

# The Effect of KalDiDASH (DASH Diet Calendar) Usage on Knowledge Level and Diet Adherence Among Hypertension Patients the Kalibagor Village Posbindu

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## ABSTRACT

*Background:* Hypertension is a condition where an individual's systolic blood pressure is 140 mmHg, or higher and diastolic blood pressure is 90 mmHg or higher, occurring in both men and women. One recommended approach to manage hypertension is the DASH (Dietary Approaches to Stop Hypertension) diet. However, in implementing the hypertension diet, patients often lack knowledge about permissible foods and tend to follow the diet only immediately after seeking medical attention, with adherence declining after the first week. *Method:* This study employed a quantitative method with a pre-experimental design using a one-group pretest-posttest approach. The sample consisted of 27 respondents suffering from hypertension at Posbindu Kalibagor Village, selected through the total sampling technique and G\*Power software. Data analysis utilized Paired Sample T-Test with a significance level of 0.05. *Results:* There was a significant difference in the average knowledge level before and after DASH diet health education using the KalDiDASH media, with  $t(26) = -7.772, p = 0.001$ . There was also a significant difference in the average diet adherence level before and after using KalDiDASH, with  $t(26) = -2.993, p = 0.006$ . There was an effect of using KalDiDASH (DASH Diet Calendar) on the knowledge level and diet adherence of hypertension patients at the Kalibagor Village Posbindu, with p-values of 0.001 and 0.006 (less than 0.05), respectively, and a large effect size. *Conclusion:* Using KalDiDASH affects hypertension patients' knowledge level and diet adherence at the Kalibagor Village Posbindu.

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## 1. INTRODUCTION

Hypertension is the main cause of premature death worldwide. The 2018 Riskesdas data shows the prevalence of hypertension according to the results of measurements in residents aged  $\geq 18$  years of 34.1%. This figure has increased from the results in the 2013 Riskesdas, which was 25.8% [1]. Based on BPS data for Central Java Province in 2022 it shows that the prevalence of people in Central Java Province with hypertension is 37.57%. The prevalence of hypertension in women (40.17%) is higher than that of men (34.83%). The prevalence in urban areas is slightly higher (38.11%) than in rural areas (37.01%). The prevalence increases with increasing age. The estimated number of hypertension sufferers aged  $> 15$  years in 2021 is 8,700,512

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people or 30.4% of the entire population aged > 15 years. Hypertension still occupies the largest proportion of all reported NCDs, which is 76.5%, while Diabetes Mellitus is the second highest at 10.7% [2].

One of the ways to treat hypertension is by controlling hypertension risk factors such as obesity, stress, and physical activity and can also be prevented and treated by maintaining a healthy diet, namely a healthy diet and balanced nutrition [3]. The modification of the food intake pattern referred to is following the general guidelines for balanced nutrition as well as in accordance with the *Dietary Approach to Stop Hypertension* (DASH), namely high in vegetables and fruit, high fiber food ingredients, low fat milk, meat and nuts and what is also a concern is energy intake, amount and type of protein, as well as fat and carbohydrate components [4]. Research conducted by Mukti (2019) found that the DASH diet is very helpful in reducing hypertension or high blood pressure in adults. The reduction in blood pressure resulting from the application of the DASH diet can reach 8-14 mmHg [5].

Lack of knowledge in sufferers is caused by not getting a stimulus to an object that can affect the level of knowledge of sufferers. The impact of ignorance on the DASH Hypertension diet causes inappropriate treatment of hypertension resulting in more severe hypertension patients. Research conducted by Lubis (2019) found that there was a significant effect of providing health education on the level of knowledge after health education was carried out with a p-value < 0.000 [6]. Patients with good knowledge have a 6.06 times chance of good diet management compared to patients with poor knowledge [7].

The hypertension diet is carried out by hypertensive patients throughout their lives so that the patient's willingness and compliance to carry out dietary therapy is required. Based on the research results of Agrina *et al* (2011) that 56.7% of hypertensive patients were disobedient in the management of a hypertensive diet [8]. However, in carrying out the hypertension diet, sufferers do not know what food ingredients are allowed to be consumed and they only go on a diet after treatment, after one week they begin to disobey the diet.

