficacy, and vice versa.

Research Procedure

Intervention and data collection was carried out by researchers and 5 nurses whose perceptions had been similar to the research. The SME intervention was given 12 weeks with the following steps

Step 1, Identification. In this step, a pre-test of the client's knowledge and self-efficacy was carried out using a knowledge and self-efficacy questionnaire. Besides, clients are identified for the management of pulmonary TB on five pillars, namely related to knowledge, drug ingestion behavior, nutritional fulfillment, physical activity, and prevention of TB disease transmission. This activity is carried out in the first week.

Step 2, Advice. In this step, the problems identified in the previous step are reported to the client and the client is informed about TB management in the five pillars, namely knowledge, drug ingestion behavior, physical activity, nutrition and prevention of disease transmission, and positive behavior changes if they have positive behavior related to pulmonary TB. In step 2, individuals are given education on the five pillars. Step 2 was carried out at the second and third weeks of the intervention.

Step 3, Consent: A written agreement is made with the Client regarding the behavior change objectives and activities required to achieve the goals. Therefore, for each problem identified in the first step, an action plan is developed based on the stated objectives. To ensure patient adherence to activities, a list of intended activities is made for each client and the client is asked to provide a written daily report in a notebook, with the help of family members, on involvement in physical activity,

nutritional fulfillment, ingestion of drugs and prevention of TB disease transmission. This stage is carried out from week 4 to week 11.

Step 4, Behavioral counseling. In this step, TB clients who are not adherent to ingesting drugs, given activities, nutrition consumed, and disease prevention needs are given counseling according to the findings of each individual. Counseling is given if any problems are found in the patient until the completion of the 11-week intervention session.

Step 5, Follow-Up Activities: At this stage, the patient is followed up once a week regarding drug ingestion behavior, physical activity, nutrition, and prevention of disease transmission. The client was also reminded by telephone call every day in the initial 3 weeks of the intervention, namely weeks 3, 4, and 5. In this session, the patient's written report in the notebook was also assessed. To ensure compliance with the objectives set and activity plans made.

Step 6. Evaluation: at this stage, an evaluation of the success of the intervention is carried out by providing a post test of the knowledge and self-efficacy of pulmonary TB clients. The post-test uses the same questionnaire during the pre-test. This stage is carried out at week 12.

Data Analysis

Univariate analysis was used to determine the client's demographic characteristics (age, gender, and education level). The data are presented in the form of numbers and presentations, while the data of knowledge and self-efficacy are presented in the form of mean counts. A paired T-test was used to answer the objectives of this study. The analysis is said to be significant if the p-value <0.005, which indicates the influence of SME on knowledge and self-efficacy of pulmonary TB clients in Timorese tribal communities in NTT province, with the help of IBM software 21.

RESULT

Demographic Characteristics

A total of 30 pulmonary tuberculosis patients who belong to the Timorese people were involved and were able to complete this intervention well. Table 1 provides a summary of client demographic data consisting of age, occupational, sex, and education level.

Table 1 Distribution of age, sex, occupation, and education level of clients with pulmonary tb in timor tribal communities in the work area of the Naibonat public health center, kupang, April-September 2020

Characteristic	N	Percentage (%)
1. Gender		
a. Male	17	56.7
b. Female	13	43.3
Total	30	100
2. Age		
a. 17-25	2	6.7
b. 26-35	8	26.7
c. 36-45	6	20.0
d. 46-55	4	13.3
e. 56-65	10	33.3
Total	30	100
3. Education		
a. Uneducated	8	26.7
b. Preliminary	8	26.7
c. Junior High school	7	23.3
d. Senior High school	7	23.3
Total	30	100
4. Occupation		
a. Housewife	13	43.3
b. Farmer	10	33.4
c. Private Workers	4	13.3
d. Students	3	10.0
Total	30	100

Source : Primarily data

Table I shows a total of 30 pulmonary TB patients. In general, 56.7% of the respondents were male. Most of the TB sufferers were at the age of 56-65 years with the most occupations as housewives. In general, the education level of TB clients is comparable between those who do not go to school and those who have primary school education as much as 26.7%

Knowledge and Self Efficacy

Knowledge and self-efficacy of clients with pulmonary tuberculosis were measured twice, namely before being given SME intervention at the first-week meeting and after being given SME intervention at week 12. The summary can be seen in Table 2.

