

The Relationship Between Knowledge and Behavior of Diet with The Status of Blood Pressure Measurement in Pekauman Health Center, Banjarmasin

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ABSTRACT

Background: High blood pressure or hypertension is a condition of blood pressure above 120/80 mmHg. Hypertension is influenced by several factors such as behavior and lifestyle. Non-pharmacological therapy is considered the safest and most effective treatment for hypertension because it helps patients improve unhealthy lifestyles. Increasing life expectancy can lead to higher health problems for the elderly, assessment of knowledge and behavior in the elderly can support the health of the elderly who feel involved and have knowledge that can increase awareness for healthy living behavior. **Objective:** To determine the relationship between knowledge and dietary behavior with blood pressure measurement status. **Methods:** This study used a quantitative method with a cross sectional approach. Sampling using the slovin formula as many as 77 respondents with purposive sampling technique. Data were analyzed using green chi-square with a significant value of $p = <0.05$. **Results:** Chi-square test results with $\alpha = 0.05$. From the results of the statistical test, the chi-square test obtained a significant value of p -value = 0.000 for the analysis of the relationship between knowledge obtained and the status of blood pressure measurement and a significant value of p -value = 0.000 for the analysis of the relationship between dietary behavior and blood pressure measurement status. revealed that there is a relationship between dietary knowledge and behavior with blood pressure measurement status. **Conclusion:** Patients with good knowledge of hypertension have blood pressure that is not high or close to normal and good dietary behavior. Meanwhile, people with hypertension who lack knowledge have high blood pressure and poor dietary behavior.

Keywords: blood pressure, dietary behavior, hypertension, knowledge.



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INTRODUCTION

High blood pressure or hypertension can be defined as persistent blood pressure, namely systolic pressure of more than 140 mmHg and diastolic pressure of more than 90 mmHg; hypertension can be said to be mild if the diastolic pressure is 95-104 mmHg and moderate if the diastolic pressure is 105-114 mmHg and hypertension which is said to be severe with a diastolic pressure of more than 115 mmHg (Warren, 2018).

Now, hypertension is still a problem in several ways, including the prevalence of hypertension is increasing. It turns out that there are still many patients with hypertension who do not know the factors that cause hypertension, so this disease is commonly called The silent killer because there are no signs and symptoms that can be seen from the outside. It causes complications, including heart, brain, and kidney disease (Maulidina, 2019).

The World Health Organization (WHO) states that the number of people with hypertension in developing countries reaches 40%. In comparison, in developed countries, it is only 35%, and adults with hypertension in Southeast Asia comprise 36%. According to WHO representatives in Indonesia, it was revealed that there was an increase in the number of people with hypertension by 13%, both in men and women (Imelda et al., 2020).

In 2018 hypertension in Indonesia was ranked first for non-communicable diseases with 185,857 cases; according to data from WHO, Indonesia is in fifth place with the most hypertension sufferers. Based on data from (Riskerdas, 2018) states that the highest prevalence of hypertension in Indonesia in 2018 is in South Kalimantan Province, which ranks first at 44.1% for ages > 18 years, while the lowest is in Papua at (22.2%). Hypertension occurs in the age group 31-44 years (31.6%), age 45-54 years (45.3%), and age 55-64 years

(55.2%), but in Basic Health Research in 2013 Kalimantan Province The South is ranked second at 25.8% for ages > 18 years. It can be seen from these data that the incidence of hypertension has increased very significantly in South Kalimantan Province (Mustaqimah et al., 2021).

Factors that can influence the occurrence of hypertension are divided into two major groups, namely factors that cannot be modified/cannot be changed, such as gender, age, and genetics, and factors that can be modified/factors that can be changed, such as diet (junk food, food intake). Sodium, fat intake), exercise habits, and others. For hypertension, it is necessary to have the role of these risk factors together (common underlying risk factors); in other words, one risk factor alone is not enough to cause hypertension (Warren, 2018).

Increasing life expectancy can lead to higher health problems for the elderly; assessment of knowledge and behavior in the elderly can support the health of the elderly who feel involved and also have knowledge that can increase awareness for healthy living behavior (Asiah, 2021)

Knowledge is the result of someone who knows objects through their senses and includes concepts regarding health and illness, knowledge of diet for hypertension, and also the concept of preventing hypertension for controlling blood pressure for people with hypertension, in addition to the level of knowledge of diet and dietary health behavior is also influenced by communication, information, culture, and personal experience can lead to good knowledge of a person and being able to carry out a healthy lifestyle such as carrying out a hypertension diet for people who have very good knowledge and can consume healthy foods thereby lowering the risk of developing hypertension and cardiovascular disease (Riyadina et al., 2019).

