

The Correlation between the Levels of Family's Knowledge about Pulmonary Tuberculosis and Efforts in Prevention of Pulmonary Tuberculosis Infection

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Abstract--- *Pulmonary tuberculosis (TB) is an infection caused by Mycobacterium tuberculosis. This study aimed to analyze the correlation between family knowledge about pulmonary TB and efforts to prevent the spread of pulmonary TB infection in health centers. This study was a correlational study with a cross-sectional approach. The population in this study were families with pulmonary TB in Primary Healthcare. The sampling method used purposive sampling and obtained 25 samples. The independent variable in this study was family knowledge about pulmonary TB. The dependent variable was the family's effort to prevent the spread of pulmonary tuberculosis infection. Data were taken using a questionnaire and analyzed by the Spearman rho test with $\alpha \leq 0.05$. This study showed that there was a correlation between family knowledge about pulmonary TB and efforts to prevent the spread of pulmonary tuberculosis infection ($p = 0,000$, $r = 0.695$). Higher knowledge can increase family efforts to prevent the spread of pulmonary tuberculosis infections. The results of this study were expected to increase the motivation of nurses to provide health education and counselling to people who still do not understand how to prevent the transmission of pulmonary TB infection.*

Keywords--- *knowledge; prevention; pulmonary tuberculosis*

I. INTRODUCTION

The Ministry of Health of the Republic of Indonesia in 2011 reports that Indonesia has been recognized for its success in tuberculosis (TB) control [1], which reported by World Health Organization report in 2009 that as the country with the highest number of TB patients in the world, Indonesia succeeded in reducing its position from position 3 to position 5 [2]. Besides, Global Report data can also be seen from Indonesia's success in reducing TB mortality from 348/day [3], 300/day [4], 250/day [2], and 169/day [5]. In West Nusa Tenggara (NTB), the number of pulmonary TB sufferers from 2013-2015 always increased year by year, which was as follows: in 2013 the number of TB sufferers in NTB were 3174 people, in 2014 there were 3182 people, and the last was in 2015 TB sufferers in NTB increased to 3193 people. Meanwhile, in Mataram, 307 people suffered from pulmonary TB in 2013. In 2014 there were 315 people, and in 2015 it increased to 328 people. The number of patients with pulmonary TB in 10 districts/cities in NTB province in 2015, namely: Mataram City (347 people), West Lombok (371 people), North

Lombok (242 people), Central Lombok (315 people), East Lombok (428 people), Sumbawa (295 people), West Sumbawa (256 people), Dompu (364 people), Bima (317 people), and 332 people in Bima City [6].

The lack of family knowledge on the transmission of the pulmonary TB virus is one of the cause's factors. Less understanding of the cause, the ways of transmission and efforts to prevent infection can increase the number of spreads of infection thereby increasing the number of sufferers. Knowledge of pulmonary TB can be obtained through reading books, getting information from health workers, or other facilities. The main principle of it is a learning process that can changes knowledge and abilities (behaviour) in the subject of learning [7], [8].

After conducting a preliminary study at the Mataram City Health Center, West Nusa Tenggara on 7 October 2015, as many as 5 out of 10 respondents who had families with pulmonary TB sufferers did not understand about pulmonary TB care, including home care, treatment, and prevention. Following the results of observations, patients with pulmonary TB who visited the health centre for treatment did not close their mouth properly when sneezing and coughing and throwing saliva in any place. Moreover, from the results of a short interview, answered from 6 of 10 families with pulmonary TB that at home eating utensils such as plates, cups, and spoons sufferers were nothing different from other family members and about 4 out of 10 family members remain in the same room with sufferers. Health counselling had also been carried out by the health centre, but only in the health centre environment, not concentrated in several special places around the homes of residents. Only did every family come with the patient given a short health education to treat pulmonary TB patients and home visits were not provided by the primary healthcare to every home. That health education tends to less than optimal.

Patients with positive TB often interact with family in their home environments. There is potential contact with disease transmission or people who live at home and have close contact with patients have a high risk of infected. The amount of bacillus exposed and the contact duration increase transmission of infection. Prolonged contact with sufferers is greater for household members. Shared room history will raise the likelihood of exposure to TB bacilli. Lack of family knowledge in understanding the causes, ways of transmission, and efforts to prevent infection can increase the number of spreads of infection, thereby increasing the number of sufferers [8], [9]. Currently, there are still many people who do not know that there is a free pulmonary TB health service program at Primary Healthcare.