Table 2 shows the average knowledge and self-efficacy of TB clients before and after being

Table 2 Knowledge and self-efficacy of pulmonary tuberculosis clients before and after being given SME in timor tribal communities in the work area of the Naibonat public health center, Kupang, April-September 2020

Variables		Mean ± SD	Min-Max	Normality Test
Knowledge	Pre Test	5,23±1,04	3-7	0,104
	Post Test	6,33±1,18	4-9	0,056
self-efficacy	Pre Test	4,77±1,07	3-6	0,096
	Post Test	7,13±0,94	5-9	0,103

Source: Primarily data

given SME, which has a normal data distribution. The results also showed that the average client knowledge and self-efficacy were higher after intervening with SME

Analysis of the influence of SME on knowledge and self-efficacy

Analyzes were performed using the paired T-test to see the effects of the SME given over 12 weeks. The results can be seen in Table 3 below.

Table 3 shows that there is a significant change in knowledge and self-efficacy of TB clients after being given SME with a value of $p < 0.001$. This shows that SME can increase the knowledge and self-efficacy of the Timorese people who suffer from pulmonary TB.

DISCUSSION

This study aims to determine the effect of SME on knowledge and self-efficacy of pulmonary TB clients by emphasizing the five pillars of TB management, namely increasing knowledge, taking medication behavior, fulfilling nutrition, physical activity, and preventing TB disease transmission.

The results showed that there was an increase in the mean score of knowledge and self-efficacy after being given SME with a p -value < 0.05 . The research findings show that giving SME increases the knowledge and self-efficacy of clients with pulmonary TB. This finding is in line with two findings in previous studies, namely Masyfahani, (2019) and Jauhar et al., (2019). Masyfahani’s

Table 3 Knowledge Analysis and Self Efficacy before and after being given SME to the community Timorese in the work area of the Naibonat public health center, Kupang, April-September 2020

Variables	(N=30)	Mean ± SD	95% CI Min-Max	P(value)
Knowledge	Pre Test	5,23 ± 1,04	0,66 - 1,542	0,000
	Post Test	6,33 ± 1,18		
Deviation	1,100 ± 1,185			
T Score df (29) = 5,086				
self efficacy	Pre Test	4,77 ± 1,07	1,89 - 2,84	0,000
	Post Test	7,13 ± 0,94		
Deviation	2,37 ± 1,27			
T Score df (29) = 10,19				

Source: Primarily data

research, (2019) on 30 primary pulmonary TB clients, it was found that SME were able to increase medication compliance behavior and self-efficacy of pulmonary TB clients by giving intervention for 1 month. Jauhar, Nursasi, & Wiarsih, (2019) self-management can improve health care seeking

behavior and compliance with pulmonary tuberculosis clients taking medication and correlate with self-efficacy.

Jadgal’s research, Nakhaei-moghadam, Alizadeh-seiouki, Zareban, & Sharifi-rad, (2015) in Iran on providing education to TB clients also

improves clients' knowledge and behavior about pulmonary TB initiatives. Another study that is also in line with the results of this study is the research of Sitanggang, Amin, & Sukartini, (2017) on self-coaching in TB clients where TB clients are given motivational health education and counseling for one month divided by 4 treatment sessions, it is known that health education in the form of health coaching affects the increase in knowledge, attitudes, and actions, and self-efficacy of pulmonary TB clients. In this intervention, a follow-up was also carried out after health education was given to each client.

Increased knowledge and attitudes experienced by TB clients can change client actions in preventing TB transmission for the better. Health education can increase a person's knowledge through the learning process by changing and influencing human behavior in increasing awareness and self-confidence so that clients are aware and willing to change their behavior to be healthy (Sukartini, Kurniawati, & Makhfudli, 2020).

This research intervention is also in line with Putra's research, (2020) on clients with chronic obstructive pulmonary disease (COPD) given by SME through booklet media, it is known that SME increases client empowerment (knowledge, attitudes, actions, decision-making abilities, and self-efficacy) in 18 clients. COPD but not yet effective in reducing COPD symptoms this is due to the condition of the disease and comorbid factors experienced by the client.

Increased knowledge and self-efficacy in Timorese people suffering from TB occurs because the SME approach given is carried out in 5 systematic steps and is oriented towards solving target problems carried out following what is felt or occurs in pulmonary TB clients. According to (Han & Park, 2016) SME can increase knowledge, medication adherence, and self-efficacy and can be developed based on the needs and characteristics of the target population with various cultural backgrounds. In this research, SME is given to the Timorese people who have different cultures and values and views about health and the use of health services. The Timor tribal community will use health service facilities if they are already suffering from a very serious disease. Education carried out with a systematic and gradual approach is the basis of the success of this therapy.