Behavior is the habit of something positive or negative, if poor diet patterns, such as often consuming foods high in sodium, fat and rarely consuming vegetables, fruits can cause risk factors for hypertension that can be corrected, but what can influence a person's behavior is knowledge and a good quality diet can reduce blood pressure to normal which is related to good knowledge of hypertension disease nutrition (Sa'diyah, 2021).

Based on a preliminary study on 28 November 2022 at the Banjarmasin City Health Office, the highest number of hypertension sufferers at the Pekauman Health Center in 2019 was 3,326 people; in 2020, there were 2,676 people; in 2021, there were 3,659 people, and in 2022, there were 2,326 people (Banjarmasin et al. Office, 2022). The number of data on hypertension patients in September - November 2022 was 339 people. So the researchers were interested in researching the "Relationship Between Knowledge and Dietary Behavior with Blood Pressure Measurement Status at the Pekauman Health Center, Banjarmasin City".

MATERIALS AND METHODS

This study uses a quantitative method with a cross-sectional design. This research was conducted in the working area of the Pekauman Public Health Center, Banjarmasin City, from February to March 2023.

The population in this study were patients with a history of hypertension at the Pekauman Health Center, Banjarmasin City, which recorded 339 people in September - November 2022.

The sample in this study was calculated using the Slovin technique with as many as 77 respondents with a sampling technique using a purposive sampling technique according to the inclusion criteria, namely:

1. Patients suffering from hypertension at the Pekauman Health Center, Banjarmasin City.
2. Patients who can communicate well at the Pekauman Health Center, Banjarmasin City.
3. Willing to be a respondent in research at the Pekauman Community Health Center, Banjarmasin City.

The research instrument used a hypertension knowledge level questionnaire and a dietary behavior questionnaire adopted from a research questionnaire tested for validity and reliability on the knowledge variable by Wati (2018) from a total of 84 respondents. The results obtained were $r_{\text{count}} > r_{\text{table}}$ (0.620 – 0.865) as many as 12 question items so that the questionnaire is declared valid and can be used to conduct research. The results obtained after the reliability test are the $r_{\text{count}} > 0.413$ for 12 question items with a reliability value of Alpha Cronbach Coefficient-Alpha $\alpha = 0.928$. The 12 questions are reliable because they are close to 1.

In the dietary behavior variable, a previous research questionnaire was used. Validity and reliability tests were carried out by Nurdiyanti (2016) in Wati (2018) from a total of 84 respondents, and the results

obtained were $r_{\text{count}} > r_{\text{table}}$ (0.555 – 0.856) so that it can be stated that the questionnaire dietary behavior is valid. The results of the questionnaire trial found that all question items with Cronbach statistical test scores obtained internal consistency results with a value of 0.956. So it can be concluded that the diet behavior questionnaire is reliable.

To determine the relationship between knowledge and dietary behavior with blood pressure measurement status at the Pekauman Health Center, Banjarmasin City can be known by measuring the results of the answers from respondents. The knowledge questionnaire consists of 12 questions in a true-false format using the Guttman scale. The questionnaire consisted of 9 positive question items and three negative question items consisting of 2 answer choices, namely a positive question "True" score of 1 and a "False" score of 0 and negative questions "True" score of 0 "False" score of 1.

The dietary behavior questionnaire consists of 34 questions in the format always (SL), often (SR), sometimes (KD), and never (TP) using a scale. The questionnaire consisted of 21 positive question items and 13 negative question items consisting of 4 answer choices, namely positive questions always (SL) with a value of 4, often (SR) with a value of 3, sometimes (KD) with a value of 2, never (TP) with a value of 1 and for negative questions, always (SL) is given a value of 1, often (SR) is given a value of 2, sometimes (KD) is given a value of 3, never (TP) is given a value of 4.

Statistical tests used univariate analysis to describe the characteristics of the respondents and bivariate analysis to determine the relationship between dietary knowledge and behavior and blood pressure measurement status. The Chi-Square test is carried out with a value of $\alpha = 0.05$. If the p-value is less than the value of $\alpha = 0.05$, then there is a relationship between the two variables. If the p-value is greater than the value of $\alpha = 0.05$, then there is no relationship between the two variables.

Ethical clearance was obtained from the Research Ethics Committee of the University of Sari Mulia Banjarmasin on 12 April 2023 under number No.591/KEP-UNISM/IV/2023.

RESULTS AND DISCUSSION

1. Respondent Characteristics

Respondents in this study were hypertensive patients at Pekauman Community Health Center, Banjarmasin City. Respondents were taken in this study using a purposive sampling technique with 77 respondents who met the criteria for conducting research, and characteristics based on age, gender, education, and duration of suffering from hypertension were taken. Based on the research, the following data were obtained.

