Poltekita: Jurnal Ilmu Kesehatan
http://jurnal.poltekkespalu.ac.id/index.php/JIK

Vol.17 No.3 November 2023: Hal. 1066-1073
p-ISSN: 1907-459X e-ISSN: 2527-7170

Original Article

Predisposing Factors in Preventing The Transmission of Drug-Resistant TBC: A Qualitative Study in Jember

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ABSTRACT

Drug-Resistant Tuberculosis (DR TB) is a form of tuberculosis caused by Mtb bacteria resistant to anti-tuberculosis drugs (OAT). The prevalence of DR TB in Jember has significantly increased over the years, and many still refuse treatment. These individuals actively spread the bacteria to people at home or in the workplace. This research aims to identify predisposing factors in preventing the transmission of DR TB based on knowledge, attitudes, and beliefs. It is a qualitative case study involving primary subjects, DR TB patients, additional information from patient support organizations, and health department officials in Kab. Jember. The criteria for research subjects are residing in Kab. Jember, undergoing treatment, and willing to participate. The subject selection technique uses purposive sampling, resulting in 10 individuals. Data collection techniques involve in-depth interviews and observations. Data presentation follows the guidelines of Milles and Huberman, employing Thematic Content Analysis (TCA) for analysis. Data validity checks use credibility and dependability tests with source and technique triangulation. The research results indicate varying knowledge among subjects regarding DR TB prevention, with most obtaining information from healthcare professionals and patient support. In terms of attitude perspectives, all subjects show a positive response, expressing willingness to prevent DR TB transmission. Belief perspectives reveal diverse actions in DR TB transmission prevention. Most trust advice from healthcare professionals and patient support, while a minority still believe in herbal treatments and the culture of "tirah" to support TB treatment. In conclusion, knowledge, attitude, and belief perspectives are positive, but there is room for improvement in the behavior of implementing DR TB transmission prevention measures.

Keywords: *Behaviour, Tuberculosis, Drug-Resistant*

https://doi.org/10.33860/jik.v17i3.3173

INTRODUCTION

Drug-Resistant Tuberculosis (DR TB) is a form of tuberculosis caused by the Mycobacterium tuberculosis (Mtb) bacterium that is resistant to anti-tuberculosis drugs (OAT). This disease poses a threat and is a major public health issue in many countries worldwide, including Indonesia. Various efforts and methods to control DR TB have been undertaken by communities, governments, and related stakeholders; however, the transmission of DR TB continues to rise.

The situation of DR TB in Indonesia

ranks third globally, following India and China[1]. In 2019, approximately 11,500 DR TB patients were identified and reported, with 48% of them initiating second-line TB treatment, achieving a treatment success rate of 45% [2]. Furthermore, East Java is the eighth-ranked province in terms of TB Treatment Coverage in Indonesia, at 29.3724%. By mid-2022, 27,677 cases of diagnosed TB had been identified out of the target of 95,811 cases. The estimated number of DR TB cases in East Java in 2022 is 2,803, and by December 2022, 39% of the targeted DR TB cases have been identified [1]. The 2020 Health Department report revealed that Jember Regency ranked second in East Java with the highest number of identified TB cases, totaling 51,367 notified TB cases and 47,485 cases treated. In 2021, the Health Department of Jember Regency identified 3,166 cases out of an estimated 5,578 cases, indicating a significant gap between the actual cases and the target set by the Ministry of Health of the Republic of Indonesia [1].

The Jember Regency government is committed to supporting TB control through the issuance of the 2019 Regional Action Plan (RAD) on TB control. Budgets from the national budget (APBN) and funds from Non-Governmental Organizations (NGOs) also contribute to TB control in Jember Regency. Despite active and extensive TB case detection efforts, the number of TB cases in Jember Regency continues to rise. Field phenomena suggest that the behavior of TB patients, which does not support TB transmission prevention, is a major cause of the high prevalence of TB in Jember Regency. Public health beliefs in Jember Regency are related to the transmission of DR TB.

