



# Educational Intervention on Knowledge, Attitudes, and Preventive Behaviors Toward Tuberculosis and Hypertension in Kelurahan Binaan

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## ABSTRACT

Tuberculosis (TB) and hypertension remain major public health burdens in Indonesia, contributing to the country's persistent double burden of disease. Community-based health promotion programs serve as a strategic approach to enhance awareness and preventive behaviors. This research aim to evaluate the effect of educational interventions on knowledge, attitudes, and preventive behaviors related to tuberculosis and hypertension under the Kelurahan Binaan. A pre-post interventional study was conducted among 83 adult participants selected using inclusion and exclusion criteria. Interventions included health education on TB and hypertension and dietary counseling delivered through lecture-based methods. Data on knowledge, attitudes, and preventive behaviors were collected using validated questionnaires. Wilcoxon Signed Rank and McNemar tests were applied for analysis. Significant improvements were observed in knowledge of tuberculosis ( $Z = -6.050$ ;  $p < 0.001$ ) and hypertension ( $Z = -4.735$ ;  $p < 0.001$ ). Attitudes toward TB ( $p = 0.012$ ) and hypertension ( $p < 0.001$ ) also increased significantly. Preventive behavior significantly improved for both TB ( $Z = -3.632$ ;  $p < 0.001$ ) and hypertension ( $p < 0.001$ ). Correlation analysis revealed significant associations between knowledge, attitudes, and preventive behaviors. Educational and dietary interventions effectively improved community knowledge, attitudes, and preventive behaviors toward tuberculosis and hypertension. Sustainable and continuous education programs are recommended to maintain these improvements.

**Keywords:** Behavior; Education Intervention; Hypertension; Tuberculosis; Community

## INTRODUCTION

Indonesia continues to face a persistent double burden of disease, characterized by the coexistence of communicable diseases such as tuberculosis and non-communicable diseases such as hypertension (Harahap & Siregar, 2022). Recent estimates indicate that the combined burden of these diseases affects up to 24.7% of the national population (Yanti, Mulyani, & Rafiuddin, 2024). Tuberculosis remains a leading infectious disease with high transmission rates, particularly in densely populated and socioeconomically challenged communities, while hypertension contributes significantly to morbidity and mortality through its complications such as stroke, renal failure, and heart disease.

The World Health Organization (WHO) reported that globally, approximately 1.28 billion adults aged 30–79 years have hypertension, yet only 42% are diagnosed and receive adequate treatment. In Indonesia, although the National Health Survey (SKI 2023) noted a slight decline in

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hypertension prevalence from 34.1% to 30.8%, the absolute number remains high. South Sumatra alone recorded over 2 million hypertension cases, with Palembang contributing the largest proportion around 435,336 reported cases (Health District of Palembang City, 2023).

Promoting preventive health behaviors including lifestyle modifications, dietary practices, and early recognition of symptoms can substantially reduce morbidity. According to Notoatmodjo (2014), health behavior is influenced by three essential domains: knowledge, attitudes, and actions. Understanding disease mechanisms, risks, and preventive strategies can shape positive attitudes, which eventually encourage adoption of healthy practices (Biney, Wowor & Rumayar, 2022).

In response, the Kelurahan Binaan Program of Universitas Muhammadiyah Palembang emphasizes community empowerment and family medicine-based interventions to strengthen public health literacy. Preliminary surveys in the target Kelurahan indicated insufficient preventive practices toward TB and hypertension, highlighting the need for structured educational intervention. Thus, this study aims to evaluate the impact of educational interventions of the disease and diet on knowledge, attitudes, and preventive behaviors toward tuberculosis and hypertension.

