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THE INFLUENCE OF HEALTH EDUCATION ON DIETARY BEHAVIOR AND HYPERTENSION PREVENTION AMONG THE ELDERLY IN THE ULEE KARENG COMMUNITY HEALTH CENTER AREA

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ABSTRACT

Hypertension is one of the most common health problems experienced by older adults and is closely related to dietary patterns. A study conducted among elderly individuals in the service area of the Ulee Kareng Community Health Center, Banda Aceh, found that 69% of respondents suffered from hypertension and 63% had poor dietary habits. The analysis revealed a significant relationship between dietary patterns and the incidence of hypertension (p = 0.004). These findings highlight the important role of health education in improving public knowledge and awareness, particularly among older adults, regarding healthy eating habits. Through structured educational programs implemented within families, communities, and healthcare settings, individuals can gain a better understanding of nutritious food choices and hypertension prevention. Therefore, health education serves as an important strategy for reducing the risk of hypertension and improving the quality of life of older adults.

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INTRODUCTION

A person who has reached the age of 60 or older is classified as an older adult (senior citizen) according to the classification established by the World Health Organization (WHO). This group of older adults has gone through the aging process, experiencing physical and psychosocial changes that result in a number of health problems. Non-communicable and degenerative conditions such as hypertension, rheumatism, stroke, cardiovascular disease, and diabetes mellitus are among the issues commonly faced by older adults (Gunawan et al., 2025). Non-communicable diseases are one of the leading causes of morbidity and mortality worldwide each year. In fact, by 2030, it is estimated that deaths from non-communicable diseases will surpass all other causes of death globally.

Hypertension is a condition characterized by a systolic blood pressure above 140 mmHg and/or a diastolic blood pressure of ≥ 90 mmHg. This condition is referred to as the “silent killer” because it can lead to serious complications and even sudden death without the patient

experiencing any noticeable symptoms beforehand. Factors contributing to the development of hypertension include advancing age, unhealthy dietary habits, obesity, and an unhealthy lifestyle (Akbar et al., 2025). Hypertension is one of the age-related conditions most commonly experienced by the elderly. Advancing age can influence an increase in blood pressure; thus, as a person ages, the risk of developing hypertension also rises.

According to WHO data (2018) cited in the Nursing & Journal (2020), an estimated 972 million people—or 26.4% of the global population—suffer from hypertension. This figure is projected to rise to 29.2% by 2021. Annual deaths due to hypertension and its complications are estimated to reach 9.4 million. It is estimated that 63 million Indonesians suffer from high blood pressure, and 427,000 of them die. By age group, the prevalence of hypertension in Indonesia increases with age, standing at 45.9% among those aged 55–64, rising to 57.6% among those aged 65–74, and reaching 63.8% in the group aged 75 and older (Ners et al., 2018).

In Aceh province, 1,131,562 people were diagnosed with hypertension in 2020; 426,684 of them, or 38%, received medical care at public health centers (Puskesmas). In 2019, 1,113,987 individuals were recorded as having the condition, and approximately 283,910 people, or 25.4%, received treatment at Puskesmas. According to these statistics, the number of hypertension patients in Aceh Province increased by 5.8% over the course of a year, while the number of patients receiving medical care increased by 12.6% compared to the previous year (Widianto et al., n.d.). Based on data from the Banda Aceh City Health Department, the number of people with hypertension reached 11,836, consisting of 4,352 men (36.8%) and 7,484 women (63.2%). Meanwhile, the Ulee Kareng Community Health Center reported 1,301 cases of hypertension in 2025, with 993 of those cases occurring in the elderly population.

The rise in the incidence of hypertension among the elderly is influenced by both unmodifiable and modifiable risk factors. Age, gender, skin color, and family history are examples of unmodifiable factors. Stress, an unhealthy or excessive diet, obesity, lack of physical activity, smoking, poor potassium intake, alcohol consumption, and nutritional status are all modifiable factors. According to Talumewo (2014), the risk of developing hypertension is 17.71 times higher for individuals with family members who have the condition compared to those who do not (Jaya et al., 2025).

