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## Effectiveness of Health Education Using Video and Poster Media on Elderly Knowledge About Hypertension

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### Abstract

**Background:** The elderly, defined as individuals aged 60 years and above, had experienced a population increase due to advancements in healthcare. However, they also faced significant health challenges, including hypertension. Hypertension, often referred to as "The Silent Killer," had become increasingly prevalent among the elderly due to physiological changes associated with aging. This condition was a leading cause of cardiovascular diseases globally and heightened the risk of serious complications such as stroke and heart attack.

**Objectives:** This study aimed to determine the effectiveness of health education using video and poster media on the knowledge of the elderly regarding hypertension.

**Methods:** This study employed a quasi-experimental design using a Nonequivalent Control Group Design method, where the experimental and control groups were not randomly assigned. A total of 32 samples were collected and divided into two groups: control and treatment. Data analyses included univariate, bivariate, and multivariate approaches.

**Results:** The results of the MANOVA test indicated that the most influential variable affecting the respondents' knowledge level was education, with a p-value of 0.026. This value suggested that education had a stronger correlation compared to other variables.

**Conclusion:** There was a significant effect of health education using video and poster media on the knowledge level of the elderly regarding hypertension.

**Keywords:** elderly, health education, hypertension

### Introduction

The elderly are individuals aged 60 years and above, whose numbers have increased along with advancements in various fields, especially in healthcare.<sup>1</sup> This increase in life expectancy and quality of life has an impact on the decline of physical and mental conditions associated with the aging process, one of which is hypertension.<sup>2</sup> Hypertension, often referred to as "The Silent Killer," is a non-communicable disease whose prevalence

continues to rise with age, particularly among the elderly. The elderly are highly susceptible to this condition due to anatomical and physiological changes that occur as a result of the degenerative process.<sup>3</sup> Additionally, the lack of awareness and knowledge among the elderly about hypertension contributes to inadequate control of this disease, thereby increasing the risk of serious complications such as stroke and heart attack.<sup>4</sup>

The trend of hypertension as reported by the World Health Organization (WHO) in 2020 highlights significant global disparities in the prevalence, awareness, treatment, and control of hypertension. While high-income countries have seen a decline in hypertension rates, low- and middle-income countries are experiencing an increase, posing a substantial public health challenge. This shift is influenced by various socio-economic and healthcare factors, necessitating targeted interventions to manage and mitigate the burden of hypertension worldwide.<sup>5</sup> The number of people with hypertension continues to increase each year, and it is estimated that by 2025, there will be 1.5 billion people affected by hypertension, with an estimated 10.44 million people dying each year from hypertension and its complications.<sup>6</sup> In 2018, the prevalence of hypertension in Indonesia was 8.4%, with the highest prevalence in North Sulawesi Province at 13.2% and the lowest in Papua Province at 4.4%. Meanwhile, Bengkulu Province had a prevalence of approximately 8.4%.<sup>7</sup> According to data from the Bengkulu Provincial Health Office in 2015, there were 12,675 people, or 54.66%, in Bengkulu Province suffering from hypertension or high blood pressure; in 2016, there were 9,036 people, in 2017, there were 2,048 people, and in 2018, there were 10,257 people.<sup>8</sup>

Factors contributing to hypertension in the elderly include poor lifestyle choices and declining bodily functions.<sup>9</sup> However, there is a gap in the implementation of effective health education for the elderly, particularly regarding the use of appropriate educational media to enhance understanding and control of hypertension. Based on its function, health education media is divided into three categories: print media, electronic media, and billboard media. Audiovisual media is one type of media that can be used in health education. This type of media involves both hearing and sight simultaneously in a single process or activity. The messages conveyed through audiovisual media can be either verbal or non-verbal.<sup>10</sup>

