

## PREVENTION OF PULMONARY TB TRANSMISSION IN THE FAMILY: LITERATURE REVIEW

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### ABSTRACT

*Family is the main source of transmission and plays an important role in healing family members of pulmonary TB sufferers. Prevention of transmission of pulmonary TB in families globally is not implemented well at 95 percent, in fact cases of pulmonary TB tend to be hidden, which causes the number of pulmonary TB sufferers to increase. This research is a literature review. The transmission of Tuberculosis in families that occurs can be influenced by remote areas with difficult access to health care, discrimination and community stigma (Kolte et al., 2020). Families who live in the same house as pulmonary TB sufferers account for 20.7 percent of cases causing pulmonary TB transmission and the source of TB infection in the family comes from close family (Kozihnska and Augustynowicz-Kopeć, 2016). The aim of this study to collect and analyze articles related to preventing the transmission of pulmonary TB in the family. The data synthesis process in this research was by comparing 13 pieces of literature that met the inclusion and exclusion criteria with the database sources used, namely: Scholar, Proquest and Ebsco. Data is processed and presented in tabulated form. The results of the research show that in several countries such as Indonesia, Brazil, Ethiopia, Geneva, Kenya and Korea, which were reviewed using a reference system, eight literatures (61.53%) were found to discuss preventing transmission of pulmonary TB in the family and the causes of transmission of pulmonary TB in the family, namely five pieces of literature. (38.47%). Factors that cause transmission are home conditions that do not allow separation between sufferers and other family members, room lighting conditions that act as a breeding ground for bacteria which slows down the healing process for pulmonary TB.*

**Keywords:** *Transmision Prevention, Pulmonary TB, Family*

### INTRODUCTION

TB is an infectious disease caused by the bacterium *Mycobacterium tuberculosis* and one of the 10 main causes of death worldwide. Pulmonary TB is caused by bacteria (*Mycobacterium tuberculosis*) which most often attacks the lungs and can be prevented and cured. It spreads through the air when sufferers cough and talk. Pulmonary TB bacteria can move through the blood to infect other parts of the body, such as the kidneys, spine and brain (CDC, 2020). The increase in TB cases not only has an impact on morbidity and mortality rates in society, but also has an impact on other health problems. According to reports *World Health Organization (WHO)* in 2020 globally, pulmonary TB causes one point two million deaths in developing countries with 10 million new pulmonary TB cases and one point three million deaths worldwide. In

Indonesia, the number of pulmonary TB cases in Indonesia in 2020 was 845,000 with the discovery of 301 new cases per 100,000 population and a death rate of 98,000 or the equivalent of 11 deaths/hour (Kementerian Kesehatan Republik Indonesia, 2021). North Sumatra is the ninth largest contributor to pulmonary TB cases in Indonesia with a prevalence of 33,779 and 138 per 100,000 population of new cases and a death rate of 782 cases in 2020 (Kementerian Kesehatan Republik Indonesia, 2021).

Wingfield dan Verguet (2019) stated that one of the places where the highest transmission of TB cases occurs is in the family. The majority of TB cases in families occur within the first two years after TB is diagnosed. The results of research conducted by Sasilia (2013), Families who live in the same house as pulmonary TB sufferers account for 20.7 percent of cases causing pulmonary TB transmission. Kozińska & Augustynowicz-Kopeć, (2016) said the source of TB infection in the family came from close relatives. The family plays an important role in the healing process of TB patients. The family is a group that deals directly with family members 24 hours a day. Puri (2018) states that one of the duties of family members is to care for sick family members and prevent infection to healthy family members. The family as primary care encourages TB sufferers to recover and is the main attribute in the process of preventing TB transmission which requires family involvement, collaboration, negotiation, counseling and sharing information as well as family support (Rakhmawati dkk., 2020).

