

RELATIONSHIP BETWEEN NUTRITIONAL STATUS AND HYPERTENSION DEGREE WITH COGNITIVE FUNCTION OF HYPERTENSION PATIENTS

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ABSTRACT

Introduction: Hypertension is a condition where systolic blood pressure is more than 140 mmHg or diastolic pressure is more than 90 mmHg (Ministry of Health of the Republic of Indonesia, 2021). One of the complication is cognitive impairment due to lack of adequate nutrition.

Objectives: this study was conducted to determine the relationship between nutritional status and degree of hypertension with cognitive function in patients with hypertension. **Methods :** the cross-sectional was conducted in this study. Data collection techniques in this study used MMSE questionnaires and blood pressure measurements. Data analysis using Chi Square test. **Results :** The results of this study in the univariate analysis showed that the majority of people had an obese BMI as many as 39 people (63.9%), most of the respondents suffered from grade 1 hypertension as many as 34 people (55.7%), and respondents with normal cognitive function as many as 42 people (68.9%). Meanwhile, the results of bivariate analysis showed hypertension (p value=0.582), while the degree of hypertension variables and cognitive function showed a significant relationship (p value=0.002). **Conclusion:** in this study is that there is no relationship between nutritional status and cognitive function. In addition, there is a significant relationship between the degree of hypertension and cognitive function in hypertensive patients at the Jatiwarna sub-district health center

Keywords: hypertension; nutritional status; cognitive function

ABSTRAK

Pendahuluan: Hipertensi adalah kondisi dimana tekanan darah sistolik lebih dari 120 mmHg atau tekanan darah diastolik lebih dari 90 (Kementerian Kesehatan Republik Indonesia, 2021). Salah satu komplikasi sistem saraf pusat dari tekanan darah tinggi adalah penurunan fungsi kognitif yang disebabkan oleh nutrisi tidak adekuat. **Tujuan :** penelitian ini bertujuan untuk mengetahui hubungan antara status nutrisi dan derajat hipertensi dengan fungsi kognitif. **Metode :** penelitian kuantitatif ini menggunakan pendekatan cross-sectional study. Sampel dalam penelitian berjumlah 61 orang dengan menggunakan metode purposive sampling Teknik pengumpulan data dalam penelitian ini menggunakan angket MMSE dan pengukuran tekanan darah. Analisis data menggunakan uji Chi Square. **Hasil :** Hasil penelitian ini pada analisis univariat menunjukkan jumlah mayoritas memiliki IMT gemuk sebanyak 39 orang (63.9%), sebagian besar responden menderita hipertensi derajat 1 sebanyak 34 orang (55.7%), dan responden dengan fungsi kognitif normal sebanyak 42 orang (68.9%). Sedangkan untuk hasil analisis bivariat menunjukan hasil hipertensi (p value=0,582), sedangkan derajat variabel

*hipertensi dan fungsi kognitif menunjukkan hubungan yang signifikan (p value=0,002). **Kesimpulan :** tidak ada hubungan antara status gizi dengan fungsi kognitif, selain itu terdapat hubungan yang signifikan antara derajat hipertensi dengan fungsi kognitif pada penderita hipertensi di Puskesmas Jatiwarna .*

Kata kunci: Pengertian hipertensi, status gizi, gangguan fungsi kognitif

Keywords: hipertensi; status gizi; fungsi kognitif

INTRODUCTION

One of the most common non-communicable disease problems that most people suffer from in both developed and developing countries is heart and blood vessel disease. Hypertension or high blood pressure is a disease that has the nickname The Silent Killer because it is quite dangerous. High blood pressure is a condition where the systolic blood pressure (>140) or diastolic blood pressure (>90) is higher than the normal range (Ministry of Health of the Republic of Indonesia, 2021).

According to the World Health Organization (WHO), around 1.13 billion people in the world have hypertension or high blood pressure, meaning that 1 in 3 people in the world are diagnosed with hypertension. The number of hypertension sufferers will increase every year, it is estimated that in 2025 there will be 1.5 billion people diagnosed with hypertension, and it is estimated that every year 9.4 million people will die due to high blood pressure and its complications (Ministry of Health of the Republic of Indonesia, 2019). Based on data from the Health Service in 2019-2022 in West Java Province, Bekasi Regency, there were 1,956,417 people suffering from hypertension.

