The Effect of Multimedia-Based Education on the Management of Hypertension on Behavioral Change for Stroke Prevention

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Abstract

This study aims to determine the effect of multimedia-based education on the management of hypertension on changes in stroke prevention behavior. The method in this study uses a quasi-experimental pre-post and post-test with control group design. The study population was all elderly with hypertension in Cipayung District, East Jakarta. The sampling technique uses purposive sampling. The number of samples in 64 respondents, in the intervention group and the control group. The method of data collection by pre-post and post-test, the data characteristics of respondents, knowledge, attitudes and actions using a questionnaire. While the blood pressure data checks the respondent. The study was conducted in the working area of the Cipayung District Health Center in East Jakarta, the time of the study was from April to November 2019. Interventions that were conducted to respondents were multimedia-based education using Video and Modules. Univariate and bivariate data analysis, using the dependent and independent t-test while multivariate data analysis using the mancova test. The results showed that the average age of respondents was 63 years in the intervention group, while the control group was 62 years. The majority of respondents are female, not working and have low education both in the control and intervention groups. There are significant differences in multimedia-based education on respondents' knowledge, attitudes, actions and blood pressure. There is a significant influence between respondent's age, occupation and systolic blood pressure on stoke prevention behavior. Conclusion: There is a significant difference in multimedia-based education on changing the behavior of respondents for stroke prevention.

Keywords: Education, Multimedia, Hypertension, Behavior, Stroke.

A. INTRODUCTION

Hypertension or better known as high blood pressure, according to the Indonesian Hypertension Association, hypertension is a condition in which a person's systolic blood pressure is more than 139 mmHg and diastolic 89 mmHg. This disease is categorized as the silent disease because the patient does not know he has hypertension before checking his blood pressure. Hypertension that occurs in
the long term and continuously can trigger strokes, heart attacks, heart failure and is the main cause of chronic kidney failure (Purmomo, 2009).

According to the World Health Organization in 2011, one billion people in the world suffer from hypertension, two-thirds of whom are in low- and middle-income developing countries. The prevalence of hypertension will continue to increase sharply, it is predicted that by 2025, around 29 percent of adults worldwide suffer from hypertension. Hypertension has resulted in the death of about 8 million people every year, 1.5 million deaths occur in Southeast Asia, of which a third of the population suffers from hypertension (Ministry of Health, Directorate of PPTM, Sub-Directorate of Heart and Blood Vessel Disease Control, 2013).

The 2013 National Basic Health Research showed that the prevalence of hypertension in Indonesia was obtained through measurements at the age of >18 years by 25.8 percent and would be higher in the elderly. Therefore it is very important to check blood pressure from a young age and if hypertension is found it should be checked regularly and blood pressure controlled to the recommended level by correcting bad living habits and with medication. Hypertension does not provide typical complaints and symptoms so that many sufferers do not realize it (Riskesdas, 2013).

Hypertension management is needed to prevent long-term target organ damage, thereby reducing morbidity and mortality. Various studies recommend that hypertension can be reduced by making lifestyle modifications, controlling weight, blood pressure, exercise, healthy diet, reducing alcohol and cigarette consumption. Recently, it is recommended that the emphasis on prevention, early detection, evaluation and management of hypertension should be carried out through health promotion and modification of healthy lifestyles (Joint National Committee, in Black, 2009). Complications that often occur in hypertensive patients are stroke. Stroke is a cerebrovascular disease and is a worldwide problem. Stroke is the occurrence of a physical disorder that arises suddenly caused by impaired blood circulation to the brain. Stroke is the third leading cause of death. In addition, stroke is a cause of invalidity/disability (Wahyuningsih.R, 2013).