One modifiable risk factor for hypertension is diet, which reflects an individual's habits in selecting and consuming daily meals, including the types, amounts, and frequency of consumption. These dietary patterns are adopted for specific purposes, such as maintaining health, meeting nutritional needs, and supporting the recovery process from illness. Poor eating habits are common among the elderly, including frequent coffee consumption, a tendency to consume fatty, sugary, and salty foods as well as those made with coconut milk, and insufficient intake of fruits and vegetables. An increase in body fat levels, particularly cholesterol, can result from certain eating habits. High cholesterol levels can trigger an increase in blood pressure by causing an increase in extracellular fluid volume, thereby increasing the risk of hypertension (Nani et al., 2021).

The high prevalence of hypertension in the vicinity of the Ulee Kareng Community Health Center indicates that this condition remains a major health issue, particularly among the elderly. Consequently, researchers are interested in investigating the relationship between dietary habits and the prevalence of hypertension as a key factor. It is hoped that the findings of this study will serve as a basis for organizing health promotion and prevention initiatives at the primary care level. Additionally, this study aims to provide a comprehensive overview of the role of

nutrition in the occurrence of hypertension, thereby supporting healthcare workers in developing prevention strategies to curb the rise in hypertension cases.

RESEARCH METHODS

This study employs a quantitative approach, a cross-sectional design, and a descriptive correlational method. This design was chosen because it allows for the simultaneous measurement of independent and dependent variables, enabling the relationship between dietary patterns and the incidence of hypertension to be analyzed at a single point in time (Tarigan, 2025; Waruwu et al., 2025).

This study was conducted in the service area of the Ulee Kareng Community Health Center in Banda Aceh. The research process spanned from the preparatory phase through the completion of the thesis report, beginning in January 2026. Activities included a preliminary survey, drafting the study proposal, data collection, and consultations with the thesis advisor.
The study group consisted of 993 elderly residents who visited the Ulee Kareng Community Health Center between January and December 2025. The sample consisted of 100 respondents, calculated using the Slovin formula. This sample was a representative subset of the population selected to reflect the overall population based on specific criteria (Suriani et al., 2023).

The study instrument used was a Food Frequency Questionnaire (FFQ) consisting of 25 questions to assess the respondents' dietary patterns. The questionnaire employed a Likert scale and response options describing consumption frequency, ranging from "always" to "never," with each option assigned a different score. This study instrument has been validated and found to be reliable based on test results, with a Cronbach's Alpha value of 0.952 in the reliability test and a validity value of 0.421 (Meghan, 2023). In addition to the questionnaire, the researchers also conducted direct blood pressure measurements on the respondents.

The collected data was then processed through five stages: editing (reviewing the questionnaires), coding (assigning codes to the data), data entry (inputting data into computer software), cleaning (removing inconsistencies from the data), and processing (scoring and presenting the data in distribution tables) (Soesana et al., 2023). Univariate and bivariate data analyses were conducted. The frequency distribution of each variable was described using univariate analysis and the calculation of the percentage $P = (f/n) \times 100\%$. Bivariate analysis was intended to examine the relationship between the occurrence of hypertension as the dependent variable and dietary habits as the independent variable. Since more than fifty samples were found, a normality test using the Kolmogorov-Smirnov test was performed before evaluating the hypothesis. The Chi-Square test and a significance level of $\alpha = 0.05$ were used to analyze the relationship between variables. The null hypothesis (H_0) was rejected if the p-value was < 0.05, indicating a significant relationship (Widodo et al., 2023).

RESULTS AND DISCUSSION

Research Overview

This study was conducted in April 2026 within the service area of the Ulee Kareng Community Health Center, with a total population of 993 older adults. The sample size was determined using the Slovin formula, resulting in a sample of 100 respondents. Data collection was conducted in person through the completion of a Food Frequency Questionnaire (FFQ) to assess dietary patterns, as well as blood pressure measurements to identify cases of hypertension.

The study results are presented in the form of descriptive statistics covering respondent characteristics, such as gender, occupation, and educational level. This study aimed to analyze the relationship between dietary patterns and the prevalence of hypertension among the elderly at the Ulee Kareng Community Health Center. The relationship between the independent variable (dietary patterns) and the dependent variable (hypertension) was tested through bivariate analysis using the Chi-Square test.

Univariate Analysis

The frequency distribution of the categorical data is shown in Table 1.

