Study of Tuberculosis Transmission Prevention Behavion in Pulmonary Tuberulosis Patients in The Working Area of Binamu Community Health Center

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Abstract: Pulmonary tuberculosis is a serious problem in Indonesia. In addition to having a high risk of transmission, it's treatment encounters many barriers, such as the length of treatment, large number of medicine, and adverseeffects. Thus, it is important to identify the transmission prevention behavior in pulmonary tuberculosis patients. This research aims to explore the pulmonary tuberculosis transmission prevention behavior in pulmonary tuberculosis patients in the working area of Binamu Community Health Center. This research was a qualitative research with a phenomenological approach. The method used was in-depth interviews with six pulmonary tuberculosis patients by means of purposive sampling technique. The findings revealed that the tuberculosis transmission prevention behavior in pulmonary tuberculosis patients was still lacking, for examples, the lack of knowledge about tuberculosis, transmission prevention through proper separation of eating and drinking utensils, transmission prevention through contact restrictions at the same house was still low, poor coughing and sputum etiquette, and incompliance with mask-wearing behavior at home. This research recommended providing more education about tuberculosis on an ongoing basis to patients and conducting regular home visits to TB patients' houses to evaluate the actions that have been recommended by health workers.

Keywords: Behavior, Prevention, Pulmonary Tuberculosis, Transmission

Introduction

Tuberculosis (TB) is an infectious disease caused by bacterium *Mycrobacterium tuberculosis*, which can attack various organs, especially lungs. If it is not treated or completely prevented, this disease can lead to dangerous complications and even death[1,2,3]. Globally, in 2016 there were 10.4 million tuberculosis incident cases (CI 8.8 million-12 million) equivalent to 120 cases per 100.000 population. WHO stated that Indonesia was one of the *High Burden Countries* (HBC) with the number of new TB cases in Indonesia of 420.994 cases in 2017[4,5]. The new pulmonary tuberculosis cases in South Sulawesi Province in the last three years had fluctuated where the number of new cases was 8.348 cases in 2016, there was a decrease of 7.172 cases in 2017, and there was an increase to 7.914 cases in 2018.[678] The TB cases in Jeneponto Regency in the last three years had increased where there were 465 cases in 2017, then increased to 537 cases in 2018 and to 605 cases in 2019.[9,10,11].

Breaking the transmission chain and preventing recurrence are the main goals in TB treatment in addition to curative goals. The TB transmission prevention behavior is carried out to reduce the rate of TB transmission to people in the surrounding environment, especially at the family level[12]. Family members are subjects easily transmitted since they live with the patients and the mode of transmission is easy, especially in the congested environmental conditions and inappropriate places to live[13]. Individual understanding and

knowledge about TB, including modes of transmission, dangers, and treatment methods, will affect a person in taking preventive measures. Hence, it is crucial to understand further the TB transmission prevention behavior in TB patients to reduce the transmission of this infection at Binamu Community Health Center area.

Methods

1. Type of Research

This research used a qualitative method research design with phenomenological approach[14,15,16,17]. It focused on finding facts about a social phenomenon that aimed to obtain answers to in-depth information about a person's social experience, especially the transmission prevention behavior in pulmonary tuberculosis (TB) patients, seen from the person's point of view.

2. Informant

Participant in this research were tuberculosis patients, with the inclusion criteria, namely the patients' families registered in the working area of Binamu Community Health Center and willing to be participants. In this research, the sample size was adjusted to the completeness of the information/data required by the researchers or the saturation of the required data that had been reached or when there was no new information that had been found. The number of informants in this research was six informants.

3. Data Collection Method

The data collection method used in-depth interviews. The interview process was performed at Binamu Community Health Center, in a room where the informants felt comfortable. The researchers used voice recorder (mobile phone that had voice recording facility) to record the results of the interview.

4. Research Instruments

The research instruments used in the research were the researchers themselves, in-depth interview guides, field notes, and voice recorder. In this research, the researchers, as the sole interviewers and research instrument, directly and openly extracted information about the transmission prevention behavior in pulmonary tuberculosis patients in the working area of Binamu Community Health Center.