Based on a preliminary survey of the hypertensive elderly population at the Prolanis Public Health Center, Cipayung Sub-district, East Jakarta in January 2019 as many as 100 people, of which 2 people had a stroke, while the hypertensive elderly at the Prolanis Health Center at Lubang Buaya Village were 120 people. To prevent the occurrence of more stroke complications in the elderly with hypertension, it is necessary to provide education about the management of hypertension including: patient compliance in therapy, carrying out a hypertension diet, exercising regularly. Based on this, the researcher conducted a study entitled "The Effect of Multimedia-Based Education in the Management of Hypertension on Changes in Stroke Prevention Behavior".
B. METHOD

This study uses a quasi-experimental pre-post test design with a control group through a multimedia-based educational intervention on hypertension management using videos and modules to prevent stroke. The population in this study was elderly hypertension in the Puskesmas area of Cipayung Village and Puskesmas Lubang Buaya, East Jakarta. The sampling technique was purposive sampling from an affordable population. Determination of the sample size using the 2 mean difference test. The determination of the sample size was calculated using the sample size software from Lameshow, so the sample calculation was obtained for 31 respondents. The number of samples that met the requirements during the study were 32 respondents in both the intervention group and the control group, so the total sample was 64 respondents. The inclusion criteria set were 1) Respondents had at least graduated from elementary school, lived in the work area of the Cipayung Community Health Center and Lubang Buaya Village, East Jakarta and were willing to be respondents. The exclusion criteria set were elderly hypertension with complications, and patients who withdrew became respondents. Collecting data using a data collection tool in the form of a questionnaire instrument for respondent characteristics, knowledge, attitudes, and actions, while blood pressure data collection is through measuring the respondent's blood pressure. Data analysis includes univariate, bivariate and multivariate analysis. Bivariate data analysis used Dependent t.test, while multivariate data analysis used Linear Regression test.

C. RESULT AND DISCUSSION

This study aims to determine the effect of multimedia-based education in May to September 2019. The number of respondents who became the sample was 32 people. Research analysis was based on univariate, bivariate and multivariate analysis procedures.

1. Univariate Analysis

In the univariate analysis of this study, the characteristics of the respondents will be described descriptively. The following is the univariate analysis:

Table 1 Distribution of Respondents Characteristics by Gender, Education Level and Occupation (n=32)

| No | Variable       | Category       | Intervention |       | Control |       |
|----|----------------|----------------|--------------|-------|---------|-------|
|    |                |                | Total | %    | Total | %    |
| 1  | Gender         | Man            | 9     | 28.1 | 12    | 36.4 |
|    |                | Woman          | 23    | 71.9 | 20    | 63.6 |
| 2  | Education Level| Low education  | 17    | 53.1 | 18    | 56.2 |
|    |                | Higher education| 15    | 45.9 | 14    | 43.8 |
| 3  | Occupation     | Work           | 3     | 9.4  | 10    | 31.2 |
|    |                | Does not work | 29    | 90.6 | 22    | 68.8 |

The table above shows that most of the respondents in the intervention group were women, had low education and did not work. Meanwhile, the control group...
showed that most of the respondents were women, had low education and did not work. The results of this study indicate that the average age of respondents in the intervention group is 63.25 years, the youngest age is 53 years and the oldest is 85 years, while in the control group the average age of respondents is 62.33 years with the youngest age being 53 years and the oldest 79 years. The results of this study differ from the results of Ulya, Z., et al (2017) which shows that the average age of respondents in the intervention group is 53.88 years, the youngest age is 48 years and the oldest is 60 years, while in the control group the average age of respondents is 54.31 years old with the youngest 45 years old and the oldest 60 years old.

The results of this study are in line with the results of Saputri’s research. Y.I, et al (2014) stated that the majority of respondents were aged 60-74 years in the intervention group and the control group. Hypertension is closely related to age, the older a person is, the greater the risk of developing hypertension (Sugiharto, 2007). Blood pressure increases due to natural changes in the heart and reduced elasticity of the arteries, so the incidence of hypertension is higher in the elderly.

The results of this study indicate that the gender of the respondents in the intervention group is the majority of women, which is 71.9%, while in the control group the majority of women are 63.6%. The results of this study are in line with the results of research by Mardhiah, A., et al. (2014) which states that the gender of the respondents is mostly (89.2%) women. Likewise, the results of research by Haryani, S., et al (2016) stated that the gender of the respondents was mostly (74.4%) female.

