



Health Education Model for Elderly Hypertension on Knowledge, Attitudes, and Adherence to Following the Dietary Approaches to Stop Hypertension (DASH)

Reni Prima Gusty¹

¹ Nursing Faculty, Andalas University

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ABSTRACT

Applying the DASH diet to people with hypertension can reduce blood pressure. However, the existing phenomenon shows a low adherence to this diet. Appropriate methods of providing education are still needed as an effort to increase knowledge, attitudes, and dietary adherence. The study aimed to determine the effectiveness of educating elderly hypertensives models on knowledge, attitudes, and adherence to DASH (Dietary Approaches to Stop Hypertension) in community health centers. The study was a quasi-experimental design with one group pre-test and post-test, using purposive sampling with a sample of 40 people. The intervention had for two weeks. Collecting data using guided interviews with questionnaires that included socio-demographic characteristics, knowledge, attitudes, and adherence to the DASH diet. Statistical analysis using statistical paired sample t-test, Wilcoxon rank, and McNemar tests. The average age of the respondents was 62.62 years. Most of the women were unemployed, had hypertension < 5 years, and had a family history of hypertension. After the health education intervention, there was an increase in knowledge ($p = 0.000$), attitude ($p = 0.000$), and adherence to the DASH diet ($p = 0.000$) with $p < 0.05$. The elderly hypertensive health education model is effective in increasing the knowledge, attitudes, and adherence of elderly hypertensive patients to the DASH diet. It takes the support of families and health workers to achieve optimal DASH dietary adherence

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Kata kunci:

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*) corresponding author

Dr. Reni Prima Gusty, S.Kp, M.Kes

Medical Surgical Nursing Department,
Nursing Faculty, Universitas Andalas).
Mailing address

Email: renigusty@nrs.unand.ac.id

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ABSTRAK

Penerapan diet DASH pada penderita hipertensi mampu menurunkan tekanan darah. Namun fenomena yang ada menunjukkan rendahnya perilaku patuh melaksanakan diet ini. Metode pemberian pendidikan yang tepat masih diperlukan sebagai upaya meningkatkan pengetahuan, sikap dan kepatuhan diet. Tujuan studi untuk mengetahui efektifitas model pemberian edukasi pada lansia hipertensi terhadap pengetahuan, sikap dan kepatuhan menjalankan DASH (Dietary Approaches to Stop Hypertension) di pusat kesehatan masyarakat. Penelitian ini merupakan penelitian eksperimen semu dengan rancangan control group pre- post test, menggunakan purposive sampling dengan jumlah sampel 40 orang. Intervensi dilakukan selama 2 minggu. Pengumpulan data menggunakan wawancara terpandu dengan kuesioner yang mencakup karakteristik sosio-demografis, pengetahuan, sikap, dan kepatuhan terhadap diet DASH. Analisis statistik menggunakan uji statistik paired sample t-test, uji peringkat Wilcoxon, dan uji McNemar. Rata-rata umur responden 62,62 tahun, Sebagian besar Wanita, tidak bekerja, mengalami hipertensi < 5 tahun dan memiliki Riwayat keluarga hipertensi. Setelah dilakukan intervensi pendidikan kesehatan terjadi peningkatan pengetahuan

($p=0,000$), sikap ($p=0,000$) dan kepatuhan ($p=0,000$) melakukan diet DASH dengan nilai $p < 0,05$. Model pendidikan lansia hipertensi efektif meningkatkan pengetahuan, sikap dan kepatuhan penderita lansia hipertensi untuk melakukan diet DASH. Dibutuhkan dukungan keluarga dan petugas kesehatan untuk mencapai kepatuhan diet DASH yang optimal

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INTRODUCTION

The incidence of hypertension in the world and Indonesia is relatively increasing. 2018 WHO survey predicts that there will be an increase in cases of hypertension from 26.4% to 29.2% worldwide. Meanwhile, in Indonesia, the prevalence of hypertension increased from 25.8% to 34.1%. West Sumatra Province occupies the 32nd position out of 34 provinces in Indonesia, with a majority of 25.1% (Kemenkes.RI, 2018). The Padang City Health Office stated that hypertension in Padang City was the highest in the West Sumatra region, with 21,878 cases.

