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Food consumption pattern for hypertension patient in Klaten Regency, Central Java Province, Indonesia

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ABSTRACT

Hypertension, commonly known as high blood pressure, is a grave medical condition that serves as a catalyst for the onset of various other ailments, each bearing significant consequences that may ultimately lead to fatality. Unhealthy eating habits, such as consuming foods heavy in sugar, sodium, or saturated fat, are the primary cause of elevated incidences of hypertension. This research aimed to determine the relationship between food consumption patterns in hypertensive patients. This study used a cross-sectional study design conducted on outpatients at the Prambanan Health Center, Prambanan District, Klaten Regency, from December 2022 to February 2023. The population used in this study were all patients with hypertension in Klaten Regency, which amounted to 2,884 people from January until December 2021. The research sample was taken randomly with a value α of 5%. Based on the sample calculation, the sample size was 339 hypertension sufferers. Data analysis used in this study was univariate and bivariate analysis using the chi-square test with a degree of confidence of 95%. The results of this study indicate that the level of salt, fiber, and fat consumption is not related to sufferer hypertension. Maintaining a nutritious diet and engaging in physical activity as part of a healthy lifestyle may also help lower blood pressure. This study supports the hypothesis that dietary variety might be important for the future. Future research endeavors ought to delve into the intricate relationship between dietary practices and blood pressure across diverse cultural contexts, elucidating how variations in dietary habits influence blood pressure levels. Furthermore, it is imperative to investigate the potential repercussions of elevated blood pressure on various cultural groups, shedding light on tits unique impacts ondifferent societal frameworks.

1. Introduction

Hypertension is a noncommunicable disease and can be prevented by changing lifestyles. However, hypertension is often the trigger for the emergence of diseases with a serious impact on individuals. Hypertension can cause heart disease, stroke, kidney disease, eye damage, diabetes, gout and dementia [1–7]. Globally, sufferer's hypertension is estimated at 1 billion and on increasing every year. Of these, two-thirds are found in the country growing, including Indonesia [1]. Riset Kesehatan Dasar (Riskesdas) 2018 showed the highest prevalence of blood pressure in Indonesia was 34.11%, with the proportion of hypertension sufferers being female (36.85%) [8]. Meanwhile, the

prevalence of hypertensionin urban areas it was slightly higher (34.43%) than in rural areas (33.72%). The prevalence of hypertension in Klaten Regency, Central Java was 32.38% and makes Klaten Regency ranked 21st for the prevalence rate of hypertension, compared to other districts in Central Java [9].

The main trigger factor for high cases of hypertension is unhealthy eating patterns, such as foods that contain high sodium, foods that are high in sugar, and foods that are high in saturated fat. Consuming foods that contain excess sodium can increase plasma volume or body fluids and blood pressure [10,11]. Several previous studies have also revealed that salty food consumption has a significant relationship with the incidence of hypertension in a person. Likewise, foods that are high in sugar content are also directly related to the incidence of hypertension [12–14]. Saturated fats and foods that contain high cholesterol will increase a person's high risk of developing hypertension [14,15]. In addition, groups of people who don't like to exercise, tend to get stressed easily, like to smoke, and don't get used to eating lots of vegetables and fruit increase the risk of developing hypertension [16,17].

Interest factors to prevent the occurrence of hypertension are to consume foods that contain lots of magnesium, potassium, calcium, and high fiber, such as fresh foods (for example fruits , and vegetables) [18]. Diet food on sufferer hypertension done for prevent morbidity and mortality Which caused by hypertension by keeping blood pressure within the normal range (below 140/90 mm Hg) [19]. However, most people did not have the awareness to change this unhealthy lifestyle [20]. This research aims to determine the relationship between food consumption patterns in people with hypertension. This is because, a healthy food diet every day can be used to reduce and maintain blood pressure stability for people with hypertension.

2. Method

This study used a cross-sectional study design, which was conducted on outpatients at the Prambanan Health Center, Prambanan District, Klaten Regency from December 2022 to February 2023. The population used in this study were all patients with hypertension in Klaten Regency which amounted to 2,884 people in the month January until December 2021. The research sample was taken randomly with a value α of 5%, the sample size was 339 hypertension sufferers.