According to Chen, et al (2014) more women suffer from hypertension after menopause, this happens because of a decrease in hormones that cause a decrease in body homeostasis. After the age of 45, women are more at risk of developing hypertension because the production of the hormone estrogen affects high density lipoprotein (HDL) levels. These hormonal changes can cause hypertension and thickening of blood vessels or atherosclerosis. The results of the 2013 Riskesdas stated that the prevalence of hypertension in Indonesia for women tends to be higher than in men.

The results of this study indicate that the education of the respondents in the intervention group and control group has the majority of low education (SD and SMP) which is 53.1% in the intervention group and 56.2% in the control group. The results of this study are in line with the results of research by Haryani, S., et al. (2016) which stated that the majority of respondents’ education (53.3%) had low education (no junior high school). Likewise, the results of the study by Saputri, Y., et al (2014) stated that most of the respondents had junior high school education in both the treatment group and the control group. Riskesdas (2013) states that the prevalence of hypertension tends to be higher in the lower education group due to ignorance about a good diet.

The results of this study indicate that the majority of respondents in the intervention group and control group did not work, namely 96.6% in the intervention group and 68.8% in the control group. The results of this study are in line with the results of research by Mardhiah, A., et al. (2014) stated that the majority
of respondents did not work in the intervention group by 90.6% and 68.8% in the control group. Likewise, the results of research by Haryani, S., et al (2016) stated that most of the respondents 66.4% did not work.

Women who do not work or housewives are at a higher risk of suffering from hypertension compared to women who work, this is probably due to the lack of activities carried out by housewives where most of them just stay at home with routines that make them busy, in contrast to mothers who work more lots of activity and make time to do sports. In addition, usually working mothers are more active than mothers who do not work or are only partly housewives. Individuals with low activity are at risk of developing hypertension by 30-50% than active individuals (Waren, 2008).

Table 2 Distribution of Respondents Characteristics Based on Age (n= 32)

| No | VARIABLE | Intervention | Control |
|----|----------|--------------|---------|
|    | Mean     | Median       | Min     | Max     | Mean     | Median   | Min     | Max     |
| 1  | Age      | 63.25        | 64      | 53      | 62.33     | 61       | 53      | 79      |

The table above shows that the average age of respondents in the intervention group is 63.25 years, while in the control group the average age of respondents is 62.33 years.

2. Bivariate Analysis

Differences in knowledge, attitude and behavior scores in stroke prevention before and after intervention in the intervention and control groups

Table 3 Analysis of Knowledge, Attitudes and Behavior Scores in Stroke Prevention Before and After Multimedia-Based Education Interventions

| Variable     | Group       | Mean   | SD    | 95% CI          | T      | P value |
|--------------|-------------|--------|-------|-----------------|--------|---------|
| Knowledge    | Ex. Intervention | 7.348  | 1.342 | -1.046 - -0.784 | -2.370 | 0.024   |
| Score        | Before      | 7.906  |       |                 | 0.055  | 0.000   |
|              | After       |        |       |                 | 0.012  | 0.011   |
|              | Difference  | 7.757  | 0.857 | -0.918 - -0.516 | 1.421  | 0.165   |
|              | Ex. Control | 24.303 | 0.509 | -0.613 - 1.461  | 0.833  | 0.411   |
|              | Before      | 22.062 | 4.428 | -0.034 - 3.159  | -1.996 | 0.055   |
|              | After       | 22.625 |       |                 | 0.754  | 0.441   |
|              | Difference  |        | 1.562 |                 | 0.424  | 0.411   |
| Attitude     | Ex. Intervention | 5.225  | 1.632 | -0.293 - -1.143 | -5.943 | 0.000   |
| Score        | Before      | 6.967  |       |                 | 0.876  | 0.876   |
|              | After       |        | -1.741|                 | 0.000  | 0.000   |
|              | Difference  | 4.242  |       |                 | 0.424  | 0.411   |

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The results of the analysis showed that there were significant differences in the scores of knowledge, attitudes, behavior, systolic BP and diastolic BP in prevention in the intervention group and before and after the intervention (p value = 0.024; p = 0.055; p = 0.000, p = 0.000, p = 0.000 ), and the difference in the average value of increasing knowledge scores in the intervention group was greater (difference value = 0.562) while in the control group the average difference in score was 0.212, as well as the difference in the average score of attitudes in stroke prevention in the intervention group was more large (difference value = 1.562) while in the control group the average difference is 0.424, as well as the difference in the average value of increasing behavioral scores in the intervention group is greater (difference value = 1.741) while in the control group the average difference is 0.031. The average difference in systolic BP in the intervention group was greater (difference value = 13.375) while in the control group the average difference was 0.363 as well as the average difference in diastolic BP in the intervention group was greater (difference value = 9.78) while in the control group the mean the average difference is 1,212.