Table 1. Respondent Characteristics Based on Age, Gender, Education and Length of Suffering from Hypertension

Respondent Characteristics	Frequency	Percentage (%)
Age		
45-59 Yo	42	54,5
60-74 Yo	30	39
75-90 Yo	5	6,5
Gender		
Male	25	32,5
Female	52	67,5
Education		
Elementary School	68	88,3
Junior High School	8	10,4
Senior High School	1	1,3
Length of Suffering from Hypertension		
> 3 month	5	6,5
> 6 month	31	40,3
> 1 month	41	53,2

Based on table 1 shows that the majority of hypertension patients at the Pekauman Health Center in Banjarmasin City suffer from hypertension at the age of 45-59 years, as many as 42 people (54.5%), with the majority being female, as many as 52 people (67.5%). The education of hypertensive patients was at the

elementary school level as many as 68 people (88.3%) with the duration of suffering from hypertension mostly > one year as many as 41 people (53.2%).

2. Relationship between knowledge and blood pressure measurement status

The bivariate analysis in this study was a cross-tabulation of the chi-square test on the relationship between knowledge and blood pressure measurement status at the Pekauman Health Center, Banjarmasin City.

Table 2. Cross tabulation and Chi-Square Test of Relationship Between Knowledge and Blood Pressure Status

Knowledge	Blood Pressure Status		Total	p value
	Degree 1	Degree 2		
	n (%)	n (%)		
Low	20 (57,1)	40 (95,2)		
Good	15 (42,9)	2 (4,8)	77 (100%)	0,000
Total	35 (100)	42 (100)		

Based on Table 2, the results of bivariate analysis using the Chi-Square Test obtained a value of p = 0.000 because p < 0.05, it was stated that there was a relationship between knowledge and blood pressure status of hypertensive patients at the Pekauman Health Center, Banjarmasin City. The results of the research on the relationship between knowledge and blood pressure status at the Pekauman Health Center in Banjarmasin City showed that based on univariate analysis, 60 people (77.9%) were in the poor category, and 17 people (22.1%) were in the good category.

The statistical analysis of the Chi-Square test showed that the p-value was 0.000 (p < 0.05), meaning that Ha was accepted and H0 was rejected. These results prove a significant relationship between knowledge and the occurrence of hypertension blood pressure measurement status at the Pekauman Health Center in Banjarmasin. The results of the values in Table 5 show that 20 people (57.1%) have grade 1 hypertension, while 40 people (95.2%) have grade 2 hypertension.

In this study, the level of knowledge has three indicator items, which were developed by (Wati, 2018) through its questionnaire instrument. There are three indicator items, namely, the level of knowledge is in the poor category (<55%), the level of knowledge is moderate (56% -75%), and the level of knowledge is good (76% -100%). To find out the lowest and highest values of the three indicator items, the categories used are by looking at the scale used in answering the questionnaire questions. The scale used is Guttman, including positive statements with a true score of 1 and a wrong score of 0, while negative questions are a true score of 0 and a wrong score of 1.

Based on the results of the analysis, it was found that the highest knowledge level indicator item was the "definition" indicator item in the medium category (65.58%) with a score of 50.5, so most of the answers to the questions were answered "correctly." Meanwhile, the lowest knowledge level indicator item, namely the "food diet" indicator item, was in the less category (44.81%) with a score of 34.5, so most of the answers answered "wrong."

The definition indicator item shows the highest percentage (65.58%). Research conducted by (Maswibowo, 2018) examined the relationship between knowledge of hypertension and blood pressure control behavior in hypertensive patients in the working area of the Gang Sehat Health Center, Pontianak, with p-value results. = 0.000 (p < 0.05) and (r) correlation value of 0.0905 indicates that there is a significant relationship between knowledge of hypertension and blood pressure control behavior.

Food diet indicator items get the lowest percentage (44.81%). According to Notoatmodjo (2018), one factor that influences knowledge is education; education is very influential in the learning process because the higher a person's education, the easier it is to receive information and certainly easier to gain knowledge about health information.

This aligns with Pudji's research (2020) entitled "The relationship between the level of Knowledge and blood pressure in hypertensive patients in the inpatient room of Sultan Faithuddin Bun Bawah General

Hospital." The results of the analysis obtained the Rank-Spearman correlation test (ρ) obtained $p = 0.000$ with the result $\rho = 0.000$, which means ($\rho < 0.05$). This shows a relationship between the level of knowledge and blood pressure in the Sultan Imanuddin Pangkalan Hospital with high blood pressure. RS Bun and respondents with almost half of the knowledge of respondents with hypertension blood pressure were ten people (32.3%).

