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STROKE PREVENTION ALTERNATIVE: APPLICATION-BASED STROKE PATH EDUCATION FOR HYPERTENSION PATIENTS

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ABSTRACT

In many regions of the world, hypertension is becoming more common. There are 74.5 million American adults older than 20 who have hypertension, although 90% of these instances have no identified etiology. The signs and symptoms of hypertension can differ from person to person and resemble those of other conditions. It is a silent killer. As a result of the high prevalence of hypertension in primary healthcare and the fact that up to 34.1% of Indonesians under the age of 18 suffer from the condition, there are an estimated 63,209,620 instances of hypertension in the country. In the meantime, there have been 427,218 cases of hypertension-related deaths in Indonesia. If left untreated, hypertension. If hypertension is not treated appropriately, it can damage blood vessels all throughout the body yet the risk of damage to the kidneys, heart, brain, and eyes is the most obvious. With the use of both pharmaceutical and non-pharmacological therapy, these dangers can be avoided and reduced. Knowing how to recognize a stroke clearly can help someone who has hypertension reduce their risk of having one. This research goal is to evaluate the effects of stroke preventive education's "Stroke Path" application-based approach on hypertension patients' knowledge, attitudes, and behavior. A control group and a pre-posttest quasi-experimental design are used in this investigation. The sample size was established by using the test statistic of the mean-variance variance of the two unique teams, and simple random sampling was applied as the sampling method. For the purposes of processing and analyzing statistical data, paired and independent t-tests were used in this study. Outcomes of the application-based stroke path education intervention in terms of knowledge, attitude, and behavior (p=0.000, respectively). In conclusion, application-based stroke prevention education is effective at enhancing patients' knowledge, attitudes, and behavior.

KEYWORDS: Education, Stroke Path, Hypertension, Stroke.

INTRODUCTION

Hypertension or more often called high blood pressure is a health problem that is often found in both developing and developed countries.[1] Adults with hypertension have systolic and diastolic pressures of more than 140 mmHg is more than 90 mmHg.[2] Indicators of high blood pressure include symptoms, risk factors, and diseases because each person's symptoms can vary and frequently match those of other conditions, or sometimes not present at all in rare situations, hypertension is sometimes referred to as the "silent killer."[3]

The World Health Organization estimates that there are 1.13 billion hypertension patients worldwide as of 2013. In 2025, the WHO predicts that there will be 1.56 billion people with hypertension. In Indonesia, the predominance of high blood pressure is 45.35 percent among those aged 45 to 54 and 31.6% among those aged 31 to 44. 55.2% of people were in the 55 to 64 age brackets. According to WHO statistics, the prevalence of high blood pressure increases with age, affecting 1 in 10 persons in their 20s to 30s and 5 in 10 people in their 50s. Every adult should check their blood pressure and maintain it within normal ranges because early detection is crucial. Due to the high prevalence of hypertension and its frequent identification in primary healthcare settings, the problem of hypertension is a significant challenge in Indonesia. Riskesdas reports that the prevalence of hypertension rose from 7.6% in 2007 to 9.5% in 2013, with the rate for the elderly being about 25.8% higher in 2013. In addition, despite the fact that there is an abundance of good medications, hypertension control has not been satisfactory. Riskesdas (2018) reports that hypertension affects 63,209,620 Indonesians over the age of 18 and affects 34.1% of the population as a whole. In the meantime, there have been 427,218 cases of hypertension-related deaths in Indonesia.

The aged are a group at risk in society who are more susceptible to risk factor exposure, such as life style, economic, social, physical, biological, and biological factors. Poor self-esteem, a poor quality of life, a low socioeconomic status, being powerless, and not being able to take care of one self are only a few of the seven variables that contribute to vulnerability. Environment, lifestyle, and genetics are among the risk factors that predispose to health issues. nutritional and sociocultural factors.[4]

The findings of a survey on the socioeconomic circumstances and health of the old undertaken by Komnas Lansia in 10 provinces in 2006 revealed that joint disease (52.3%), hypertension (38.8%), anemia (30.7%), and cataracts (23%) were the most frequent diseases experienced by the elderly. Most typically affecting the aged, high blood pressure is a condition marked by blood pressure that is higher than usual. Because it frequently has no symptoms, it is also known to as a fatal disease.[5] According to estimates, 76% of hypertension cases in the community have not yet received a diagnosis, meaning the patient is unaware of the condition. These illnesses are the primary causes of older infirmity, making them a burden on families, communities, and the authorities.6 In accordance with data from East Jakarta's Cipayung Sub-district Health Center, there were 629 visits overall in 2016 for hypertension patients seeking treatment, with 96 new visits and 533 repeat visits. In contrast, this illness had a substantial increase in 2017 there were 119 new hypertension patient visits, compared to 1636 old visits, for a total of 1755 visits from hypertension patients seeking therapy.