The various types of strategies to prevent and break TB infection transmission have been carried out through health programs at the Primary Healthcare level, in the form of developing a TB control strategy known as the DOTS (directly observed treatment) strategy, which has been proven to be able to reduce the number of infections, as well as prevent the development of MDR (Multi Drugs Resistance) TB, although the results have still no reached as expected [10], [11]. The main focus of the DOTS strategy 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 the incidence of TB in the community [12]. Finding and healing patients is the best way to prevent the transmission of pulmonary TB disease and break infection [11], [13]. Therefore family's cooperation is needed, so long as it supports the success of one's treatment by always reminding patients to take medicine, giving a deep understanding of patients who are sick and encouraging them to continue to be diligent in treatment [14], [15]. Furthermore, health workers such as doctors and nurses as part of professional healthcare providers are expected to always improve their knowledge and skills to be more perfect on early detecting and diagnosing TB. This study uses behaviour theory from Lawrence Green which tries to analyze human behaviour from the level of health. A person's health is influenced by two main factors, namely: behavioural factors (behaviour causes) which consist of predisposing factors, supporting factors, and driving factors, and external factors behaviour (non-behaviour causes).

Based on the explanation mentioned above, the researchers were encouraged to analyze the correlation between the level of family knowledge and efforts preventing transmission of pulmonary TB infection.

AI. METHODS

Correlational with a cross-sectional approach was used to execute this study. The correlational study aimed to describe the important events that are happening at present. Families of patients with pulmonary TB were being population in this study. The duration of collecting data was from January to December 2015 and gained 63 people. The sampling technique used was purposive sampling.

The independent variable was the level of family knowledge of pulmonary TB patients and the dependent variable was the family's efforts preventing transmission of pulmonary TB infection. A questionnaire that has been tested for validity and reliability was the instrument used for data collection. Furthermore, the data were analyzed using Spearman's rho correlation statistical test with a significance level <0.05 . The interpretation is that if H_0 is rejected which means there is a correlation between the level of family knowledge and efforts preventing transmission of pulmonary TB infection.

BI. RESULTS

Respondent characteristic data presented in a table consist of age, sex, education level, and occupation. The level of family knowledge about pulmonary TB, efforts in the prevention of transmission of pulmonary TB infection, and the correlation of the level of family knowledge about pulmonary TB and efforts preventing transmission of pulmonary TB infection had shown in the tables below.

Table 1. Distribution of respondents characteristics

Characteristics	n	%
Ages		
17-25 (late teenager)	5	20
26-35 (early adult)	13	52
36-45 (late adult)	6	24
46-55 (early elderly)	1	4
Total	25	100
Gender		
Male	16	64
Female	9	36
Total	25	100
Education		
Uneducated	3	12
Primary School	15	60
High School	5	20
Higher Education	2	8
Total	25	100
Occupation		
Unemployed	2	8
Private Sector	3	12
Civil Servant	1	4
Farmer	2	8
Labour	6	24
Entrepreneur	11	44
Total	25	100

Based on the data above, the total number of respondents was 25 people which the majority were in early adulthood (26-35 years) in a total of 13 respondents (52%). About 16 respondents were male (64%) and 9 respondents were female (36%). For the level of education, the majority of respondents experienced a primary school of 15 respondents (60%). In addition, an entrepreneur was being the common occupation of the respondent which reached 11 respondents (44%).

Table 2. Distribution of knowledge and prevention level

Variables	n	%
Knowledge		
Good	8	32%
Sufficient	7	28%
Less	10	40%
Total	25	100%

Prevention Level		
Good	8	32%
Sufficient	8	32%
Less	9	36%
Total	25	100%

Based on table 2, most respondents have a less level of knowledge which counted as many as 10 people (40%). Family efforts preventing transmission of pulmonary TB infection was still lacking that can be seen from a total of 9 people (36%).

Table 3. Cross-tabulation of the correlation between family knowledge about pulmonary TB and efforts preventing transmission of pulmonary TB infection

Knowledge	Prevention effort of transmission TB Infection			Total
	Good	Sufficient	Less	
Good	5	3	0	8
Sufficient	3	2	2	7
Less	0	3	7	10
Total	8	8	9	25

Spearman's rho $p=0,000$ $r=0,695$

Table 3 showed that Spearman's rho statistical test results obtained $p=0,000$ ($p < 0.05$), thus the hypothesis (H1) was accepted. This indicated that there is a correlation between family knowledge about pulmonary TB and efforts preventing transmission of infection in pulmonary TB patients. The Correlation coefficient showed a significant result ($r=0.695$), while the direction of the correlation was positive for the ground reason that the value of r was positive. This indicated that the higher the level of knowledge is, the more efforts to prevent transmission of infection will happen.

IV. DISCUSSION

The finding showed that the majority of respondents' knowledge was included in the category of less, namely 10 people. In contrast, only 8 respondents had good knowledge. According to Notoatmodjo in 2012, the definition of knowledge is the result of understanding, which occurs after people sensing a certain object. Sensing occurs through the five human senses, namely the sense of sight, hearing, smell, taste, and touch [16]. Most of the knowledge is obtained from the sense of sight and sense of hearing. Knowledge is a very essential domain in shaping one's actions. Knowledge is influenced by the learning process, as well, that has the characteristics of obtaining something new not known before and not understood. Therefore, those actions are causing someone to gain, to know, and to understand the information provided. Not only does Lack of respondents' knowledge level cause due to education factors, but it can also be influenced by age, occupation, and income. The more mature of age and income people are, the more mature the person's to think is, which will affect the level of knowledge.