Table 1. Frequency Distribution of Respondent Characteristics by Age, Gender, Blood Pressure, Education Level, and Occupation

Characteristic	Frequency Respondents (n)	Precentage
Age (Years)		
Elderly	91	91.0
Old	9	9.0
Gender		
Male	32	32.0
Female	68	68.0
Blood Pressure		
Hypertension	69	69.0
No Hypertension	31	31.0
Education Level		
Elementary School	34	34.0
Junior High School	29	29.0
High School	33	33.0
Bachelor's/Associate's Degree	4	4.0
Employment Status		
Employed	47	47.0
Unemployed	53	53.0
Total	100	100

Table 1 shows that of the 100 respondents, 91 (91%) were in the older age group (60–74 years), 68 (68%) were women, 69 (69%) had hypertension, 34 (34%) had completed only elementary school, and 53 (53%) were unemployed.

Table 2. Distribution of Respondents by Dietary Patterns Among Elderly Hypertensive Patients at the Ulee Kareng Community Health Center in 2026

Diet	Frequency Respondents (n)	Precentage
Good	37	37.0
Not so good	63	63.0

Table 2 shows that 37 respondents (37%) have healthy eating habits, while the remaining 63 respondents (63%) have less healthy eating habits

Bivariate Analysis

Table 3. The Relationship Between Dietary Patterns and Elevated Blood Pressure in Hypertensive Patients at the Ulee Kareng Community Health Center

Diet	Tekanan Darah				Total	P-Value
	Hypertension (n)	Hypertension (%)	No hypertension (n)	No hypertension (%)		
Good	32	86,5	5	13,5	37	0,004
Not so good	37	58,7	26	41,3	63	
Total	69	69,0	31	31,0	100	

Table 3 shows that of the 100 respondents, 32 (32.0%) had a healthy diet but still suffered from hypertension, while 5 (5.0%) had a healthy diet but did not suffer from hypertension. On the other hand, 37 respondents (37.0%) were found to have hypertension, while 26 respondents (26.0%) did not have hypertension.

The results of the Food Frequency Questionnaire showed that both respondents with and without hypertension continued to consume foods high in sodium, MSG, and other flavor enhancers, even though they fell into different dietary categories. Additionally, respondents regularly consumed foods such as anchovies, sardines, and instant noodles, which are known to contribute to hypertension. The habit of regularly consuming these foods contributes to elevated blood pressure.

Statistical test results showed a p-value of 0.004 (<0.05). These findings indicate a significant association between dietary patterns and the incidence of hypertension among patients at the Ulee Kareng Community Health Center.

Discussion

According to the study's findings, of the 100 respondents, 91 (95.9%) were between the ages of 60 and 74, and 9 (4.1%) were between the ages of 75 and 90. This study supports the findings of Ikhwan (2017) that people aged between 60 and 75 are more susceptible to hypertension because the risk increases with age. According to Afriyanti et al., (2020), hypertension is a degenerative disease characterized by an increase in blood pressure with advancing age. This condition occurs due to anatomical and physiological changes in the heart and blood vessels, such as thickening of the left ventricular wall and decreased elasticity of blood vessels. Riyada et al. (2023) added that collagen buildup in the muscle layer thickens the arterial walls, causing blood vessels to become stiff and constricted, and leading to increased sympathetic activity and peripheral resistance.

By gender, the majority of respondents were women (68 people). This study supports the findings of Mustaqimah (2016) that women are 53% more likely to develop hypertension than men due to declining estrogen levels after menopause. Falah (2019) explains that decreased estrogen levels in postmenopausal women can lead to reduced HDL levels, thereby increasing the risk of atherosclerosis, which contributes to elevated blood pressure. Additionally, women are more susceptible to hypertension associated with obesity.

Based on blood pressure readings, 69 respondents (69.1%) had hypertension, while 31 respondents (31.0%) did not. Hypertension is often referred to as the "silent killer" because its symptoms, such as headaches or neck pain, are frequently considered mild and insignificant (Afriyanti et al., 2020). Sari & Susanti (2016) state that the incidence of hypertension increases with age due to the accumulation of collagen, which thickens arterial walls, narrows them, and reduces blood vessel elasticity. The researchers concluded that hypertension is an asymptomatic disorder that increases the risk of cardiovascular disease, with age and gender serving as additional contributing factors to hypertension.