In a study conducted by Wayuni (2019), the distribution of respondents' knowledge levels before and after the intervention showed a significant difference in effectiveness between videos and slide presentations in improving attitudes toward hypertension prevention. However, there was no significant difference in effectiveness between videos and slide presentations in increasing knowledge about hypertension prevention.<sup>11</sup> Another study conducted by Bezzubtseva (2022) in Russia, with a sample size of 2,108, concluded that the most effective method for informing the public about primary hypertension prevention using social media sites follows this order: video clips followed by text posts.<sup>12</sup> However, these studies do not clearly explain the difference between using videos and posters in health education to improve knowledge about hypertension in the elderly. Based on the discussion above, the purpose of this study is to determine the effectiveness of health education using video and poster media on the knowledge of the elderly about hypertension. It is hoped that the results of this study will contribute to the development of more effective hypertension prevention strategies among the elderly.

## Methods

This study design is quantitative experimental, and the type of research used is Quasi-Experimental Design. In this study, the researcher used a Nonequivalent Control Group design. The population selected by the researcher includes all elderly residents of the Pantti Sosial Tresna Werdha in Bengkulu City who have been diagnosed with hypertension, totaling 32 elderly individuals. The sampling technique used in this study is total sampling, where the sample consists of all elderly residents of the Pantti Sosial Tresna

Werdha in Bengkulu City diagnosed with hypertension, totaling 32 individuals who will be divided into two groups (control and treatment). The inclusion criteria are (1) Elderly individuals with hypertension aged  $\geq 60$  years, (2) Elderly residents of the Panti Sosial Tresna Werdha in Bengkulu City, and (3) Willing to participate as respondents. Exclusion criteria are (1) Elderly individuals without hypertension and (2) Not willing to participate as research respondents. The instrument to be used is the HK-LS (Hypertension Knowledge Level Scale). (HK-LS) is a validated and reliable instrument for assessing knowledge about hypertension in various populations, including the elderly. Validity tests have included content validity, which is ensured through expert evaluation to ensure comprehensive coverage of hypertension knowledge.<sup>13</sup> Construct validity has been demonstrated through correlation with other established health knowledge measures, confirming that the scale appropriately assesses the intended domain.<sup>14</sup> Additionally, criterion validity has been established by comparing HK-LS scores with clinical outcomes, such as hypertension control and management success.<sup>13</sup> For reliability, studies have consistently reported high internal consistency for the HK-LS, with Cronbach's alpha coefficients ranging from 0.75 to 0.88, indicating strong coherence among the items in the scale.<sup>15</sup> The tool has also demonstrated test-retest reliability with correlation coefficients exceeding 0.80, showing that the instrument yields stable and consistent results across different administrations.<sup>14</sup> This instrument was developed and tested in 2012 in Turkey. It consists of 22 questions with 6 sub-dimensions. The data analysis used in this study includes Univariate, Bivariate analysis using t-test independent, and Multivariate Analysis using MANOVA (multivariate Analysis of Variance).

## Results

### Univariate Analysis

**Table 1.** Frequency Distribution Based on Respondents' Characteristics by Age, Gender, and Education Level of Elderly with Hypertension (N=32)

Respondent Characteristics	Intervention Group		Control Group	
	n	%	n	%
<b>Age</b>				
60-74 (elderly)	11	68.8	10	62.5
75-90 (old)	5	31.3	6	37.5
<b>Gender</b>				
Male	6	37.5	6	37.5
Female	10	62.5	10	62.5
<b>Education</b>				
High	6	37.5	8	50.0
Low	10	62.5	8	50.0

Based on [Table 1](#) above, the frequency distribution of respondents' characteristics is depicted. For the age of respondents in both the intervention and control groups, the largest number is in the 60-74 years age group (elderly), with 11 respondents, accounting for 68.8%. Regarding the gender distribution of respondents in both groups, the majority are female, with 10 respondents, representing 62.5%. In terms of the respondents' education level, in the intervention group, 10 respondents have a low education level, accounting for 62.5%, while in the control group, 8 respondents have a low education level, accounting for 50%.