Extension media can be divided into several groups, namely print media (leaflets, calendars, posters, booklets, etc.), billboard media, and electronic media such as videos. The counseling media has an important role in carrying out health education activities, one of which is calendar media. Calendar media is media that is rarely used in health education and learning so that it can attract more readers. Giving knowledge is more interesting if it is conveyed with interesting methods and media.

Based on the background above, the authors feel the need for research on the use of KalDiDASH (DASH Diet Calendar) on the level of knowledge and the level of dietary adherence in hypertension sufferers at Posbindu in Kalibagor Village to analyze the extent to which the use of KalDiDASH has an effect on increasing knowledge and the level of dietary adherence in hypertension sufferers.

## 2. RESEARCH METHOD

This research was subjected to an ethical test on February 24 2023 by the Health Research Ethics Commission at the University of Muhammadiyah Purwokerto with the number: KEPK/UMP/80/II/2023 and has gone through the ethical review procedure and is feasible to carry out. The Informed Consentsheet has been included on the researcher's research questionnaire sheet. This type of research uses a pre-experimental design with a one group pretest-posttest approach. This research was conducted in May 2023 at the Kalibagor Village Posbindu. The population in this study were 50 people with hypertension in Posbindu Kalibagor Village. The sample in this study used the total sampling technique and G\*Power software, namely hypertension sufferers in Posbindu Desa Kalibagor totaling 27 respondents with sample inclusion criteria aged 35-65 years and having systolic blood pressure  $\geq 130$  mmHg and diastolic  $\geq 80$  mmHg, and can read and write well. Exclusion criteria were patients who had comorbidities other than hypertension, had decreased hearing and vision abilities.

The instrument used in this study was a respondent characteristic questionnaire including: a knowledge questionnaire about the DASH diet consisting of 15 Multiple Choice Question (MCQ) questions with 3 options/points for answer choices, if the respondent chooses the correct answer he gets a score of 1 and if the respondent chooses the answer option the wrong one gets a score of 0. The lowest score is 0 and the highest score is 15 with the results of the validity of all question items about the respondent's knowledge being valid because the value of  $r_{count} > r_{table}$  and the reliability of the variable shows the Cronbach's *Alpha value* of  $0.758 > 0.60$ , so the items questions in the knowledge variable are declared reliable as data collection tools in research. Then this menu and monitoring sheet is used to determine the respondent's dietary compliance after implementing a diet according to KalDiDASH. The level of dietary adherence of respondents was measured by assessing how far (%) respondents were able to carry out a diet according to the food menu contained in KalDiDASH.

## 3. RESULT AND DISCUSSIONS

### RESULT

#### 3.1. Univariate

##### 3.1.1 Characteristics of respondents

From the research and descriptive analysis that has been done, the characteristics of the respondents are obtained with the following results:

Table 1. Frequency Distribution of Respondent Characteristics (n=27)

Parameter	n	%
<b>Age (years)</b>		
35-59	13	48,1
60-74	14	51,9
75-90	-	-
> 90	-	-
<b>Gender</b>		
Man	8	29,6
Woman	19	70,4
<b>Work</b>		
Doesn't work	9	33,3
Farmer	5	18,5
Self-employed	3	11,1
Trader	2	7,4
Other	8	29,6
<b>Level of education</b>		
No School	3	11,1
Primary School	14	51,9
Junior High School	8	29,6
Senior High School	2	7,4

Based on table 1 above, it is known that the majority of respondents aged 60-74 years were 14 (51.9%) with the majority being female, namely 19 (70.4%). Most of the respondents did not work, namely as many as 9 (33.3%) with the educational level of the majority of respondents having elementary school education (SD), namely 14 (51.9%) respondents.