Family involvement in preventing TB transmission plays a role in increasing family awareness and willingness to maintain and improve the health status of their family members (Prasad dkk., 2016). Prevention of transmission of pulmonary TB in families globally is not implemented well at 95 percent, in fact cases of pulmonary TB tend to be hidden so that transmission continues within families which causes the number of pulmonary TB sufferers to increase significantly, this is due to a lack of attention to the focus of prevention as an important element in breaking the chain of pulmonary TB disease (Hamada dkk., 2019). Remote areas with difficult access to health care, discrimination and human rights violations, where the role of community stigma is very important in preventing the transmission of pulmonary TB (Kolte dkk., 2020). Nursasi dkk. (2021) states that family support can improve the recovery of pulmonary TB sufferers through motivation and providing funds and support for healthy behavior.

Prevention of pulmonary TB in the family is an action to prevent pulmonary TB by facilitating evaluation of interactions between members through monitoring all preventive care, data on identification and registration, clinical assessment, screening for active pulmonary TB, infection testing and treatment (*World Health Organization*, 2022). Families and TB sufferers need to be given information regarding the importance of prevention and control efforts that can change

family behavior in fostering aspects of knowledge, understanding, changes in attitudes and actions and awareness in terms of care and treatment of family members suffering from pulmonary TB (Marwansyah, dan Sholikhah, H.H. 2015). The source of TB infection in the family comes from close relatives (Kozinska, M., & Augistynowicz-Kopec, E. 2016). The study is supported by research from Prasad, B.M., et al (2016) states that family involvement in preventing TB transmission plays a role in increasing family awareness and willingness to care for and improve the health status of their family members. The main role of the family in the success of TB treatment is family involvement in monitoring medication taking by paying attention to BTA examinations, weight gain, and completeness in taking medication. The family is also the main motivator in reminding people of optimal sputum re-examination, monitoring medication taking, and as an educator for pulmonary TB sufferers (Febrina, 2018).

## **METHOD**

### 1. Data Search Strategy (Search Strategy)

This type of research is a systematic review (Systematic Literature Review), namely a research methodology or research and development carried out to collect and evaluate research related to a particular research topic focus. The details of this activity consist of determining a data search strategy and/or information sources. For relevant data, a search was carried out using the keywords used: Family; Transmission Prevention; Pulmonary Tuberculosis

### 2. Information Sources

Literature search via Google Scholar, Proquest and EBSCO.

### 3. Eligibility Criteria

Eligibility criteria in this study include inclusion and exclusion criteria. The inclusion criteria in this research are) Literature review in the form of scientific journals, both qualitative and quantitative research, 2) Data sources for scientific journals: Google Scholar, Proquest and Ebsco, 3) Scientific journals have open access, 4) Articles must be accessible in full text form , 5) Scientific journals use English or Indonesian, 6) Journal publication year between 2018-2023, 7) Discussion in scientific journals includes family behavior in preventing transmission of pulmonary TB based on family health duties and functions and factors causing the transmission of pulmonary TB in family. The exclusion criteria in this study are the denotation form of the exclusion criteria. To limit the scope of research using the PICO method (Population/Problem, Intervention, Comparison, Outcomes) as in the following table:

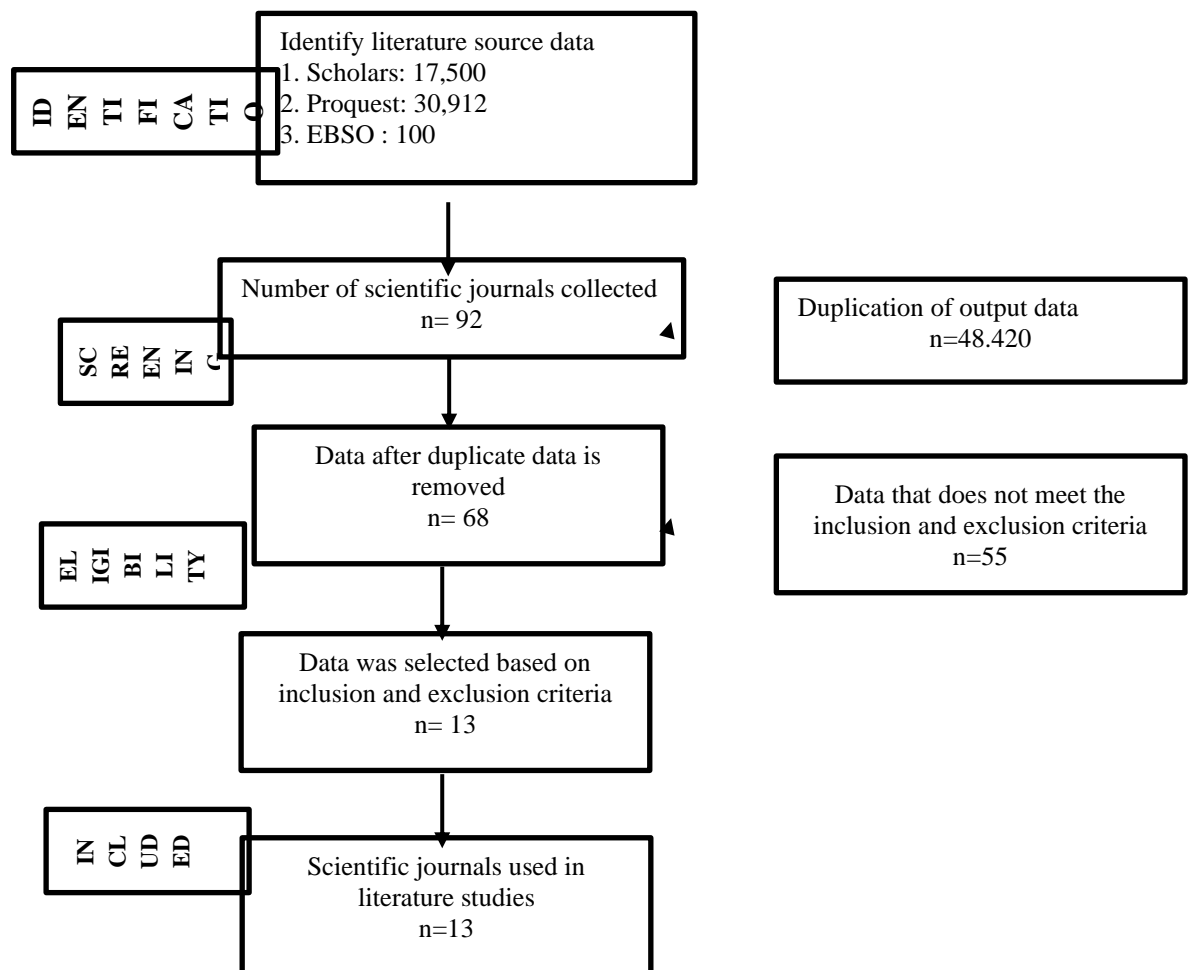
**Table 1 Summary of PICO**

Component	Information
<i>Population/ Problem</i>	Prevention of Pulmonary TB Transmission
<i>Intervention</i>	Description of Family Behavior in Preventing Pulmonary TB Transmission
<i>Comparison</i>	-
<i>Outcomes</i>	Family behavior in preventing transmission of pulmonary TB includes: covering your mouth when coughing and sneezing, letting sunlight into the room, reminding you to take anti-pulmonary TB medication, using separate eating utensils, screening for pulmonary TB by the family, compliance with using masks, washing hands with water. soap and prepare a container filled with disinfectant and closed

## RESULTS AND DISCUSSION

### 1. Quality assessment

Literature selection uses the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analysis) method. The PRISMA flow diagram in this research is as follows:



### Figure 1. PRISMA Flow Diagrams

Based on the PRISMA method that has been carried out, results can be obtained, namely that from a total of 92 journal articles identified, 48,420 of them were excluded because there was duplication of data and furthermore the data did not meet the criteria so that only 13 journals were used in the literature study.