**Table 2.** Frequency Distribution Based on Respondents' Knowledge Level Before and After Intervention in Hypertension Respondents (N=32)

Kelompok	Knowledge Level					
	Pre-Test			Post-Test		
	Good n (%)	Fair n (%)	Poor n (%)	Good n (%)	Fair n (%)	Poor n (%)
Intervention	-	11 (68.8%)	5 (33.3%)	14 (87.5%)	2 (25.5%)	-
Control	-	7 (43.8%)	9 (56.3%)		10 (62.5%)	6 (37.5%)

Based on [Table 2](#) above, the knowledge levels of respondents in the intervention group before the intervention (pre-test) showed that the majority of respondents had a fair level of knowledge, with 11 respondents, representing 68.8%. After the intervention (post-test), the majority of respondents had a good level of knowledge, with 14 respondents, accounting for 87.5%. In the control group, before the intervention (pre-test), the majority of respondents had a poor level of knowledge, with 9 respondents, representing 56.3%. After the intervention (post-test), the majority of respondents had a fair level of knowledge, with 10 respondents, representing 62.5%.

### Bivariate Analysis

**Table 3.** Results of Independent Sample Test

Group	Test	Mean	Mean Difference	Sig (2 Tailed) P-Value
Intervention	Pre-Test	13.44	4,62	0.000
	Post-Test	18.06		0.009
Control	Pre-Test	11.56	1,32	0.000
	Post-Test	12,88		0,010

Based on [Table 3](#) above, the results of the Independent Sample Test show that there is an increase in the mean knowledge level of respondents in both the intervention and control groups. In the intervention group, the mean knowledge level before the intervention (pre-test) was 13.44, and after the intervention (post-test), it increased to 18.06. In the control group, the mean knowledge level before the intervention (pre-test) was 11.56, and after the retest (post-test) without any intervention, the mean level increased to 12.88. The results indicate a difference in the mean values between the two groups. Therefore, it can be concluded that the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted, as indicated by the Sig (2-tailed) values for each variable showing results < 0.05.

### Multivariate Analysis

**Table 4.** Box's M Test of Equality of Covariance Matrices

Box's M	F	df1	df2	Sig
2,623	0,811	3	1620000,000	0,487

Based on [Table 4](#) above, the Box's M test is used to examine the assumption of MANOVA, specifically the homogeneity of variance-covariance matrices. The Box's M value in the table is 2.623 with a significance of 0.487. Since the significance value is greater than 0.05, it can be concluded that the null hypothesis (H0) is accepted, indicating that the variance-covariance matrix is homogeneous.

**Table 5.** Multivariate Analysis of Knowledge Level with Intervention and Control Groups

	Value	F	Hypothesis Df	Error Df	Sig.	Observed Power
Wilks' Lambda	0,111	1296,62	2,000	29,000	0,000	1000

From [Table 5](#) above, it can be seen that the Wilks' Lambda value is 0.111 with a significance of 0.000, which is less than 0.05. This indicates that there is a significant difference in the mean between the data groups, further supported by the observed power value of 1.000.

**Table 6.** Multivariate Analysis of Age, Gender, and Education on Respondents' Knowledge Level

Variable	Value	Observed power	P Value
Age	0,007	1000	0,000
Gender	0,024	1000	0,000
Education	0,026	1000	0,000

Based on [Table 6](#), the results of the multivariate analysis using the MANOVA test indicate that the variable with the most significant impact on the respondents' knowledge level is education. The value obtained is 0.026, which is closer to 1, indicating a stronger correlation compared to the other variables.

## Discussion

### Overview of Respondent Characteristics

Based on the results of the study, the majority of respondents were aged between 60-74 years, which falls into the elderly category. This finding aligns with research conducted by David Viligius Nia et al. (2018) on the knowledge of elderly individuals about hypertension at the Permadi elderly health post in Tlogomas Village, Lowokwaru District, Malang. In that study, among 50 respondents, the majority (34%) were over 60 years old (elderly), totaling 17 respondents.<sup>16</sup> Moreover, research by Wardani et al. (2018) included information on the largest proportion of respondents being over 50 years old, suffering from hypertension, and having similar characteristics to those in David Viligius Nia's (2018) study.<sup>17</sup> The risk of hypertension increases with age, contributing to the high prevalence of the disease among individuals over 60 years old (about 50%) and accounting for 40% of related deaths. Individuals aged 50 and above show a significant increase in the incidence of hypertension, and the likelihood of developing hypertension rises sharply with age.<sup>18</sup>