Table 2. Frequency Distribution of Respondent Characteristics Based on Anthropometry (n=27)

Variable	n	%	<i>M±SD</i>	Min-Max
<b>Height (cm)</b>				
149-153	7	25,9	158,56±7,495	149-171
154-158	9	33,3		
159-163	3	11,1		
164-168	5	18,5		
169-173	3	11,1		
<b>Weight (kg)</b>				
55-64	23	85,2	60,85±5,059	55-76
65-74	3	11,1		
75-84	1	3,7		
<b>IMT</b>				
Normal	15	55,6		
Overweight	12	44,4		

Variable	n	%	<i>M±SD</i>	Min-Max
<b>LILA</b>				
Man				
Normal	4	14,8		
Abnormal	11	40,7		
Woman				
Normal	4	14,8		
Abnormal	8	29,6		
<b>Physical</b>				

<b>Activity</b>	14	51,9
Light	8	29,6
Currently	5	18,5
Heavy		

Based on table 2. it shows that most of the respondents have a height of 154-158 cm which is 33.3%, with a body weight of 55-64 kg 85.2%. BMI calculation results show that most of the respondents have BMI in the normal category, which is 55.6%. Respondents who had abnormal LILA were 40.7% male and 29.6% female. Light physical activity was mostly carried out by research respondents compared to other levels of physical activity, namely 51.9%.

Table 3. Frequency Distribution of Respondents' Energy Needs (n=27)

<b>Gender</b>	<b>M±SD</b>	<b>Min-Max</b>
Man	1841,5±259,3	1.497,8-2.217,75
Woman	1581,9±165,4	1.399,08-1.981,65

Based on the table above, the results of measuring energy requirements (kcal) for male respondents were  $1841.5 \pm 259.3$  kcal and for women  $1581.9 \pm 165.4$  kcal.

Table 4. Frequency Distribution of Respondents' Knowledge Before and After Giving KalDiDASH(n=27)

<b>Variable</b>	<b>Pre</b>		<b>Post</b>	
	<b>M±SD</b>	<b>Min-Maks.</b>	<b>M±SD</b>	<b>Min-Maks.</b>
Knowledge	5,96±2,121	2-10	8,78±1,553	6-11

Based on the results of the study it was known that the respondents' knowledge had increased with an average before counseling, namely  $5.96 \pm 2.121$  and after counseling, namely  $8.78 \pm 1.553$ .

Table 1. Average Diet Compliance of Respondents Before and After Using KalDiDASH (n=27)

<b>Variabel</b>	<b>Pre</b>		<b>Post</b>	
	<b>M±SD</b>	<b>Min-Maks.</b>	<b>M±SD</b>	<b>Min-Maks.</b>
Dietary Adherence	46,56±6,767	33-63	49,85±6,509	38-65

Based on table 5. shows that the respondents' dietary adherence has increased with an average in the 1st week (pre) which is  $46.56 \pm 6.767$  and the 2nd week (post) which is  $49.85 \pm 6.509$ .

Table 6. Differences in Average Level of Knowledge and Compliance with the DASH Diet in Hypertension Patients at Posbindu in Kalibagor Village (n=27)

<b>Variable</b>	<b>Difference</b>		<b>t (df)</b>	<b>p</b>	<b>r</b>
	<b>M</b>	<b>SD</b>			
Knowledge	-2,815	1,882	-7,772 (26)	<0,001	0,84
Dietary Adherence	-3,296	5,723	-2,993 (26)	0,006	0,51

Based on table 6 above, it shows that there is a significant difference in the average level of knowledge before and after the DASH diet health education with KalDiDASH media at Posbindu Kalibagor Village,  $t(26) = -7.772$ ,  $p < 0.001$ . There was a significant difference in the average level of dietary compliance before and after using KalDiDASH at Posbindu in Kalibagor Village,  $t(26) = -2.993$ ,  $p = 0.006$ .

### 3.2. Bivariat

The effect of using KalDiDASH on the level of knowledge and adherence to the DASH diet in hypertensive patients at Posbindu in Kalibagor Village The effect of using KalDiDASH on the level of knowledge and adherence to the DASH diet in hypertensive patients at Posbindu in Kalibagor Village is calculated using the formula:

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

Where  $r$  = effect size,  $t$  = calculated value of the  $t$  statistic, and  $df$  = degree of freedom. The calculation results obtained  $r = 0.84$  and  $r = 0.51$  for knowledge and dietary adherence respectively. According to Cohen (1988, 1992)  $r = 0.10$  (small effect),  $r = 0.30$  (medium effect), and  $r = 0.50$  (large effect). Health education about the DASH diet with KalDiDASH has a major effect on the level of knowledge. The use of KalDiDASH has a major effect on dietary adherence of hypertension sufferers at Posbindu in Kalibagor Village.

