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Potential of Family-Based Diet Management Programs to Behavior of Diet Hypertension Patients in Four Areas of Community Health Centers Cibeureum Working Areas in Tasikmalaya City, Indonesia

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Abstract—Objectives: **The purpose of this study was to examine the potential of Family-Based Dietary Management Program For People with Hypertension Diet Behavior. Method: The research method used was quasi experiment, the design used was pre-test and post-test with control group design. The sampling technique uses cluster random sampling with the total number of samples is 88 people, the grouping of samples is done randomly. The interventions provided were education, goal setting and POA carried out for three weeks, carried out twice home visits, and follow-up. Data analysis uses paired t-test and independent t-test. Results and Discussion: The results showed that there was a significant effect between family-based diet management programs on dietary behavior (on macronutrients) carbohydrate and protein scores (p <0.05). The results of this study indicate that a family-based diet management program is effective against dietary behavior in people with hypertension. Conclusion: Diet management programs can be practiced by community nurses and / or non-communicable disease program holders in implementing and developing family support strategies in an effort to reduce the incidence and / or severity caused by hypertension.**

Keywords: ***hypertension, diet behavior, family-based dietary management program***

I. INTRODUCTION

Hypertension is a non-communicable disease (PTM) which is a chronic health problem in the community (Ministry of Health Republic of Indonesia, 2012); (El-Deeb M.H., Sulaiman K.J., Al-Riyami A.A., Mohsin N., Al-Mukhaini M., 2015); Konner, 2014). Based on WHO predictions in 2025 the prevalence of hypertension throughout the world in adults reaches 29.2% (MOH RI, 2007).

Hypertension is one of ten diseases that cause mortality in Asia (Saha, Sana, and Shana, 2006). Hypertension can cause 70% stroke and 60.5% kidney disease. This phenomenon can be caused by changes in people's lifestyles globally, such as the ease of getting fast food, the low consumption of fresh and fiber-containing vegetables, the high consumption of salt, fat, sugar and calories that continue to increase so that it has a major role in increasing the incidence of hypertension (Sewang & Darmawan, 2014). Lifestyle modification can be done by changing behavior. Research conducted by Campbell in Wang and Abbot (2001) states that behavior has a large impact on health. Diet modification can reduce blood pressure (Appel, L.J, 2003). By going on a diet can reduce blood pressure 8-14 mmHg (Chobanian, 2004), 2003).

Nutrient intake can affect the incidence and severity of hypertension. The DASH diet is a lifestyle modification and is part of a self-management program / self-management program that can reduce blood pressure (Roussell et al., 2014). Diet management programs can utilize existing resources with a family approach strategy. Self-management facilitates patients and family members in the treatment and prevention of complications, collaborating with health workers so that the patient and family independence in managing their health independently (Brennan et al, 2013).

Tasikmalaya City is one of the cities in West Java Province, one of the provinces that has the largest population in Indonesia. Most of the population of West Java are Sundanese, they have eating habits that contain high sodium one of which is salted fish. High sodium intake has a close relationship with the incidence of hypertension. The phenomenon that occurs in the Cibeureum Health Center area is that in general hypertensive patients put more

emphasis on pharmacological efforts compared to non-pharmacological efforts (lifestyle modification).

Patients with hypertension can manage themselves well with management skills needed in managing their illness. Therefore, a family-based self-management program can be a positive factor that can help improve dietary management behavior in hypertensive patients (Aklima, Kritpracha, & Thaniwattananon, 2012).

Government programs in anticipation of hypertension invite people to "SMART" by doing regular health checks, get rid of cigarette smoke and other air pollution, diligent physical activity, healthy diet, adequate rest, and stress control. The improved intervention model is a public health intervention, because the level of public understanding and knowledge about hypertension is still low. Therefore, education should be give in a way that is easily understood and encourages the independence of the community to recognize and be able to prevent hypertension. The manifestation is that they know and are able to apply a healthy lifestyle by carring out clean and healthy life behavior as a culture of daily living (Sulistyowati, 2014).

II. MATERIAL AND METHOD

A. Procedure

(1) Preparation: (a) Manage research permission;(b) Looking for research assistants to assist researchers in collecting data; (c) Coordination with the public health center for conducting research

(2) Implementation Stage : (a) The research was conducted in four urban village Puskesmas Tasikmalaya Cibeureum ; (b) Determine respondents as research subjects ; (c) Identifying

B. Data Analysis

Respondents in this study were divided into two groups, namely the control group and the intervention group. The control group was only observed in the hospital, the implementation of the family-based diet management program was implemented for each respondent included in the intervention group in this study. The control group will get the program at the last meeting after filling in the food record.

