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The Effect of Health Coaching-based Health Belief Model on Preventing the Pulmonary Tuberculosis Transmission at *Puskesmas* Karang Taliwang and Ampenan West Nusa Tenggara

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Abstract. Adherence is an essential factor in achieving optimal health status in patients with tuberculosis. The study aimed to examine the effect of health coaching on preventing the infection of pulmonary tuberculosis patients. A quasi-experimental study design, pre, and post-test with the non-equivalent control group. Seventy samples were recruited by using a purposive sampling technique. The intervention group received the health coaching program for two months, while the control group received the usual care. The results showed that health coaching was to improve adherence prevention of infection (p<0,001). Health coaching based on the Health Belief Model was a positive effect on preventing infection transmission.

Keyword: tuberculosis, adherence, education, health coaching, health belief model

INTRODUCTION

Adherence is a significant factor in achieving optimal health status in patients with pulmonary TB. In many countries around the world, the DOTS strategy has been implemented since 1995, but this is felt to be still insufficient because pulmonary TB is still a global problem that is difficult to resolve because of its long-term treatment and the need for adherence from sufferers (1).

Indonesia ranks third with the highest number of TB sufferers after India and China, which is 10% of all sufferers. In 2017 there were 446,732 cases of tuberculosis cases, with details of 321 / 100,000 population. The prevalence of Indonesians diagnosed with pulmonary TB by health workers in 2018 is 0.4%, not different from 2007 and 2013. According to the Indonesian Health Profile, TB disease is the first in priority disease control because of the high TB cases that result in death. Non-adherence to treatment has a broad influence on the quality of life and economy and mortality. The impact is the occurrence of treatment failure, the possibility of recurrence of the disease, drug resistance, continuous transmission of infection, failure to achieve cure rates for pulmonary TB, loss of household income and stigma, and even being excluded by society (2)

Transmission of pulmonary TB in the family can be done through coughing, sneezing, talking, or spitting. Patients will sweat TB germs into the air, known as bacilli (3). Basil can be resolved in free air for 1-2 hours, depending on the presence or absence of ultraviolet light, excellent facilities, and humidity. In humid and germicidal situations, it can take days to months (4). Patients with pulmonary TB with a positive smear status can transmit at least 10-15 other people, including their own family. TB germs can become dormant for years by forming thick waxy cell walls. If a person's immune system decreases, it is likely to be more prominent (5). Home and family are an environment that often interacts with positive TB sufferers, so the potential for disease transmission to occur means that people who live at home / have close contact with patients are at high risk of contracting it. The amount of bacillus that is exposed and continuous-time can facilitate the transmission of infection (6). Prolonged contact with patients with a higher percentage for household members. A bedtime history will also increase the likelihood of exposure to the TB bacillus (7)

Various efforts to overcome and terminate the chain of transmission of TB infection has been carried out through health programs at the Puskesmas level. In the form of developing a TB prevention strategy known as the DOTS strategy (directly observed treatment), which has been shown to reduce the number of infections, it also prevents the development of MDR (Multi Drugs Resistance) -TB. However, the results are still felt not as expected. The DOTS strategy's primary focus is the discovery and healing of patients, with the priority of infectious TB patients. This strategy will decide on TB transmission and is expected to reduce TB incidence in the community. Finding and healing patients is the best way to prevent pulmonary TB transmission and break the chain of infection (8). Therefore, family support is essential because it supports the success of one's treatment by always reminding the patient to take medication, a deep understanding of the sick patient, and encouraging them to continue to be diligent in their treatment (9). Also, health workers such as doctors and nurses, as part of professional healthcare providers, are always expected to increase their knowledge and skills to be perfect for detecting and diagnosing TB disease at an early stage (10).

Based on the description above, the authors are interested in providing a form of an educational intervention with Health Coaching to improve belief in TB patients so that later it is hoped that behavioral behavior will be generated by using the theory of Health Belief Model.

OBJECTIVE

The study aimed to examine the effect of a health coaching based health belief model on preventing pulmonary tuberculosis transmission.