#### 5. Synthesis data

The data synthesis process in this research was carried out by comparing literature that had met the quality assessment and inclusion and exclusion criteria. Synthetic data refers to the research objective, namely to determine the prevention of pulmonary TB transmission in the family.

#### 6. Data Extraction

The data extraction is in the form of a table consisting of the researcher's name, year of publication, research title and research results.

#### Results and Discussion

The research locations from the literature are from Indonesia, Brazil, Ethiopia, Geneva, Kenya and Korea. The aspects discussed in the literature are prevention of transmission of pulmonary TB carried out by families as many as 8 (61.53%) of the literature and the causes of transmission of pulmonary TB in the family namely five pieces of literature (38.47%). The article discusses the importance of family collaboration with health workers, especially regarding preventing the transmission of pulmonary TB in addition to monitoring medication taking. Apart from that, the literature also discusses the role of the family in supporting family members, especially regarding the psychology of pulmonary TB sufferers. Wingfield and Verguet (2019) stated that one of the places where the highest transmission of TB cases occurs is the family. The majority of TB cases in families occur within the first two years after TB is diagnosed. One of the high rates of transmission in TB cases is in families affected by TB and one of the factors that causes transmission is poor lighting at home (Sasilia, 2013). Another factors that cause the transmission of pulmonary TB in families include age, knowledge, comorbidities and nutritional status as well as inadequate room size or remote areas with difficult access to health care, discrimination and violations of human rights, where community stigma is very high. important in preventing transmission of pulmonary TB (Adane, A., et.al and Kolte, I.V., et. al 2020). On average, TB sufferers who have been diagnosed will experience psychological disorders and a low quality of life (Diamanta and Buntoro., 2020). Prevention of transmission of pulmonary TB in the family has a big influence on the increase in pulmonary TB cases because the family is the smallest unit

of society. The role of health workers in preventing transmission of pulmonary TB from an early age is an important task that must be carried out. An approach that can be taken is to provide information to families on TB immunization, improving nutritional status, environmental modification and increasing supervision of family members taking medication (Paneo and Nursasi, 2019). In addition, for family members who live in the same house, it is necessary to carry out early detection of pulmonary TB to identify treatment and care measures as early as

**Table 2. Results of Literature Research Data**

<b>No</b>	<b>Year</b>	<b>Writer</b>	<b>Title</b>	<b>Result</b>
1	2019	Diamanta et al.,	Prevention of tuberculosis in household members: Estimates of children eligible for treatment.	Prevention is an important element in breaking the chain of pulmonary TB disease
2	2019	Wingfield & Verguet,	Active case finding in tuberculosis-affected households: time to scale up.	One of the places where high TB case transmission occurs is in families affected by TB and the majority of TB case incidents in families occur in the first two years after a TB patient is diagnosed.
3	2019	Aditama et al.,	Relationship between Physical Condition of House Environment and the Incidence of Pulmonary Tuberculosis , Aceh , Indonesia	Another factor that contributes to TB transmission is lighting
4	2019	Paneo & Nursasi,	Prevention of Pulmonary TB in the Family: Literature Review	Prevention of pulmonary TB in the family includes providing immunizations, improving nutrition for TB sufferers, modifying the home environment and compliance with TB treatment by the family
5	2019	Yang et al.,	The risk of active tuberculosis among individuals living in tuberculosis-affected households in the Republic of Korea	Prevention of pulmonary TB transmission in the Republic of Korea means that individuals or family members who live with pulmonary TB sufferers have a high risk of transmitting pulmonary TB so this can be an effective strategy in preventing pulmonary TB through early detection of all members or individuals. yang terpapar penderita TB Paru.
6	2020	Diamanta et al.,	The Relationship Between Stress Levels and Income Levels with the	The research results show that psychological disorders and low quality of life