Independent variable was measured using the instrument food frequency questionnaire, to measure salt consumption, fiber consumption and fat consumption. The variable measurement of salt consumption is used to observe the intake of foods containing salt in hypertensive patients in a day (such as chips, french fries, packaged foods, junk food). Salt consumption is categorized into normal (salt consumption per day of $\leq$ 5 grams) and high (salt consumption per day > 5 grams). Fiber consumption, used to measure the high fiber content in vegetables and fruit consumed by patients in a day. Fiber consumption categories were classified into two, namely normal (female patients > 20 grams; and male patients > 22 grams) and less (if female, fiber consumption < 20 grams; if patient was male, consumption of fiber < 22 grams). For the fat consumption variable, it is used to measure consumption intake of animal and vegetable fats. This fat consumption variable is categorized into two, namely normal (if fat consumption is 67 grams or 5 tablespoons per day) and high (if fat consumption is > 67 grams or > 5 tablespoons per day).

While the dependent variable in this study is hypertension. Hypertension data were obtained from blood pressure checks on outpatients, then the status of hypertensive patients was carried out after being checked for hypertension by doctors at the Prambanan Health Center, Klaten Regency, Central Java. Blood pressure categories are classified into two, namely hypertension (if

systolic blood pressure is ≥ 130mmHg or diastolic is ≥ 80mmHg) and non-hypertension (if systolic blood pressure is 120-129mmHg or diastolic is < 80mmHg).

Data analysis used in this study is univariate and bivariate analysis. Univariate analysis was used to present the percentage of the research variables. While bivariate analysis is used to see the relationship between variables, using the chi square test with a degree of confidence of 95%. This research has received approval from the Universitas Ahmad Dahlan ethical committee team with number 012211182. Informed consent was obtained from each individual before data collection was carried out. Participation is voluntary.

3. Results and Discussion

3.1. Results

A total of 339 respondents were interviewed in this study. Of the hypertension sufferers, there were 71.50% male and 64.60% female. Of all the hypertension sufferers who had a lean body mass index of 63.00%, normal as much as 68.20% and the remaining 68.40% fat. In detail the characteristics of the respondents are described in Table 1.

Table 1. Characteristics Respondents Sufferer Hypertension Public Health Center Prambanan Regency Klaten (N = 230)

Characteristics		Hypertension			
		Yes		*No*	
		n	***%***	***n***	***%***
Gender	Man	113	71.50	45	28.50
	Woman	117	64.60	64	35.40
Age	< 55 year	46	63.90	26	36.10
	56-65 year	116	68.20	54	31.80
	> 65 year	68	70.10	29	29.90
Education Level	No	22	71.00	9	29.00
	Elementary school	63	70.00	27	30.00
	Junior high school	34	54.80	28	45.20
	Senior High School	80	69.00	36	31.00
	University	31	77.50	9	22.50
Work	Traders/Entrepreneurs/Entrepreneurs	71	68.30	33	31.70
	Laborer/Worker Factory/Employee Private	37	68.50	17	31.50
	Farmer	36	60.0 0	24	40.00
	Government Employee/Teacher/Lecturer	20	90.90	2	9.10
	Mother House Ladder and No Work	66	66.70	33	33.30
History Disease	There is History	230	100.0	0	0.00
	No There is history	0	0.0 0	109	100.00
BMI	Underweight	17	63.0 0	10	37.0 0
	Normal	161	68.20	75	31.80
	Overweight	52	68.40	24	31.60

Meanwhile, the distribution of respondents based on intake, consumption of salt, consumption of fiber, consumption of fat is shown in Table 2. The majority of hypertensive patients consume excess salt, fat and less fiber.

Table 2. Consumption Level Distribution of Hypertension Patients at Prambanan Health Center Regency Klaten (N = 230)

Variable Independent		Hypertension			
		Yes		*No*	
		n	***%***	***n***	***%***
Consumption Salt	Excess	66	64.10	37	35.90
	Normal	164	69.50	72	30.50
Consumption Fiber	Not enough	220	67.70	105	32.30
	Normal	10	71.40	4	28.60
Consumption Fat	Not enough	193	66.60	97	33.40
	Normal	37	75.50	12	24.50
Consumption Energy	Not enough	4	57.10	3	42.90
	Normal	226	68.10	106	31.90
Consumption Proteins	Not enough	118	66.30	60	33.70
	Normal	112	69.60	49	30.40
Consumption Carbohydrate	Not enough	226	68.30	105	31.70
	Normal	4	50.0	4	50.00

Table 3 shows that there was no relationship between salt consumption, fiber consumption, and fat consumption on the incidence of hypertension.

