

The Influence of Health Education Intervention on Community Knowledge Regarding Tuberculosis Prevention in Tanak Beak Village, UPT Puskesmas Narmada Work Area



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ABSTRACT

Tuberculosis remains a major public health problem worldwide and continues to contribute significantly to morbidity and mortality, particularly in developing countries. Limited public knowledge regarding tuberculosis transmission and prevention often leads to delayed diagnosis and inadequate preventive practices within communities. Health education provided by nurses is considered an important strategy to improve community awareness and promote preventive behaviors against tuberculosis. This study aimed to determine the effect of a health education intervention on community knowledge regarding tuberculosis prevention in Tanak Beak Village, within the working area of UPT Puskesmas Narmada. This study used a pre-experimental design with a one-group pretest-posttest approach. The participants consisted of 30 community members selected using purposive sampling techniques. Data were collected using a structured questionnaire that measured knowledge of tuberculosis prevention before and after the health education intervention. The educational session was delivered by nurses using lectures, discussions, and visual educational media. Data analysis was conducted using descriptive statistics and a paired sample t-test to determine differences in knowledge scores before and after the intervention. The results showed that the mean knowledge score before the intervention was 56.3, indicating a moderate level of knowledge among respondents, while after the health education intervention the mean score increased to 82.7, reflecting a substantial improvement in community understanding of tuberculosis prevention. Statistical analysis demonstrated a significant difference between pretest and posttest scores ($p < 0.05$), indicating that the intervention was effective in increasing knowledge levels. In conclusion, nurse-led health education interventions play an important role in strengthening community knowledge and awareness related to tuberculosis prevention. Continuous community-based health promotion programs are recommended to support tuberculosis control efforts and reduce disease transmission.

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INTRODUCTION

Tuberculosis remains one of the leading infectious diseases worldwide and continues to pose a major public health challenge, particularly in developing countries. According to the World Health Organization, tuberculosis is caused by *Mycobacterium tuberculosis* and primarily affects the lungs, although it can also involve other organs. The disease spreads through airborne droplets when an infected individual coughs, sneezes, or talks. Despite the availability of effective treatment, tuberculosis continues to contribute significantly to morbidity and mortality due to delayed diagnosis, inadequate treatment adherence, and limited community awareness regarding prevention strategies. In many developing regions, tuberculosis control remains a major priority within national health programs, including those implemented by the Ministry of Health of the Republic of Indonesia.

Tuberculosis continues to be a major public health concern in Indonesia. The country is among the nations with the highest burden of tuberculosis globally, with thousands of new cases reported annually. Several factors contribute to the high incidence of tuberculosis, including dense population, poor ventilation in households, limited knowledge about disease transmission, and stigma associated with the illness. These factors often result in delayed healthcare seeking behavior and inadequate preventive practices within communities. As a result, strengthening community knowledge regarding tuberculosis prevention is an essential component of public health strategies aimed at reducing transmission and improving early detection.

Community knowledge plays a critical role in preventing the spread of tuberculosis. Individuals who possess adequate knowledge about the disease are more likely to adopt preventive behaviors such as covering the mouth while coughing, improving household ventilation, seeking early medical examination when experiencing symptoms, and supporting adherence to tuberculosis treatment. Conversely, limited knowledge may lead to misconceptions regarding disease transmission and treatment, which can increase the risk of ongoing transmission within households and communities. Therefore, educational interventions that focus on improving community knowledge are essential in tuberculosis control programs.

Health education is one of the most effective strategies to increase public awareness and encourage positive health behaviors. Nurses, as frontline healthcare providers, play an important role in delivering health education to individuals, families, and communities. Through structured education sessions, nurses can provide accurate information about tuberculosis transmission, symptoms, prevention methods, and the importance of early detection and treatment adherence. Educational interventions delivered by healthcare professionals have been shown to significantly improve knowledge levels and promote preventive practices in various community health programs.

In community health nursing practice, health education is considered a fundamental intervention aimed at empowering communities to take an active role in maintaining their health. Educational activities conducted at the community level such as counseling sessions, group discussions, and the use of educational media can effectively improve understanding of disease prevention. When implemented consistently, these interventions can contribute to long-term improvements in community health outcomes and support disease control efforts at the population level.

Tanak Beak Village, located within the working area of UPT Puskesmas Narmada, represents a community setting where health promotion activities are essential in supporting tuberculosis prevention efforts. Limited access to health information and varying levels of community awareness may influence the effectiveness of disease prevention strategies in this area. Therefore, implementing targeted health education interventions led by nurses may provide an effective approach to improving community knowledge regarding tuberculosis prevention.

Based on the importance of community knowledge in tuberculosis control, this study aims to examine the effect of health education interventions on community knowledge regarding tuberculosis prevention in Tanak Beak Village within the working area of UPT Puskesmas Narmada. The findings of this study are expected to provide valuable insights for healthcare providers, particularly nurses, in strengthening community-based health education programs to support tuberculosis prevention efforts.