Naturally, this condition warrants therapy, particularly from medical specialists who can carry out patient preventative and care programmes. It is also highly frightening and requires treatment. Untreated hypertension can lead to issues including stroke, coronary artery disease, diabetes, renal failure, and blindness. Stroke is the primary cause of death (51%) while the extent of blood pressure rises and the length of time that high blood pressure problems go unnoticed and untreated determine the harm to target organs. The use of application media in health education offers a number of

advantages, including: piqueing target interest; removing barriers of time, space, language, and sensory power in the process of receiving education; removing the target's passive attitudes; and supplying stimulation, experience, and generating the same perception. This stimulates the target's curiosity to learn more, investigate, and comprehend something that may ultimately lead to a favorable understanding of the pertinent health message. Also, the target will spread the word to other people, resulting in the acquisition of more targets.[7,8]

The digital era that uses computer and internet technology has wide application in various fields of health, including in health care. Real-time monitoring via connected devices can save lives in medical emergencies, such as: patients with heart failure, diabetes, asthma attacks and strokes. Through real-time monitoring of existing conditions using a smart medical device connected to a smartphone application, the connected device can collect necessary medical and other health data and use the smartphone data connection to transfer the collected information to health providers. Stroke path is the name of a social networking application on a cellphone made by researchers to be able to provide information to hypertensive patients about stroke and its treatment.[9,11]

Several researchers have studied the effects of stroke, but no non-pharmacological therapies have ever been developed through the integration of knowledge and applications In order to boost the health state of patients through stabilization or a decline in hypertension to levels that are typical, the authors are therefore interested in undertaking research by creating an instructional model in the form of an application for those with hypertension.

RESEARCH METHOD

This study used a quasi-experimental pre-post-test with control group design. Prior to the start of treatment, pretests were given to both groups. The intervention group received therapy in the form of application-based teaching, while the control group did not get any. Both groups will take a post-test when the intervention group's course of therapy is complete. The study population included all hypertension patients who went to the Cipayung Village Health Centre in East Jakarta. The sample method used was simple random sampling. The mean difference between two independent groups was the sample size employed for the hypothesis test. In this study, there were 60 participants, 30 of whom were in the intervention group and 30 of whom were in the control group. An affordable population was chosen for sampling using a straightforward random sample technique. Patients with hypertension who sought treatment at the Cipayung Village Health Center and who met the following criteria were included in the study: age range of 35 to 60; possession of an Android phone; ability to use said phone; completion of at least elementary school; and willingness to a topic of study. Patients experiencing problems from hypertension and those who stopped responding to surveys were excluded from the study.

Pre-tests were administered to participants (intervention and control groups) in the study's first phase, and modules, pocket books, and instructional DVDs were created as educational resources. Enumerators were trained to employ multimedia-based education, which was also put to the test. The second step entails giving the intervention group multimedia-based teaching and giving a post-test to all participants at week nine. This research was carried out in several stages. Stage I is developing educational instruments with activities, making the "STROKE PATH" application; application trial to hypertensive patients; Enumerator training to use the “STROKE PATH” application; implementation of pre-test to respondents (intervention and control groups). Stages II, the activities carried out included

training respondents to use the "STROKE PATH" application; use of the "STROKE PATH" application in the experimental group independently; in the ninth week, administered a post-test to all participants.

In order to minimize misunderstandings, the researcher designed a questionnaire as the study instrument. It was structured with open- and closed-ended questions using simple and intelligible language for respondents. On the other hand, share it can be used to download the offline instrument stroke route depending on an application. With the help of bivariate analysis and the statistics of the Paired t-test and Independent t-test, it will be determined how the "STROKE PATH" application affected the knowledge, attitudes, and behavior of hypertension patients before and after the intervention. Multivariate analysis was performed using the Multiple Logistic Regression statistical test to determine how the characteristics of hypertension patients impacted their knowledge, attitudes, and behavior.