One of the central nervous system complications of high blood pressure is a decrease in cognitive function or memory function. Cognitive function is one of the most important aspects for humans. Cognitive function has several crucial functions including perception, thinking, memory and information processing. Cognitive decline can be influenced by various factors, including the cardiovascular system. Hypertension causes adaptive changes in blood vessels in the brain resulting in hypoperfusion, white matter damage and microangiopathy. High blood pressure causes arteriosclerosis in brain tissue and is associated with cognitive impairment (Arshinta et al., 2018).

Study Simanjuntak et al (2021) stated that there is a significant relationship between cognitive function and blood pressure in hypertensive patients in the work area of the Tanjung Rejo Deli Serdang Health Center UPT with a p value = 0.006, so that it means that the higher the blood

pressure, the lower the cognitive function. And from research results (Fachriani & Raharjo, 2023), hypertensive patients with cognitive impairment are usually included in the category of moderate cognitive impairment. 54.2% of patients had grade 2 hypertension and 20.8% of patients had grade 1 hypertension.

Nutritional status or being overweight (obesity) will affect an abnormal Body Mass Index, and can also cause serious health problems that can be fatal and cause complications, such as high blood pressure, coronary disease, diabetes mellitus, heart failure, and other diseases. . One of the factors that can cause a decrease in cognitive function is the condition of nutritional status. If a person has poor nutritional status, the blood flow that carries nutrients to the brain experiences obstacles or decreases, and will cause memory problems and decreased concentration. From the research results Khasanah (2022). It was found that 21.5% of nutritional status was a factor causing hypertension in Indonesia based on Indonesian Family Life Survey (IFLS) data. According to Kusumawati (2021). It was found that there was a relationship between nutritional status and cognitive function in hypertensive patients in the Silo Health Center working area, Jember Regency. To the researcher's knowledge, there are still few studies that discuss the relationship between nutritional status and hypertension levels with patient cognitive function. So the researcher is interested in conducting research related to this.

METHOD

The is quantitative reseach with a cross-sectional approach. The hypothesis of this research is Ha: There is a relationship between nutritional status and the degree of hypertension and cognitive function in hypertensive sufferers. The research took place for five months starting from February-June 2024, at the Jatiwarna sub-district health center. The sample in the study was 61 yang didapatkan dari rumus lemeshow, using the purposive sampling method. In the data analysis, univariate analysis was used to determine the characteristics of respondents and bivariate analysis to determine the relationship between variables. The inclusion criteria for the selected sample were: respondents aged >18 years, had a history of hypertension, lived in Jatiwarna sub-district. The instrument used to measure nutritional status uses anthropometry by measuring BMI in the categories of thin, normal and fat, while to measure the degree of hypertension using a sphygmomanometer for measuring blood pressure. The cognitive function assessor used the MMSE (Mini Mental State-Examination) questionnaire with a total of 11 questions and a total score of 30.

RESULTS AND DISCUSSION (12pt)

According to the respondents characteristics were pre-elderly, 47 people (77.0%) with the majority of respondents being female, 44 people (72.1%). There were 44 highly educated respondents (72.1%). The majority of respondents who did not work were 46 people (75.4%), and the majority of respondents who had suffered from hypertension for >5 years were 39 people (63.9%). This research showed that respondents were in the age range 18->60 years. The results of the study showed that more respondents were pre-elderly, 47 respondents (77.0%). As a person gets older, blood pressure will increase, in middle age the arterial walls will thicken due to the buildup of collagen in the muscle layer so that the blood vessels will gradually narrow and become stiff. This study showed that the majority of respondents were female, 44 respondents (72.1%). It can be seen that the percentage of hypertension incidents occurs more in women than in men. The prevalence of high blood pressure in women will increase when they enter menopause. Production of the hormone estrogen decreases during menopause, women lose its beneficial effects so blood pressure increases. Education is one of society's efforts to increase knowledge, attitudes and positive behavior. Based on the research results, it shows that the highest level of education among respondents was at the higher education level (SMA-College), 44 respondents (72.1%). The research results showed that there are still many respondents with higher education who still do not know the risk factors for hypertension and its complications.