As individuals approach the age of 50 to 60 years or older, there is a significant increase in the incidence of hypertension. This is due to changes in blood pressure and the loss of arterial elasticity as a result of aging. Age can influence a person's mindset, behavior, and health patterns. As a person ages, there is a decline in immune function and memory.<sup>19</sup> Based on these findings, the researchers concluded that age impacts the occurrence of hypertension, particularly in late adulthood, because the elasticity of blood vessels decreases, causing an increase in blood pressure within the vessels.

Based on gender, the results of the study showed that the majority of respondents diagnosed with hypertension were female. This is consistent with the findings of a study conducted by Chen, Lo, Chang, and Kuo (2014), which found that 51.2% of women and 48.8% of men suffer from hypertension. According to Cheng et al. (2014), women are more likely to suffer from hypertension after menopause due to a decrease in hormones that leads to a decline in body homeostasis. After the age of 45, women are at higher risk for hypertension because of the decreased production of estrogen, which affects High-Density Lipoprotein (HDL) levels. These hormonal changes can lead to hypertension and thickening of the blood vessels, or atherosclerosis.<sup>20</sup> Additionally, the study's results are in

line with research conducted by Zakiyatul Uya (2017), where the gender distribution in both groups was 100% female. This occurred because the elderly health post in Banteran village, Sumbang sub-district, Banyumas, is always held in the morning, resulting in a majority of female participants.<sup>21</sup>

Based on the analysis of the study results regarding the education level of respondents, it was found that in the intervention group, there were 10 respondents with a low education level (elementary to junior high school), while in the control group, there were 8 respondents with a low education level (elementary to junior high school). These findings are consistent with a study conducted by Juwita Yanti Pakpahan (2019), which showed that the majority of hypertension patients had a middle school education background, with 36 respondents accounting for 36.4% of the total 99 respondents.<sup>22</sup> This study aligns with the research by Lumowa (2020), which reported that the majority of hypertension patients were among respondents with a low education level (no schooling or elementary school), with 115 respondents (91.2%) out of 126 respondents. This is because an individual's ability and knowledge in adopting healthy behaviors, particularly concerning hypertension, are influenced by their level of education. The higher a person's education, the easier it is for them to understand information and have good knowledge, compared to someone with a low education level, which gives them a greater ability to implement healthy behaviors.<sup>23</sup>

#### **Differences in Average Knowledge Scores of Respondents Before and After Receiving Health Education Interventions Using Video and Poster Media on the Knowledge Level of the Elderly**

Based on the statistical test results regarding the differences in respondents' knowledge levels before (pre-test) and after (post-test) health education interventions using video and poster methods on hypertension, there was an increase in knowledge levels among 32 respondents. This was first assessed by conducting a normality test using the Shapiro-Wilk test. The results from this test to determine the normality of the research data showed significant measurements with a p-value of  $< 0.05$ , indicating that the data distribution in this study is normal.

In this study, respondents were provided with health education interventions using video and poster methods in the intervention group, while the control group did not receive any interventions. In the intervention group, the respondents appeared highly enthusiastic about the intervention process. This was evident from the number of respondents who asked questions during the intervention. The results of the study's analysis showed that the intervention group experienced an increase in the average knowledge score after the intervention, and there was a significant difference in the average knowledge score of respondents about hypertension before the intervention, where the average score was 13.44, and after the intervention, the average score increased to 18.06. In contrast, in the control group, which did not receive any intervention, there was also a change in the average knowledge score, although the change was not as significant. The average knowledge score during the pre-test was 11.56, and after the post-test measurement, the average knowledge score was 12.88.