Hypertension is a contributor to half of cardiovascular disease mortality and morbidity. Patients with hypertension treated but not controlled will be at higher risk of all causes of heart disease (Zhou et al., 2018). The study's results in Padang found that self-care ability was still relatively low. Self-care for patients with hypertension is the second lowest of the six components, namely doing a hypertension diet by 16.9% (R. P. Gusty & Merdawati, 2020). In line with Destiani et al., (2021) found that the behavior of consuming noodles and fast food and having an overweight or obese body is the cause of the high incidence of hypertension in the community.

According to JNC VII in 2003, one of the efforts to control Hypertension is to regulate the diet for people with Hypertension by applying the DASH (Dietary Approaches to Stop Hypertension) diet method. The existing fact is that dietary regulation only focuses on regulating salt and sodium (a low-salt diet), but does not consider the quality of a dish arrangement. Several studies have shown that the daily DASH diet can reduce and maintain blood pressure stability for people with Hypertension (Dadgari et al., 2017). The DASH diet regulates salt consumption and high-fiber, low-fat and high-protein diets. A decrease can occur in systolic blood pressure of 13.1 mmHg and diastolic blood pressure of 13.1 mmHg (Uliatiningsih & Fayasari, 2019). The study results show that both controlled and uncontrolled hypertension sufferers have problems regarding the recommended amount of salt consumption, nutritional information, and food labels (Wicaksana, 2017). This phenomenon shows the need to provide innovative health education so that health information can be adequately conveyed and change health behavior for the better.

Continuing health education using various methods is needed to improve knowledge, attitudes, and behavior. Previous studies have proven that health education effectively increases knowledge, attitudes, and practices in people with hypertension; counseling is the best way to improve attitudes (George et al., 2017). Another study states that interactive education effectively increases people's knowledge (Lu et al., 2015). Another study also stated that face-to-face and direct video counseling through WhatsApp significantly increases public knowledge (Sjamsuddin et al., 2022). In addition to health education methods, communication between health workers and patients

determines the success of increasing self-care behavior for people with hypertension (Mulyati et al., 2013)

In another context, the results of the study prove that direct counseling efforts using booklet media (S. Wahyuni, 2016), poster media (Ulya & Iskandar, 2017), and audiovisual (Fernalia, *et.al.*, 2019) are proven able to increase knowledge and self-care behavior of hypertension sufferers. It was still a weakness, namely the improvement of knowledge and self-care behavior is not permanent because there is no continuity, assistance, and monitoring from health workers (doctors and nurses). Opportunities by combining health education methods with face-to-face and digital can be used for hypertension sufferers, the majority of whom are elderly. Therefore, researchers are interested in combining these two methods as an alternative to providing health education in the community. The study wanted to see to what extent the effect of the combination of direct education and mHealth was able to increase the knowledge, attitudes, and dietary adherence of the elderly.

METHODS

Participant characteristics and research design

The research design used a quasi-experimental design with one group pre-test and post-test designs. The design aims to determine the effect of providing a combination of direct education and mobile health on the knowledge, attitudes, and adherence of hypertensive patients on the DASH diet.

The characteristics of the participants who were assessed were age, gender, education, occupation, five hypertension and family history of hypertension

Sampling procedures

The education model provided education about the DASH Intervention diet using two methods, direct education (face to face) and mobile health using an Android mobile phone. Providing education in mobile health by utilizing the WhatsApp group feature as a place for sending learning videos. Providing education is carried out at the Puskesmas by forming two groups with a total of twenty people each

Measurement using a questionnaire consisting of two parts. The first part is demographic data consisting of gender, age, education, occupation, length of time suffering from hypertension, and family history of hypertension. The second part is about knowledge, attitude, and dietary adherence.

The knowledge questionnaire consists of 26 questions from a modified Orabi (2017) questionnaire. This questionnaire was tested on 30 respondents at the public health center with a reliability value of Cronbach's Alpha 0.852 and a validity value of 0.362-0.546. The knowledge questionnaire consists of six components: an introduction to

diet, low salt diet, high fiber diet, low-fat cholesterol diet, high protein diet, and foods and drinks that should be avoided. Questionnaire was scored correctly = 1, wrong = 0

The attitude questionnaire consists of eight items. It was adopted and modified by Hapsari (2017). The questionnaire has been tested and produces a validity test of 0.393-0.783, and the reliability of Cronbach's Alpha is 0.732. This questionnaire has five responses or reactions for each question, namely Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The questionnaire consists of positive questions (statement numbers 2,3,4,5,6,9 and 10). The highest score is SA = 4, and the lowest is strongly disagree = 1. For negative questions (statement number 1,5,7,8), the highest score is SD = 4, and the lowest value is A = 1).