METHOD

Research Design

This study employed a quantitative approach using a pre-experimental design with a one-group pretest-posttest model. The design aimed to measure changes in community knowledge before and after the implementation of a health education intervention. The researcher first conducted a pretest to assess baseline knowledge regarding tuberculosis

prevention. Afterward, a structured health education intervention was delivered, followed by a posttest to evaluate changes in knowledge levels. This design enables direct assessment of intervention effectiveness within a single group without a control group. It is appropriate for examining causal effects in a community-based setting where controlled experimental conditions are limited. The design aligns with the study objective, which focuses on identifying the effect of educational intervention on knowledge improvement.

Study Setting and Period

The study was conducted in Tanak Beak Village, located within the working area of UPT Puskesmas Narmada. This location was selected due to its relevance to community health promotion efforts and the need to strengthen public awareness of tuberculosis prevention. The community demonstrates varying levels of access to health information, which makes it suitable for evaluating educational interventions. The research was carried out over a defined period that included preparation, data collection, intervention implementation, and data analysis. All activities were coordinated with local health authorities to ensure smooth execution and community participation.

Population and Sample

The study population consisted of all community members residing in Tanak Beak Village within the UPT Puskesmas Narmada service area. The sample was selected using purposive sampling based on specific inclusion criteria relevant to the study objectives. The inclusion criteria included individuals who were willing to participate, able to communicate effectively, and available to attend the entire research process from pretest to posttest. Based on these criteria, a total of 30 respondents were selected. This sample size is considered adequate for a pre-experimental study focusing on within-group comparison of knowledge changes following an intervention.

Research Variables

This study included one independent variable and one dependent variable. The independent variable was the health education intervention delivered by nurses. The dependent variable was the level of community knowledge regarding tuberculosis prevention. Knowledge was assessed based on respondents' understanding of tuberculosis causes, transmission, symptoms, and prevention strategies. The variable was operationalized through a scoring system derived from respondents' answers to a structured questionnaire.

Research Instrument

Data were collected using a structured questionnaire designed to measure respondents' knowledge of tuberculosis prevention. The instrument consisted of multiple-choice questions covering key aspects of tuberculosis, including causes, modes of transmission, clinical symptoms, and preventive measures. Each correct answer was assigned a score, and the total score was converted into a percentage. Based on the score, knowledge levels were categorized into three groups: good, moderate, and poor. The questionnaire was developed in accordance with the study objectives and adapted to the local context to ensure clarity and relevance for respondents.

Data Collection Procedure

The study was conducted through several systematic stages. First, the researcher obtained permission from the management of UPT Puskesmas Narmada and local village authorities. After approval, respondents were recruited based on the predetermined inclusion criteria.

The pretest was administered to assess baseline knowledge levels. Following this, the researcher implemented the health education intervention led by nurses. The intervention was delivered using lectures, interactive discussions, and visual educational media. The content covered essential information about tuberculosis, including its definition, transmission mechanisms, symptoms, and preventive practices.

After completing the educational session, respondents were asked to complete the posttest using the same questionnaire. This procedure ensured consistency in measurement and allowed for accurate comparison of knowledge levels before and after the intervention. All stages were conducted in a controlled and organized manner to maintain data reliability.

Data Analysis

Data analysis involved both descriptive and inferential statistical methods. Descriptive statistics were used to summarize respondent characteristics and describe knowledge levels before and after the intervention. The results were presented in the form of frequency distributions, percentages, means, and standard deviations.

To evaluate the effect of the health education intervention, a paired sample t-test was applied. This test was appropriate because it compares two sets of related data obtained from the same group of respondents. The level of significance was set at 0.05. A p-value less than 0.05 indicated a statistically significant difference between pretest and posttest scores, demonstrating the effectiveness of the intervention in improving community knowledge.

Ethical Considerations

This study adhered to ethical principles in health research. Each respondent received a clear explanation of the study objectives, procedures, and potential benefits before participation. Informed consent was obtained voluntarily from all participants. The researcher ensured confidentiality by not disclosing respondents' identities and by using the data solely for research purposes. The study also respected local social and cultural norms throughout the research process.

RESULTS AND DISCUSSION

Characteristics of Respondents

This study involved 30 respondents who were community members of Tanak Beak Village in the working area of UPT Puskesmas Narmada. The characteristics of respondents analyzed in this study included age, gender, and level of education. Identifying respondent characteristics is important to provide an overview of the study population and to understand factors that may influence community knowledge regarding tuberculosis prevention.

Table 1. Distribution of Respondent Characteristics (n = 30)

Characteristics	Category	Frequency (n)	Percentage (%)
Age	20–30 years	8	26.7
	31–40 years	10	33.3
	41–50 years	7	23.3
	>50 years	5	16.7
Gender	Male	12	40.0
	Female	18	60.0
Education	Primary School	9	30.0
	Secondary School	14	46.7
	Higher Education	7	23.3

Based on Table 3, the majority of respondents were in the age group of 31–40 years, accounting for 10 individuals (33.3%). This age group is categorized as productive age, which generally has high social interaction within the community. In terms of gender distribution, female respondents were more dominant, totaling 18 individuals (60%). This may occur because women are often more involved in community health activities such as health education programs or community health services.