Given such epidemiological trends, research on the behavior of TB patients becomes crucial to understanding epidemiological behavior, effective control efforts, and the impact on other sectors. Understanding the preventive behavior against DR TB in this community allows for control efforts to prevent new infections and behavioral changes regarding DR TB transmission risks. The objective of this study is to explore the behavior leading someone to become resistant to TB drugs, with an examination of preventive behaviors. This research aims to identify predisposing factors in preventing the transmission of DR TB based on knowledge, attitudes, and beliefs.

METHOD

This research was conducted in Jember Regency, East Java, from May to July 2023. The study is qualitative and adopts a case study approach. Data collection involved in-depth interviews. The interviews were open-ended, guided by an interview script, and audio recordings were made using a smartphone. The primary subjects of the study were DR TB patients, with additional information sourced from patient support organizations and health officials from the Jember Regency Health Department. Ten research subjects were selected using purposive technique based on data saturation obtained by the researcher.

The criteria for selecting subjects included: a) residing in Jember Regency, b) undergoing the intensive treatment phase, c) not discontinuing medication, d) willing to provide informed consent and able to narrate their experiences as DR TB patients. The collected data were transcribed and analyzed. Thematic Content Analysis (TCA) was employed for data analysis in this qualitative research. The researcher ensured data validity through credibility and dependability tests, utilizing source triangulation and technique triangulation. Source triangulation involved posing the same questions to different sources, while technique triangulation involved observation and documentation. The tools and materials used in the study included the interview guide, smartphone for documentation, and a notebook.

Ethical considerations in research aim to maintain the quality of research, especially in the field of health[3]. Before conducting interviews, subjects were asked for their willingness to participate. Research subjects had the right to refuse or consent to being part of the study by signing an informed consent agreement. The researcher explained that the interview results would be kept confidential and only accessible to the researcher unless required by relevant parties. Research subjects received compensation in the form of a gift. The researcher submitted the ethical review to the Faculty of Public Health, University of Jember. This research was approved by the Research Ethics Committee of the Faculty of Public Health, University of Jember, on March 7, 2023, with registration number: 340/KEPK/FKM –UNEJ/III/2023.

RESULTS

Predisposing factors in preventing RO TB transmission

The research results indicate that the majority of subjects are distributed in the Subdistricts of Sumbersari, Kaliwates, Pakusari, Ajung, and Sukorambi in Jember Regency. Most of the research subjects are male. The majority of subjects fall into the productive age group, exposing them to a higher risk of contracting TB. Additionally, most subjects have a low educational background. The low level of education is associated with the subjects' knowledge about DR TB, as illustrated in the following table.

Table 1. Characteristics of research subjects

Characteristics	Category	Total
Age	Late adulthood (36 – 45 years)	2 persons
	Early elderly (46-55 years)	4 people
	Late elderly (56 - 65 years)	2 persons
	Seniors over the age of 65 years	2 persons
Gender	Man	8 people
	Woman	2 people
Education	Not completed in primary school	1 person
	Finished elementary school	1 person
	Finished middle school	4 people
	Finished high school	2 persons
	Finished PT	2 persons
Work	Self-employed	7 people
	Government employees	1 person
	Housewife	2 persons
Duration of Treatment	Intensive phase (0 – 6 months)	1 person
	Early Advanced Phase (7 – 15 months)	7 people
	Final Advanced Phase (16 – 24 months)	2 persons

Source: Primary Data, 2023

Predisposing factors are elements within an individual that underlie behavioral changes. These factors encompass knowledge, attitudes, and beliefs, influencing the behavior of individuals or communities towards health. The results of the research are as follows:

a. Knowledge factors in preventing TB RO transmission

The subjects' knowledge regarding the prevention and transmission of DR TB varies. Most subjects acquire knowledge about DR TB transmission from healthcare professionals and companions. Subjects adhere to the medication schedule prescribed by the doctor, fearing a restart of the treatment process if medication is not taken regularly.