The results of this study indicate that there is a significant difference in knowledge in the intervention group before and after the multimedia-based educational intervention with p value = 0.024, and the difference in the average value of increasing knowledge in the intervention group is greater (value difference = 0.562) while in the control group the average the difference in score is 0.212. The results of this study can be concluded that there is a significant difference in multimedia-based education (videos and modules) to increase respondents' knowledge.
The results of this study are in line with the results of research by Meidiana, et al (2018) which showed that there was a significant difference between knowledge before and after being given education through audio-visual media (leaflets and videos) with p.value = <0.005. The results of this study are also in line with the research of Ulya, Z., et al, (2017). Stating that there is a significant difference between health education and poster media on increasing knowledge of hypertension management in patients with hypertension with p value = 0.000. There was an increase in knowledge scores before and after treatment.

The results of this study support the research of Wibowo, S, et al (2013). Shows that there is an effect of health promotion, both the audio-visual method and the pocket book method with a p value = 0.00, there is an increase in knowledge of the use of MSG. The results of this study are in line with the research of Purnamasari.DU, et al (2014) which showed that there was a significant difference in health knowledge using the media module with p = 0.000 and an increase in the average score in the pre-test group from 64.17 to 87.22 in the pre-test group. The post-test group, showed that there was a change in the average knowledge score of 22.05. Likewise, the results of research by Mardhiah, A., et al (2014) stated that there was an effect of health education on increasing knowledge with p. value = 0.0001 and an increase in knowledge scores at 46.62 pretest and 69.86 posttest.

The results of this study indicate that multimedia-based education is very effective in increasing respondents' knowledge of hypertension management for stroke prevention, compared to providing education without multimedia. Multimedia is the use of computers to present and combine text, sound, images, animation, audio and video with tools and connections (links) so that users can navigate, interact, create and communicate (Wikipedia, 2019).

Multimedia-based educational research on hypertension management for stroke prevention using multimedia in the form of videos and modules. Modules are given after education so that the material that has been delivered can be reread at home. Video media is media that presents information in the form of sound and moving images, while modules are media in the form of writing and still images. The success of health education can be supported by the existence of tools or media, to help facilitate the delivery of messages or materials to be conveyed (Daryanto, 2015). Learning video media is a set of components or media capable of displaying images as well as sound at the same time (Sukiman, 2012), while the module is a particular unit of discussion that is systematically, operationally and directed to be used by students (Amri. S, 2010).

Knowledge is the result of a person's human sensing of objects through his senses. At the time of sensing to produce knowledge is strongly influenced by the intensity of attention and perception of the object. One's knowledge is obtained through the senses of hearing and sight. A person's knowledge of objects has different intensities or levels (Notoatmodjo, 2010).

The results of this study indicate that there is a significant difference in attitude scores in the intervention group before and after multimedia-based
education with a p value of 0.055. The difference in the average value of the increase in the attitude score in stroke prevention in the intervention group was greater at 1.562, compared to the control group at 0.424. The results of this study can be concluded that there is a significant difference in multimedia-based education in the management of hypertension on changes in respondents' attitudes to prevent stroke.

The results of this study are in line with the results of research by Meidiana, et al (2018) which showed that there was a significant difference between attitudes before and after being given education through audio-visual media (leaflets and videos) with p.value = <0.005. Likewise, the results of research by Mardhiah, A., et al. (2014) stated that there was an increase in knowledge scores at the time of pre-test 80.16 and post-test 88.05, there was an effect of health education on attitude change with p.value = 0.0001. Research results Widyasari, F., et al. (2010) also showed a statistically significant increase in attitudes before and after health education.