## DISCUSSIONS

### 1. Respondent characteristics

The results of research on the age of respondents found that some respondents were aged 60-74 years, namely 51.9%. Riskesdas in 2018, the highest disease suffered by seniors aged 55-64 67 years old is hypertensive with a prevalence of 55.2%. This is in line with the opinion of Amanda and Martini (2018) who explain that age >59 years is a risk factor for hypertension. As you get older, blood pressure will also increase. Arterial walls thicken due to the buildup of collagen in the muscle layer, causing narrowing and hardening of the blood vessels (Amanda and Martini, 2018).

From the results of research on the characteristics of respondents based on gender, it was found that the majority of respondents were female, 70.4%. Based on research by Azhari (2020), female respondents have a 2.7 times chance of developing hypertension compared to male respondents.

Based on the research results, it was found that 33.3% of respondents did not work. Based on the research results of Anggara and Prayitno (2012), work influences a person's physical activity. Someone who does not work has the possibility of developing hypertension due to lack of physical activity or light physical activity. People who don't work don't do much activity, which can increase the incidence of hypertension.

Based on data from the research, the results showed that the respondent's education level was dominated by elementary school (SD) education, namely 51.9%. According to Budiman and Riyanto (2013) education is one of the factors that can influence individuals in the learning process. The higher the individual's level of education, the easier it is for the individual to receive various kinds of new information and knowledge.

Based on the research results, it can be seen that there is a decrease in blood pressure, both systolic and diastolic, before and after using KalDiDASH. This research is in line with research by Mahdiaty et al (2021) and Mulya (2019). According to research by Mahdiaty et al (2021), the use of a functional calendar can effectively reduce blood pressure in hypertensive patients. The results of Mulya's research (2019) showed that the average blood pressure in the control group was systolic blood pressure of 143.12 mmHg, diastolic blood pressure of 87.56 mmHg, while in the treatment group before being given education using leaflets the systole was 152.24 mmHg, diastole was 92, 28 mmHg and after being given education using leaflets the systole was 127.56 mmHg and the diastole was 82.80 mmHg.

Based on the results of research that has been carried out, anthropometric images are obtained which are assessed based on height, weight, BMI, LILA, physical activity and energy needs (kcal), the majority of respondents have a height of 154-158 cm (33.3%), with Most respondents' body weight was in the range of 55-64 kg (85.2%). Based on research by Asaleo (2017), there is a significant relationship, sufficient correlation, and a positive relationship between body height and systolic blood pressure, while body height and diastolic blood pressure have a significant relationship, low correlation, and a positive relationship.

In this study, the BMI anthropometric index showed that the majority of respondents were in the normal category, namely 55.6%, but quite a few were overweight, 44.4%. Someone who is obese or overweight will need more blood to work to supply food and oxygen to body tissues. This will cause the volume of blood circulating through the blood vessels to increase, the heart's work will increase and this will cause blood pressure to also increase (Tiara, 2020).

In measuring LILA, the results showed that 70.4% of respondents had LILA that was not normal with the majority of physical activity carried out by respondents being in the light category, 51.9%. The results of this study are in line with research by Amila et al (2020) which states that there is a moderate and positive relationship between nutritional status (upper arm circumference) and increased blood pressure in respondents.

Based on the research results, the majority of physical activity carried out by respondents was in the light category, 51.9%. The results of this study are in line with research by Maskanah et al (2019) which states that there is a relationship between physical activity and blood pressure in people with hypertension.

Based on the Harris-Benedict formula calculation, it shows that men's energy needs (kcal) are in the range 1,497.8-2,217.75 kcal and women's 1,399.08-1,981.65 kcal. Based on the DASH diet requirements, namely energy requirements according to age and body activity, if you want to lose weight, consume fewer calories than the energy burned or by increasing physical activity. The energy value range in KalDiDASH is 1,487.7-1,818.4 kcal. Of the 27 respondents, it was found that 22.2% of respondents had energy needs above normal (not in accordance with the amount of energy requirements contained in KalDiDASH) and 77.8% of respondents had normal energy requirements (in accordance with the amount of energy requirements contained in KalDiDASH),

So KalDiDASH can be recommended or used as a DASH diet guide because the energy range provided is between 1,487.7-1,818.4 kcal and 77.8% of research respondents are in that range.

