

## DASH (Dietary Approaches to Stop Hypertension) Diet Principle-Based Snacks in Affecting Blood Pressure in Elderly

Retno Wahyuningsih<sup>1\*</sup>, Joyeti Darni<sup>2</sup> dan Lalu Khairul Abdi<sup>3</sup>

<sup>1-3</sup> Department of Nutrition, Ministry of Health Polytechnic Mataram

Jln. Praburankasari Dasan Cermen, Sandubaya Mataram City

Tel./Fax. (0370) 631160

<sup>1</sup>Email : [retno\\_ghiana@gmail.com](mailto:retno_ghiana@gmail.com)

### Article Info

#### Article history:

Received July 15th, 2022

Revised August 20th, 2022

Accepted September 25th, 2022

#### Keyword:

Based Snacks; Blood Pressure; DASH Diet; Elderly.

### ABSTRACT

**Background.** Hypertension is a degenerative disease that is the leading cause of death globally. Handling hypertension can be done by giving the DASH diet. In this case, this study provides an interlude to the DASH diet.

**Research Methods.** This study uses a quasi-experiment (pre-test-post-test control group design). The study subjects consisted of two groups: the treatment group with the administration of the DASH diet interlude and the control group.

**Research Result.** Most of the subjects in this study were elderly 70-74 years (33.3%) in the treatment and 75-80 years (50%) in control. The research subjects were primarily female, with 27 elderly (75%). The mean blood pressure in both groups before the intervention was higher than the mean blood pressure after the intervention. The analysis of the two groups' different tests showed no difference in systolic and diastolic blood pressure before the intervention. However, there were differences in systolic and diastolic blood pressure after the intervention. Furthermore, giving a DASH diet interlude affected Systolic blood pressure ( $p=0.000$ ) and Diastolic blood pressure ( $p=0.034$ ) after the DASH diet snack was provided.

**Conclusion.** There is an effect of giving the DASH diet interlude on blood pressure after giving the DASH diet snack.

### INTRODUCTION

Hypertension is a degenerative disease that is the leading cause of death globally. Hypertension is a condition of increasing a person's blood pressure, where systolic blood pressure is 140 mmHg, and diastolic is 90 mmHg on repeated examinations (Indonesian Hypertension Doctors Association, 2019). The global prevalence of Hypertension is 22% of the total world population, which is estimated by WHO (2019). Southeast Asia is in the third highest position, with a prevalence of 25% of the total population. The incidence of Hypertension also continues to increase every year. It is estimated that by 2025 there will be 1.5 billion people affected by Hypertension, and every year it is estimated that as many as 10.44 million people die from Hypertension and its complications.

The results of Riskesdas in 2018 showed that the prevalence rate of Hypertension based on the measurements in the population aged  $\geq 18$  years was 34.1%, an increase of 8.3% from the figure of 25.8% in the 2013 Riskesdas data. The prevalence of Hypertension in West Nusa Tenggara (NTB) is 27.80%, an increase of 3.5% from Riskesdas 2013, which is 24.3%.

Several controllable factors influence Hypertension, including fiber intake, sodium intake, and physical activity. Lifestyle changes that are relaxed and less physically active can hurt health. Lifestyle changes also bring about changes in one's diet and eating habits. The types of restaurants or restaurants that offer foods that are high in sodium and low in fiber are preferred by the general public. Low fiber consumption is one of the risk factors for high blood pressure (Sulviana, 2008). A diet lacking in fiber which is abundant in

vegetables and fruit, will trigger atherosclerosis and increase the risk of high blood pressure (Khomsan, 2008).

Management of Hypertension can be done by providing pharmacological and non-pharmacological. Pharmacological treatment is by giving drugs, while non-pharmacological methods are lifestyle modification, weight loss, reduced alcohol intake, regular physical activity, reduced sodium intake, and smoking cessation (Smeltzer & Bare, 2002).

Handling hypertension can also be done by giving the DASH diet (Dietary Approaches to Stop Hypertension) (National Heart, Lung, and Blood Institute, 2011). The DASH diet is a diet program that reduces salt intake, cholesterol, and saturated fat intake reduces calorie intake, and increases foods containing fiber and potassium. Based on a study entitled "Dietary Therapy in Hypertension" explains that the DASH diet is effectively applied to patients with Hypertension because the DASH diet can reduce systolic and diastolic blood pressure in patients with Hypertension (Sacks et al., 2010).

So far, hypertension sufferers are only given a low-salt diet but have not paid attention to foods based on the DASH diet. Therefore, this study provides interludes/snacks based on the principles of the DASH diet so that it is expected to help control blood pressure in people with Hypertension.

### RESEARCH METHODS

This study used a quasi-experiment with a pre-test-post-test control group design. The study subjects consisted of two groups: the treatment group with the administration of the DASH diet interlude and the control group. The population in this study was all the elderly at BSLU Mandalika, and the selected sample was the elderly who had Hypertension. In this study, snacks based on the principles of the DASH Diet were given for 14 days. Prior to further analysis testing, the data were tested for normality with the Shapiro-Wilk test, and this is because of the number of samples < 50. Standard distributed data were analyzed by parametric statistical tests with different tests for each group using the Independent sample t-test.