The dietary adherence questionnaire was adopted from the H-SCALE (Warren-Findlow et al., 2013). The number of questions consists of 12 items. The adherence assessment was taken from the behavior of the last seven days.

Data analysis

Data processing using SPSS.v23. The initial stage was to assess the normality of the data using the Shapiro-Wilk normality test for the variables of knowledge, attitude, and dietary adherence. Furthermore, to see the effect of education on knowledge and attitudes, a paired t-test was carried out because it met the normality test, and the Wilcoxon test carried out the dietary adherence variable because it did not meet the requirements for normality

RESULTS AND DISCUSSION

Characteristics of respondents obtained an average age of 62.62 years; most of them are women, have low education, do not work, suffer from hypertension 0-5 years, and have families with hypertension (table 1).

Table 1. Respondents Characteristic

| Characteristic | Group (n=40) |
|--|---------------|
| Age (mean±SD) | 62.62 ± 5.886 |
| Gender {n (%)} | |
| male | 4 (10 %) |
| Famale | 36 (90 %) |
| Education {n (%)} | |
| Lower (basic until senior high school) | 31 (77.5%) |
| Higher (College graduate) | 9 (22.5 %) |
| Employment status {n (%)} | |
| Employed | 2 (5%) |
| Unemployed | 38 (95%) |
| Family history of hypertension {n (%)} | |
| Hypertension | 28 (75 %) |

Table 2. Effect of education on knowledge, attitudes about DASH Diet in patients with hypertension

| Variable | mean | Standar deviation | t | p |
|-----------|-------|-------------------|-------|--------|
| Knowledge | | | | |
| Pre-test | 17.95 | -4.050 | 4.025 | -7.506 |
| Post-test | 22.00 | | 2.602 | 0.000 |
| Attitude | | | | |
| Pre-test | 29.38 | -6.025 | 3.985 | -7.552 |
| Post-test | 35.40 | | 3.733 | 0.000 |

| | |
|-------------------------------------|------------|
| No hypertension | 12 (25 %) |
| Hypertension periods {n (%)} | |
| 0-5 years | 29 (72.5%) |
| 6-10 years | 9 (22.5%) |
| > 10 years | 2 (5%) |

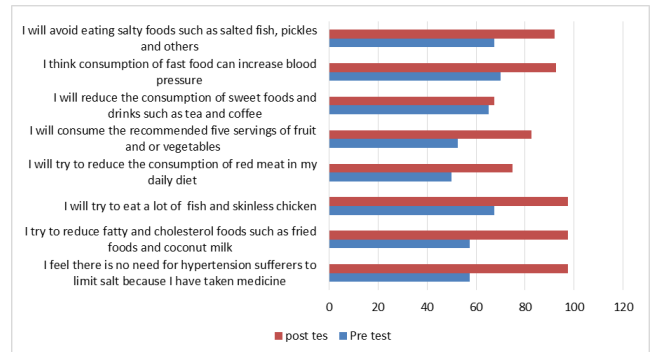


Figure 1. Percentage of Respondents' Positive Attitude on DASH Before and After Education

Figure 1 explains that most have shown a positive attitude, but two attitudes still need to be improved: the attitude of reducing red meat consumption and the consumption of sweet foods and drinks.

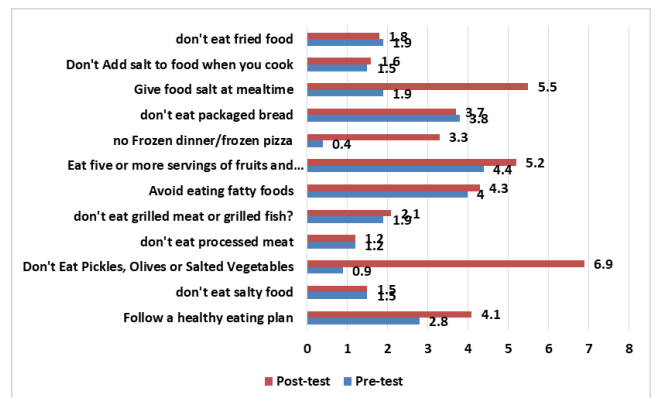


Figure 1 Behavior of Respondents Doing DASH Within Seven Days

Figure 2. It shows an increase in adherence with DASH after education, but most respondents have not achieved an average of six days for each adherence assessed.