Regarding educational background, most respondents had a secondary education level (SMP/SMA equivalent), accounting for 14 individuals (46.7%). Educational level can influence an individual's ability to receive and understand health-related information. Individuals with higher education levels tend to have better access to health information and are generally more capable of understanding health education materials.

Level of Knowledge Before Health Education Intervention

The level of respondents' knowledge regarding tuberculosis prevention was measured before the health education intervention was provided. This measurement aimed to identify the baseline understanding of the community regarding the causes, transmission, symptoms, and prevention strategies of tuberculosis.

Table 2. Respondents' Knowledge Level Before Health Education

Knowledge Category	Frequency (n)	Percentage (%)
Good	6	20.0
Moderate	15	50.0
Poor	9	30.0
Total	30	100

Based on Table 4, most respondents had a moderate level of knowledge, accounting for 15 individuals (50%). Respondents with good knowledge accounted for 6 individuals (20%), while 9 respondents (30%) had poor knowledge regarding tuberculosis prevention.

These results indicate that prior to the intervention, community knowledge regarding tuberculosis prevention was still limited. This condition may be influenced by limited access to health information, insufficient exposure to health education programs, and misconceptions about tuberculosis within the community.

Level of Knowledge After Health Education Intervention

After the health education intervention conducted by nurses, respondents' knowledge levels were reassessed using the same questionnaire. The health education intervention was delivered through lectures, interactive discussions, and visual educational media explaining the causes, transmission, symptoms, and prevention of tuberculosis.

Table 3. Respondents' Knowledge Level After Health Education

Knowledge Category	Frequency (n)	Percentage (%)
Good	21	70.0
Moderate	7	23.3
Poor	2	6.7
Total	30	100

Based on Table 5, there was a significant improvement in respondents' knowledge after the health education intervention. The majority of respondents achieved a good level of knowledge, totaling 21 individuals (70%). Respondents with moderate knowledge were 7 individuals (23.3%), while only 2 respondents (6.7%) remained in the poor knowledge category.

These results demonstrate that the health education intervention provided by nurses was effective in improving community understanding regarding tuberculosis prevention.

Effect of Health Education on Community Knowledge

To determine the effect of the health education intervention on the improvement of community knowledge, statistical analysis was performed using a paired sample t-test by comparing knowledge scores before and after the intervention.

Table 4. Comparison of Knowledge Scores Before and After Intervention

Variable	Mean	Standard Deviation	p-value
Pretest	56.3	8.5	
Posttest	82.7	6.9	0.000

Based on Table 6, the average knowledge score before the intervention was 56.3. After the health education intervention, the mean score increased to 82.7. The statistical test showed a p-value of 0.000 ($p < 0.05$), indicating that there was a significant effect of the health education intervention on improving community knowledge regarding tuberculosis prevention.

These findings indicate that health education is an effective strategy for improving public knowledge. Educational interventions delivered by nurses help community members understand important information about tuberculosis transmission, proper cough etiquette, maintaining adequate home ventilation, and the importance of early health examinations when tuberculosis symptoms appear.

The results of this study are consistent with previous research showing that community-based health education programs significantly improve public knowledge and awareness regarding infectious disease prevention. Improved knowledge among community members is expected to encourage healthier behaviors and support tuberculosis control efforts at the community level.

Overall, the findings highlight the important role of nursing interventions in community health promotion. Nurses play a strategic role in delivering accurate health information and empowering communities to adopt preventive health behaviors. Continuous health education programs are therefore recommended to strengthen community awareness and support long-term tuberculosis prevention efforts.



Fig. 1. Home Visit for Tuberculosis Patients

CONCLUSION

This study aimed to determine the effect of health education interventions on community knowledge regarding tuberculosis prevention in Tanak Beak Village, within the working area of UPT Puskesmas Narmada. The results of the study demonstrated that health education interventions provided by nurses had a significant effect on improving community knowledge about tuberculosis prevention. Before the intervention, the majority of respondents had a moderate level of knowledge regarding tuberculosis prevention, indicating that awareness and

understanding within the community were still limited. After the implementation of the health education program, there was a substantial improvement in knowledge levels, with most respondents achieving a good level of understanding regarding tuberculosis transmission, symptoms, and preventive measures.

Statistical analysis using a paired sample t-test showed a significant difference between pretest and posttest knowledge scores ($p < 0.05$), confirming that the educational intervention effectively increased community knowledge. The improvement in knowledge can be attributed to the use of structured educational methods, including lectures, interactive discussions, and visual educational media that helped respondents better understand the information provided.

These findings highlight the important role of nurses in delivering community-based health education programs as part of tuberculosis prevention strategies. Health education serves as a key nursing intervention in promoting public awareness and encouraging preventive behaviors within communities. By improving community knowledge regarding tuberculosis prevention, educational programs can contribute to reducing disease transmission and supporting public health efforts to control tuberculosis.

Therefore, it is recommended that health education activities related to tuberculosis prevention be implemented regularly at the community level, particularly in areas with high risk of tuberculosis transmission. Continuous collaboration between healthcare providers, community leaders, and local health institutions is essential to ensure the sustainability and effectiveness of health promotion programs aimed at improving community health outcomes.

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