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## Research Articles

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# The Effect of Providing Education Using E-Booklet Media on Changing Students' Knowledge about Prevention of Hypertension Disease at Smanu Pakis Malang District

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#### **ABSTRACT**

**Introduction:** Hypertension in teenagers can continue into adulthood and cause complications and even death. Providing information is one strategy that can produce behavior, namely by increasing knowledge so that it raises awareness. Providing information can be done through educational media, one of which is e-booklet.

**Objective:** The aim of this research was to determine the level of students' knowledge about preventing hypertension before and after being given education, and the effect of providing education using e-booklet media on changes in students' knowledge about preventing hypertension at SMANU Pakis, Malang Regency.

**Method:** This research is a quantitative research with a pre-experiment research design using a one group pretest posttest design. The population of this study was 327 students at SMANU Pakis Malang Regency with a sample size of 38 students selected using purposive sampling techniques. The instrument used was a questionnaire.

**Result:** The research results showed that 44.7% of students' knowledge scores before being given education had sufficient knowledge with an average score of 67.63, while after being given education 73.7% of students had good knowledge with an average score of 85.92. The Wilcoxon test results show ap value of 0.000 < 0.05, meaning that Ha is accepted and there is an influence of providing education using e-booklet media on changes in students' knowledge about preventing hypertension.

**Conclusion:** Providing education using e-booklet media can change students' previous knowledge to become good. Through providing education, it is hoped that it can broaden students' insight into taking early prevention and can be used as a basis for further research.

**Keywords:** Education; E-Booklet; Knowledge; Hypertension

#### INTRODUCTION

Non-communicable diseases (NCDs) are diseases that cannot be transmitted between individuals, and their development occurs slowly over the long term(1). Prevention of non-communicable diseases (NCDs) can be done through promotive preventive efforts, namely through health promotion programs and efforts to control risk factors that can be changed (lifestyle). Health promotion itself aims to provide information which at a further level can trigger public awareness regarding programs or movements currently being implemented by the government, such as realizing a Clean and Healthy Lifestyle by creating and getting used to the community's SMART behavior, namely regular health checks, Get rid of it. cigarette smoke, regular physical activity, healthy diet and balanced nutrition, adequate rest, and managing stress(2).

One of the non-communicable diseases (NCDs) which is the main trigger for other chronic diseases is hypertension. Chronic diseases that can arise are heart attacks, strokes and kidney failure(3). Hypertension is a disease that often appears without symptoms (the silent killer) so that the sufferer is not aware of it until complications arise that can result in death(2).

One of the non-communicable diseases (NCDs) which is the main trigger for other chronic diseases is hypertension. Chronic diseases that can arise are heart attacks, strokes and kidney failure(3). Hypertension is a disease that often appears without symptoms (the silent killer) so that the sufferer is not aware of it until complications arise that can result in death(2).

Based on the results of Riskesdas (2018), the prevalence of people with high blood pressure in East Java Province is 36.3%. The prevalence increases with increasing age. The estimated number of hypertension sufferers aged  $\geq$  15 years in East Java Province is around 11,686,430 people, with the proportion of men 48.38% and women 51.62%. Based on data from the Malang District Health Service in 2021, the estimated number of hypertension sufferers aged  $\geq$  15 years in Malang Regency is around 803,392 people. Based on the 2023 non-communicable disease (NCDs) recap data in the Pakis Health Center working area, it shows that hypertension is ranked 1st out of 10 diseases that are commonly suffered with the estimated number of hypertension sufferers aged  $\geq$  15 years being around 8,525 residents.

Hypertension does not only occur in adults, but can also occur in adolescents. The incidence of hypertension in adolescents globally is estimated at 4-15%, but only 13-26% is detected.(4). Based on data from NCDs screening recaps at the Pakis Community Health Center, the estimated number of teenagers aged 15-23 years with blood pressure of 140/70 mmHg to 180/90 mmHg is around  $\pm 1399$  people and 864 of them are sufferers of hypertension in teenagers.

The results of a preliminary study on SMANU Pakis students showed that most of them had blood pressure that was classified as pre-hypertensive with systolic blood pressure reaching the range of 130-140 mm with diastolic blood pressure reaching the range of 80-90 hg. Based on the data from the students' answers, it showed that there were still many students who don't know enough about non-communicable diseases (NCDs), one of which is hypertension, some students have a genetic history of hypertension from one of their parents, and from the data obtained some students have unhealthy lifestyles, from the unhealthy lifestyle of teenagers. If done for a long period of time and becomes a habit, it can increase the risk of cardiovascular disease, one of which is hypertension. From the results of observations made by researchers when conducting a preliminary study at SMANU Pakis, it was found that there were still many students who consumed high-fat foods, especially fried foods, foods containing preservatives, colorings and flavorings, apart from that, students still did not fulfill the recommendations for physical activity (exercise). for 30 minutes every day, and there are several students who are overweight which is a risk factor that can trigger hypertension. The unhealthy lifestyle adopted by SMANU Pakis students, if not immediately changed, can trigger hypertension in teenagers. This is the main reason researchers chose SMANU Pakis to make students know, willing and able to prevent hypertension from an early age by changing their lifestyle to a healthier one. through providing education.

