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The Effect of Health Education on Preventing Pulmonary Tuberculosis Transmission with Knowledge Deficit Problems Through Audiovisual Media

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ABSTRACT

Purpose: The aim of this research is to determine the effect of health education on preventing transmission of pulmonary tuberculosis with knowledge deficit problems through audiovisual media before and after health education is carried out. **Method:** the research method used is descriptive with a case study approach. The research subjects were 43 respondents taken using the minimum sample in the Slovin formula. **Result:** the results showed that there was an increase in the level of knowledge from before health education was carried out, namely in the category of insufficient level of knowledge of 32 respondents (74%) to 0 respondents (0%), in the category of sufficient level of knowledge of 11 respondents (26%) to 2 respondents (5 %), The good knowledge level category was 0 respondents (0%) to 41 respondents (95%). **Conclusion:** Thus, it can be concluded that health education to prevent transmission of pulmonary tuberculosis with the problem of knowledge deficit through audiovisual media can have an influence in increasing knowledge among respondents.

Keywords: Audiovisual, health education, pulmonary tuberculosis

Introduction

Tuberculosis (TB) is a directly transmitted infectious disease caused by the bacterium *Mycobacterium tuberculosis*. Pulmonary tuberculosis is commonly found in communities. Anyone can contract TB if there is a source of infection in their environment. The most common mode of transmission for pulmonary tuberculosis is through airborne droplets; TB bacteria are expelled into the air when an infected person coughs or sneezes. Community habits, such as rarely wearing masks in densely populated areas, smoking, and limited sunlight entering homes, can contribute to an increased incidence of pulmonary tuberculosis in society.

According to a comparative report from WHO between 2019 and 2020, Indonesia remained the country with the second-highest percentage of tuberculosis cases in the world (14%), after India (41%) among 16 countries (WHO, 2021). In 2020, 5.8 million people worldwide were infected with TB, and the disease caused 18% of annual deaths (WHO, 2021). Based on the 2018 Basic Health Research, Central Jakarta had the highest prevalence of pulmonary tuberculosis in the DKI Jakarta Province, with a percentage of 0.88% (Oktiano et al., 2022). DKI Jakarta is among the top ten provinces with the highest TB prevalence (Pangaribuan et al., 2020).

Based on an interview with the neighborhood head (RT) on July 16, 2024, it was revealed that RT013 RW005 is classified as a Pulmonary Tuberculosis Alert Area. TB is characterized by a persistent cough lasting at least two weeks, night sweats for a month without physical activity,

fever lasting more than a month, weight loss, blood-streaked sputum, hemoptysis, shortness of breath, fatigue, and loss of appetite. If these symptoms are not promptly checked at a healthcare facility, complications may arise, such as spinal pain, joint damage, meningitis, liver or kidney problems, and heart disorders. Therefore, it is essential to prevent the transmission of pulmonary tuberculosis.

Preventive measures include Bacillus Calmette-Guérin (BCG) vaccination, consistently wearing masks in crowded areas, maintaining personal hygiene including handwashing, covering the mouth when coughing or sneezing, disposing of sputum and saliva properly, and ensuring good home ventilation and exposure to sunlight. Public behavior and awareness are crucial in combating tuberculosis. A thorough understanding of TB symptoms, transmission methods, and preventive actions can assist in more accurate diagnosis and treatment. Thus, raising public awareness through health education is essential.

Health education is an effort to convey health messages to the public, with the expectation that the community gains knowledge about various ways to prevent the transmission of pulmonary tuberculosis. Commonly used health education media include printed media (booklets, leaflets, flyers, flip charts), internet-based media (Facebook, Twitter, Instagram), and audiovisual media (television, radio, video, CD, DVD). One of the most effective health education tools is audiovisual media, which simultaneously stimulates hearing and vision. Audiovisual materials are engaging and easier for the public to understand because they combine images and sound, increasing interest and comprehension regarding the prevention of pulmonary tuberculosis.

A study conducted by Masriwati (2022) entitled *"The Effect of Audiovisual Media on Increasing Family* Knowledge *in Preventing Pulmonary Tuberculosis in the Coastal Area of Soropia District"* found that audiovisual media significantly improved family knowledge in TB prevention efforts. Based on the data above, nurses play a vital role in efforts to prevent the transmission of pulmonary tuberculosis, particularly through promotive actions such as monthly meetings in village or sub-district communities, especially in densely populated areas, using educational media like posters, leaflets, brochures, and audiovisual materials. Preventive efforts include encouraging the community to consistently wear masks or maintain distance when interacting with people infected with pulmonary tuberculosis. Therefore, considering the aforementioned data and circumstances, the researcher is interested in conducting a study entitled: "The Effect of Health Education on the Prevention of Pulmonary Tuberculosis Transmission on Knowledge Deficit Issues Through Audiovisual Media."