III. RESULTS

a. Overview Hypertension Patients Dietary Behaviors

The data dietary behaviors were obtained from food Records is a record of the type and amount of food and beverages in one period, food diary for 3 days. Data were analyzed using Nutrisurvey Software that is a program used to analyze the nutrient content. Food consumed is converted into units of household size. Overview of the dietary behaviors of patients with hypertension are presented in the form of macronutrient and micronutrient.

Table 1 showed mean picture dietary behavior macronutrient in the \ average consumption of carbohydrates in the intervention group was 271.52 SD = 15.23 and the average carbohydrate in the control group was 279.16 SD = 20.61. The average consumption of protein in the intervention group was 59.56 SD = 3.04 and an average protein in the control group was 58.17 SD = 2.93. Average consumption of fat in the treatment group was 69.94 SD = 3.11 and an average protein in the control group was 6155 SD = 3.63.

Average dietary behavior micronutrient in the average consumption of sodium in the intervention group was 580.83 SD = 581.11 and the intervention group was 686.76 SD = 485.90. Average consumption of potassium in the intervention group was 3123.60 SD = 3474.15 and in the intervention group was 3355.30 SD = 2212.22.

TABLE 1. Overview Dietary Behaviors in macronutrient and micronutrient hypertension patients Intervention Group (n = 44) and control group (n = 44) in Four Village the working area of Community Health Centers Cibeureum Tasikmalaya City

Variabel	Treatment (n=44)		Compare (n=44)	
	Min-Max	Mean (SD)	Min-Max	Mean (SD)
Macronutrient				
Carbohydrate	128,90 - 549,37	271,52 (15,23)	77,70 - 893,50	77,70 - 893,50
Protein	21,57 - 117,27	59,56 (3,04)	26,50 - 113,50	26,50 - 113,50
Fat	24,23 - 110,57	69,94 (3,11)	28,67 - 121,60	28,67- 121,60
Micronutrient				
Sodium/natrium	14,13 - 3502,77	580,83 (581,11)	44,83 - 2161,67	44,83 - 2161,67
Potasium	376,03 - 2091,60	3123,60 (3474,15)	611,10 - 9243,70	611,10 - 9243,70

b. Bivariat Analysis

1. The Difference mean Dietary Behaviors Patients with Hypertension Pre-test and post-test Interventions Intervention group

Table 2 that the mean before-test and after-test dietary management programs based on the family in the intervention group obtained from macronutrients and micronutrients, score carbohydrates that have an influence on blood pressure reduction

TABLE 2: The Difference average of dietary behaviors hypertension at treatment group before-test and after- test dietary management program based on family

Variabel	Before-test		After-test		Paired t-test	*P*
	Mean	Deviation standar	Mean	Deviation standar		
Macronutrient						
Carbohydrate	271,52	101,05	310,62	42,72	-2,43	0,02
Protein	59,55	20,15	63,37	11,57	-1.09	0,28
Fat	64,94	20,62	62,06	13,32	0,75	0,46
Micronutrient						
Sodium/natrium	580,83	581,11	599,44	431,36	-0,21	0,84
Potasium	3123,60	3474,15	2770, 61	963,49	0,68	0,50

2. Difference Average Dietary Behaviors patients with High Blood Pressure before-test and after-test in compare group

   Table 3 above shows that the average dietary behavior seen from the macronutrient and micronutrient scores states that of the five scores showing p-values < 0.05 are protein and carbohydrates.

   This shows that dietary behavior (protein and carbohydrate consumption) influences the intervention between the treatment group and the comparison group.

TABLE 3. The difference means Dietary Behaviors patients with hypertension before-test and after-test in compare group dietary behaviors management programs based on family

Variabel	Before-test		After-test		Paired t-test	*P*
	Mean	Deviation standar	Mean	Deviation standar		
Macronutrient						
Carbohydrate	310,62	42,72	263,10	70,91	3,80	0,00
Protein	63,36	11,52	57,22	12,29	2,41	0,01
Fat	62,05	13,32	62,46	17,67	0,067	0,90
Micronutrient						
Sodium/natrium	599,44	431,36	702,93	459,15	0,58	0,28
Potasium	2770,61	963,49	3307,41	1814,75	0,00	0,08

3. The Difference Averages Dietary Behaviors Patients with Hypertension before-test and after- test Intervention.

   Table 4 above data showed that the average dietary behavior seen from the scores of macronutrients and micronutrients stated that from the fifth score p-value> 0.05. This shows that there is no influence on dietary behavior before the intervention either the treatment group or the compare group.