Table 2 shows that there is an effect of providing a combination of direct education and mobile-Health on increasing the knowledge and attitudes of respondents with a value of $p = 0.000 < 0.05$. The most significant increase in score occurred in attitude (score 6.025) when compared to knowledge (score 4.050).

Table 3 shows an increase in the adherence of all respondents in doing DASH after being given education with a value of $p = 0.000 < 0.05$. The resulting increase in dietary adherence score was 12.05.

Table 3 The effect of education on adherence to DASH in patients with hypertension

| | N | Mean | Std deviation | Z | p |
|--|----------------|------|---------------|--------|-------|
| DASH adherence after education - DASH adherence before education | Negative Ranks | 0 | 44.33 | -5.514 | 0.000 |
| | Positive Ranks | 40 | 32.28 | | |
| | Ties | 0 | | | |
| | Total | 40 | | | |

Table 4 Differences in the components of DASH knowledge on pretest and posttest of patients with hypertension

| Knowledge of DASH diet | Pre test | | Post test | | p |
|------------------------------|----------|------|-----------|------|-------|
| | f | % | f | % | |
| the meaning of the DASH diet | | | | | |
| • adequate knowledge | 27 | 67.5 | 38 | 95 | 0.007 |
| • inadequate knowledge | 13 | 32.5 | 2 | 5 | |
| Low salt diet | | | | | |
| • adequate knowledge | 22 | 55 | 37 | 92.5 | 0.001 |
| • inadequate knowledge | 18 | 45 | 3 | 7.5 | |
| High fiber diet | | | | | |
| • adequate knowledge | 22 | 55 | 38 | 95 | 0.000 |
| • inadequate knowledge | 18 | 45 | 2 | 5 | |
| Low fat diet and cholesterol | | | | | |
| • adequate knowledge | 19 | 47.5 | 31 | 77.5 | 0.004 |
| • inadequate knowledge | 21 | 52.5 | 9 | 22.5 | |
| High protein diet | | | | | |
| • adequate knowledge | 13 | 32.5 | 33 | 82.5 | 0.115 |
| • inadequate knowledge | 27 | 67.5 | 7 | 17.5 | |
| Foods and drinks to avoid | | | | | |
| • adequate knowledge | 13 | 32.5 | 21 | 52.5 | 0.000 |
| • inadequate knowledge | 27 | 67.5 | 19 | 47.5 | |

Table 4 explains that the six components of knowledge about DASH showed an increase in knowledge after being given education with a p-value of <0.05 . almost half (47.5%) of respondents have inadequate knowledge about avoiding sugary foods and drinks.

DISCUSSION

The results showed that after direct health education was given and combined with the provision of learning videos through the WhatsApp group, it increased knowledge, attitudes, and adherence to the DASH diet with a significance value of $p < 0.05$. The provision of systematic and repeated education, as well as direct questions and answers and discussions in WhatsApp groups, were able to make all respondents interested in knowing the DASH diet. The Stimulus-Organism-Response Theory (S-O-R) explains that behavior can change if the stimulus (stimulus) given can convince the organism (Effendy, 2003). Responses from health workers in direct questions and answers and discussions in WhatsApp groups increased the respondents' understanding and confidence in following the DASH diet. The example of eating shown in the learning video motivates respondents to increase adherence. The process carried out is a form of emotional support by health workers for people

with hypertension to make behavioral changes for the better (Leon, *et.al*2015).

The increase in all knowledge components shown in table 4 with a p-value of <0.05 indicates that the health education provided effectively increases respondents' knowledge. This result is in line with several previous studies which showed an increase in knowledge after health education interventions (Kamran *et al.*, 2015; E. Orabi, 2016). Although the health education intervention given for two weeks with the provision of structured and repeated education was able to provide the same results as previous studies, providing education for at least two months to 6 months. This result is supported by R. Gusty *et al.*, (2022) research, which states that providing comprehensive and repeated health education can increase.