Method

This study employs a descriptive research approach using a case study method (Sugiyono, 2018). The research design applied in this study is a case study. A case study is a research method that investigates a problem through a specific case consisting of a single unit. The research subjects are individuals, places, or objects observed as the targets of the study. The subjects in this research were 43 respondents residing in RT013 RW005, Tanah Abang District, Central Jakarta. The research instrument used was a questionnaire consisting of knowledge-based questions related to the prevention of pulmonary tuberculosis transmission. Regarding research ethics, this study adheres to the following ethical principles: Justice, Beneficence, Informed Consent, Non-Maleficence, Veracity, Anonymity, and Fidelity.

Result

Table 1. Distribution of Respondents by Age Who Participated in Health Education on Pulmonary Tuberculosis Transmission Prevention

(N = 43)

Age Group	Frequency (f)	Percentage (%)
17–25 years	8	19%
26–35 years	16	37%
36–49 years	19	44%
Total	**43**	**100%**

The age distribution results in Table 1 show that the majority of respondents were aged 36–49 years, accounting for 19 respondents (44%), followed by those aged 26–35 years with 16 respondents (37%), and those aged 17–25 years with 8 respondents (19%).

Table 2. Distribution of Respondents by Gender Who Participated in Health Education on Pulmonary Tuberculosis Transmission Prevention

(N = 43)

Gender	Frequency (f)	Percentage (%)
Male	5	12%
Female	38	88%
Total	**43**	**100%**

The gender distribution in Table 2 indicates that the majority of respondents were female, totaling 38 respondents (88%), while male respondents accounted for 5 individuals (12%).

Table 3. Distribution of Respondents by Education Level Who Participated in Health Education on Pulmonary Tuberculosis Transmission Prevention

(N = 43)

Education Level	Frequency (f)	Percentage (%)
Junior High School	9	21%
Senior High School	31	72%
Bachelor's Degree	3	7%
Total	**43**	**100%**

The education level distribution in Table 3 above shows that the majority of respondents who participated in health education on pulmonary tuberculosis transmission prevention had completed senior high school, with 31 respondents (72%). Nine respondents (21%) had completed junior high school, and three respondents (7%) had completed a university degree.

Table 4. Distribution of Respondents' Knowledge Level Before Health Education on Pulmonary Tuberculosis Transmission Prevention

(N = 43)

Knowledge Level	frequency (n)	Percentage (%)
Good (76–100%)	0	0%
Fair (56–75%)	11	26%
Poor (≤55%)	32	74%
Total	**43**	**100%**

The knowledge level distribution of respondents before health education, as shown in Table 4 above, indicates that 32 respondents (74%) had a poor knowledge level (≤55%). Eleven respondents (26%) had a fair knowledge level (56–75%), and no respondents had a good knowledge level.

Table 5. Distribution of Respondents' Knowledge Level After Participating in Health Education on Pulmonary Tuberculosis Transmission Prevention

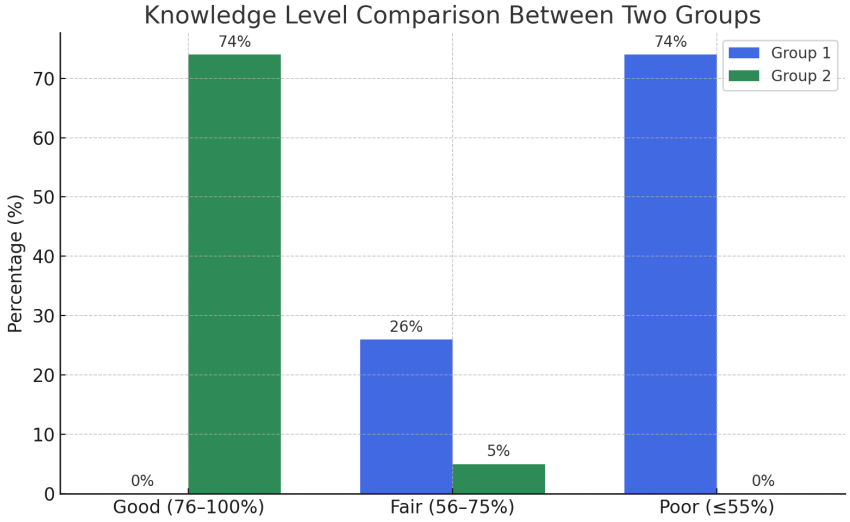
(N = 43)