METHOD

We conducted the quasi-experimental study design, pre and post-test with the non-equivalent control group. Seventy samples were selected based on the purposive sampling

technique in the working area of Puskesmas Karang Taliwang and Puskesmas Ampenan. The research was conducted to provide the effect of a health coaching based health belief model on preventing pulmonary tuberculosis transmission in treatment groups for two months. Patients who are respondents are patients who can read and write, are cooperative, and are in intensive phase treatment. The statistical trials used in the research Wilcoxon Signed Rank Test with a significance level of $\alpha < 0.05$.

The research instrument used education based on the health belief model and the questionnaire's prevention of infection that was answered by the respondents. The questionnaire was modified from the Sukartini et al. (11), which was modified by researchers. This questionnaire consisted of 10 statement items using a Likert scale of 1-5. Researchers have tested the validity and reliability to guarantee/improve the quality of research results. This test was conducted at the Puskesmas Selaparang West Nusa Tenggara, tested for pulmonary tuberculosis patients who were not included in the sample.

The intervention in this study was given the Health Belief Model theory-based educational interventions four times home visits with a frequency of once two weeks for 20 minutes of education each meeting. In the first session, researchers examined patients' readiness for pulmonary tuberculosis, which includes patient perceptions about the benefits of adhering to medication and the prevention of pulmonary tuberculosis transmission. Furthermore, barriers from patients also would be assessed, such as preventing pulmonary tuberculosis transmission and side effects. Attitudes on medication adherence and transmission prevention, family support in taking medication and transmission precautions, and environmental influence to medication and transmission prevention measures. In the second session, researchers provided education and motivation. They were expected after participating in health coaching activities. Patients were able to understand the basic concepts of pulmonary tuberculosis diseases, including understanding, causes, signs, and symptoms of the disease, complications, treatment, and side effects of treatment. In the third session, the researcher trains prevention and transmission measures, including how to cough correctly, how to cough forcefully, how to wash hands, and create a pleasant home environment for health. In the last session, the patient can practice the health coaching activities that have been given since the beginning of the meeting. Educational interventions provided include material about how to prevent transmission of infection. Ethical approval with certificate number 1313-KEPK from the Ethics Committee of the Faculty of Nursing, Airlangga University

RESULTS

Characteristic of respondents

Table 1 showed the results of the characteristic of respondents.

Table 1. Characteristic of respondents

	Intervention (n=35)		Control (n=35)		P-value
	Frequency	%	Frequency	%	
Gender					
Male	18	51.4	17	48.6	1.000
Female	17	48.6	18	51.4	
Age					
26-35 years old	16	45.7	1	2.9	0.042
36-45 years old	13	37.1	19	54.3	
46-55 years old	6	17.1	15	42.9	

Education						
No school	4	11.4	4	11.4		
Primary Education	17	48.6	17	48.6		
Secondary Education	7	20.0	6	17.1		0.764
Higher Education (D3/S1)	7	20.0	8	22.9		
Occupation						
No working	7	20.0	6	17.1		
Laborer	4	11.4	5	14.3		
Farmer	5	14.3	7	20.0		0.40
Swasta	7	20.0	7	20.0		
Entrepreneur	4	11.4	4	11.4		
Civil servant	8	22.9	6	17.1		

The effect of health coaching based on Health Belief Model on preventing infection transmission pulmonary tuberculosis patients

Patients in the experimental group showed a significant difference between pre and post, with a 95% confidence value obtained P-value = 0.000 (<0.05). The pre-test at the intervention group showed *a mean* 1.83, and the post-test at the intervention group showed a mean 2.27, with delta at the intervention group, was 0.44. The pre-test at the control group showed *mean* 2,03 and post-test at the control group showed *mean* 2.34, with delta at the control group, was 0.31. Based on the table effect of health coaching based on the Health Belief Model on preventing infection transmission, pulmonary tuberculosis patients meaning that the intervention group had 0.44 times higher adherence prevention of infection than the control group.

Table 2. The effect of health coaching based on Health Belief Model on preventing infection transmission pulmonary tuberculosis patients

Adherence Prevention of infection	**Group**				***delta***	***P-value***
	Pre-test		**Post-test**			
	Mean	**SD**	***Mean***	**SD**		
Intervention Gorup (n=35)	1.83	.761	2.27	.721	0.44	0.000
Control Group (n=35)	2.03	.785	2.34	.725	0.31	0.005

DISCUSSION

Educational intervention health coaching based on Health Belief Model influenced to improve the adherence of prevention invention in patients with pulmonary tuberculosis. The result showed mean of knowledge increased after the intervention compared to before the intervention in the treatment group. The treatment group experienced an increase in scores after being given educational intervention health coaching based on the Health Belief Model to bring up respectful behavior in the prevention infection of tuberculosis.