According to Kustandi, C (2013). revealed that video is a tool that can present information, explain processes, explain complex concepts, teach skills, shorten or slow down time and influence attitudes. Attitude is a closed response from a person to a certain stimulus/object that already involves the opinion and emotion factor concerned. Attitude is a syndrome or collection of symptoms in response to a stimulus or object, so that the attitude involves thoughts, feelings, concerns and other psychological symptoms. Factors that influence the determination of attitudes as a whole such as knowledge, thinking, beliefs and emotions, all of which play an important role (Notoatmodjo, S, 2010).

Multimedia-based education is very effective in changing respondents' attitudes, this is evident from the results of this study an increase in the average attitude score after the multimedia-based educational intervention was carried out. The use of media in learning is highly recommended to enhance the quality of learning. Video media and modules make it easier for people to convey and receive information and can avoid misunderstandings. Multimedia is very effective in conveying messages in a systematic, concise and concise manner in the form of writing and images. This media is very effective in conveying messages that are systematic, short and concise (Notoatmojo, 2012).

The results showed that there was a significant difference in the score of the action in the intervention group before and after education with p. value = 0.000, and the difference in the average value of increasing behavioral scores in the intervention group was greater (difference value = 1.741) while in the control group the difference was 0.031. , it can be concluded that there is a significant difference between multimedia-based education with videos and modules on the respondent's actions/practices to prevent stroke complications.

The results of this study are in line with the results of research by Mardhiah, A., et al. (2014) stated that there was an increase in knowledge scores at the time of pre-test 20.72 and post-test to 86.49, there was an effect of health education on improving the skills of families with hypertension p.value = 0.0001. Likewise, the results of research by Rendi, et al (2017), stated that there was a significant
relationship with a p.value of 0.001 which means that there is an effect of health education on hypertension on changes in the lifestyle behavior of hypertension respondents.

One of the efforts to change the patient's attitude towards the treatment program is by conducting health education or education. Multimedia-based education is very effective to increase knowledge. The knowledge he has is expected to be the starting point for changes in the patient's attitude and lifestyle which will ultimately change his behavior towards the treatment program he is undergoing (Siregar, 2006).

3. Multivariate Analysis

The influence of respondent characteristics on the level of knowledge, behavior, pressure Systolic and diastolic blood in stroke prevention:

Tabel 4 The effect of respondent characteristics on Knowledge, attitude and behavior Level in stroke prevention

| Independent Variable | Dependent Variable | Mean Square | df | F     | P value |
|----------------------|--------------------|-------------|----|-------|---------|
| Age                  | Knowledge         | 0.047       | 1  | 0.034 | 0.855   |
|                      |                   | 24.444      | 1  | 11.332| **0.001**|
|                      | Behavior          | 22.124      | 1  | 0.124 | 0.726   |
|                      |                   | 62.604      | 1  | 0.502 | 0.482   |
|                      | Systolic BP       |             |    |       |         |
|                      | Diastolic BP      |             |    |       |         |
| Occupation           | Knowledge         | 0.383       | 1  | 0.277 | 0.601   |
|                      |                   | 11.281      | 1  | 5.226 | **0.026**|
|                      | Behavior          | 166.397     | 1  | 9.314 | **0.004**|
|                      |                   | 340.655     | 1  | 2.733 | 0.104   |
|                      | Systolic BP       |             |    |       |         |
|                      | Diastolic BP      |             |    |       |         |

Based on the results of the multivariate test, it was found that age had an effect on behavior in stroke prevention, while work had an effect on behavior and systolic blood pressure in stroke prevention.

