

Effectiveness of Educational Videos on Tuberculosis Prevention: A Community-Based Study among Household Contacts

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Abstract

Purpose: The high incidence of tuberculosis (TB) in Pringsewu District, particularly in the Ambarawa Community Health Center (Puskesmas) working area, requires serious attention, especially for high-risk households with TB patients.

Literature Review: Conventional education methods are considered suboptimal in changing preventive behaviors. This study aims to determine the effectiveness of educational videos in improving knowledge, attitudes, and practices related to TB prevention.

Methodology: This study used a quasi-experimental design with a pre-test and post-test with a control group. The population consisted of families living with TB patients at the Ambarawa Community Health Center, with a total sampling technique of 26 respondents divided into an intervention group (video) and a control group (leaflet). Data analysis used the Paired T-Test and Independent T-Test.

Result: The results showed that the intervention group experienced a significant increase in knowledge (p-value 0.007), attitude (p-value 0.000), and practice (p-value 0.000). In contrast, the control group experienced a decline in attitude and practice.

Conclusions: There was a significant difference in effectiveness between the use of educational videos and leaflets. Digital-based educational videos proved to be effective in improving family competence in TB prevention.

Recommendations: It is recommended that community health centers utilize video media as a routine health promotion strategy.

Keywords: Household Contacts, Prevention Practices, Attitudes, TB, Educational Videos

INTRODUCTION

Tuberculosis is a public health problem that occurs all over the world. This disease is still problematic because it can cause high disability, pain, and death. Therefore, serious attention is needed in efforts to overcome it (Putriady, 2022). About 60% of TB cases occur in developing countries, such as India, Indonesia, China, Nigeria, Pakistan, and South Africa (Novalia et al., 2023). According to WHO data (2020), the number of new cases of TB worldwide reached 10 million cases with a death rate of 1.2 million people per year (Marna et al., t.t.).

The latest data from the Global Tuberculosis Report 2023 shows an increase in TB cases globally by 4% compared to the previous year, which confirms the importance of massive handling (WHO, 2023). In Indonesia, tuberculosis is still a serious public health problem. Indonesia ranks second after India as the country with the highest number of TB cases in the world (Umniyati et al., 2024).

Based on the 2022 Global TB Report, there are around 969,000 cases of TB in Indonesia or equivalent to 11 deaths per hour. This number represents an increase of 60% compared to 2020, with The death rate reached 93,000 people or a death rate of 55 per 100,000 population. Of the total cases, only 443,000 cases (about 45.7%) have been found, while the rest, around 525,765 cases (54.3%), have not been detected and have the potential to be a source of transmission for the people around them (Waluyo et al., t.t.). And this number is at risk of transmitting to the people

around them.

The number of TB patient prevalence in Lampung Province continues to increase every year. Until May 2024, there were around 31,302 cases of tuberculosis, making Lampung Province one of the four provinces with the highest case burden in Indonesia after West Java, East Java and Central Java with the top 3 positions. Based on data from the Lampung Provincial Health Office, in 2022 there were 1,115 cases of tuberculosis in Pringsewu Regency, with an almost even distribution of cases between men and women and around 405 cases in children. The sub-districts that have the highest number of suspected TB cases in Pringsewu Regency include: Ambarawa Health Center with 176 suspected cases, Pagelaran Pringsewu Health Center with 137 suspected cases and Bumi Ratu Health Center with 123 suspected cases.

Based on the Pringsewu Regency Tuberculosis Data Report as of March 12, 2025, it is known that Ambarawa District is the area with the highest contribution to TB cases. There were 176 suspected cases, with 12 cases of tuberculosis notified, and 11 of them had received treatment in the work area of the Ambarawa Health Center. This data shows that the burden of TB cases in Ambarawa is relatively higher than other sub-districts in Pringsewu Regency.

According to the United States Agency for International Development (USAID) Health Care Improvement Project, TB transmission occurs through the air. When a TB patient coughs, sneezes, or spits, TB germs will be spread into the air in the form of nucleic droplets, which can then be inhaled by healthy people causing infection. A TB patient can transmit the disease to 15–20 other people. In addition to airborne transmission, proximity and intensity of exposure also play a role in the transmission of TB infection. Individuals who live in the same household or are in close proximity to active TB patients, such as family members, are at high risk of infection. The increase in the incidence of TB increases the possibility of direct transmission, which ultimately causes the number of TB patients to continue to increase (Bili et al., 2019).