The increase in knowledge that occurred in this study was not hampered by old age, low education, and duration of suffering from hypertension. This condition proves that continuous health education improves a person's knowledge and belief in self-management (Movahedi *et.al.*, 2019). Due to its portability and dual function, mHealth is readily accepted by different socioeconomic groups, enabling users to access the health education they need (T. Li *et.al.*, 2019). It follows the characteristics in this study: respondents can accept the use of mHealth in providing health education from low to high education and all genders. Respondent's knowledge of avoiding sugary foods and drinks is still

inadequate (47.5%). It can be caused by the habits possessed by respondents, such as the consumption of sweet tea and coffee.

The increase in attitudes occurred after the educational intervention, which was in line with an increase in knowledge about the DASH diet. This result is in line with the research of E. Orabi, (2016), who found a positive attitude change about the DASH diet. In addition, continuous learning and increasing knowledge will reduce negative perceptions of difficulties in carrying out healthy behaviors (Shorey, *et.al*, 2017). The combination of direct and video education can increase the respondent's attitude toward a positive direction with an average increase of 67.5%-97.5%. These results are in line with the findings of Wahyuni *et al.*, (2019). They found that providing health education using percentages and videos improved the attitude of people with hypertension.

Figure 1 shows that the percentage of positive attitudes that are still low (67.5%-75%) is to reduce the consumption of sugary foods and drinks and the consumption of red meat. It can happen because it is a habit and culture in Padang. Another study showed that the culture of eating delicious and fatty foods that became the tradition of the Minang people is challenging to change, even though they already suffer from hypertension because it is difficult to change their tastes or preferred food choices. Momentary changes occur when the patient is sick, but after recovering, the eating pattern returns to previous habits (Erda, 2012). This condition can be minimalist by increasing understanding and awareness of the importance of healthy living in groups of people with hypertension. Family support is essential to strengthening positive attitudes to behave following the DASH diet.

All respondents also experienced increased adherence to the DASH diet after receiving health education with a $p = 0.000$, which can be seen in Table 3. Health education carried out in groups with the direct method (face-to-face) using WhatsApp groups was able to increase compliance gradually. It is proven that all respondents experienced an increase in adherence, as shown in Table 3. The same finding from another study shows that monthly group education for 45 minutes is recommended to increase health promotion in the community (Tam *et al.*, 2020). In addition, effective communication will increase understanding and motivation in patients to comply with self-care and advice from health workers (Alwi, *et.al.*, 2021; Patriani & Ayuningtyas, 2013)

Based on the assessment of adherence to the DASH diet according to the H-SCALE, it was stated that an average of six days to determine compliance with hypertension patients on the DASH diet (Warren-Findlow *et al.*, 2013). The results of this study indicate that one question item that was declared obedient was carried out by the respondent, namely, not consuming pickles and salted vegetables. The rest still do not comply. Another finding found that health education increased adherence to not consuming salty foods (Haryani *et al.*, 2016).

Good knowledge and a positive attitude do not necessarily indicate behavior compliance. It takes time for someone that good behavior can become a habit so that respectful behavior is realized. Another study explained that diet-adherent behavior was the lowest performed by people with hypertension compared to other self-care (Park *et al.*, 2016). It is due to the assumption that hypertension sufferers think this action is difficult and impossible to do (Shim, Heo, & Kim, 2020)

LIMITATION OF THE STUDY

The provision of health education can be used by nurses, especially holders of non-communicable disease programs, as a health promotion strategy for people with hypertension in the community. This intervention can do in community health centers or hospitals. Strengthening this information requires the support of the hypertension family to achieve optimal adherence so that the goal of controlled blood pressure can achieve. The limitation of this study is that researchers cannot ensure that people with hypertension open and study the videos provided thoroughly. Cannot be sure one hundred percent of participants are actively involved in discussions in WhatsApp groups.

CONCLUSIONS AND SUGGESTIONS

The educational model for the elderly using a combination of direct health education and mobile health effectively increases the knowledge, attitudes, and compliance of hypertensive patients with the DASH diet. It takes the support of families and health workers to achieve optimal DASH dietary adherence.

Acknowledgment

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ETHICAL CONSIDERATIONS

The Health Research Ethics Committee of Dr. M Djamil Hospital Padang approved the research protocol with the number LB.0202/5.7/210/2022. Furthermore, with confidentiality and privacy, the researchers notified eligible participants about their rights to participate voluntarily and withdraw at any time. Patients with hypertension who agreed to participate sign a consent form. All data contained in the questionnaire will be kept confidential.

Conflict of Interest Statement

The authors state that they are unaware of any competing financial interests or personal relationships that could affect the work reported in this paper.

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