Based on the results of the study, it was found that the intervention had an effective impact on changing the knowledge scores about hypertension among the elderly. Before the intervention, both the intervention and control groups had relatively low knowledge scores, but after the intervention, there was a significant difference. These findings are consistent with the study conducted by Amir Widianti (2022), which showed that the average knowledge score of respondents before receiving health education through posters was 14.75, and after the intervention, it increased to 17.90. The average knowledge score of respondents before receiving health education through videos was 15.15, and after the intervention, it increased to 22.50. There was an impact of health education through posters and videos on the clients' knowledge about hypertension treatment, with a p-value of 0.000

(<0.05).<sup>24</sup>

Another study that aligns with these findings was conducted by Zakiyatul Ulya (2017). In this study, most respondents were aged 45-60 years, were female, had a primary school education, and were mostly housewives. The results of the paired t-test showed a significant increase in knowledge in the intervention group ( $p = 0.000$ ) compared to the control group ( $p = 0.194$ ). The results of the independent t-test indicated an increase in knowledge between the intervention and control groups ( $p = 0.016$ ). Health education using posters was effective in improving knowledge of hypertension management among hypertension patients.<sup>21</sup> Another study also found that among hypertension patients who were provided with educational posters, there was an increase in hypertension knowledge in 13 (93%) respondents. According to the Wilcoxon statistical test, the increase in hypertension knowledge with poster media showed a p-value of 0.001, while the audiovisual video media showed a p-value of 0.180.<sup>25</sup>

### **The Impact of Health Education Using Video and Poster Media on Knowledge Levels Among the Elderly**

Based on this study, the independent samples t-test results show a p-value of 0.000  $< \alpha = 0.005$ , indicating that  $H_0$  is rejected and  $H_a$  is accepted. This means that there is a significant effect of health education using video and poster media on the level of knowledge about hypertension among the elderly at the Panti Sosial Tresna Werdha in Bengkulu City. Knowledge results from seeking information, which occurs after individuals perceive a specific object. Perception happens through the human senses: sight, hearing, smell, taste, and touch. Knowledge is a crucial domain in the formation of individual actions. It is the outcome of human perception or one's understanding of an object through their senses (eyes, nose, ears, etc.).<sup>22</sup>

Knowledge of hypertension among individuals, families, and communities aids in managing hypertension because it encourages individuals to visit doctors regularly and adhere to treatment. In hypertension, patients' knowledge and attitudes can influence adherence, blood pressure control, morbidity, and mortality.<sup>26</sup> Health education is an effort to support health programs by effectively enhancing knowledge over specific periods. It helps transform public understanding into actionable knowledge.<sup>27</sup> Health education can play a role in changing behavior in alignment with health values. Healthy behavior can result from knowledge and awareness gained through the learning process.<sup>28</sup>

Media are educational tools that can be used to convey instructional materials. Educational health media can also be referred to as media because they help illustrate and present teaching content. The principle in creating educational tools or media is to leverage the existing knowledge that each person has in receiving or perceiving information through their senses.<sup>29</sup> Video media has a more significant impact on health education because it engages both auditory and visual senses. The engaging nature of video presentations makes it easier for messages to be quickly and easily remembered, thereby enhancing knowledge and leading to an increase in understanding. The duration and pace of video media can affect the level of knowledge among respondents. This is evident in the comparison of clients' knowledge about hypertension treatment before and after receiving health education through video media.

Similarly, posters also play a significant role. The size of the poster, along with the images and text it contains, should have a good composition to ensure that the information is well understood. Posters can be particularly engaging for respondents, contributing positively to their knowledge about hypertension. The effectiveness of posters lies in their ability to present information, with appealing colors and a simple design, making them easy to create and cost-effective.<sup>30</sup> Sources of health information can influence an individual's behavior toward health. Limited information available to the elderly often results in less effective knowledge about hypertension prevention. The more someone is exposed to information about hypertension, the greater their understanding of the disease

and health in general. According to Notoatmodjo (2014), health education can change an individual's and a community's knowledge and actions related to health. Health education, through outreach, can enhance knowledge effectively.<sup>31</sup>