RESULT AND DISCUSSION

Table 1 *(Variation of participants' attributes by educational level and age.)*

Variable	Intervention		Control	
	N	%	N	%
Sex				
Male	15	50	11	36.7
Female	15	50	19	63.3
Education				
Elementary school	3	10	9	30
Junior high school	5	16.7	5	16.7
Senior high school	9	30	10	33.3
College	13	43.3	6	20

According to Table 1, women made up the majority of both groups of people with hypertension. With the intervention group, respondents with college degrees make up the majority of the respondents, whereas for the control group, participants with senior high school diplomas make up the majority of the respondents.

Table 2 *(Distribution of features of participants based on age and length of sickness high blood pressure.)*

Variable	Groups	n	Mean	Median	Min - Max
Gender	Intervention	60	57.67	62	37-70
	Control	60	59.80	59.50	35-80
Duration of illness hypertension	Intervention	60	6.63	5.00	2-22
	Control	60	4.77	4.00	2-14

Table 2 shows that most of the respondents in the intervention group were women aged 57.67 years with tertiary education and suffering from hypertension more than 6.63 years old. In contrast, it can be said that the majority of participants in the control group were women aged 59.80 years with high school education and suffering from hypertension for less than 4.47 years.

Table 3 *(Comparison of groups' women's equality, levels of education, and length of high blood pressure.)*

Variable	Intervention		Control		p-*value*
	N	%	N	%	
Gender					
Man	15	50	11	36.7	0.297
Women	15	50	19	63.3	
Education					
Elementary school	3	10	9	30	
Junior high school	5	16.7	5	16.7	0.028
Senor high school	9	30	10	33.3	
College	13	43.3	6	20	
Duration of illness	11	36.7	17	56.7	0.121
< 5 years	19	63.3	13	43.3	
≥ 5 years					

Table 3. Respondents in the intervention and control groups did not differ in the characteristics of gender and length of hypertension, according to the results of the equivalence test analysis, which revealed that there were differences in education levels between the intervention group and the control group.

Table 4 *(Study of group differences in age.)*

Variable	Groups	N	Mean	SD	P- *value*
Gender	Intervention	30	57.61	9.571	**0.416**
	Control	30	59.80	10.568	

The respondents in the treatment group as well as the control group do not differ in age, as shown in Table 4.

Table 5 *(Analysis of hypertension patients' knowledge, attitudes, and conduct levels about reducing mortality before and after intervention in the intervention and control groups.)*

Variable	**Group**	**Mean**	**SD**	**95% CI**	**T**	**p-value**
Knowledge	Intervention		3.298	-3.732- -1.268	-	**0.000**
	Pre-test	17.07			4.151	
	Post-test	19.57				
	Difference	-2.50				
	Control		0.263	-0.098 – 0.098	0.000	**1.000**
	Pre-test	19.6				
	Post-test	19.6				
	Difference	0.00				
Attitudes	Intervention		3.124	-6.133 - -3.800	-	**0.000**
	Pre-test	22.73			8.079	

	Post-test	27.70				
	Difference	-4.967				
	Control		0.320	-0.086 – 0.153	0.571	**0.573**
	Pre-test	24.07				
	Post-test	24.03				
	Difference	0.033				
Behavior	Intervention		1.755	-1.889 - -0.578	-	**0.000**
	Pre-test	8.33			3.848	
	Post-test	9.57				
	Difference	-1.233				
	Control		0.263	-0.098 – 0.98	0.000	**1.000**
	Pre-test	7.93				
	Post-test	7.93				
	Difference	0.00				

The data in Table 5 above demonstrate that there was a significant difference between the knowledge scores of the intervention group and the control group prior to and following the application-based stroke path education session (p value = 0.000); the difference in the average value increasing knowledge scores in the intervention group was greater (difference value = 2.50), whereas it was not significant in the control group. The results of the analysis mentioned above also demonstrate a significant attitude score difference between the intervention group before and after the application-based stroke path education intervention (p value = 0.000), with the intervention group's average attitude score increasing attitude score differences differing more (difference value = 4,967). However, the control group didn't notice any difference from it. The average increase in behavior ranking in the treatment group was higher (difference value = 1.23) than in the experimental group (average difference = 0.00), and the behavior score in the intervention group differed significantly before and after the application-based stroke path associated with entering (p value = 0.000).