TABLE 4. The Difference average dietary behaviors pre-test between intervention group and control group inpatient with hypertension.

Variabel	Before-test		After-test		Paired t-test	*P*
	Mean	Deviation standar	Mean	Deviation standar		
Macronutrient						
Carbohydrate	279,15	136,71	263,10	70,91	0,93	0,35
Protein	58,17	19,41	57,22	12,29	0,32	0,75
Fat	61,54	24,05	62,46	17,67	-0,26	0,79
Micronutrient						
Sodium/natrium	686,76	485,90	702,93	459,15	-0,20	0,84
Potasium	3355,30	2212,22	3307,41	1814,75	0,28	0,77

4. The difference average before-test dietary behavior of hypertension between intervention groups and control group.
   Table 5 data showed that the average dietary behavior seen from the scores of macronutrients and micronutrients stated that of the five scores, which showed p-value <0.05 are proteins and carbohydrates. This indicates that the dietary behavior (consumption of protein and carbohydrates) have an influence after treatment between the treatment and compare groups.

TABLE 5. The difference average post-test dietary behavior of hypertension between treatment groups and compare group in patients with hypertension

Variabel	Before-test		After-test		Paired t-test	*P*
	Mean	Deviation standar	Mean	Deviation standar		
Macronutrient						
Carbohydrate	271,52	101,05	279,15	135,71	0,62	0,77
Protein	59,55	20,15	58,17	19,41	0,87	0,74
Fat	64,94	20,61	61,54	24,05	0,38	048
Micronutrient						
Sodium/natrium	580,83	581,11	686,76	485,90	0,90	0,36
Potasium	3123,60	3474,15	3355,30	2212,22	0,62	0,71

IV. DISCUSSION

The Effect Of Dietary Management Program based On The Family to Dietary Behavior To Hypertension patients.

The results showed different test average dietary behavior in the intervention group and controls group, before and after interventions dietary management program based on the family result are significant difference in the scores of macronutrients (carbohydrates and proteins), meaning that there was influence dietary management program based on the family to dietary behaviors to patients with hypertension than with scores micronutrients (Sodium, Potassium):

1. The effect of carbohydrate
   The Effect carbohydrates on blood pressure caused by the effects of the components of carbohydrate, sucrose, and fructose to hypertension. Research conducted by Jalal et al (2010) states that individuals with no history of hypertension to consume fructose> 74 g / day are derived from sugar-sweetened drinks had a 30% increased risk of blood> 14/90 mmHg.
   Dietary fructose can be obtained from sweet drinks, bread/bakery, fruit drinks, candy, and sweet cakes. Fructose effect is caused by several factors: an increase in the sympathetic system, lowering sodium excretion in the urine, increase sodium absorption in the gastrointestinal tract, and the uric acid that can reduce product nitric intrinsic oxide vasodilator (Jalal et al, 2010).
2. The Effect of Protein
   Foods containing vegetable protein do not affect increasing blood pressure. Foods containing vegetable protein do not affect increasing blood pressure. Research conducted by Wang et al (2008) states that high protein intake, especially in vegetable protein can lower blood pressure significantly, whereas the intake of animal protein or total protein does not get significant results. High intake of protein can increase plasma concentrations of amino acids that can stimulate the excretion of sodium in the kidneys, which can lower blood pressure.
   Another mechanism is due to the amino acid content which includes cysteine, glutamate, glutathione, arginine, leucine, taurine, and Tifton from proteins that have antihypertensive effects. The effect of these amino acids in lowering blood pressure by improving insulin resistance and glucose metabolism. This situation can reduce Advanced Glycation End Product (AGE), reduce oxidative stress, reduce vascular intracellular calcium, increase nitric oxide (NO) production which will improve endothelial function and reduce peripheral vascular pressure resulting in decreased blood pressure (Vasdev & Astuckless, 2010).
3. The Effect of Fat
   Based on the research that fat doesn't affect the blood pressure of p = 0.90. The effect of fat intake on blood pressure is controversial (Appel, L.J, 2006). The fatty acid component which are components of fat has different effects on blood pressure. Research conducted by Rasmussen, B.M (2006) who showed that dietary monounsaturated fatty acids (ALTJ-T) can lower blood pressure in healthy individuals, whereas diets high in saturated fatty acids (ALJ) makes no changes in blood pressure. but the role of unsaturated fatty acids will be lost if fat intake is more than 37% of total fat.