The results of this study are reinforced by the research of Sunarti & Patimah (2019) that hypertension sufferers with good knowledge tend to have controlled blood pressure, and hypertension sufferers with less knowledge tend to have uncontrolled blood pressure. *Good knowledge* is the initial capital that must be owned by hypertension sufferers so that sufferers understand the therapy program that will then be given. In addition, good knowledge is also needed so that sufferers understand how to control blood pressure so that it is integrated or able to be applied to daily life patterns (Sunarti, 2019).

The researcher assumes that age influences one's knowledge because, with increasing age, a person will also increase the person's knowledge because there will be much experience that is felt, much information is obtained with much experience, and the person's knowledge is also wider.

This research is also in line with that conducted by Inayah (2018) at Arifin Achmad Hospital in Riau Province, showing that there is a relationship between age and hypertension; the results of the study stated that most respondents with hypertension were in the late adult age group, namely 45-59 years with a total of 16 respondents (40%).

This research is supported by Tirtasari (2019), who states that with age, body functions will decrease, especially in late adulthood, called a degenerative process, where the elasticity of blood vessels decreases so that they tend to narrow and cause increased blood pressure. The researcher assumes that education affects a person's knowledge; someone with higher education will have different knowledge from someone with low education. With the higher education one takes, the level of one's knowledge will increase.

This research is in line with research conducted by Mardiana (2021); the results showed that hypertension sufferers most often occur in the last educational background, namely elementary school. Supported by research conducted by Cahyaningrum (2022) with the title Relationship between age and level of education with increased blood pressure in the elderly, the results showed that most respondents had an elementary school education background (63.27%). A person's level of education will affect a person's mindset for taking action, including making decisions (Cahyaningrum et al., 2022).

3. Relationship between Dietary Behavior and Blood Pressure Measurement Status

Bivariate analysis in this study was cross-tabulation of the chi square test of the relationship between dietary behavior and blood pressure measurement status at the Pekauman Health Center, Banjarmasin.

Table 3. Cross-tabulation and Chi-Square Test Relationship between Dietary Behavior and Blood Pressure Status

Dietary Behavior	Blood Pressure Status		Total	p value
	Degree 1	Degree 2		
	n (%)	n (%)		
Bad	2 (5,7)	42 (100)	77 (100%)	0,000
Good	33 (94,3)	0 (0)		
Total	35 (100)	42 (100)		

Based on Table 3, the results of bivariate analysis using the Chi-Square test obtained a value of $p = 0.000$ because $p < 0.05$, it was stated that there was a relationship between dietary behavior and blood pressure status of hypertensive patients at the Pekauman Health Center, Banjarmasin. The results of research on the relationship between dietary behavior and blood pressure status at the Pekauman Community Health Center, Banjarmasin City, showed that based on univariate analysis, the results of dietary behavior in the bad category were 44 people (57.1%) and in the good category, there were 33 people (42.9%).

The statistical analysis of the Chi-Square test showed that the p-value was 0.000 ($p < 0.05$), meaning that H_a was accepted and H_0 was rejected. These results prove a significant relationship between dietary behavior and the occurrence of hypertension blood pressure measurement status at the Pekauman Health Center in Banjarmasin. The results of the values in Table 4.6 show that 33 people (94.3%) have grade 1 hypertension in the good category and two people (5.7%) have a bad category, and 42 people (100%) have grade 2 hypertension.

In this study, dietary behavior has nine indicator items developed by (Wati, 2018) through its questionnaire instrument. The nine indicator items are bad diet behavior (<56%) and good diet behavior (57% -100%). To find out the lowest and highest values of the nine indicator items, the categories used are by looking at the scale used in answering the questionnaire questions. The scale used is Likert covering positive statements, always a score of 4, often a score of 3, sometimes a score of 2, and never a score of 1. Meanwhile, negative questions always score 1, often 2, sometimes score three, and never 4.

Based on the results of the analysis, it was found that the highest dietary behavior indicator item was the "isoflavone source" indicator item in the good category (63.64%) with a score of 196.0, so most of the answers to the questions answered "always." Meanwhile, the lowest dietary behavior indicator item, namely the "source of calcium" indicator item, was in a bad category (47.56%) with a score of 146.5, so most of the answers answered "never."