The high cases of tuberculosis are caused by low public awareness (Muannisa & Sulistiadi (t.t.). Many individuals still have misconceptions, such as thinking that TB only affects certain groups, cannot be cured, or is caused by the supernatural and heredity. Some sufferers even think that tuberculosis is just an ordinary cough, so they are less concerned about the risk of transmission. In addition, people tend to be reluctant to get checked because they are afraid and embarrassed if they are sentenced to TB (Putri et al., 2022).

The lack of understanding of TB prevention and transmission also exacerbates the situation. Prevention efforts include administering BCG vaccine to infants aged 0–1 months, chemoprophylaxis with isoniazid for close contact, treatment of TB patients, correct coughing etiquette, and not spitting carelessly (Putri et al., 2022). A clean and healthy living culture (PHBS) and consistent treatment success help control the spread of germs. However, the weak knowledge and attitude of the community remains an obstacle (Suhendrik et al., t.t.).

This is exacerbated by the low motivation of the community in carrying out prevention efforts. The habit of not covering one's mouth when coughing/sneezing, spitting carelessly, sharing beds or cutlery with sufferers, and poorly ventilated homes are the main factors in TB transmission. Unfortunately, many consider this trivial.

With a high case load, comprehensive, coordinated, and sustainable measures are needed to reduce the transmission rate and increase treatment success. Responding to this challenge, the Indonesian government has prepared the National Action Plan for Tuberculosis Control (RAN TB) 2020–2024 as a national strategic guide, through five main strategic pillars, one of which is health promotion. This strategy places community education at the heart of the intervention with the aim of raising awareness, eliminating stigma, and encouraging behavioural change that supports early detection and complete treatment of TB.

This is in line with the Qur'an Surah Al-Baqarah (2): 195 concerning the Obligation of Muslims in Carrying out Disease Prevention Efforts, which reads:

وَلَا تُلْقُوا بِأَيْدِيكُمْ إِلَى التَّهْلُكَةِ وَأَحْسِنُوا إِنَّ اللَّهَ يُحِبُّ الْمُحْسِنِينَ

(And do not throw yourselves into destruction, and do good. Truly, Allah loves those who do good)

This strategy emphasizes the importance of delivering targeted information, using media in accordance with the times, and active community involvement in TB education (Ministry of Health of the Republic of Indonesia, 2023). The TB Policy Memo 2024–2029 also highlights the need for cross-sector collaboration and evidence-based approaches. Educational media innovations, including the use of digital platforms and social media, are directed to reach the wider community, especially the younger generation (Ministry of Health of the Republic of Indonesia, 2024).

The selection of the right educational media greatly affects the effectiveness of delivering health information to the public. Eko Winarti and Febry Y.Y. Roempoembo (2024) found that audiovisual media is effective in increasing family knowledge and behavior related to TB prevention, especially in understanding symptoms, modes of transmission, and preventive measures. Kurniawati and Lira (2023) also stated that humans only remember 20% of what they see and 30% of what they hear, but this figure increases to 50% when they see and hear at the same time,

and reach 90% when accompanied by action.

Video media provides a more real learning experience through simulation and visualization, making it easier for people to understand the process of TB transmission and prevention. Compared to other conventional educational media such as leaflets or one-way counseling, videos offer significant advantages.

These advantages include the ability to capture attention for longer through a combination of moving and audio visual elements, more dynamic and emotional message delivery, and ease of distribution and access repeatedly by the public as they need. Video is also able to overcome geographical and time limitations that are often obstacles in direct counseling methods.

Health education or health education is also one of the Indonesian Government's strategies in the target of eliminating TB by 2030. One of the main programs launched by the government is the TOSS TB (Find Tuberculosis, Treat Until Cured) campaign which aims to increase public awareness about the importance of early detection and treatment of TB until it is complete (TB Indonesia, 2024).

Along with technological developments, the use of social media such as TikTok as a health education medium is one of the important innovations that is in line with government policies. This platform has great potential in conveying health information effectively because this media is more interactive and close to people's daily lives, especially to the younger generation who are active users of social media. With an educational approach through TikTok videos, it is hoped that the public will better understand the importance of preventing TB transmission and implementing healthy living behaviors in daily life.

Based on the data and pre-survey activities carried out, the Ambarawa Health Center in Pringsewu Regency is one of the areas that is active in implementing the TB control program. This health center routinely conducts structured activities, such as searching for suspected cases and active cases in villages, investigating household contact with active TB patients, and screening TB in toddlers. This activity is part of the annual agenda carried out by health center officers as an effort to detect early and break the chain of transmission.