Table 3. Analysis Bivariate Consumption Sufferer Hypertension in Health Center Prambanan Regency Klaten (N=230)

Consumption Sufferer		Odds rasio	95% CI	P-value
Consumption Salt (ref. normal)	Excess	0.783	0.48 – 1.28	0.963
Consumption Fiber (ref. normal)	Not enough	0.838	0.257 – 2.74	0.086
Consumption Fat	Not enough	0.65	0.32 – 1.29	1.542

3.2. Discussion

In case of the sufferer hypertension in the public health center Prambanan Klaten, 164 respondent sufferer hypertension consume salt in prone to normal, whereas 66 other respondents consume salt excessively in daily life per day. Based on statistical tests, it was found that the p-value was on the variable salt consumption of 0.964 which means that the level of salt consumption had no associations with sufferer hypertension. Consumption of salt or the amount of sodium content in food which are consumed daily by the community cannot be used as food reference reason sufferer hypertension. However, the pathophysiological relationship between sodium intake and increased blood pressure values is still being debated until now. High sodium intake and increased blood pressure (BP) levels are linked by changes in vascular resistance, but the mechanism controlling this phenomenon may not be viewed solely as a reflex pressure response aimed at increasing sodium excretion [10].

Excessive salt intake can cause several side effects, leading to microvascular endothelial inflammation, anatomic remodeling, and functional abnormalities, even in normotensive subjects [21]. More recent studies have shown that changes in plasma sodium levels not only have an effect on small-resistance arteries, but can also affect the function and structure of the arteries increasing elasticity [10,22,23]. The issue of salt sensitivity, which refers to an individual's susceptibility to variations in blood pressure following changes in dietary salt intake, has also been recently debated in light of its pathophysiology and clinical implications [24,25].

Consumption of fiber is one thing that must be considered in order body balance in undergoing metabolism [26]. Fiber can be obtained from animals and plants. In this study, fiber consumption was not making it one of the triggers of hypertension sufferers. Several studies also state that it is still unclear whether fiber can lower blood pressure. Directly, dietary fiber reduces the glycemic index of food, thereby weakening the insulin response [27]. Insulant plays a role in regulating blood

pressure [28], and dietary fiber has been shown to increase insulin sensitivity and improve vascular endothelial function [27,29].

Furthermore, fiber is able to increase the absorption of minerals in the digestive system, which may possibly have an indirect effect in lowering blood pressure [30]. However, a study on respondents aged 46 years reported that grain-type fiber showed no effect in reducing blood pressure in hypertensive patients [31]. Therefore, further research to observe the mechanism of fiber types in reducing blood pressure needs to be done in the future.

Consumption fat is wrong one matter which needed by body; however, if excessive will endanger body because precipitate in various parts of the body. The results of this study indicate that fat consumption is not make it one of the triggers of hypertension sufferers. Different types of fat have different effects on blood pressure. Experimental studies in rats found that intake of saturated fatty acids resulted in impaired endothelial function and then increased nerve activity, which had an impact on increasing blood pressure. The results of different studies on polysaturated fatty acid intake can actually reduce blood pressure [32]. Previous research is also in line with the results of this study, which stated that low fat intake was not significantly associated with a decrease in blood pressure [33].

The use of medical health care services for blood pressure measures, which has been demonstrated to share the many benefits of ambulatory monitoring, is a key strength of our study. Measuring blood pressure in public health settings more closely represents the validity and precision of data blood pressure, and hence is more reproducible and capable of predicting hypertensive organ damage. This study was limited by its cross-sectional design and the possibility of recall bias in dietary intake reporting.

4. Conclusion

The results of this study indicate that the level of salt consumption no related with sufferer hypertension. Following a healthy lifestyle that includes exercise in addition to a healthy diet may have further influence on decreasing blood pressure. The decrease of salt in the food supply accounts for the majority of population-level initiatives to lower blood pressure. This study lends credence to the idea that dietary diversification may also have a role. The relationship between food consumption and blood pressure deserves further exploration due to inconsistency in findings in study. Future research should look into the impact of dietary patterns on blood pressure in various cultures that may be influenced by rising blood pressure.

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Author contributions

AEBDN and SS who have designed and drafted this manuscript. Data collecting and analysis were done by SS and AEBDN. LL has been involved in correcting the manuscript. All authors have been read and approve the final manuscript.

Conflict of Interest

Author declares no potential conflict of interest.

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