### RESULTS AND DISCUSSION

The subjects of this study used 36 older people who had Hypertension. Of the 36 subjects, they were divided into two groups, namely the treatment group of 18 elderly and the control group of 18 elderly. The characteristics of the subject of study are presented in table 1.

**Table 1. Characteristics of the Subject of Research**

Characteristic	Group				p
	Intervention (n=18)		Control (n=18)		
	n	%	n	%	
Age (yr)					
60-64	2	11,1	2	11,1	0.080 <sup>a</sup>
65-69	5	27,8	1	5,6	
70-74	6	33,3	6	33,3	
75-80	5	27,8	9	50	
Mean ±SD	70.56±5.752		73.72±5.050		
Gender					
Man	4	22,2	5	27,8	0.000 <sup>a</sup>
Woman	14	77,8	13	72,2	

*a = Normality analysis with Saphiro Wilk*

Table 1 shows that most of the subjects in this study were older people aged 70-74 years (33.3%) in the treatment group and 75-80 years (50%) in the control group. Table 1 also shows that the age in the control group is higher than in the treatment group. However, the normality test results showed no age difference between the two groups (p=0.080), meaning that each group had the same age distribution and proportion in achieving the research results.

The subjects in this study were the elderly (elderly) aged 60 years or older with Hypertension. The selection of subjects with elderly criteria was due to an increase in age directly proportional to an increase in blood pressure values (Babatsikou F, 2011). In addition, the risk of Hypertension is more significant in the elderly group due to the following mechanism. In the elderly group, there is a decrease in the elasticity of peripheral blood vessels due to the aging process, which will increase peripheral vascular resistance (Martono, 2010).

With age, the elderly experience several physical changes, including changes in the immune system, namely the body becomes susceptible to allergies and diseases; the digestive system begins to be disturbed, the teeth begin to fall out, and the ability to digest food and absorption begins to be sluggish and less efficient, the

peristaltic movement of the intestine decreases so that you often experience constipation; changes in the metabolic system; decreased nervous system, decreased sensitivity to smell, taste and touch, decreased hearing, vision, and visual memory, slowed reactions, decreased mental function; changes in the respiratory system characterized by decreased elasticity of the lungs which makes breathing difficult so that the feeling of tightness and blood pressure increases; and decreased elasticity and flexibility of joints.

The research subjects were primarily female, namely 27 elderly (75%) and 9 (25%). This is because more older women live in orphanages than men.

Examination of blood pressure in the elderly was carried out before the intervention was given and on the 15th day after the intervention. The characteristics of diastolic systolic blood pressure before and after the intervention are presented in table 2.

**Table 2. Systolic Blood Pressure Characteristics Before Intervention**

Group	Decrease	%	No Decrease	%
Intervention	18	100	0	0
Control	18	100	0	0

Table 2 shows that all subjects experienced a decrease in systolic blood pressure after the intervention. The characteristics of diastolic blood pressure examination after the intervention are presented in table 3 as follows

**Table 3. Diastolic Blood Pressure Characteristics Before Intervention**

Group	Decrease	%	No Decrease	%
Intervention	18	100	0	0
Control	15	83,3	3	16,7

Table 3 shows that all subjects in the treatment group experienced a decrease in diastolic blood pressure after the intervention. While in the control group, it decreased by 3 people (16.7%). The analysis to determine the effect of the DASH diet interlude on blood pressure is presented in table 4.

**Table 4. The Effect of the DASH Diet Interlude on Blood Pressure**

Blood Pressure (mmHg)	Group		P
	Intervention (n=18)	Control (n=18)	
	<i>Mean±SD</i>		
Δ BP Systolic	26,83±8,652	9,78±6,005	0.000 <sup>a</sup>
Δ BP Diastolic	12,56±9,507	6,72±5,869	0.034 <sup>a</sup>

*a = independent sample t-test*

Table 4 shows the results of the effect of the DASH diet interlude on Systolic blood pressure ( $p = 0.000$ ) and Diastolic blood pressure ( $p = 0.034$ ) after the DASH diet. The DASH diet is recommended by the American Heart Association and the National Institutes of Health in the United States to manage blood pressure and protect heart health (Tiong, 2018). The DASH diet follows a heart-healthy diet because it is low in saturated fat, trans fat, and cholesterol and is rich in nutrients that can lower blood pressure, especially potassium, magnesium, calcium, protein, and fiber (National Institutes of Health, 2013).

For patients with Hypertension, recommended sodium intake is less than 100 mmol or 2000 mg/day, equivalent to 5 g (one small teaspoon) of table salt. This can reduce systolic blood pressure (TDS) by 3.7 mmHg and diastolic blood pressure (TDD) by two mmHg. Most nutritionists recommend taking 250–350 mg of magnesium daily from magnesium supplements for adults. Consumption of potassium is good enough to lower blood pressure by consuming potassium in the amount of 4,700 mg/day. The recommended calcium requirement is more than 1000 mg/day (Nurhumairah, 2014). High fiber is essential for people with Hypertension, and dietary fiber can reduce cholesterol levels in the bloodstream to reduce and prevent the risk of cardiovascular disease. Dietary fiber can also reduce the increase in blood glucose and become controlled (Santoso, 2011).