## MATERIALS AND METHODS

This study used a quasi-experimental one-group pretest–posttest design conducted from October to November 2025 in a supervised urban village of the Faculty of Medicine, Universitas Muhammadiyah Palembang. All adult residents (>17 years) were eligible, and total sampling yielded 83 respondents who met the inclusion criteria of being willing to participate and residing in the area for more than six months, while those absent during data collection or with communication or cognitive impairments were excluded. The intervention consisted of structured health education and diet counseling on tuberculosis and hypertension, with knowledge, attitudes, and preventive behaviors as the dependent variables. Data were collected through interviews using validated questionnaires administered before and after the intervention. Data processing included editing, coding, entry, and cleaning, followed by univariate analysis for descriptive characteristics and bivariate analysis using the Wilcoxon Signed Rank Test and McNemar Test to compare pre- and post-test outcomes at a significance level of  $p < 0.05$ .

## RESULTS AND DISCUSSION

The study included 83 respondents who met the inclusion and exclusion criteria, representing a diverse community profile in terms of gender, age, education level, medical history, and blood pressure status. Most respondents were adults in the productive age group with mean age 48,8 years, varied educational backgrounds and a notable proportion having a history of hypertension.

The intervention produced clear improvements across all measured variables. Knowledge of tuberculosis increased substantially following the educational program, shifting most respondents into the higher knowledge category. A similar pattern was observed for hypertension, where the number of respondents with good knowledge increased after the intervention.

In terms of attitudes, both tuberculosis- and hypertension-related attitudes improved noticeably. Prior to the intervention, many respondents demonstrated negative attitudes; however, post-intervention measurements showed a marked shift toward more positive attitudes for both conditions. These changes were evaluated using median cut-off scores due to non-normal data distribution. The median cut-off for tuberculosis and hypertension is 37 and 39, consecutively.

**Table 1.** Characteristic of Respondents

Characteristics	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	31	37,3
Female	52	62,7
<b>Age</b>		
Adult (18-59 years)	61	73,5
Elder ( $\geq 60$ years)	22	25,6
<b>Latest Education</b>		
No Schooling/Did not Complete Elementary School	7	8,4
Elementary School	30	36,1
Junior High School	18	21,7
Senior High School	23	27,7
Undergraduate/Equivalent	5	6,0
<b>Previous Disease History</b>		
None	41	49,4
Hypertension	42	50,6
Tuberculosis	1	1,2
<b>Blood Pressure</b>		
<140/90 mmHg	43	51,8
$\geq 140/90$ mmHg	40	48,2
<b>Total</b>	<b>83</b>	<b>100</b>

**Table 2.** Result of Knowledge of Tuberculosis and Hypertension Before and After Intervention

Knowledge	Tuberculosis				Hypertension			
	Pre		Post		Pre		Post	
	n	%	n	%	n	%	n	%
Good	11	13,3	40	48,2	38	45,8	58	69,9
Enough	34	41	33	39,8	34	41	20	24,1
Poor	38	45,8	10	12	11	13,3	5	6
<b>Total</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>

**Table 3.** Result of Attitude Toward Tuberculosis and Hypertension Before and After Intervention

Attitude	Tuberculosis				Hypertension			
	Pre		Post		Pre		Post	
	n	%	n	%	n	%	n	%
Positive	37	44,6	49	59	38	45,8	59	71,1
Negative	46	55,4	34	41	45	54,2	24	28,9
<b>Total</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>

Preventive behaviors also showed enhancement following the intervention. More respondents engaged in adequate tuberculosis prevention practices after receiving the educational materials. Likewise, hypertension prevention behaviors increased, with a greater proportion of respondents meeting the criteria for performing preventive actions based on median scores.

**Table 4.** Result of Prevention Behavior Before and After Intervention

Behavior	Pre		Post	
	n	%	n	%
<b>Tuberculosis</b>				
Good	40	48,2	58	69,9
Enough	27	32,5	19	22,9
Poor	16	19,3	6	7,2
<b>Hypertension</b>				
Implemented	23	27,7	48	57,8
Not Implemented	60	72,3	35	42,2
<b>Total</b>	<b>83</b>	<b>100</b>	<b>83</b>	<b>100</b>

The correlation analysis demonstrated that knowledge and attitudes were significantly associated with preventive behaviors for both tuberculosis and hypertension. Higher tuberculosis-related knowledge was moderately correlated with better preventive behavior, while attitudes toward tuberculosis showed a weaker yet still significant association with prevention practices. A similar pattern was observed for hypertension: greater knowledge was moderately associated with improved preventive behavior, and positive attitudes were also significantly linked to the implementation of hypertension prevention measures. Overall, these findings indicate that both cognitive and affective factors play important roles in shaping preventive health behaviors within the community.