Based on the results of the study, it was found that the majority of family efforts prevention of transmission of pulmonary TB infections included in the category of less, as many as 9 people. Whereas those recorded as a good category, namely as many as 8 respondents and those being in the category of sufficient had the same number of respondents as good categories. According to the theory of Lawrence Green in Notoatmodjo in 2003, enabling factors are encouragement factors that provide a reason to behave or manifest motivation to take action [17]. Sunaryo in 2004 stated that the social economy is one of the exogenous factors that influence someone's behaviour [18]. This statement is supported by Snehandu B. Kar's theory in Notoatmodjo in 2003 that a person will behave just as a situation that allows for action [17]. This opinion is in line with the results of research from Ristyo, Imam, & Pepin in 2012 stated that there is a correlation between the socioeconomic level and the incidence of pulmonary TB in Jombang [19]. Theory of Green & Kreuter in 1993 revealed that factors that influenced, changed, maintained, or enhanced behaviour to be more positive were health education [20]. Through health education and health counselling, the enlargement of knowledge can attain in which respondents are directed to be able to understand about the prevention of transmission of pulmonary TB infection. As a result, this knowledge will lead respondents to think and

build emotions and form respondents' beliefs to be able to behave and act more positively. This theory is consonance by the results of research from Handayani & Purwanti in 2011, health education influenced on controlling and treating group in Surakarta [21]. In addition, the study result from Alis et al., in 2013 stated that there is an engagement between health education and health knowledge as well as the attitude of clients with pulmonary TB in Sragen [22].

Based on the results of statistical analysis using Spearman's rho, it was found that there was a relationship between the level of family knowledge and efforts to prevent the transmission of infection in pulmonary TB patients. This result was supported by research conducted by Nurfadillah, Yovi, & Restuastuti in 2014 which stated that there was a relationship between knowledge about pulmonary TB with preventive measures for pulmonary TB transmission [23]. The results of this study were in accordance with the behaviour theory of LW Green & Kreuter in 2005 declared that knowledge is one of the predisposing factors influencing behaviour [24]. Knowledge or cognitive domain was a very essential domain in shaping actions [25]. The theory showed that knowledge correlates with efforts to prevent transmission of pulmonary TB infection. The results of this study are consistent with the study done by Bowo in 2015 which revealed a correlation between the knowledge and attitudes of sufferers and the prevention of pulmonary TB transmission behaviour [26]. The lower the level of knowledge is, the lower the effort to prevent the spread of pulmonary TB infection will be. Hanif in 2016 said that there is a correlation between the level of patient knowledge and transmission prevention behaviour in Mataram [27].

According to Notoatmodjo in 2012, factors that considering behaviour are the environment, both the physical, socio-cultural and economic environment [16]. Environmental factors are a dominant factor in behaviour. An inappropriate person's behaviour can come due to a lack of firmness and lack of motivation. Transmission of TB is easy among people who live in the same house. This theory is in line with Sasilia study which proven a correlation between age, knowledge, comorbidities, and nutritional status and the transmission of pulmonary TB to families who live in the same house in East Aceh [28].

Knowledge, age, sex, occupation, and income of respondents were the key variables on changing the behaviour of respondents. Actions or behaviours that are based on knowledge will be long-lasting rather than actions that are not based on knowledge, in order that respondents with a good level of knowledge have more efforts to prevent transmission of infection and vice versa. If the respondent's knowledge is in the less category, the respondent's actions will be even less. Likewise, considering age, work and income, the more mature age and the higher income is the more mature the person's way of thinking will.

V. CONCLUSION

Most of the family's knowledge about pulmonary TB is in the less category so long as the majority of respondents only have primary and secondary education. This result has an impact on receiving less and limited information due to the low level of understanding of respondents. In addition, the low level of respondents' knowledge also occurred as they claimed that they still did not receive counselling or health education about pulmonary TB. Family efforts in preventing transmission of pulmonary TB infection were mostly in the less category since most families were unable to provide separate rooms for sufferers and other family members due to economic reasons, and perceiving about washing and drying a patient's bed as not important to prevent transmission of pulmonary TB. Moreover, most of the respondents' home conditions were less direct sunlight, rarely did families monitored patients in taking medicine directly, and provided masks for sufferers and other family members at home. There is a correlation between the level of family knowledge about pulmonary TB and efforts preventing transmission of pulmonary TB infection in the Mataram City Health Centre, NTB.

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