Education on knowledge and prevention of DR TB transmission can be conducted by healthcare professionals and communities, starting from the moment the patient is diagnosed with DR TB. Support from healthcare professionals and communities aims to enhance treatment success and increase awareness of TB prevention and transmission[4].

Social media serves as an alternative research subject for obtaining information on the prevention and transmission of DR TB. Subjects seek a deeper understanding of their illness, prompting them to take the initiative to explore more through social media.

> *"Oh, I don't really know. I used to only know about regular TB. But now, there's something called XDR too. I saw it on YouTube, how to deal with it and all. I get stressed when taking the medicine, stressed about the side effects. Even now, when it's almost time to take the medicine, I start feeling anxious beforehand. It stresses me out." (IU.8, 54 years old).*

This is reinforced by the results of observations made by researchers, which show that subject 8 is actively looking for TB RO disease on one of the social media pages, www.youtube.com.

b. Attitude Factors in preventing TB RO transmission

The research results indicate that all subjects are willing to take actions to prevent the transmission of DR TB. Every subject provided a positive response, expressing their willingness to undertake preventive measures against DR TB transmission. The subjects' motivation to engage in preventive actions stems from their desire to prevent their family and those around them from suffering from TB, as expressed by IU.6.

"Oh, of course, I want to, sister. I have grandchildren, almost every day they are here. I don't want my illness to transfer to my grandchildren." (IU.6, 62 years old).

Attitude is the subject's response to a stimulus or object. The subject's response to being diagnosed with TB can be either positive or negative. In this study, it was noted that all subjects exhibited a positive response in taking preventive measures against DR TB, indicating that the transmission of DR TB could be controlled.

c. Trust Factor in preventing DR TB transmission

The subjects' beliefs regarding the effectiveness of the actions taken in reducing the transmission of DR TB are diverse. The majority believe that the recommendations provided by healthcare professionals and companions can prevent the transmission of DR TB. This was expressed by IU.10.

"I believe, sister. If we obediently follow what the doctor or healthcare workers say, like wearing a mask when told to, covering the mouth when coughing, not indiscriminately disposing of phlegm, that's enough." (IU.10, 46 years old).

In this study, it was found that herbal treatment is still believed to be able to assist in healing comorbid conditions with TB.

"In front of my house, there's a 'juar' tree, with yellow flowers like a frangipani tree, its fruit resembling 'pete' or 'lamtoro'... the leaves of the 'juar' tree, along with ¼ of turmeric and ¼ of black turmeric, are washed thoroughly and boiled every day to make a drink. Because I feel sorry for my kidneys, I chose this herbal drink for my diabetes." (IU.1, 66 years old).

The tradition of "tirah" is still practiced by a small number of subjects. Subjects explain that "tirah" is undertaken as an effort to prevent the illness they are experiencing from spreading to others. The Indonesian Dictionary (Kamus Besar Bahasa Indonesia - KBBI) explains that "tirah" or "tetirah" is an activity of moving to another place in order to recover one's health [5].

"Tirah" is believed to assist in the recovery of health conditions, as conveyed by IU.7.

"Originally, I'm here. I only stayed with my wife at her house. But when I got TB, my parents wanted to be close to visit, so eventually, I rented a house, was told to stay here, and this belongs to my sibling... yes, it's called 'tirah.' My parents rented it because they wanted to be close and visit their child." (IU.7, 42 years old).

DISCUSSION

Characteristics of research subjects

The Ministry of Health of the Republic of Indonesia (Depkes RI) classifies age into several categories, namely toddler, child, early adolescent, late adolescent, early adulthood, late adulthood, early elderly, late elderly, and very elderly[6]. The research results indicate that the majority of the research subjects fall within the productive age group. In the productive age group, people are more active outside and interact with many individuals. The demands of work and community activities allow for interaction with others who have the risk of TB exposure.