5. Data Processing

The results of the interviews that had been made in the form of transcripts were then analyzed by the researchers by making categorization based on the same answers given by participants, then grouped the answer into sub-themes and became a final theme. The researchers validated the final theme by contacting the participants by telephone.

Result

1. Knowledge about tuberculosis

Most of patients did not know about the definition, causes, and modes of transmission of tuberculosis. This can be seen from the general expressions of the informants as follows:
"I know that TB is coughing, but I don't know the cause of TB and I know how it's transmitted through coughing, but I don't really know."

2. Transmission prevention through proper separation of eating and drinking utensils

One of the preventive measures that had been taken by the patients was to separate the eating and drinking utensils. This had been done by all informants in accordance with the recommendations given by health workers when they were diagnosed with tuberculosis.
"The plates, tablespoons, and glasses should be used separatedly. The doctor said that TB was contagious, so they told me to stay away from children, things should be used separatedly and cannot be shared.."

3. Transmission prevention through contact restrictions between family members in the same household is still low

The low contact restrictions among family members at the same house had a very high risk of transmitting tuberculosis to other family members. This is illustrated in the informant's expression as follows:
"If it's with my family, it's just as usual, and we still gather together… but we are still in one bedroom since we don't have any other bed."

4. Poor coughing and sputum etiquette

Most of the patients' families explained that the patients had implemented proper coughing behavior to prevent the tuberculosis transmission, but there were some patients who had not applied proper and correct coughing behavior. This can be seen from the patient's expression as follows:
"When coughing, I cover my mouth with my hands (clenching the fists while covering the mouth) or leave the house, or go out or go to the bathroom."
Besides, generally, patients expelled sputum in humid place and collected it in a bad container.
"When there is sputum, when I feel like I want to cough, I go to the bathroom and I throw it in the closet and immediately flush it."

5. Incompliance with mask-wearing behavior at home

The level of compliance of tuberculosis patients in using masks during illness was still very low. This can be seen from the expressions and behavior of five informants as follows:
"*I just use it. I get short of breath if I cover my mouth with mask for too long. If I am at home, I rarely wear a mask."*

Discussion

1. Lack of knowledge about tuberculosis

TB patients' knowledge about tuberculosis was still lacking. This can be seen from the expressions that said that they did not know/only knew about TB, did not know about the causes, and how it was transmitted. There was an patient who said that tuberculosis was not contagious since in the family the patient was the only one who suffered from the disease.

According to the researchers, the actions taken to enrich the knowledge of the patients had not been maximally implemented at Binamu Community Health Center. This was in accordance with the results of interviews with the program managers who stated that the information about knowledge about tuberculosis was given to the patients only at the first contact (when the patients were diagnosed with TB). Likewise, home visits were carried out by the officers only once, but not all patients could be visited. According to the officers, the evaluation of the patients' knowledge, attitude, and behavior was seen from the patients' progress. It was found that the patients experienced weight gain, did not suffer from coughing, and did not produce sputum at the end of the second month of treatment. Therefore, this showed that the patients could take measures to prevent tuberculosis transmission at home. Moreover, outreach activities about tuberculosis to the patients and PMOs were carried out only once a year or depending on the existing operational funds. The researchers argued that these measures were still lacking since the information on TB disease and home visits carried out only once were not enough to provide more knowledge or even change the behavior of patients about tuberculosis transmission prevention at home.

2. Transmission prevention through proper separation of eating and drinking utensils

The findings indicated that generally, the TB patients' families had made efforts to prevent tuberculosis transmission by separating eating and drinking utensils from other family members. These results were in line with the research conducted by (Risdayani et al., 2016)[18] stating that the patients' eating and drinking utensils are separated with the aim at not transmitting germs to other family members.

The researchers argued that the act of separating items used by the pulmonary TB patients was one of the efforts to prevent the pulmonary TB transmission since if it was not done, it would risk other family members to be infected by the disease. Furthermore, they also believed that during the first counseling, the health workers had provided good and easily understood explanations so that the patients could prevent TB transmission by separating eating and drinking utensils. This action should be maintained and continued in counseling new patients.