The results showed a significant effect of the Health Belief Model-based health coaching on the prevention of transmission prevention in pulmonary TB patients. Based on the pre-test and post-test mean values, the treatment group experienced a significant increase after being given health coaching rather than the control group. This improvement was achieved by growing confidence in patients while providing health coaching interventions for eight weeks.

The results showed an influence of the Health Belief Model-based health coaching educational intervention in increasing adherence to the prevention of transmission. A significant impact on transmission prevention compliance in the intervention group was obtained through the Health Belief Model-based health education on prevention of transmission and an explanation of the environment that supports transmission prevention. In this intervention, the patient is given an understanding of how the ethics of coughing and sneezing are correct, how to expel phlegm, the use of eating and drinking utensils and the home environment to prevent transmission.

Education or promotion of TB treatment is directed to increase compliance through correct and comprehensive knowledge about prevention of transmission, treatment, diet, clean and healthy lifestyle so that there are changes in attitudes and behaviors of TB program targets related to this and eliminate stigma as well as community discrimination and health care workers against TB patients (1)

Health Belief Model-based health coaching education interventions try to offer appropriate learning or education to improve patient compliance in preventing pulmonary TB transmission. This educational intervention is expected to be a learning material for patients to be able to interact appropriately with others so that patients can do ways to prevent transmission of pulmonary TB so as not to infect their diseases to others. Along with the formation of the patient's understanding of the prevention of transmission, patients are also still motivated to be able to implement transmission prevention both not only at home but also when the patient when interacting with a more comprehensive social scope (12).

Health coaching can affect motivation, overcome obstacles, overcome a patient's inability, influence patients not to limit themselves, produce, and how to become more involved and make decisions (13). Health coaching provided is done to improve the perception of pulmonary TB patients related to the benefits of transmission prevention behaviors, by increasing awareness and motivating for healthy actions such as closing the mouth when coughing or sneezing, expelling phlegm in a particular place and wearing a mask. Help overcome obstacles faced, such as difficulties in treatment, challenges in obtaining information related to the disease, and the need for knowledge related to the disease (14). Improving attitudes about prevention of transmission and involving the family as the primary source of interpersonal that is expected to support patients in the prevention of pulmonary TB transmission behavior and can improve health-promoting behavior by increasing patient understanding of pulmonary TB disease (15). This result is supported by research by Tola et al. (2016) (16), which states that educational interventions and psychological consultation based on HBM can significantly reduce the level of non-compliance in pulmonary TB patients (17). HBM tries to explain and predict the possibility of behavior changes associated with belief patterns in patients so that patients are confident in their ability to recover from pulmonary TB (18).

This is supported by research from Desy (2014), which shows a significant relationship between family support and medication adherence in patients with pulmonary TB in Ciputat. This research is also supported by research from Rahardjo et al. (2017) (19), which reports that there is a relationship between the level of education and medication adherence. The researchers' educational intervention in this study was a health coaching educational intervention based on a health belief model to improve patient compliance with medication. This is supported by research by Tola et al. (2016) (20), which shows that educational

interventions and psychological consultation based on HBM can significantly reduce the level of non-compliance in pulmonary TB patients. Another supportive study is the study of Wakefield et al. (2015) (21), which shows that health coaching can improve adherence in patients with DM, hypertension, and hyperlipidemia.

CONCLUSION

Health coaching showed a positive effect on preventing infection transmission because health coaching can affect motivation, overcome obstacles, overcome a patients' inability, influence patients not to limit themselves, produce and how to become more involved, and making decisions. The limitation of this study is data collection only by using the questionnaire. The study used quasi-experimental research, which means the researcher could not control all outside factors that affect the intervention.

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RECOMMENDATION

Pregnant women can use the red ginger extract as an alternative treatment for pregnancy hypertension. Future studies are expected to evaluate blood pressure every day and control for socio-cultural factors and maternal food factors. Future researchers can develop research related to red ginger extract by adding other variables, namely anxiety and levels of nitric oxide (NO) in blood or saliva.

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