## 2. Respondents' level of knowledge in the pretest and posttest

Based on the research results, it was found that the respondents' knowledge had increased from the good category, which was initially 29.6% to 77.8%. This shows that providing health education can increase respondents' knowledge with a large effect size (0.84).

This research is in line with research by Mazarina& Sari (2021) which shows the results that almost all elderly patients (70%) have knowledge in the good category in health education for managing hypertension diet after counseling. Knowledge is a very important domain in determining behavior.

The use of the KalDiDASH calendar media can influence increasing knowledge of hypertension diet in line with research conducted by Bar (2021) which used KALPIN media (smart calendar) to increase knowledge about diet and food intake for Diabetes Mellitus sufferers, the results show that there is a significant difference between the group averages. respondents who use smart calendars and those who do not use smart calendars.

## 3. Level of DASH diet compliance of respondents before (pre) and after (post) given KalDiDASH

Based on the research results, it was found that the picture respondents' dietary compliance before (pre) being given KalDiDASH had mean 46.56 with the highest score being 63% and after (post) given KalDiDASH has a mean of 49.85 with the highest score being 65%.

This matter shows that the respondent's diet compliance is good. More than 50% running diet. From not knowing about the DASH diet to being able to do so with a mean post knowledge of 8.78. as knowledge increases, mindset increases, it is hoped Respondents' awareness and behavior also increased. After behavior changes, it will affect efforts to diet well. In KalDiDASH there is also an internal monitoring sheet go on a diet. Where on the monitoring sheet there is diet monitoring every day and every menu, so this will make it easier for respondents to stick to the diet.

## 4. The effect of using KalDiDASH on the level of knowledge and dietary compliance in hypertension sufferers at PosbinduKalibagor Village

The results of this study showed that there was an increase in knowledge and dietary compliance among respondents after being given the intervention. So it can be concluded that providing intervention using KalDiDASH media can increase knowledge and dietary compliance in hypertension sufferers at PosbinduKalibagor Village. Based on the effect size calculation, it shows that KalDiDASH media also has a large influence on respondents' knowledge and dietary compliance.

Based on research conducted by Briawan&Rifsyina (2015), in their research, it is stated that the better the knowledge, the better the diet behavior. Based on research conducted by Yuliana (2014) regarding the influence of providing DASH (Dietary Approach to Stop Hypertension) Hypertension Diet Health Education on Increasing the Knowledge and Attitudes of Hypertension Sufferers in the working area of the Rakit 2 Community Health Center, which shows that there is an influence with a value of 0.0001.

Based on research by Siregar et al (2021) which uses calendar media as a health education medium, it shows that the average score of respondents who use calendars is 11.97 higher than respondents who use leaflets and posters. Based on the research results, it can be seen that there was a decrease in blood pressure, both systolic and diastolic, before and after the respondents implemented a diet according to KalDiDASH. Knowledge and dietary compliance influence pressure changes 84 blood in respondents. Based on research by Putri et al (2023), it is stated that there is a relationship between diet compliance and changes in blood pressure in hypertensive patients at the Jambon Community Health Center, Ponorogo Regency. From the Pearson Correlation results, the result was 0.000, indicating that there was a positive relationship, so that the more adherent to the diet, the blood pressure was within normal limits in hypertensive patients.

## 4. CONCLUSION AND RECOMMENDATION

### A. CONCLUSION

There was a significant difference in the average level of knowledge before and after DASH diet health education with KalDiDASH media at Posbindu Kalibagor Village,  $t(26) = -7.772$ ,  $p < 0.001$ . There was a significant difference in the average level of dietary compliance before and after using KalDiDASH at Posbindu Kalibagor Village,  $t(26) = -2.993$ ,  $p = 0.006$ .

There is an effect of using KalDiDASH (DASH Diet Calendar) on the level of knowledge and level of dietary compliance in hypertension sufferers at Posbindu Kalibagor Village with a p-value  $< 0.001$  and  $0.006 (< 0.05)$  with a large effect size.

### B. RECOMMENDATION

It is hoped that it can become a reference for conducting research with the same theme by adding control groups and counts more respondents. Then you can choose the type of diet menu changed

according to the respondent's abilities. For measurement anthropometry, energy needs (kcal), and dietary compliance of respondents recommended before and after intervention.

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