Providing health education for pulmonary TB clients in this program is followed by individual

counseling according to the problems found in the 5 pillars of pulmonary TB management. The goal is that TB clients are allowed to be independently responsible for their disease by being directly involved in the management of TB disease. All client activities related to ingesting drugs, physical activity, fulfilling nutrition, and TB disease prevention behavior are carried out by the client and assisted by their family. In line with this situation, Daniali, Eslami, & Maracy, (2017) explained that SME interventions need to be followed by home visits by health workers. The focus of intervention should really change the client's medication practice, not just counseling, and providing social support to improve medication adherence. Clients must be made a schedule for taking medication and must be given reminders in taking medication and scheduled reports to health workers. Scheduled reports were also made by the TB client for each weekly home visit in this study. Masyfahani further, (2019) explained that SME is an educational program for clients that aims to increase knowledge and skills in disease control through behavior change to get better clinical results.

Client education is an important aspect of management programs for clients with chronic diseases, such as diabetes mellitus, hypertension, and pulmonary tuberculosis. Education to clients is recommended to be given at the time of diagnosis and continued until the end of treatment. The goal is that patients have good self-management and are responsible for managing their disease (Sutandi, 2012; Lestari & Isnaini, 2018). The SME intervention in this study was given not only once but was continued at follow-up every week. This is done because the treatment and care of pulmonary TB is a long process that requires strategies in managing the disease. With the provision of SME, it is hoped that the client's knowledge can increase to increase self-efficacy which has an impact on his management in the management of pulmonary TB disease.

Increasing the self-efficacy of pulmonary TB clients in this study is a process that cannot be separated from the client's understanding of the disease. The point is that the increase in TB client self-efficacy occurs after the client understands about TB management in 5 pillars, namely increased knowledge, drug-taking behavior, the fulfillment of nutrition, physical activity, and prevention of TB disease transmission.

Several factors affect the self-efficacy of clients with chronic diseases such as pulmonary TB besides knowledge. According to Alligood, (2014) self-efficacy or self-confidence is a person's ability to take certain actions that can develop from the learning process, own experiences, and experiences of other people. Islamic research, (2018) states that self-efficacy in clients with pulmonary tuberculosis is positively correlated with self-experience, observation of other people, verbal persuasion (information and emotional support), and physiological evaluation (the client's physical and emotional state) affects pulmonary TB clients in undergoing treatment.

Previous experience in achieving success or achievement is the strongest form of self-efficacy, experience in completing treatment during the intensive phase can form self-efficacy in completing the advanced phase of treatment. Various other related experiences will influence subsequent behavior. Pulmonary TB clients tend to observe the behavior of other pulmonary TB patients undergoing treatment. The sufferer is a model who has similarities with the client. The failure or success of the model in treatment can affect the level of client self-efficacy. Information and emotional support provided optimally can increase the self-efficacy of pulmonary TB clients in demonstrating their ability to undergo treatment (Islami, 2018).

Other factors that are thought to increase the self-efficacy of clients in this study are age and experience of undergoing treatment where clients in this study are clients who are undergoing treatment at the incentive stage with an average age of adults and the elderly. In the incentive stage, clients learn from the experience for advanced treatment, besides that TB clients also learn from the behavior of their fellow TB clients in undergoing treatment.

Research by Weiwei Ding, Tong li, Qiying so, Maohua Yuan, (2018) regarding self-management in hypertensive clients, it is known that demographic characteristics, namely age are significantly related to self-efficacy and positively correlated with self-management in hypertensive sufferers where the more mature a person is, the better self is. client efficacy and the better self-management of the disease.

Researchers argue that pulmonary tuberculosis patients in this study have good self-efficacy after having sufficient knowledge through SME

interventions and also supporting factors such as age and learning from their own experiences so that they have a direct impact on behavior changes in disease management related to physical activity, fulfillment. nutrition, ingestion of drugs, and preventing TB disease transmission.

CONCLUSIONS

This study concluded that the educational self-management program for pulmonary TB clients by emphasizing the five pillars of pulmonary TB management, namely increasing knowledge, taking medication behavior, fulfilling nutrition, physical activity and preventing the transmission of TB disease had a significant positive effect on increasing client knowledge and self-efficacy in the management of pulmonary tuberculosis.

SUGGESTIONS

The recommendation of this research is that it is hoped that policy makers in both health services and the government, in this case the Health Office, can design training programs in the management of pulmonary tuberculosis by emphasizing 5 aspects, namely increasing knowledge, taking medication behavior, fulfilling nutrition, physical activity and preventing transmission. TB disease and train all health workers, especially nurses who work in health care centers, on the implementation of the 5 pillars of pulmonary TB management in providing nursing care. This intervention can also be used as a community nursing intervention in the management of pulmonary TB

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