Table 6 *(compares the knowledge and behavior scores for the various groups.)*

Variable	Group	N	Mean	SD	95% CI	F	p-value
Knowledge	Intervention	30	-2.50	3.298	-3.709 - -1.290	72.291	**0.000**
	Control	30	0.00	0.262			
Attitudes	Intervention	30	-4.97	3.124	-6.148 - -3.852	49.944	**0.000**
	Control	30	0.03	0.320			
Behavior	Intervention	30	-1.23	1.755	-1.882 - -0.585	53.847	**0.000**
	Control	30	0.00	0.263			

The analysis in Table 6 above shows that there were significant differences in the knowledge, attitudes, and behavior scores between the invasion group and the control group after the application-based Stroke Path educational intervention, with a value of p = 0.000; 0.000; 0.000. Based on the findings of this study, it can be said that application-based Stroke Path educational interventions have a

considerable impact on improving hypertension patients' understanding, perspectives, and behavior with regard to managing their condition in order to prevent catastrophe.

Table 7 *(shows how respondents' attributes affected their understanding, opinions, and practices regarding hypertension's role in preventing strokes.)*

Variable Independent	Variable Dependent	Mean Square	Df	F	P- *value*
Education	Knowledge	6.057	1	0.892	**0.349**
	Attitudes	37.961	1	3.838	**0.055**
	Behavior	1.063	1	0.545	**0.469**
Duration of hypertension	Knowledge	9.027	1	1.330	**0.131**
	Attitudes	33.967	1	3.434	**0.059**
	Behavior	0.249	1	0.128	**0.722**

Based on the results of the multivariate test in table 7 above, it was found that education and duration of suffering from hypertension were variables that influenced patient attitudes in treating hypertension to prevent stroke in the provision of application-based "Stroke Path" educational interventions.

DISCUSSION

The study's findings, which showed that patients with hypertension in the intervention group ranged in age from 37 to 70, while in the control group, patients' ages ranged from 35 to 80, provide evidence of the age variable. Whereas responders in the control group were on average 59 years old, those in the intervention group were 57 years old on average. The findings of this study support studies by Ekarini, et al. (2019), which stated that the majority of respondents with hypertension were between the ages of 42 and 71. . The conclusions of this research are consistent with those of the 2018 Riskesdas whereas the age ranges from 35-44 years old to over 75 years old, the incidence of hypertension continues to increase. Based on Riskesdas (2018) there was an increase in the incidence of hypertension with age, from 8.4% (2013) to 8.8% (2018). Atherosclerosis develops as we age as a result of normal changes to the heart, blood vessels, and hormones. It will grow stiff in the major arteries as it loses its elasticity, forcing blood to flow through the constricting blood vessels with each heartbeat, which ultimately raises hypertension.[12,13]

Blood pressure can be raised by a number of risk factors, including aging, sex, genetic factors, overweight, increased salt levels, and unhealthy lifestyle choices including smoking and alcohol consumption. For instance, the simplest effort is to regularly monitor your cholesterol levels more than once, engage in physical activity, and try to avoid other factors that can cause high blood pressure. Someone who is at risk ought to be less vigilant and proactive about taking precaution.[14,15]

The results showed that both in the intervention group and the control group, women made up the majority of responders. Research by Sumartini, which shows that most persons with high blood pressure are female, supports the findings of this study. Young women tend to have relatively low blood pressure, but this does not mean that they will always be free from hypertension as they age. The risk of this condition, which is commonly referred to as the silent killer, must be increased, especially when people turn 50. As they get closer to adolescence, women begin to lose the hormone estrogen, which causes a rise in the prevalence of hypertension in women between the ages of 45 and 55. Un menopausal

women are protected by estrogen, which also helps HDL (High Density Lipoprotein) levels grow. Atherosclerosis can be avoided by having high HDL levels. Because women physically have a higher likelihood of physically growing their body mass index, women are likewise more at risk of having hypertension. Due to this hormonal procedure, post-menopausal monthly cycle syndrome (premenstrual syndrome) makes it simple for the distribution of body fat to collect. According to the 2013 Riskesdas data, women in Indonesia are more likely than males to have hypertension.[12,16]

One of the things that affects someone's view of being more open to new concepts and technology is their level of education (Notoatmodjo, 2010). According to the study's findings, the intervention group's respondents were mostly college graduates, whereas the control group's respondents were mostly seniors in high school. The results of Rosiana's survey, which discovered that most respondents had only finished elementary school, are in contradiction to those of this study. Both the intervention group and the control group's respondents had a majority of junior high school diplomas, according to similar findings from research by Saputri, et al. In the case of hypertension, the likelihood is influenced by education level; persons with greater levels of education are more likely to be informed about their health and aware of how to control it.[6,17]