			Quality of Life of Pulmonary TB Sufferers in Kupang City.	
7	2020	Adane et al.,	Prevalence and Associated Factors of Tuberculosis among Adult Household Contacts of Smear Positive Pulmonary Tuberculosis Patients Treated in Public Health Facilities of Haramaya District	Factors that cause transmission of pulmonary TB in families include age, knowledge, comorbidities and nutritional status. Other factors that influence the transmission of pulmonary TB include inadequate room size and having more than one family member with TB
8	2020	Kolte et al.,	The contribution of stigma to the transmission and treatment of tuberculosis in a hyperendemic indigenous population in Brazil.	Other factors that contribute to TB transmission are co-infection, and abuse of Narcotics, Alcohol, Psychotropics and Addictive Substances (NAPZA) makes individuals susceptible to TB. Remote areas with difficult access to health care, discrimination and human rights violations, where the role of community stigma is very important in preventing the transmission of pulmonary TB
9	2020	Rakhmawati et al.,	Family-centered care of tuberculosis prevention in children : a concept analysis.	The family is providing care for sick relatives and preventing transmission to healthy family members. The family as primary care encourages TB sufferers to recover and is the main attribute in the process of preventing TB transmission which requires family involvement, collaboration, negotiation, counseling and sharing information as well as family support.
10	2020	Purba, .	<i>The Influence of Behavioral Factors and Residential Density on the Incidence of BTA Positive Pulmonary TB Disease in the Serdang Bedagai Regency Work Area</i>	Pulmonary TB sufferers in Deli Serdang Regency have the habit of throwing phlegm carelessly at 80 percent, opening windows at 16 percent, coughing without covering their mouths, inadequate lighting in the living room and bedroom respectively at 36 percent, smoking at 72 percent, history of contact with TB sufferers at 22 percent and has a residential density of 20 percent. Some of these habits have the potential to cause pulmonary TB transmission
11	2020	Ifansyah et al.,	<i>Increasing Family Empowerment in Treating Tuberculosis Sufferers Through Perceived Control and Behavioral Intentions</i>	Beliefs and intentions that individuals have implemented health behaviors can increase family empowerment in caring for pulmonary TB patients at home which took research samples from the general public in Banjar Regency, Indonesia, with an analytical observational research design, cluster random sampling, carrying out interventions through distributing questionnaires about perceived



				behavioral control , and modification of the empowerment questionnaire from the Nurse-Patient Interaction Scale (NPIS).
12	2020	Puspitha et al.,	Family Empowerment in Tuberculosis Treatment	Families of pulmonary TB sufferers in the city of Makasar, using a prospective cohort approach, carried out family training (caregiver) interventions, family assistance and empowerment, as well as intensive supervision of treatment for TB sufferers.
13	2021	Nursasi et al.,	The healthcare needs of families caring for patients with pulmonary tuberculosis.	Family support can improve the recovery of pulmonary TB sufferers through motivation and providing funds and support for healthy behavior

## CONCLUSION

Prevention is an important part in breaking the chain of transmission of pulmonary tuberculosis. One of the places where the prevalence of tuberculosis cases is high is in the families of tuberculosis sufferers, and most cases of tuberculosis occur in families during the first two years after the diagnosis of tuberculosis patients. People or family members who suffer from pulmonary TB are at high risk of contracting pulmonary TB. The family is the main caregiver who encourages the recovery of TB patients and is the most important element in the process of preventing the spread of TB, which requires family participation, cooperation, negotiation, counseling and sharing information, as well as family support. Factors that influence the spread of tuberculosis include age, knowledge, comorbidities, and nutritional status. The transmission of pulmonary tuberculosis is also influenced by the lack of space and the number of family members who suffer from tuberculosis, as well as the lighting in the house. Other factors that influence the spread of TB include co-infection and abuse of drugs, alcohol, psychotropic and addictive substances (NAPZA) in people who are predisposed to TB. Suburban areas have difficulty accessing health services, there is discrimination and human rights violations, where community stigma plays a very important role in preventing the spread of pulmonary tuberculosis

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