Based on the study results, the frequency distribution of respondents by dietary patterns shows that the majority of respondents (63.0%) have poor eating habits, while the remaining 37.0% have good dietary patterns. These findings are consistent with the research by Rihiantoro & Widodo (2025), which found that nutrition plays a role in a number of diseases, including hypertension.

Dietary habits that may contribute to hypertension include excessive snacking, consumption of fast food and processed foods, as well as certain foods and ingredients that can affect blood pressure. Maqfirah et al. (2024) explain that consuming high-fat foods may increase the risk of hypertension because it can raise blood cholesterol levels. Cholesterol buildup on arterial walls can lead to narrowing or blockage of blood vessels, thereby disrupting blood flow and raising blood pressure (Maqfirah et al., 2024). Additionally, individuals with hypertension are advised to adopt a healthy diet, including reducing sodium or salt intake, limiting consumption of high-fat foods such as organ meats, red meat, high-fat dairy, and cheese, and increasing intake of fiber-rich fruits and vegetables. Foods rich in potassium, such as beans, bananas, and starfruit, are also recommended as they help regulate blood pressure. Furthermore, a balanced intake of magnesium-rich foods, such as potatoes and legumes, and calcium sources like soybeans and low-fat milk, is necessary. People with hypertension are also advised to consume foods containing isoflavones, such as tempeh and soy milk, and to avoid excessive consumption of alcohol and caffeine.

The Relationship Between Dietary Patterns and the Prevalence of Hypertension in the Service Area of the Ulee Kareng Community Health Center in Banda Aceh

This study aimed to analyze the relationship between dietary patterns and the prevalence of hypertension in the service area of the Ulee Kareng Community Health Center. Based on the results of the Chi-Square test, with a p-value of 0.002 ($p < 0.05$), H_0 was rejected and H_1 was accepted. These findings indicate a significant association between dietary habits among the elderly and the incidence of hypertension in this region.

Rikayoni et al. (2024) explain that atherosclerosis caused by excessive fat consumption is a primary cause of hypertension because it increases vascular resistance, forcing the heart to beat faster to ensure blood reaches the entire body. Therefore, reducing high-fat foods and exercising regularly are key components in preventing hypertension. Unhealthy eating practices, such as consuming food without considering its type and ingredients, are considered to increase the risk of hypertension.

Daily eating habits are a key factor influencing an individual's nutritional status. The quantity and quality of food and beverages consumed can impact health, both at the individual level and for society as a whole. Rikayoni et al. (2024) emphasize that the public's dietary patterns must be improved toward a nutritionally balanced diet in order to prevent various chronic or

noncommunicable diseases related to nutrition.

Consuming fast food high in fat and salt, fried foods, and coconut milk can be harmful to health. The saturated fat in these foods raises LDL (bad cholesterol) levels, which clogs blood vessels and increases blood pressure. Too much salt causes the body to retain water, leading to hypertension. Trans fats in fried foods increase the risk of obesity and heart disease, while coconut milk contains saturated fats that impair blood vessel function. Rikayoni et al. (2024) concluded that it is crucial to maintain a balanced diet, choose nutritious foods, limit intake of fat, salt, and sugar, and engage in regular exercise.

Thus, if unhealthy eating habits are maintained regularly, they can contribute to hypertension. Consuming excessive amounts of high-fat and high-sodium foods causes the body to accumulate fat that impedes blood flow. This blockage of blood flow to the heart ultimately increases blood pressure, or leads to hypertension.

CONCLUSION

There is a correlation between the prevalence of hypertension in the Ulee Kareng Community Health Center (Puskesmas) area and the eating habits of the elderly, according to the results of a 2026 study involving 100 respondents:

1. A total of 63 respondents (63.0%) indicated that the majority of the elderly in the Ulee Kareng Community Health Center (Puskesmas) service area have poor eating habits.
2. A total of 69 respondents (69.0%) indicated that the majority of the elderly in the area have hypertension.
3. A statistical test p-value of 0.002 indicates a significant correlation between dietary habits and the prevalence of hypertension among the elderly in the Ulee Kareng Community Health Center service area.

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