The results of this study showed that the majority of respondents did not have a job, 46 respondents (75.4%). Our research found that the incidence of hypertension is more common in respondents who do not have a job. Someone who does not work tends to do less physical activity, physical activity is a risk factor for hypertension. People who are inactive usually have a faster heart rate and their heart muscle works harder with each contraction, the harder and more often the heart has to pump, the greater the force pushing against the arteries. This study also found that the majority of respondents with hypertension >5 years were 39 people (63.9%). According to research by Rahmayanti (2018), someone with hypertension >5 years is more likely to experience complications than someone with hypertension <5 years, one of the complications that can occur is neurological disorders, namely decreased cognitive function.

Table 1. Responcent Characteristics

Variable	Frequency (n)	Percents (%)
Respondent characteristics		
Age category		

Mature	5	8.2
Pre-elderly	47	77.0
Elderly	9	14.8
Gender		
Man	17	27.9
Woman	44	72.1
Education		
Lower education	17	27.9
higher education	44	72.1
Job		
Unemployment	46	75.4
Work	15	24.6
Long time of illness		
<5 Years	22	36.1
>5 Years	39	63.9

Nutritional status among respondents with the majority having overweight BMI, 39 people (63.9%), apart from that, 21 people (34.4%) had a normal BMI and 1 person (1.6%) had a normal BMI. The majority of respondents suffered from grade 1 hypertension, 34 people (55.7%) and 27 people (44.3%) from grade 2 hypertension. The distribution of cognitive function data shows that 19 people (31.3%) experienced a decline in cognitive function, and 42 people (68.9%) had normal cognitive function.

Table 2. Distribution of Respondents Based on Nutritional Status, Hypertension Level, and Cognitive Function

Variable	Frequency (n)	Percent (%)
Nutritional Status		
Thinnes	1	1.6
Normal	21	34.4
Overweight	39	63.9
Hypertension Level		
Grade 1 hypertension	34	55.7
Grade 2 hypertension	27	44.3
Cognitive Function		
Decline	19	31.3

Normal	42	68.9
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A person with obesity generally has an excessive eating pattern, because this will trigger hypertension in the future. This is because the pumping power of the heart and the circulating blood volume of obese sufferers with hypertension are higher than those of normal weight. If hypertension is caused by obesity, if it is not controlled it will pose a risk of neurological function disorders such as cognitive decline. The degree of hypertension is one of the risks that triggers a decline in cognitive function. In this study, the results showed that 34 people (55.7%) had grade 1 hypertension, in addition to that, 27 people (44.3%) had grade 2 hypertension. High blood pressure can be caused by several factors such as diet and physical activity, medication compliance, stress, and other factors.

Table 3 Relationship between nutritional status and cognitive function

Variable	Cognitive Function				Total		P Value
	Normal		Decline				
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
Nutritional status	(n)	(%)	(n)	(%)	(n)	(%)	0.582
Thinnes	0	0.0	1	1.6	1	1.6	
Normal	8	13.1	13	21.3	21	34.4	
Overweight	11	18.0	28	46.0	39	64.0	

Bivariate analysis found, there was no relationship between nutritional status and cognitive function, and obtained p value = 0.582 > α (0.05). The results of this study were in line with Yulitasari et al (2022), which explains that there is no relationship between cognitive function and nutritional status with p value = 0.160. Likewise, the research results obtained. Akbar & Dainy (2023) showed insignificant results between body mass index and cognitive function (p value = 0.217). Hypertension can be a disease that is triggered by excess nutritional status. If nutritional status is based on body mass index, if it is not paid attention to, it is very likely that uncontrolled hypertension will occur and can trigger complications, one of which is a decrease in cognitive function. Hypertension can cause blood vessels to become blocked so that blood

flow to the brain is not supplied properly, which can trigger symptoms of decreased cognitive function.