Knowledge Level	frequency (n)	Percentage (%)
Good (76–100%)	41	95%
Fair (56–75%)	2	5%
Poor (≤55%)	0	0%
Total	**43**	**100%**

The knowledge level distribution of respondents after health education on pulmonary tuberculosis transmission prevention, as shown in Table 5 above, indicates that 41 respondents (95%) achieved a good knowledge level (76–100%). Two respondents (5%) had a fair knowledge level (56–75%), and no respondents had a poor knowledge level.

Diagram 1. Distribution of Knowledge Level Differences Among Respondents Before and After Health Education on Pulmonary Tuberculosis Transmission Prevention

(N = 43)



Based on the diagram above, it can be concluded that there was an improvement in the respondents' knowledge level after health education was provided to all 43 respondents (100%). Of the respondents with poor knowledge, 32 (74%) initially had poor knowledge, which

improved to a good knowledge level in 41 respondents (95%) after the education. Meanwhile, the number of respondents with fair knowledge decreased from 11 (26%) to 2 respondents (5%) after the health education intervention.

Discussion

The age variable in this study aligns with the inclusion criteria, with all 43 respondents falling within the productive age range (15–49 years). According to Agus Made (2015), the productive age is a period in which individuals are capable of working or producing something either for themselves or for others. Notably, 75% of pulmonary TB cases are found among individuals in this productive age group (15–49 years). The gender distribution of respondents in this study consisted of 88% females and 12% males (5 respondents). The majority of participants in the health education program on pulmonary tuberculosis prevention were female. This may be attributed to the fact that the research was conducted on a Thursday, a regular working day, when women are more likely to be available at home. This finding also supports the theory proposed by Ritonga (2023), which suggests that women play a central role in the family and should possess adequate knowledge, as they are often the primary agents of "information sharing" within their families, social circles, and workplaces.

In terms of education level, the majority of respondents had completed senior high school (72%, 31 respondents), followed by junior high school (21%, 9 respondents), and a smaller proportion had completed a university degree (7%, 3 respondents). According to Notoatmodjo (2014), knowledge is the result of a cognitive process that occurs through sensory perception, primarily via sight and hearing. Factors that influence a person's knowledge include education, mass media or information sources, socio-cultural and economic background, environment, and personal experience.

Before receiving health education on the prevention of pulmonary tuberculosis transmission via audiovisual media, the knowledge level of the respondents was categorized as poor (≤55%) in 32 respondents (74%), and fair (56–75%) in 11 respondents (26%). None of the respondents scored in the good knowledge category. After the health education intervention, the results showed a significant improvement: 41 respondents (95%) demonstrated a good level of knowledge (76–100%), 2 respondents (5%) had a fair level of knowledge, and no respondents remained in the poor knowledge category. There was a marked increase in the respondents' knowledge levels following the audiovisual-based health education on pulmonary tuberculosis prevention among all 43 respondents (100%). The number of respondents with poor knowledge decreased from 32 (74%) to 0, while those with good knowledge increased from 0 to 41 (95%). Meanwhile, those with fair knowledge decreased from 11 (26%) to 2 (5%).

These findings are consistent with the theory proposed by Notoatmodjo (2020), who identified several factors that influence knowledge: education level, access to information, experience, culture, and socio-economic status. The data is further supported by a study conducted by Mardila (2023), titled *"The Effect of Health Education Using Audiovisual Media on Preventive Behavior in Families with Pulmonary Tuberculosis"*, which found a significant effect of audiovisual-based health education on preventive behaviors regarding TB transmission. Additionally, this is reinforced by a statement from Piola et al. (2022), who asserted that audiovisual media are in line with technological advancement, as they can be both seen and heard, making them more engaging and effective in motivating people to absorb and understand health information.

Conclusion

It can be concluded that health education on the prevention of pulmonary tuberculosis transmission using audiovisual media had an effect on addressing knowledge deficits among the 43 respondents, with a 100% improvement observed after the health education intervention.

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