3. Transmission prevention through contact restrictions between family members in the same household is still low

The findings showed that there were two TB patients' families who had performed contact restriction at home with family members by having self-isolation and maintaining distance.

However, there were four other families who rarely or even did not perform contact restriction at home with family members. This can be seen from the family's expression during the interview stating that they gathered with family as usual, and rested/slept together with other family members.

Those in close contact with someone with active TB were the most vulnerable or high risk group of people of being infected by pulmonary TB since it was difficult for them to avoid contact with the patients. This also depended on the number of organisms present in the air[19]. This was supported by the findings of research by Guwatudde et al., in Kampala, Uganda stating that the prevalence of TB BTA (+) in household contacts is equal to 6% [20].

The researcher argued that economic factors and inadequate housing conditions could be one of the factors that affected the patients from being unable to isolate/keep their distance from other family members. This was in accordance with the research conducted by (Muniroh Nuha et al., 2013)[21] explaining that the lack of family support in providing adequate housing is due to the low economic level of the community, so it is difficult for them to provide support in the form of funds, equipment, time and environment.

4. Poor cough and sputum etiquette

The findings showed that there were four informants who did not practice cough etiquette properly and correctly. On top of that, there were three informants who expelled sputum in humid places and kept it in a bad container. This can be seen from the patient's expression stating that when he coughed, he only covered his mouth with a fist/palm or sometimes a cloth.

The researchers believed that *Mycobacterium Tuberculosis* germs continued to spread in the air and infect others since the patients did not apply proper and correct cough etiquette. Additionally, these germs were very easy to breed and survive in humid place. The researchers argued that if the sputum expelled was not kept in a closed container, or continued to be disposed in the closet (humid), or not mixed with disinfectant, then the germs would continue to breed. As a consequence, the prevention measure that could be done was to keep sputum in a closed container which had been given soap or disinfectant. Liquid soap or other disinfectants could have a significant effect on the efficiency of reducing *Mycobacterium Tuberculosis* germs in the sputum of TB patients since the liquid form was more soluble so that the soap molecules spread more quickly in the sputum[22]. As a result, it is important to convey this information to the patients by providing explanations, conducting demonstrations, and showing media examples of sputum storage. Consequently, it can enrich patients' knowledge, which would have an impact on the changes in attitudes and behavior.

5. Incompliance with mask-wearing behavior at home

The findings showed that five informants were not obedient in using masks at home. This can be seen from the participants' expressions stating that they only wore mask when they wanted to cook, wore mask carelessly, and rarely wore mask due to shortness of breath or discomfort.

This can be seen from the number of TB patients who did not use masks at home while still undergoing the treatment process.

The researchers argued that using masks at all times at the home environment could minimize the spread of germs to other family members. If they did not wear masks, the risk of transmission was higher. This was in accordance with research conducted by (Nurhayati, 2015)[23] stating that the behavior of using masks is included in the poor category (59%). On the other hand, the high risk of transmission was caused by incompliance with mask-wearing behavior by TB patients, so wearing masks was one of the effective ways to prevent MDR TB. Accordingly, it was necessary to carry out continuous health education to the patients and their families in order to encrich knowledge and change the patients' attitude about preventing the TB transmission.. Likewise, it was also recommended that the mask that the patients could use was a surgical mask in order to protect the surrounding environment from droplets[24].

Conclusion

Based on the results of the data analysis and discussion, the researchers concluded that the tuberculosis transmission prevention by pulmonary TB patients in the working area of Binamu Community Health Center had not been carried out properly and correctly, as evidenced by:

1. Patients' knowledge about tuberculosis was still low.
2. Transmission prevention through separation of eating and drinking utensils had been done well by the patients.
3. Tuberculosis patients had not taken measures to prevent transmission through contact restrictions at home.
4. Tuberculosis patients did not apply proper and correct cough and sputum etiquette.
5. Tuberculosis patients still did not comply with mask-wearing behavior at home.

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