On the other hand, research conducted by Kusumawati (2021), states that there is a relationship between nutritional status and cognitive function in hypertension sufferers in the Silo Jember health center area with a p value = 0.002. Nutritional status based on body mass index can also influence blood pressure and its complications. Obesity plays an important role in the occurrence of hypertension. Obesity causes changes in the metabolic system and various other body organs. According to the opinion based on research results which state that there is no relationship between nutritional status and cognitive function, this may be due to a lack of accuracy in measuring BMI, normal nutritional status in hypertension occurs because hypertension is controlled, so that eating habits and diet can avoid complications of cognitive impairment. . A person's age can also affect nutritional status and decreased cognitive function. Older people tend to have decreased cognitive function and nutritional problems often occur due to decreased digestive organ function.

Table 4 Relationship between Hypertension Degree and Cognitives Function

Variable	Cognitive Funtion				Total		P	OR
Hypertension	Normal		Decline				value	
Degree	Frequency	Percent	Frequency	Percent	Frequency	Percent		
	(n)	(%)	(n)	(%)	(n)	(%)		
1st	5	8.2	29	47.5	34	55.7	0.002	6.24
Hypertension								(1.85-
Degre								21.00)
2nd	14	23.0	13	21.3	27	44.3		
Hypertension								
Degre								

The Chi-square test results show p value = 0.002, so H_a is accepted, which means there is a significant relationship between the degree of hypertension and cognitive function in hypertensive sufferers. Then, in the data analysis, an OR value of 6,246 was obtained, this means that respondents with high levels of hypertension (grade 2 hypertension) tended to experience a risk of cognitive decline 6,246 times greater than those with grade 1 hypertension.

This finding is in line with research conducted by Simanjuntak et al (2021) at the Tanjung Rejo Deli Serdang Community Health Center which stated that there was a relationship between blood

pressure and cognitive function with $p \text{ value} = 0.006 < \alpha (0.05)$. so it can be seen that the higher the blood pressure or hypertension level of the respondent, the more likely there is to be a decline in cognitive function. Data analysis found that the majority of respondents who had high levels of hypertension experienced decreased cognitive function. Decreased cognitive function can be influenced by several factors such as age, psychology, and pathophysiological factors such as cardiovascular system problems, one of which is hypertension.

One of the central nervous system complications of high blood pressure is a decrease in cognitive function or memory function. If left untreated for a long time dementia (vascular cognitive impairment) can develop (Simanjuntak et al., 2021). Cognitive decline can be influenced by various factors, including the cardiovascular system. One of them is hypertension which often causes pathological effects on the body's systems. Chronic hypertension can cause cognitive impairment compared to individuals with normal blood pressure and can lead to vascular dementia.

Based on the results obtained, researchers assume that the level of hypertension can affect cognitive function, the higher the degree of hypertension, the greater the risk of experiencing impaired cognitive function which attacks the brain's higher functions such as cognition, perception, memory, rationality, learning, creativity and judgment in making. Decision. A decrease in cognitive function in hypertension sufferers can also be caused by age, history of diseases such as stroke or dementia, lack of physical activity, long illness, and other causal factors.

CONCLUSION

Based on the results of the research that has been explained, it can be concluded that the characteristics of the respondents in this study mostly fall into the pre-elderly age category, with the majority gender being female, and the majority of educational levels being respondents with higher education. Most respondents did not have jobs, and the majority of respondents had a history of hypertension for > 5 years.

In the nutritional status assessment, the data obtained by the majority of respondents had a fat BMI value, and the blood pressure measurement results showed that the majority of respondents had grade 1 hypertension. Apart from that, in the assessment of cognitive function measurement results, the majority of respondents obtained normal cognitive function values.

The results of statistical tests on the variable nutritional status and cognitive function showed that there was no significant relationship between nutritional status and decreased cognitive

function in hypertension sufferers. Meanwhile, in the variables of degree of hypertension and cognitive function, it was found that there was a significant relationship between the degree of hypertension and cognitive function in hypertension sufferers. conclusion section contains research findings in the form of answers to research questions or in the form of a summary of the results of the discussion, implications of research results and recommendations can also be added. Narrative writing, a maximum of 5% of the entire content of the article.

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