Andayani's research in 2020 states that during the productive age, individuals are in the working stage, generating income for themselves and their families[7]. The density of activities, poor working conditions, and unhealthy lifestyles increase the risk of reducing immunity, making individuals more susceptible to diseases.

The proportion of research subjects was found to be mostly male. Males have a greater risk of exposure to Mycobacterium tuberculosis (Mtb) bacteria due to more interactions in their workplaces. This aligns with a 2015 study stating that males have a higher risk of contracting TB compared to females [8].

The higher mobility of males increases the likelihood of exposure, and unhealthy lifestyle habits like smoking support the risk of respiratory diseases. Unhealthy lifestyles can lower immunity and are one of the causes of cardiovascular diseases. A study conducted in South Tangerang City in 2015 mentioned that smoking increases the risk of TB by 1.69 times[9].

The educational backgrounds of the research subjects vary from incomplete elementary school to university graduates. Most subjects have a low educational background, ranging from incomplete elementary school to junior high school. A low level of education affects the knowledge of the informants regarding DR TB. Nurjana in his research stated that good knowledge influences prevention and treatment efforts when affected by TB[8]. Subjects can acquire knowledge from healthcare professionals or DR TB patient companions.

The duration of treatment for the subjects varies, with most subjects undergoing the first advanced treatment phase. Subjects in this phase feel that the complaints of DR TB have decreased, so they perceive themselves as healthy and tend to neglect using masks. Subjects feel uncomfortable wearing masks, even though it is recommended, due to discomfort and breathlessness. Observations by the researcher indicate the availability of medical masks at the subjects' homes. However, through triangulation with the subjects' neighbors, it was revealed that subjects rarely wear masks. Subjects only wear masks when healthcare professionals or companions visit.

Knowledge

The research subjects' knowledge of preventing DR TB transmission is quite good. Subjects acquire knowledge from education provided by healthcare professionals and TB patient companions. A small number of research subjects actively seek information about the disease through social media.

Technological advancements facilitate quick and up-to-date access to information. Social media, as part of the internet, serves as a means for disseminating information in various fields, including education, health, religion, business, etc. However, the existence of social media is sometimes exploited by irresponsible parties to spread misinformation.

Inaccurate information can lead to misinformation and hinder efforts to prevent and control DR TB in society. The presence of healthcare professionals and companions is crucial in helping subjects clarify and accept the information received. Yuni and Fitriani's 2017 study emphasizes the wise use of social media, as misuse in its dissemination is regulated by the Electronic Information and Transactions Law (UU ITE)[10].

Communication and Education (KIE):

The provision of Communication, Information, and Education (KIE) by healthcare professionals and patient companions can be done not only through conventional methods. In the digital era, people are closely connected to technology. This can be utilized as an opportunity to provide KIE using electronic media. Broadcasting videos to increase knowledge about preventing DR TB transmission can be shown on social media widely accessed by the public. As mentioned in Rodiahwati's previous study in 2022, there is a positive influence from health promotion using e-KIE (electronic KIE) on the increased knowledge of pregnant women regarding integrated ANC services[11].

Attitude

Attitude is the response of the subjects to a stimulus/object. The response of the subjects to the diagnosis of TB can be either positive or negative. In this study, it was noted that all subjects exhibited a positive response in taking preventive measures against the transmission of DR TB. Subjects are willing to take preventive measures because they do not want their family and those around them to suffer from TB.

The knowledge provided by healthcare professionals, DR TB patient companions, and social media has an impact on the subjects' attitudes. Good knowledge and understanding positively influence attitudes towards preventing the transmission of TB. This plays a crucial role in the success of efforts to prevent the transmission of DR TB.

This aligns with the research conducted by Rahman[12] which states that there is a significant relationship between knowledge and attitudes in preventing the transmission of DR TB in society. Therefore, it is important to carry out socialization regarding the prevention of TB transmission. This is reinforced by a study conducted in 2021, which states that there is a better attitude from TB patients after receiving health education [13].