In terms of health education, the Ambarawa Health Center has been relying on a conventional approach through direct counseling to families, using flip sheets and question and answer sessions. This education is interpersonal and is considered quite effective because it can adjust to the conditions of each family. However, the Puskesmas have not used digital media or educational videos as a means of health promotion. In fact, current technological developments open up great opportunities to convey health messages in a more interesting, interactive, and reaching a wider audience, especially the younger generation who are active on social media.

Although the incidence of TB in the work area of the Ambarawa Health Center has decreased, this achievement has not reached the target set nationally. Therefore, innovation in health education methods is needed that not only increase knowledge, but also shape people's preventive attitudes and behaviors towards tuberculosis.

One of the potential innovations is through educational video media based on digital platforms such as TikTok. This study is designed to evaluate the effectiveness of health education videos in increasing knowledge and attitudes to prevent TB transmission in the community, especially household contact families in the work area of the Ambarawa Health Center.

METHODS

This study used a quantitative approach with a quasi-experimental design through a nonequivalent control group pretest-posttest design. The study was conducted in the working area of the Ambarawa Community Health Center, Pringsewu Regency, in November 2025. Data collection was carried out directly by visiting respondents from house to house (door to door).

The population in this study consisted of all families living in the same house as active TB patients in the working area of the Ambarawa Community Health Center. The sampling technique used total sampling, in which the entire population that met the inclusion criteria was taken as respondents, totaling 26 people. The inclusion criteria included family members living in the same house as TB patients, aged ≥ 17 years, willing to be respondents, and able to read and write. Respondents were divided into two groups, namely the intervention group (13 people) and the control group (13 people).

The research instruments consisted of intervention media and questionnaires. The independent variable was health education using audiovisual (MP4) video format with a duration of 2 minutes and 36 seconds containing material on TB prevention, epidemiology, and coughing etiquette simulation, which had been validated by subject matter and media experts. The dependent variables included knowledge, attitudes, and practices, which were measured using closed-ended questionnaires. The knowledge questionnaire consisted of 15 multiple-choice questions, the attitude questionnaire consisted of 10 Likert scale statements, and the practice questionnaire consisted of 15 questions. Validity and reliability tests were conducted at the Bumiratu Community Health Center on 19 respondents. The test results showed that the instruments were valid (calculated $r > \text{table } r$) and reliable with a Cronbach's Alpha value > 0.70 .

The research procedure began with a pre-test to measure the initial knowledge, attitude, and practice scores. Next, the intervention group was given treatment in the form of educational videos, while the control group was given leaflets. After the intervention, a re-measurement (post-test) was conducted. Data analysis was performed using computer software. Data normality was tested using Shapiro-Wilk. Bivariate analysis used the Paired Sample T-Test (if normally distributed) or Wilcoxon (if not normally distributed) to determine the difference in means before and after the intervention. This study applied research ethics principles including informed consent, confidentiality, fairness, and the principle of benefit.

RESULTS AND DISCUSSION

A. Respondent Characteristics

1. Age

Table.1 Distribution of Frequency of Respondents by Age at the Ambarawa Health Center, Pringsewu Regency in 2025

Age (Years)	Means	SD	Minimum	Maximum
Intervention	36.06	13.20	19	55
Controls	49.40	13.16	25	60

Respondent Characteristics This study involved 26 respondents who were family members living with TB patients. The results of the analysis showed that the average age of respondents in the intervention group was 36.06 years (early adulthood), while the control group was dominated by older respondents with an average age of 49.40 years

2. Gender, Education, Occupation and Relationship with Patients

Table.2 Distribution of respondent frequencies based on characteristics at the Ambarawa Health Center, Pringsewu Regency in 2025

Characteristics	Groups			
	Intervention		Controls	
	F	%	F	%
Gender				
- Male	2	12.5	3	30
- Female	14	87.5	7	70
Education				
- Elementary School	3	18.75	4	40
- Junior High School	5	31.25	4	40
- High School	5	31.25	2	20
- University	3	18.75	0	0
Occupation				
- Housewives	9	56.25	5	50
- Farmer	2	12.5	3	30
- Entrepreneurship	1	6.25	2	20
- Private Employees	2	12.5	0	0
- Students	2	12.5	0	0
Patient Relations				
- Husband/Wife	6	37.5	4	40
- Children	5	31.25	0	0
- Parents	3	18.75	5	50
- Brother / Sister	2	12.5	1	10
Total	16	100	10	100

Table. 2 indicates that females predominated in both the intervention (87.5%) and control groups (70%). The intervention group had a more diverse educational background, while the control group was mainly composed of respondents with lower education levels. Housewives were the dominant occupation in both groups. Regarding patient relationships, spouses and children were more common in the intervention group, whereas parents predominated in the control group. Overall, the baseline characteristics of both groups were relatively comparable, supporting the validity of the intervention effects.