Isoflavone source indicator items showed the highest percentage (63.64%). In line with research conducted by Oktaviana (2023), there was a significant effect of soy milk intervention on changes in systolic blood pressure with a p value of 0.000 and diastolic blood pressure p value of 0.000. Soybeans contain antioxidants that can improve blood pressure and improve blood vessel health. Soy milk is very good for people with hypertension because it contains isoflavones that improve metabolism, digestion, increase immunity, strengthen the matrix structure, stabilize blood pressure, lower blood cholesterol levels, and stabilize blood sugar (Oktaviana et al., 2023).

The indicator item for the source of calcium shows the lowest percentage (47.56%). In line with research conducted by Lestari (2019) stated that the results of the analysis obtained were that most of the research respondents had low calcium intake, namely as many as 89 people out of a total of 90 respondents on the results of the Spearman rank correlation test between calcium intake and blood pressure, the p-value was obtained value of 0.968 which can be interpreted that there is no significant relationship and stated that the closeness of the relationship is weak with a positive pattern.

According to Adventus (2019) states that behavior is one of the actions or deeds of a person in responding to something and then making it a habit because there is a value that has been believed, but human behavior is essentially an action or human activity whether observed or not observed with human interaction. And the environment that is formed in knowledge, attitudes, and actions.

The assumption of female researchers tends to be more thorough and careful in understanding and doing something so that women have more knowledge than men. One of the factors that influence knowledge is gender. In reality, women are more diligent, diligent, and thorough when given a task or doing something. However, this does not explain or show that with this attitude, women have better knowledge or cognition. This is in line with research conducted by Situmorang (2019) entitled Overview of Knowledge, Attitudes, and Actions Against Hypertension in Outpatient Patients at the Medan Area South Health Center with the results of the study finding that the most gender group was female, namely 36 respondents (58, 06%).

The results of this study were also supported by Syamsu (2021), was found that the number of sufferers of hypertension was more in women than men; this was influenced by levels of the hormone estrogen where a hormone will lower its levels when women enter old age (menopause) so that women become more vulnerable against hypertension.

Based on the analysis of this study, it can be known together that the respondents at the Pekauman Health Center in Banjarmasin mostly had hypertension for > 1 year, as many as 41 people (53.2%). The researchers assumption has been suffering from hypertension for > one year due to a lack of knowledge, low educational background, and lack of exposure to health information about hypertension. Hence, it impacts bad

behavior in consuming food. In line with research conducted by Christina (2021), it was found that most respondents with a long history of suffering from hypertension were 1-5 years, namely 32 people (42.7%).

This research is also reinforced by the research of Chendra, Misnaniarti, & Zulkarnain (2020) with the results of a bivariate test between the duration of suffering from hypertension and the quality of life of Prolanis respondents who suffer from hypertension showing that there is a relationship between the duration of suffering from hypertension and quality of life in Prolanis respondents with hypertension as evidenced by the test statistics $p = 0.011 < 0.05$. Long-suffering from hypertension ≥ 1 year has a risk of 3.623 times and can cause poor quality of life in respondents who suffer from hypertension.

This research is also in line with research conducted by Mapagerang et al. (2018) obtained results from 47 respondents who had low knowledge of the dietary behavior of the elderly who were not good at controlling hypertension, as many as 31 respondents (66%). After the Chi-Square Test statistical test was carried out, a p -value = $0.002 < \alpha = 0.05$ was obtained, which means that H_a is accepted.

This research was also reinforced by research conducted by Ali (2019) obtained from the results of data analysis research. It can be concluded that there is a significant relationship between knowledge of hypertension sufferers and hypertension dietary behavior in the Working Area of the Cihideung Health Center, Tasikmalaya City, because the value $\alpha > p$ value ($0.05 > 0.000$).

This is supported by research conducted by Mapagerang et al. (2018), which states that knowledge is a very important domain for forming one's behavior. Behavior-based on knowledge will be better than behavior not based on knowledge. In line with research conducted by Et et al. (2022), the results showed that most of their dietary behavior was in the less category, namely 58 people (40.80%), with the Spearman Rank test results obtained p value = $0.00 < 0.05$. These results indicate a significant relationship between knowledge about diet and the dietary behavior of hypertensive patients at the Payangan Health Center, Gianyar Regency.

CONCLUSION

After conducting research and discussing the connection between knowledge and dietary behavior with blood pressure measurements at the Pekauman Health Center in Banjarmasin City, we have concluded the following:

- a. There is a positive relationship between knowledge and the status of blood pressure measurements at the Pekauman Health Center in Banjarmasin City, with a p -value of $0.000 < 0.5$.
- b. There is also a positive relationship between dietary behavior and blood pressure measurement status at the Pekauman Health Center in Banjarmasin City, with a p -value of $0.000 < 0.5$.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

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