**Table 5.** The Differences of Knowledge, Attitude, Prevention Behavior Toward Tuberculosis and Hypertension in Kelurahan Binaan

Variables	Test Statistic (Z)	p Sig. (2-tailed)
Knowledge Of Tuberculosis	-6.050	0,000
Attitude towards Tuberculosis	-	0,012*
Behavior in Tuberculosis Prevention	-3,632	0,000
Knowledge of Hypertension	-4.735	0,000
Attitude towards Hypertension	-	0,000*
Behavior in Hypertension Prevention	-	0,000*

\*Analysis performed using McNemar Test.

## DISCUSSION

The educational and dietary counseling interventions implemented in this study effectively improved community knowledge regarding tuberculosis and hypertension. Prior to the intervention, most respondents demonstrated inadequate understanding of TB, but a significant increase in knowledge was observed afterward. These findings align with studies by Nisa et al. (2022) and Erwinsyah et al. (2023), which concluded that health education plays a critical role in enhancing community awareness and supporting preventive actions. Furthermore, Majid et al. (2024) demonstrated that educational media such as booklets can strengthen information retention and improve post-intervention outcomes.

Knowledge of hypertension also increased significantly following the intervention. This is consistent with research by Utami et al. (2020) and Padila et al. (2024), who reported that health education contributes substantially to improving public understanding of hypertension prevention, particularly dietary regulation and lifestyle modification. Increased knowledge is expected to enhance awareness and promote earlier preventive practices against hypertension.

The intervention also successfully improved community attitudes toward TB and hypertension. Respondents who initially held negative attitudes developed more positive perspectives regarding disease prevention after receiving education. These results support findings by Wowiling et al. (2021) and Yani et al. (2025), which noted that education influences cognitive and affective processes, leading to the formation of positive health attitudes. Regarding hypertension, the findings are also supported by Subkhi et al. (2025) and Lestari & Siswanto (2022), who emphasized that perceived susceptibility and perceived benefits—core components of the Health Belief Model—encourage individuals to adopt healthier lifestyle behaviors.

In addition to knowledge and attitudes, preventive behaviors related to TB and hypertension improved significantly following the intervention. TB prevention behavior showed positive changes in line with Susanto (2023) and Notoatmodjo's theory (2014), which highlights the essential role of knowledge and attitudes in shaping health behavior. Likewise, improvements in hypertension prevention behaviors correspond with findings by Anisah et al. (2025) and Damayanti et al. (2023), who demonstrated that education enhances awareness and motivates individuals to adopt preventive measures, particularly when interventions emphasize perceived benefits. Overall, the results of this

study reinforce evidence that structured educational interventions can effectively enhance knowledge, attitudes, and behaviors, although long-term and continuous interventions are needed to sustain behavioral change.

This study has several limitations that should be considered. First, the educational intervention was delivered only once, and the post-test measurement was conducted immediately afterward, meaning the findings reflect only short-term changes in knowledge, attitudes, and behaviors. Second, the study utilized a pre–post design without a control group. Additionally, the data were collected using self-reported questionnaires, which may introduce respondent subjectivity and potential bias in the answers provided.

## CONCLUSIONS

Educational and dietary interventions significantly improved knowledge, attitudes, and preventive behaviors regarding tuberculosis and hypertension among residents of the Kelurahan Binaan. Continued public health education programs are recommended to maintain and enhance these positive outcomes.

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## Conflict of Interests

The authors declared that no potential conflicts of interest with respect to the authorship and publication of this article.

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