B. Result

Table.3 Differences in Mean Knowledge, Attitude, and Practice Before and After Intervention

Variable	Group	Pre-test (Mean $\pm$ SD)	Post-test (Mean $\pm$ SD)	p-value
Knowledge	Intervention	10.25 $\pm$ 1.69	11.50 $\pm$ 1.69	0.007
	Control	10.90 $\pm$ 1.80	10.20 $\pm$ 1.80	0.191
Attitude	Intervention	27.50 $\pm$ 3.43	38.88 $\pm$ 4.74	0.000
	Control	32.00 $\pm$ 3.43	29.20 $\pm$ 3.43	0.040
Practice	Intervention	11.50 $\pm$ 1.96	13.63 $\pm$ 1.96	0.000
	Control	12.30 $\pm$ 2.11	10.80 $\pm$ 2.11	0.018

In the intervention group, the knowledge score increased by 1.25 points (from 10.25 to 11.50), the attitude score increased by 11.38 points (from 27.50 to 38.88), and the practice score increased by 2.13 points (from 11.50 to 13.63), all of which were statistically significant ($p < 0.05$). In contrast, the control group experienced a decrease in knowledge score by 0.70 points, a decrease in attitude score by 2.80 points, and a decrease in practice score by 1.50 points. These findings confirm that the intervention was effective in improving all components of TB preventive behavior.

C. Discussion

1. Knowledge level before and after the intervention

Based on the results of the statistical test, there was a significant increase in the knowledge score in the intervention group after being given video education from an average of 10.25 in the pre-test to 11.50 in the post-test. Meanwhile, in the control group, there was a slight decrease from 10.90 to 10.20. The paired t-test in the intervention group obtained a p-value of 0.007 ($p < 0.05$), which means that providing education using video significantly increased the respondents' knowledge about TB transmission prevention.

These findings are in line with the Information–Motivation–Behavioral Skills (IMB) theory which states that accurate and easy-to-understand information is an initial component in health behavior change (Fisher & Fisher, 1992). The educational video in this study serves as the main source of information that conveys material about the definition of TB, how it is transmitted, and its prevention efforts in a clear and structured manner.

The advantage of video as an educational medium lies in its ability to convey messages audiovisually, thereby increasing the attractiveness and understanding of respondents. Video media also helps respondents remember information for longer than print media (Latif & Tiala, 2022). This accelerates the process of change from ignorance to knowing, especially in people with diverse educational backgrounds.

This increase in knowledge does not occur instantaneously, but through a gradual cognitive process. This process begins with the visual and audio stimulus of educational videos that attract the attention of respondents. After the stimulus is received, respondents enter the weighing stage, where they process the information and match it to the health condition of family members who are sick with tuberculosis. At this stage, respondents assess whether the information is relevant and trustworthy.

The increase in scores in the intervention group showed that the respondents had reached the adaptation stage, which is to accept the information in the video as a valid new understanding and store it in long-term memory. Meanwhile, respondents who are still in the medium knowledge category are likely to still be in the weighing phase and have not fully adapted detailed information related to TB prevention.

Thus, educational videos have proven to be effective in facilitating the knowledge adaptation process and effective in increasing the knowledge of household contacts about TB prevention. Video media is recommended as a means of health education that is adaptive and in accordance with the development of information technology.

2. Attitudes Before And After Intervention

The results of the statistical test showed a significant increase in attitudes in the intervention group after being given an educational video. This was marked by a significant increase in the intervention group from an average score of 27.50 to 38.88 after the administration of the intervention. In the Paired t-test, a p-value of 0.000 ($p < 0.05$) was produced, which means that there was a significant change in attitude after watching the educational video. On the other hand, in the control group there was a decrease

According to the IMB theory, the information received by individuals will affect internal motivation, which in turn shapes attitudes towards a healthy behavior (Fisher & Fisher, 1992). In this study, the knowledge gained through educational videos encouraged respondents to have a positive outlook and awareness of the importance of TB prevention. Educational videos are able to influence attitudes because they not only provide information, but also touch on emotional aspects through visualization, narrative, and examples of appropriate behavior. Digital media has proven to be effective in increasing people's positive attitudes towards health behaviors (Bulan, 2023).

A change in attitude occurred because respondents began to accept and believe that TB prevention is a shared responsibility in the family. This positive attitude is shown through respondents' willingness to support preventive behaviors such as coughing etiquette, maintaining home ventilation, and adherence to medication. It can be concluded that educational videos are effective in increasing the positive attitude of household contact families towards TB prevention. Therefore, digital media-based education needs to be carried out on an ongoing basis to maintain this positive attitude.