According to an analysis of the study's findings, the education collective's understanding of managing high blood pressure improved to 2.50 with a p-value of 0.000. This demonstrates that application-based stroke route educational interventions have a considerable impact on the understanding of hypertensive patients receiving therapy. With a p value of 0.001, this finding is in line with others that shown a connection between low-salt diet health education and changes in hypertension patients' comprehension. The study's findings also revealed that health education had a Similar to this, Ulya et al. found that health education regarding the hypertension diet had an impact on raising respondents' knowledge, with a p value of 0.089 indicating that there was no significant effect in the control group. There was a beneficial influence on participants' information levels with a p value of 0.05. A key benefit of the continuous nursing service approach therapy, according to Suratun et al.'s research, was the high blood pressure diet instruction, which raised the respondent's knowledge score from 4.091 to 0.000.21-23. The process of sensing things with one's senses leads to knowledge. The level of focus and awareness of the target at the time of sensing has a significant impact on awareness production on its own. A person learns the majority of what they know through their hearing and seeing. A human has varying degrees or intensities of object knowledge. Knowledge is a very important domain for the formation of one's actions.[17] Given that the majority of hypertension patients are senior, increased knowledge is influenced by factors such as health professionals that have experience in delivering useful information, explaining in a simple but readily understood by patients, and using appropriate media. Interventions are carried out by providing education and consultation through website-based and mobile applications on each respondent's device. In addition, researchers monitored application use and risk factors for stroke events for 4 months.

This study found that the 4,967 participants in the intervention group had a higher attitude score for hypertension therapy, with a p value of 0.000. Conclusion: Educational interventions on hypertension management delivered through websites and mobile apps have a considerable positive impact on patients' attitudes toward managing their condition. This conclusion is consistent with the findings of Suratun et al., who reported a substantial impact of the ongoing nursing care strategy using health promotion and high blood pressure dietary information changes in respondents' positive attitudes toward hypertension patients (p value = 0.000Similar findings were made by Sabouhi et al, who found

a link between hypertensive patients' attitudes and their attempts to regulate their blood pressure. Moreover, Agustini in his research also demonstrated how a person's (hypertensive patients') views regarding hypertension can alter their behaviors to prevent hypertension. Although attitude is an inclination toward action or behavior, it cannot be considered to be an action or activity. Individuals' attitudes do not always translate into actual actions; they cannot be observed right away but must instead be deduced in advance from closed conduct. Hence, attitude is one of the elements that significantly affects a person's health beliefs to successfully control high blood pressure and minimize stroke. The results of this study show that an individual's attitude or participant's attitude significantly how effectively hypertension is treated. This supports Green's idea, according to which attitude is one component that has a significant impact on health behavior.[18–20]

The examination of the behavioral factors of patients managing their hypertension revealed substantial differences in the treatment, with a p value of 0.000, and an average difference of 1,233 in behavior improvement in treating high blood pressure. This demonstrates that people with high blood pressure' behavior to manage hypertension in order to prevent stroke is significantly impacted by educational interventions on hypertension treatment provided through website-based and mobile applications. The findings of this study are consistent with those of Suratun et al., who explained that there was a substantial difference in their studies impact of the continuous medical care strategy intervention through health education about the altering high blood pressure through nutrition in the respondents' optimism with a value of p = 0.000. The findings of this study, however, differed from those of Suyoto et al study's which found no differences in respondents' adherence in either the intervention group or the control group before and after receiving health education about the hypertension diet. Adherence is the term used to describe how closely a patient follows the advised behavior and treatment plan is strongly tied to behavior by others or his physician. Safitri also discusses compliance, often known as adherence, which refers to a patient's level of obedience to the clinical advice of the treating physician. The term "compliance" refers to a level of patient conduct in which they obey or follow instructions or the recommendations of medical professionals in a medical setting. According to Nita, compliance is the degree to which a patient complies with the instructions provided by medical personnel. Individuals who have sufficient understanding of hypertension therapy can act appropriately by following instructions given by professionals with authority, such as doctors, nurses, and other healthcare professionals.[21–24]

CONCLUSION

According to the study's findings the awareness of high blood pressure sufferers, perspectives, and actions taken to avoid strokes are improved through application-based stroke path education.

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