The DASH diet recommends high levels of unsaturated fatty acids (ALTJ), omega six, and omega 3 to lower blood pressure (Kumala, 2014). Adopting the DASH diet can reduce systolic blood pressure by 8-14 mmHg by eating more fruits, vegetables, and low-fat dairy products with less saturated and total fat and rich in potassium and calcium (Muhadi, 2016). ). The DASH Diet program carried out for three months greatly affected changes in the average systolic blood pressure score and diastolic blood pressure. Besides, the

DASH diet program affected changes in perceived severity, self-efficacy, and preventive behavior (Seangpraww, 2019).

The intervention carried out in this study was the application of an interlude in the form of the DASH diet for 14 days, with the distribution of feeding once a day. The results of statistical tests in this study showed that there was an effect of giving the DASH diet interlude on Systolic blood pressure ( $p = 0.000$ ) and Diastolic blood pressure ( $p = 0.034$ ) after the DASH diet.

This is to the results of research on the application of the DASH diet and the GM diet conducted by Astuti et al. (Astuti et al. 2021) in adult hypertensive patients at the North Larangan Health Center. Posbindu in the Larangan area who applied the DASH diet showed a more significant reduction in systolic and diastolic blood pressure than the low-salt (GG) diet. Also supported by the results of a systematic review and meta-analysis of all randomized controlled trials (RCTs) up to 2013 in 2561 participants, which evaluated the effect of the DASH diet on blood pressure, showed that the DASH diet significantly reduced systolic blood pressure by 6.74 mmHg and diastolic blood pressure of 3.54 mmHg. These results reveal the beneficial reducing the effect of the DASH diet on systolic and diastolic blood pressure in adults (Saneei P, 2014).

## CONCLUSIONS

The average blood pressure in both groups before the intervention was higher than the average blood pressure after the intervention. The results showed an effect of DASH diet interlude administration on Systolic blood pressure ( $p = 0.000$ ) and Diastolic blood pressure ( $p = 0.034$ ) after giving DASH diet snacks.

## REFERENCES

- Agus Santoso. SeratPangan (Dietary Fiber) Dan ManfaatnyaBagi Kesehatan. Magistra. 2011;No. 75 Th.(0215–9511):35–40.
- Babatsikou F, Zavitsanou A. Epidemiology OfHypertensiom In The Elderly. Health Science Journal. Vol. 4. 2011
- Kumala M. Peran Diet dalamPencegahan dan TerapiHipertensi. Damianus J Med. 2014;13(1):50–61.
- Kementerian Kesehatan RI. 2018. Laporan Hasil Riset Kesehatan Dasar (Riskesdas) Indonesia tahun 2018. In Riset Kesehatan Dasar 2018 Halaman 182–183.
- Martono H. PenatalaksanaanHipertensi Pada UsiaLanjut. Dalam: Martono H, Pranarka K, editor. Buku Ajar Boedhi-DarmojoGeriatrici (Ilmu Kesehatan UsiaLanjut). Jakarta: BalaiPenerbitFakultasKedokteran Universitas Indonesia; 2009. Hal. 495.
- Muhadi. Analisis JNC 8 :Evidencebased Guideline PenangananPasienHipertensiDewasa. CDK. 2016;43(1):54–9. [11]. Seangpraw K, Autt
- National Institutes of Health. In Brief: Your Guide to Lowering Your Blood Pressure with DASH. NIH Public Access [Internet]. 2015;1–6. Available from:<https://www.nhlbi.nih.gov>
- Nurhumaira NS, Rahayuningsih HM. PengaruhPenerapan Pola Diet Dash (Dietary Approaches To Stop Hypertension) TerhadapTekanan Darah Sistolik Dan Diastolik Pada KelompokLansia Di Kota Semarang. J Nutr Coll. 2014;3(4):554–64.
- Tiong XT, NursaraShahirah A, Pun VC, Wong KY, Fong AYY, Sy RG, et al. The association of the dietary approach to stop Hypertension (DASH) diet with blood pressure, glucose, and lipid profiles in Malaysian and Philippines populations. NutrMetab Cardiovasc Dis. 2018;28(8):856–
- Sansei P, Salehi AA, Esmailzadeh A, Azadbakht L. Influence of Dietary Approaches to Stop Hypertension (DASH) diet on blood pressure: a systematic review and meta-analysis on randomized controlled trials. NutrMetab Cardiovasc Dis. 2014; 24(12):1253–61.
- Seangpraw K, Auttama N, Tonchoy P, Panta P. The effect of the behavior modification program Dietary Approaches to Stop Hypertension (DASH) on reducing the risk of Hypertension among elderly patients in the rural community of Phayao, Thailand. J MultidiscipHealthc. 2019;12:109–18.