Teenagers are a new generation who will determine the future of a nation, good health conditions are very important in achieving this goal, and one of the health problems in teenagers whose prevalence continues to increase is hypertension(5). What makes teenagers at risk of developing non-communicable diseases is due to a lack of understanding and awareness about hypertension and how to reduce the possibility of hypertension(6). Adolescents with hypertension can continue into adulthood and have a high risk of death. Efforts that can be made to prevent and control hypertension are by doing physical activity, reducing fast and fatty foods to reduce the risk of hypertension or by adopting a healthy lifestyle(7).

Providing information is one strategy that can produce behavior, namely by increasing knowledge so that it raises awareness and in the end people will behave in accordance with their knowledge. Education is one way that can be used to increase a person's knowledge(8). According to several opinions from previous researchers, the five senses that transmit the most knowledge to the brain are the eyes (approximately 75% to 87%), while 13% to 25% of human knowledge is obtained and transmitted through the other five senses(9).

Advances in information technology have had many positive impacts on the progress of the world of education. The advantages of information technology offered are not only the speed of obtaining various important information but also learning media facilities that can make learning more interesting(10). Media developed with the latest technology

will make it easier for targets to access the material provided, on the other hand, using digital media saves costs more than print media(11). Several previous studies have proven that using media developed with digital technology can help learning activities become more effective and attract target interest in learning, especially students(12).

In this study, researchers used e-booklet media, apart from saving printing costs, this e-booklet can be taken anywhere and accessed at any time via smartphone by using a QR Code scan and this e-booklet media is also designed to be attractive so that it looks more realistic like a book on a smartphone, and the transition animation when turning the page will move like a real book accompanied by sound effects like a book page being turned. Not only that, this e-booklet can also be turned automatically and manually, the display can be enlarged, reduced, full screen. Through this e-booklet, it is hoped that it can provide a change in students' knowledge about preventing hypertension from not yet knowing to knowing, wanting, and being able to prevent hypertension from an early age.

Based on the background above, researchers are interested in taking the title "The effect of providing education using e-booklet media on changes in students' knowledge about preventing hypertension at SMANU Pakis, Malang Regency".

#### **METHOD**

This research is quantitative research with a pre-experiment research design using a one group pretest posttest design. In the first stage of this research design, pretest activities were carried out to determine students' knowledge before being given education. The population of this study was 327 students of SMANU Pakis, Malang Regency with a sample size of 38 students selected using purposive sampling techniques. willing to be respondents, students who have smartphones that are used to access e-booklets, and students who are willing to take part in activities according to the schedule and directions that have been determined. The instrument used was a knowledge questionnaire totaling 20 questions in multiple choice form a, b, c, d. The validity test of the questionnaire is carried out on each question if r calculated > r table at a significant level ( $\alpha = 0.03$ ) then the instrument is considered valid and if r calculated < r table then the instrument is considered invalid. In this study, the validity of the questionnaire will be tested on class The number of students used in this validity test was 30 students.

Based on the results of the validity test carried out by the researcher, the results of the 20 questions on the questionnaire were declared valid according to the statistical tests that had been carried out, it was obtained that each r count was > 0.03. The data collection procedure was carried out pretest before being given education using e-booklet media and after it was carried out. education using e-booklet media and the results of reliability tests on class

The suitability validity test of the media was carried out on January 16 2024 to media and material experts at the Malang Ministry of Health Polytechnic, the test results stated that the media was suitable for use starting from the aspects of attractiveness, color, language, balance, form, integration, quality of program processing and quality of material content and the quality of learning with test results obtained a good score. E-booklet media was also tested on class

The data analysis used to determine the effect of providing education using e-booklet media was the Wilcoxon Test because the data was ordinal and not normally distributed after a normality test was carried out using the Shapiro-Wilk Test. The results of the normality test using the Shapiro-Wilk test show that the p-value is .003 or <0.05, meaning the data is not normally distributed, so to determine the effect of providing education using e-booklet media, a hypothesis test is carried out using the Wilcoxon Test which is generally used for test data that is not normally distributed.