Belief

Research conducted by Sitio and Silalahi in 2021 states that education is very effective in efforts to empower and culturally empower the families of TB patients[14], especially regarding knowledge of preventing TB transmission. The informant's trust in

healthcare professionals makes them willing to follow the advice of healthcare professionals to take preventive measures against TB transmission. The informant has trust in healthcare professionals, so the advice for a healthy lifestyle is followed without hesitation.

The results of this research show that there is still a cultural practice in society that increases the risk of TB transmission. The positive aspect of the cultural practice of "tirah" is a form of isolating TB patients to prevent transmission to the community. However, it is also essential to ensure that the movement of TB patients from one place to another does not create new sources of transmission in the surrounding community. Supervision and assistance from family and healthcare professionals are crucial in this regard.

The use of herbal medicine in Indonesia is one of the preferred options in society. Traditional treatment with herbal ingredients has been practiced for generations. Additionally, herbal medicines are believed to have fewer side effects compared to chemical drugs. The use of traditional medicine is recommended to be under the supervision of a doctor to ensure that it does not reduce the therapeutic effects of the TB drugs being consumed. Health education is needed for TB patients who consume traditional medicine, emphasizing that primary treatment must be continued to prevent loss to follow up (LFU).

Prevention of DR TB Transmission

The behavior of preventing the transmission of TB can be manifested in daily actions. In general, all subjects have acquired knowledge and understanding of preventing TB transmission. Research results indicate that subjects have engaged in both positive and negative actions in preventing TB transmission.

Positive actions taken by subjects include opening doors and windows in the morning to ensure smooth air circulation. Subjects avoid indiscriminate spitting and adhere to proper cough etiquette by covering their mouths with tissues or sleeves. Subjects sunbathe in the morning when their bodies are in good condition. Research subjects diligently wash their hands with soap, a habit they practice daily.

Most subjects are aware of proper cough etiquette, which minimizes the spread of saliva droplets.

Caption: The figure shows a subject demonstrating proper cough etiquette

Figure 1. Proper Cough Etiquette

Some subjects are compliant in taking preventive measures against DR TB transmission. Among the actions taken, subjects isolate themselves by limiting interactions to avoid transmitting the disease to others, as expressed by IU.2.

> *"Yeah, I keep to myself when there's a family gathering, so I don't spread it" (IU.2, 39 years old).*

From the researcher's triangulation, neighbors mentioned that subjects tend to keep to themselves during activities involving many people. This is done because subjects believe that such behavior can prevent transmission to those around them.

Negative behavior observed in some research subjects is their reluctance to use masks. The reasons for not wearing masks include discomfort, feelings of breathlessness, and only wearing them when guests or when visiting healthcare facilities.

While the subjects' knowledge regarding mask usage is quite good, in practice, not all patients comply with mask-wearing. This finding contradicts the research conducted by Veri in 2021, which stated a significant relationship between knowledge and patient compliance in mask usage.[15]

CONCLUSIONS

The predisposing factors of DR TB patients are related to the behavior of preventing TB RO transmission. In terms of the knowledge perspective, it is known that information on preventing TB RO transmission is obtained from healthcare professionals, companions, and social media. Generally, the knowledge of the research subjects is already good. The perspective of attitudes shows a positive response to preventing TB RO transmission. From the belief perspective, there is trust in healthcare professionals and companions, as well as trust in herbal treatments and the cultural practice of tirah, which can impact the prevention of TB RO transmission.

The recommendation from this study is that the dissemination of accurate information regarding the prevention of TB RO transmission by authorities is necessary and should be done more intensively within the TB RO community. The spread of information can be carried out through social media or conventional means. The use of social media can be considered, as it is easily accessible to many people.

ACKNOWLEDGEMENT

Researchers express gratitude and heartfelt appreciation to all parties involved who have granted permission and provided input during the implementation of this research.

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