The results showed that there was a significant difference in systolic and diastolic blood pressure scores in the intervention group before and after education using multimedia with p value = 0.000. The difference in the average value of the decrease in the systolic BP score in the intervention group was greater at 13,375 mmHg while in the control group it was 0.363 mmHg. The difference in the average value of the decrease in diastolic BP scores in the intervention group was greater, namely 9.78 mmHg, while in the control group it was 1212 mmHg. This study can be concluded that there is a significant difference in multimedia-based education on blood pressure reduction.
The results of this study are in line with the research of Park, at all (2010) which showed that after the intervention, BP in the experimental group decreased significantly compared to the control group. Likewise, the results of research by Nugraheny, B.S (2012) stated that there was a significant effect of counseling on changes in systolic BP in the experimental group and the control group with p.value = 0.002. BP, while diastolic BP obtained p. value = 0.025. Several factors that can affect blood pressure include lifestyle. Lifestyle can be detrimental to health and increase a person’s risk for cardiovascular disease such as smoking habits, alcohol consumption, drinking coffee, consumption of foods that contain high fat, rarely exercise, excessive sodium consumption (Junaidi, I, 2002).

The results of multivariate analysis in this study showed that age had a significant effect on behavior in stroke prevention with a p value of 0.001, while work had a significant effect on behavior and systolic blood pressure in stroke prevention with a p value of 0.026 on behavior and systolic blood pressure with a value of p=0.004. The average age of respondents in the intervention group was 63 years, while in the control group it was 62 years and most of the respondents did not work or were housewives in both the intervention group and the control group.

The results of this study can be concluded that there is a significant effect between age on stroke prevention behavior after being given multimedia-based education (Videos and Modules) about the management of hypertension in stroke prevention. Likewise, work has a significant effect on behavior and decreases systolic blood pressure, while diastolic blood pressure has no significant effect.

D. CONCLUSION

The characteristics of respondents in the intervention group were 63.25 years old on average, while in the control group the average age was 62.33 years. The majority of respondents are female, have low education (SD-SMP), do not work in the intervention group or in the control group. The results of the bivariate analysis showed that there were significant differences in multimedia-based education on the knowledge, attitudes, actions and blood pressure of respondents in the intervention group, while in the control group there was no difference. The results of the multivariate analysis showed that there was a significant effect of multimedia-based education between the age of the respondent on stroke prevention behavior, as well as the respondent’s occupation affecting behavior and systolic blood pressure in stroke prevention.

REFERENCES
1. Amri. S. (2010). Kontruksi Pengembangan Pembelajaran. Jakarta: Prestasi Pustaka.
2. Badan Penelitian dan Pengembangan Kesehatan Depkes RI. (2013). Riset Kesehatan Dasar (Riskesdas). Jakarta: Kiat Nasa.
3. Bandiro, M. (2008). Klien Gangguan Kasdieovaskuler, Seri Asuhan Keperaatan. Jakarta: EGC.
4. Black, J. W., & Howks, J. H. (2009). *Medical Surgical Nursing; Clinical Management For Positive Outcome*. Singapore: Elsevier Inc.
5. Brooker, C. (2009). *Kamus Saku Keperawatan*. Jakarta: EGC.
6. Chen, K., Chiou, C. F., Plauschitnat, C. A., Frech, F., Harer, A., & Dubois, R. (2005). Patient Satisfaction with antihypertensive therapy. *Journal of Human Hypertension*, 19, 793-799.
7. Daryanto. (2015). *Media Pembelajaran*. Bandung: Satu Nusa.
8. Haryani, S., Sahar, J., Sukihananto. (2016). Penyuluhan Kesehatan Melalui Media Cetak Berpengaruh Terhadap Perawatan Hipertensi. *Jurnal Keperawatan Indonesia*, 19(3).
9. Junaidi, I. (2010). *Hipertensi Pengenalan, Pencehahan dan Pengobatan*. Jakarta: Bhuana Ilmu Populer.
10. Kustandi, C., & Sutjipto, C. (2013). *Media Pembelajaran Manual dan Digital*. Bogor: Ghalia Indonesia.
11. Mardhiah, A., & Asnawi Abdullah, H. (2015). Pendidikan Kesehatan Dalam Peningkatan Pengetahuan, Sikap Dan Keterampilan Keluarga Dengan Hipertensi-Pilot Study. *Jurnal Ilmu Keperawatan*, 3(2).
12. Meidiana, R., Simbolon, D., Wahyudi, A. (2018). Pengaruh Edukasi melalui Media Audio Visual Terhadap Pengetahuan dan Sikap Remaja Overweight. *Jurnal Kesehatan*, 9(3).
13. Notoatmodjo, S. (2010). *Ilmu perilaku Kesehatan*. Jakarta: Rineka Cipta.
14. Nugraheny, B. S. (2012). *Pengaruh Penyuluhan Tentang Diet Hipertensi Terhadap Perubahan Tekanan Darah Pada Penderita Hipertensi*. Yogyakarta: Digilib FKIK UMY.
15. Palmer, A., & William, B. (2007). *Tekanan Darah Tinggi*. Jakarta: Erlangga.
16. Park, Y. H., Song, M., Cho, B. L., Lim, J. Y., Song, W., & Kim, S. H. (2011). The effects of an integrated health education and exercise program in community-dwelling older adults with hypertension: a randomized controlled trial. *Patient Education and Counseling*, 82(1), 133-137.
17. Paraahli (2019). *Pengertian Edukasi*. Retrieved from: [www.pengertian-menurut-paraahli](http://www.pengertian-menurut-paraahli)
18. Purnomo, H. (2009). *Pencegahan dan Pengobatan Penyakit Yang Paling Mematikan*. Yogyakarta: Buana Pustaka.
19. Purnamasari, D. U., Ulna, N., & Kusnandar. (2014). Efektifitas Penggunaan Modul Kesehatan Terhadap Peningkatan Pengetahuan Guru Pendidikan Jasmani. *Jurnal Kesindo*, 6(3), 176-183.
20. Saptutri, Y. I., et al. (2014). *Pengaruh Pendidikan Kesehatan Terhadap Pengetahuan dan Kepatuhan Diet Hipertensi Pada Lansia*. Surakarta: FIK UMS.
21. Siregar, C. J. P., & Kumulosari, E. (2006). *Farmasi klinik Teori dan Penerapan*. Jakarta: Penerbit Buku Kedokteran EGC.
22. Ramadona, A. (2011). *Pengaruh Konseling Obat Terhadap Kepatuhan Pasien di Poliklinik RSUP Dr. M. Djamil Padang*. (Thesis Universitas Andalas).