3. Practice Before and After Intervention

Based on the results of statistical tests, there was a significant increase in TB prevention practices in the intervention group which was characterized by an average increase from 11.50 to 13.63 after the intervention. The Paired t-test showed a p-value of 0.000 ($p < 0.05$), meaning that there was a significant influence of TikTok video education on TB prevention practices. In contrast, in the control group, there was a decrease in practice from 12.30 to 10.80 with a p-value of 0.04, indicating that without education, prevention practices may decline over time.

In IMB theory, health practices or actions are influenced by behavioral skills formed from sufficient information and motivation (Fisher & Fisher, 1992). The educational video helped respondents understand how to prevent TB correctly and applicably. The advantage of video lies in its ability to show examples of practice in person, so that respondents can imitate the behavior displayed. Audiovisual media has proven to be more effective in changing health practices than conventional lecture methods.

This increase in preventive practices is evidence of the formation of *Behavioral Skills* in respondents, as explained in IMB Theory. This process begins with the receipt of clear visual information from the video about TB prevention techniques, which then fosters the respondent's personal motivation to protect family members from transmission. This synergy between accurate information and strong motivation gives respondents *self-efficacy* to be able to imitate and practice real actions, such as correct cough etiquette and home ventilation management. Video plays a role in facilitating these skills through concrete visual examples, so that respondents not only know how, but are also able to do it consistently.

Thus, it can be concluded that educational videos are effective in improving TB transmission prevention practices in household contact families. Video media is highly recommended as a health promotion strategy that is applicable and in accordance with the needs of today's society.

4. The Effectiveness of Educational Videos on Improving Knowledge, Attitudes, and Practices to Prevent TB Transmission

Effectiveness on Knowledge An analysis of the effectiveness of the intervention on knowledge, attitudes, and practices is presented in Table 1. Based on the statistical test results, a significant increase in knowledge scores was found in the intervention group after being given educational videos (p-value = 0.007). In contrast, in the control group that used conventional media, there was no significant change (p-value = 0.191). These findings are in line with the Information–Motivation–Behavioral Skills (IMB) theory, which states that accurate information is the foundation for behavioral change (Fisher & Fisher, 1992). Educational videos proved to be superior because they combined visual and audio stimuli, which helped respondents with various educational backgrounds to understand abstract concepts (such as how bacteria are transmitted) more concretely. This is supported by research by Latif & Tiala (2022), which states that audiovisual media improves memory retention better than print media.

Effectiveness on Attitudes In addition to knowledge, video intervention also had a significant impact on respondents' attitudes (p-value = 0.000). The drastic increase in the average score from 27.50 to 38.88 indicates that videos can touch the emotional aspects and internal motivation of respondents. The visualization of the adverse effects of TB and the persuasive narrative in the video fostered a sense of responsibility to protect one's family. This contrasts with the control group, which experienced a significant decline in attitude scores (p-value = 0.040). The decline in the control group shows that without engaging

stimuli, respondents' motivation to adopt positive attitudes tends to decline over time because leaflets are less effective at fostering emotional engagement.

Effectiveness on Practice In terms of psychomotor skills, this study proves that educational videos are effective in improving TB prevention practices, such as cough etiquette and ventilation management (p-value = 0.000). From the perspective of IMB theory, practices are formed from Behavioral Skills. Videos facilitate this through observational learning, where respondents see real examples in the video and imitate them. The ability to replay the video on mobile phones allows the information to be embedded in the subconscious, making preventive behavior an automatic reflex or habit. In contrast, the control group experienced a significant decline in practices (p-value = 0.018), confirming that conventional methods are less effective in maintaining long-term preventive behavior in the household environment.

CONCLUSION

The study concludes that educational videos are significantly more effective than conventional media (leaflets) in improving the Knowledge, Attitudes, and Practices (KAP) of household contacts regarding tuberculosis (TBC) transmission prevention. The statistical evidence shows a high level of significance in the intervention group across all three variables (Knowledge $p=0.007$; Attitude $p=0.000$; Practice $p=0.000$). The use of visual and interactive digital media helps overcome the limitations of traditional health promotion, making complex medical information more accessible and actionable for the community. These findings suggest that the integration of digital education is a crucial strategy for primary healthcare facilities to break the chain of TBC transmission at the household level. Future research is recommended to involve a larger sample size and longitudinal observation to assess the long-term sustainability of these behavioral changes.

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