## RESULTS Univariate Analysis

In this section, general data is presented in the form of student characteristics, namely regarding student age and student gender as follows:

Characteristics	<b>Details</b>	Amount	Percentage	
Age	16-17 Years	28	73.68%	
	18-19 Years	10	26.32%	
Gender	Man	14	36.84%	
	Woman		63.16%	

Table1. Characteristics of Class XI SMANU Pakis Students in 2024

Based on table 1, it is found that 73.68% of class XI students at SMANU Pakis, Malang Regency are aged 16-17 years and it can be seen that 63.16% of students are female.

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#### **Bivariate Analysis**

In this section, specific data on students' knowledge levels are presented before and after being given education using e-booklet media and the effect of providing education using e-booklet media on changes in students' knowledge about preventing hypertension at SMANU Pakis, Malang Regency.

Table2. Bivariate Analysis of Knowledge of Class XI SMANU Pakis Students in 2024

Subject	Student Score (Before		Student Score (After		p-value	A	Results
Characteristics	being given education		being given education				
	using e-booklet media)		using e-booklet media)				
	(r=38)		(r=38)				
	F	%	F	%			
Knowledge					0,000	0.05	Ha accepted
Good	10	26.3	28	73.7			
Enough	17	44.7	9	23.7			
Not enough	11	28.9	1	2.6			
Mean	67.63		85.92				
Median	67.50		85.00				
Mode	60a		100				
Std. Deviation	16,875		12,	673			

Based on table 2, it was found that the knowledge of class After being given education, 73.7% had good knowledge and 2.6% had poor knowledge with an average posttest result of 85.92. The results of data analysis of students' knowledge before and after education using e-booklet media showed that there was a change in knowledge scores between pretest and posttest in the students' average score (mean).

The results of this analysis illustrate that there was a change in students' knowledge after being given education using e-booklet media in accordance with student responses during intervention activities. Most of the students were enthusiastic in receiving the education provided using e-booklet media and they were more receptive to the material presented as indicated by their activeness. students during a question and answer session about hypertension material. However, during the intervention, it was also found that students misused smartphones to play and did not read e-booklets, which affected their knowledge scores. These confounding factors cannot be controlled by researchers.

Based on table 2, it is known that the results of the hypothesis test using the Wilcoxon test showed that the p-value was 0.000 < 0.05, meaning that Ha was accepted, meaning that there was a significant influence between providing education using e-booklet media on changes in students' knowledge about preventing hypertension. E-booklet media helps students understand the material presented and this of course affects students' knowledge so that after being given education using e-booklet media there is a change in students' knowledge.

#### DISCUSSION

## Students' Knowledge About Preventing Hypertension Before Being Given Education Using E-Booklet Media

Based on the results of this research, during the knowledge pretest, 44.7% of students got a fair knowledge score and a small portion of students, namely 26.3%, got a good knowledge score. The results of the student knowledge pretest showed that the majority of students (73.6%) still did not know and understand about preventing hypertension.

In line with research(13)stated that the average knowledge before being given health education was 47% and based on the level of knowledge before being given health education, the majority (70%) had low knowledge. This is supported by research(14). which shows the level of knowledge in the pretest shows that respondents who have a good level of knowledge are 26.7%, 56.7% are sufficient and 16.7% are poor. From this data it can be seen that the level of knowledge of respondents at the time of the pretest was mostly at a sufficient level of knowledge, however the results obtained were that there were still some respondents whose level of knowledge was low.

According to Notoatmodjo's opinion in (15) Knowledge is influenced by several factors such as education, information, and age. Information in general can increase knowledge with new knowledge gained. Knowledge is the result of curiosity obtained through the senses, both hearing and sight.

Researchers assume that students who still have poor grades are caused by a lack of curiosity on the part of students because they assume that they are still teenagers and will not experience diseases such as hypertension. This is in accordance with opinion (6) which states that teenagers think they have no problems and do not realize the importance of knowing blood pressure, the dangers of hypertension, factors related to the incidence of hypertension and how to reduce the possibility of hypertension.

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## Students' Knowledge About Preventing Hypertension After Being Given Education Using E-Booklet Media

The posttest results showed that after being given education using e-booklet media about hypertension prevention, it showed that the majority of students, namely 73.7%, had good knowledge and a small number of students (2.6%) had poor knowledge, meaning the knowledge level of almost all of the students was 97 .4% saw an increase in value.