[https://endless-journal.com/index.php/endless/](https://endless-journal.com/index.php/endless/)
23. Rendi., Wahyuni, D. W., & Warsono (2017). Pengaruh Penkes Tentang Hipertensi Terhadap Perubahan Perilaku Gaya Hidup Klien Hipertensi. Jurnal Ilmiah Mahasiswa Keperawatan, 2(3).

24. Sugiharto, A. (2007). Faktor-faktor risiko hipertensi grade II pada masyarakat. Semarang: Universitas Diponegoro.

25. Sukiman. (2012). Pengembangan Media Pembelajaran. Yogyakarta: Pedagogia.

26. Udjianti, J. (2010) Keperawatan Kardiovaskuler. Jakarta: EGC.

27. Ulya, Z., Iskandar, A., & Asih, F. T. (2017). Pengaruh Pendidikan Kesehatan Dengan Media Poster Terhadap Pengetahuan Manajemen Hipertensi Pada Penderita Hipertensi. Jurnal Keperawatan Soedirman, 12(1).

28. Wahyuningsih, R. (2013). Pengaruh Pendidikan Kesehatan Tentang Stroke Terhadap perilaku Mencegah Stroke Pada Pasien Hipertensi. Yogyakarta: Prodi Ilmu Keperawatan STIK Aisyiyah.

29. Waren, A., et al. (2008). Faktor-faktor yang Berhubungan dengan Kejadian Hipertensi pada pasien yang berobat di Poliklinik Puskesmas. Bangkinang.

30. Wibowo, S., & Suryani, D. (2013). Pengaruh Promosi Kesehatan metode Audiovisual dan metode Buku Saku Terhadap peningkatan pengetahuan penggunaan MSG pada ibu rumah tangga. Kesmas, 7(2).

31. Widyasari, F., Candrasari, D., & Anika (2010). Pengaruh pendidikan tentang Hipertensi terhadap perubahan pengetahuan dan sikap lansia. Jurnal UMS.

32. Wikipedia. (2019). Multimedia. Retrieved from: https://id.wikipedia.org.