4. The Effect Sodium

A source of sodium that affects increasing blood pressure is excessive salt consumption. Sodium is needed by the body as a body balancer, connecting to nerve impulses and the process of relaxation. The part of the body that acts as a counterweight to sodium in the body is the kidneys. if the sodium level decreases, the kidneys will restrain spending. And when the high sodium levels, the kidneys remove it through the urine. If in particular circumstances the kidneys can not excrete sodium, sodium settles in the blood. sodium attracts and retains water, causing an increase in blood volume.

when there is an increase in blood volume, the heart will pump blood faster to drain blood. Excess sodium intake causes the concentration of sodium in the extracellular fluid to increase. To normalize again, extracellular fluid is pulled out, so the extracellular fluid volume increases. The increased volume of fluid causes increased blood volume so it can cause hypertension (Martuti, 2009).

The research results p = 0.28 shows that sodium consumption does not affect hypertension. This is caused by other factors that affect it such as age, genetics, smoking habits, and lack of sports activities. Research conducted by Maria, Puspita, and Sulistyowati (2012) states there is no significant relationship between sodium consumption and increased blood pressure (p = 0.65).

5. Effect of Potassium

Small intestine easily absorbs food containing potassium is absorbed easily in the small intestine. As much as 80-90% of the potassium eaten is excreted through the urine, the rest is removed through the stool and very little is released through sweat and stomach. Potassium is expelled in the form of ions replacing sodium ions through a mechanism of exchange within the kidneys (Almatsier, 2009). The amount of potassium recommended for consumption per day is 50-100 m Eq or between 3.7-7.4 grams (Winarno, 2004).

Excessive consumption of potassium can reduce blood pressure. The recommended consumption of potassium is 4.7 grams/day can be obtained from fruits and vegetables. (Jhondri, 2010).

The results of statistical tests show that p = 0.80 means that there was no effect between family-based diet management on dietary behavior (micronutrients potassium) hypertensive patients. Research conducted by Maria, Puspita, and Sulistyowati, 2012) states there is no significant relationship between potassium consumption with an increase in blood pressure (p = 0.47). This is due to the small number of vegetables consumed and the fruits of potassium sources.

Implementation of Self Management Process.

Good self-management can change individual health behaviors (Bodenhemer et al, 2002; Fan & Sidani, 2009). The process of self-management is used in this study developed by Kander & Gaelic-Buys. Self-management consists of three continuous stages: self-monitoring, self- evaluation, and self-reinforcement carried out by individuals with support from the family. (Kanfer et al 1991).

Self-monitoring is individuals reflecting on their behavior. Individuals are asked to identify the diet behavior they have done. Self-evaluation is done by educating and asking respondents to compare their current behavior to one of the expected targets. Educational sessions on blood pressure and dietary behavior. Educational sessions were conducted to increase respondents' knowledge about hypertension and dietary behavior for people with hypertension. counseling sessions are very effective in increasing knowledge and changing lifestyles (Drevenhorn et al, 2001 in Connel, Wolfe & McKevitt, 2008).

After the health education session was completed, respondents were given modules on hypertension and diet management. The language used is simple so that it is easily understood by respondents. The module is one of the effective media to remember at a health education session. (Melchior, charter, Helsey, Ernest & Friesner, 2010).

Self-reinforcement is setting goals and weekly plans that are carried out. Goals and action plans are very effective in changing dietary behavior of respondents. Individuals who are setting clear goals tend to be more focused on activities geared (Brown, Bartholomew, and Naik, 2007). Setting goals is notified to the respondent. This is done so that the respondent does not come out of the plan that was made. if they have obstacles in charging, they are allowed to ask the researcher or assistant to explain again.

Implementation of Family-Based Diet Management

The success of the dietary management program will be much better, when families participate (Watanabe et al, 2010). Family members involved will provide full support for people with hypertension. Research conducted by Teufel-Shone, Drummond & Rawiel (2005) the families involved can produce knowledge and positive behavior for people with hypertension. Families and clients with hypertension who have healthy behaviors are the goals of the diet self-management program. Familiarize the involvement of family members in education and counseling activities with changes in dietary behavior as a key (Eisenmann, gentile, Welk, Callahan, Strickland & Walsh et al, 2008).

V. CONCLUSION

There were differences in mean before-test and after-test dietary behavior in the treatment group that received a family-based diet management program on macronutrients

(carbohydrates). There was no difference in mean pre-test and post-test of dietary behavior in the compare group getting routine care from community health centers. There was no difference in mean pre-test dietary behavior in the intervention group receiving a family-based diet management program with a control group receiving routine care from a community health center. here was a noticeable difference in post-test dietary behavior in the treatment group that received a family-based diet management program with a control group that received routine care from a health center on protein, carbohydrate scores.

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