The results of this study align with Komalasari (2020), who reported that none of the elderly from 10 families (100%) knew about the causes, signs, symptoms, and prevention of hypertension. However, after receiving education through the distribution of leaflets about hypertension, these 10 families were able to explain how to prevent hypertension. The lack of information about hypertension prevention among the elderly leads to poor attitudes and behaviors in managing the condition, highlighting the need for health professionals to provide optimal education and assess knowledge before and after health education interventions. Health workers can measure how well the elderly can adopt preventive behaviors against hypertension, and whether the health education on hypertension prevention is being practiced or not.<sup>26</sup>

The analysis results from the control group show a significant p-value, indicating that the knowledge level of elderly individuals with hypertension at the Panti Sosial Tresna Werdha in Bengkulu City can improve, not only due to the interventions provided in this study. The standard services (health education) conducted by the management of the care facility to address issues experienced by the elderly could be a factor in increasing their knowledge about hypertension. However, the health education provided is often not structured and lacks evaluation to measure the effectiveness of the activities. This finding is consistent with the research conducted by Aida (2018), which showed that there is an impact of video and leaflet media on knowledge and attitudes, with values of ( $p=0.000$ ), and differences in media affecting knowledge ( $p=0.003$ ) and attitudes ( $p=0.042$ ).<sup>32</sup>

### **The Effect of Confounding Variables on Elderly Knowledge About Hypertension**

The analysis results from this study show that in the multivariate analysis of confounding variables (age, gender, and education) on respondents' knowledge about hypertension, education emerged as the most influential factor in increasing knowledge scores. This is supported by the correlation coefficient measurement, where the education variable had a coefficient of 0.26 with a significance value of 0.000 ( $<0.05$ ). The positive sign indicates a positive correlation between the tested variables, meaning that any increase or decrease in variable X corresponds with an increase or decrease in variable Y. A correlation coefficient of +1 or close to 1 signifies a very strong positive influence between the tested variables.<sup>33</sup>

According to Notoadmojo (2014), education significantly impacts the level of knowledge. The higher a person's education level, the easier it is for them to receive information from others. Conversely, a lower level of education can hinder someone's ability to receive information and knowledge.<sup>31</sup> Education affects the learning process; the higher a person's education, the easier it is for them to acquire information. With higher education, individuals are more likely to access information from both others and mass media. Knowledge is closely related to education, where higher education is expected to lead to a broader scope of knowledge.<sup>34</sup>

This research is consistent with the study by Agus Priyanto (2021), which indicates that health education impacts the level of knowledge. Health education involves applying educational concepts in the field of health. Education is a learning process that leads to changes in individuals, groups, or communities.<sup>25</sup> According to Andita (2014), obtaining information is influenced by the level of education. Therefore, the level of education significantly affects an individual's life. As education increases, individuals have greater opportunities to access the latest information. This is because higher education enhances an individual's ability to acquire and process more information.<sup>35</sup>

According to the researcher, knowledge enhancement is not solely derived from education; other factors can also influence it. Age is one such factor that can affect the increase in knowledge because it impacts an individual's capacity for understanding and



thinking patterns. Health education is beneficial for enabling the elderly to identify their problems and needs, understand what actions they can take to address these issues with the resources available to them, supplemented by external support, and decide on the most appropriate activities to improve their health and overall well-being, thereby ensuring the welfare of the elderly.

### Conclusion

Based on the study conducted, there is an influence of health education using video and poster media on the level of knowledge about hypertension among the elderly. Education is a significant factor in improving respondents' knowledge about hypertension. Additionally, it is crucial for the community, especially those suffering from hypertension, to actively seek information about hypertension through various media. This allows them to review the information repeatedly, which can help them understand the concepts and management strategies for hypertension. Consequently, this can enable individuals or the elderly affected by hypertension to maximize their healing process.

### Conflict of Interest Declaration

The research has no conflict of interest.

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Effectiveness of Health Education Using Video and Poster  
Media on Elderly Knowledge About Hypertension

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