In line with research (16) who stated that after being given treatment, namely with nutrition education using booklets, 7 (13%) respondents had poor knowledge, 2 (2%) had sufficient knowledge and 45 (83.3%) had good knowledge. There is an increase in knowledge from students who previously did not know to know according to the level of knowledge according to Notoadmodjo in (17) Knowledge consists of 6 levels, one of which is knowing or can be interpreted as a person's ability to remember what has been learned previously, therefore knowing is the lowest level of knowledge, to measure that a person knows material that has been studied previously, among others. say, describe, and mention.

Researchers assume that this increase in knowledge occurs because students respond by paying attention, concentrating and listening when given education and are very enthusiastic about reading the e-booklet that has been given. While providing education, researchers also asked several questions about preventing hypertension to students and they were able to answer correctly.

# The Effect of Providing Education Using E-Booklet Media on Changes in Students' Knowledge About Preventing Hypertension at SMANU Pakis, Malang Regency

The pretest results on student knowledge showed an average score (mean) of 67.63, while the posttest score had an average score (mean) of 85.92. These results show that the knowledge of almost all students increased after being given education using e-booklet media.

The results of statistical tests using the Wilcoxon test on students' pretest and posttest scores show that there is an influence of providing education using e-booklets on changes in students' knowledge. This is shown by the p-value obtained at p = 0.000 or p < 0.05, which means that Ha is accepted, that is, there is an influence of providing education using e-booklet media on changes in students' knowledge about preventing hypertension at SMANU Pakis, Malang Regency.

In line with opinion (18) The research results stated that there was an effect of giving e-booklet media on increasing knowledge with the average stunting knowledge score before giving e-booklet media was 60.41 while the average score after giving e-booklet media was 83.1 which proves this opinion.

According to (19) The research results show that before the education was carried out, the majority of respondents' knowledge was in the sufficient category with an average value of 13.90 and after the education was carried out, the majority of respondents' knowledge was good with an average value of 19.32. The Wilcoxon test obtained a p-value of 0.023 < 0.05, which means there is an influence of providing health education about nutrition to pregnant women.

Booklet media about hypertension management is suitable for use as educational media (20). Health workers should consider booklet media as an educational medium in order to increase knowledge. Based on previous research, it is revealed that providing education using e-booklet media has an influence on increasing individual knowledge, which means that this research is appropriate and e-booklets themselves have the attraction of containing complete pictures and material and packaged in electronic media (smartphones) so that they are interesting and makes it easier for readers to learn it.

In line with opinion (21) in his research, e-booklet media had an effect on increasing knowledge after statistical analysis using the Paired T-Test showed an increase in the pretest and posttest results. This opinion is supported by research (22) which states that there is a relationship between e-booklets and increased knowledge and changes in attitudes.

Researchers assume that providing education using e-booklet media has an influence on changes in students' knowledge. The e-booklet media itself can be adjusted to students' interests and needs with interesting writing and images which can reduce students' boredom during educational activities so that students can more easily accept and understand educational material.

## **Research Limitations**

Based on the research process that has been carried out by the researcher, there are several research limitations which are factors so that further research can be improved for other researchers in the future. The following are several limitations in this research, namely:

Research Instrument, this research instrument was created by the researcher himself and the level of difficulty of the questionnaire is still relatively easy and needs to be corrected and increased in difficulty, then it is hoped that the validity and reliability test will be carried out again.

Confounding Variables, this research does not control other variables so it is still possible that there may be

contributions from other factors such as attitudes and actions.

Sample, the number of samples used by researchers did not match the initial calculations because there were students who were not present during the intervention and this study did not use a control group

## **CONCLUSION**

Based on the results of research regarding the effect of providing education using e-booklet media on changes in students' knowledge about preventing hypertension at SMANU Pakis, Malang Regency, it can be concluded that: 1) Nearly half of all students at SMANU Pakis Malang Regency had sufficient knowledge before being given education using e-booklets before being given education using e-booklets before being given education using e-booklets. 2) Students' knowledge at SMANU Pakis Malang Regency about preventing hypertension after being given education using e-booklet mediamost of the students have good knowledge. 3) There is an influence of providing education using e-booklet media on changes in students' knowledge about preventing hypertension.

## **SUGGESTION**

#### For Student

After the intervention that has been carried out, it is hoped that students will continue to utilize the e-booklets that have been provided as long as there is still no better media and will continue to pay attention to newer material (updates).

It is hoped that students will be more active in other health outreach activities to broaden their knowledge and prevent disease from an early age.

#### For Further Researchers

After carrying out this research activity and finding research limitations, it is hoped that it can motivate future researchers to coordinate with the teacher responsible for the student so that the research schedule can be agreed upon properly.

To develop further research, you can add a control group in further research in order to validate and expand the research findings.

Increasing the number of samples to reduce the chance of error when generalizing.

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