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# Knowledge and food habits of hypertensive adults after counseling using nutrition & hypertension flipchart at Tanjung Priok Public Health Center

*Pengetahuan dan kebiasaan makan orang dewasa hipertensi setelah dilakukan penyuluhan menggunakan flipchart gizi & hipertensi di Puskesmas Tanjung Priok*

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## Abstract

Hypertension is a non-communicable disease that affects approximately 22% of the global population, as reported by the World Health Organization (WHO) in 2019. It also affects adults and the elderly (63,49%) more than the younger population (13,22%). This study aimed to determine the differences in the knowledge and food habits of patients after counseling using nutrition and hypertension flipcharts. The research used a pre-experimental design with a one-group pretest-posttest. The research was conducted at the Tanjung Priok Public Health Center in 2022 with 30 outpatients with hypertension as respondents. Respondents who met the inclusion criteria were selected through accidental sampling. Knowledge levels were collected using questionnaires, and food habits were assessed using a food frequency questionnaire (FFQ). Statistical analysis of the data was performed using a paired t-test (80% CI). The results showed a significant increase in the knowledge scores of patients, from 76,67 to 93,00 after counseling using nutrition and hypertension flipcharts (p <0,001). After counseling, descriptive analysis showed a reduction in the number of respondents who frequently consumed high-sodium and high-saturated foods. It was concluded that the knowledge levels and food habits of patients with hypertension can improve after counseling using nutrition and hypertension charts.

**Keywords:** Counseling, foods, hypertension, flipchart media, nutrition

## Abstrak

Hipertensi merupakan penyakit tidak menular yang dialami oleh sekitar 22% dari populasi di dunia, sebagaimana dilaporkan oleh WHO pada tahun 2019. Penyakit ini juga lebih banyak dialami oleh orang dewasa dan lansia (63,49%) dibandingkan dengan kelompok usia muda (13,22%) di Indonesia, menurut data Riskesdas 2018. Penelitian ini bertujuan untuk menilai perbedaan tingkat pengetahuan dan kebiasaan makan pasien setelah mendapatkan konseling menggunakan lembar balik gizi dan hipertensi. Penelitian ini menggunakan desain pra-eksperimental dengan pretest-posttest pada satu kelompok. Penelitian dilakukan di Puskesmas Kecamatan Tanjung Priok pada tahun 2022 dengan melibatkan 30 pasien rawat jalan yang menderita hipertensi sebagai responden. Responden yang memenuhi kriteria inklusi dipilih dengan menggunakan accidental sampling. Tingkat pengetahuan diukur menggunakan kuesioner, sementara kebiasaan makan dinilai dengan menggunakan Kuesioner Frekuensi Konsumsi Makanan (FFQ). Analisis statistik data menggunakan uji t berpasangan (80% CI). Hasil penelitian menunjukkan peningkatan signifikan pada skor pengetahuan pasien, dari 76,67 menjadi 93,00 setelah mendapatkan konseling menggunakan lembar balik gizi dan hipertensi (p <0,001). Setelah konseling,

menurut analisis deskriptif juga menunjukkan penurunan jumlah responden yang sering mengonsumsi makanan tinggi natrium dan lemak jenuh. Penelitian ini menyimpulkan bahwa tingkat pengetahuan dan kebiasaan makan pasien dengan hipertensi dapat meningkat setelah mendapatkan konseling menggunakan lembar balik gizi dan hipertensi.
**Kata Kunci:** Gizi, makanan, hipertensi, konseling, media lembar balik

## Introduction

Hypertension is the most prevalent cardiovascular disease in the world. According to the 2020 PAHO report, hypertension affects over 30% of the global adult population (Pan American Health Organization, 2020). Additionally, the World Health Organization (WHO) estimated in 2023 that approximately 1.28 billion adults aged 30–79 years worldwide have hypertension (WHO, 2023a). In the WHO South-East Asia Region in 2023, the burden of hypertension is still massive, with more than 245 million people over 30 years estimated to have raised their blood pressure (WHO, 2023b). According to Riskesdas (2018), the national prevalence of hypertension based on measurement results was 34,11%.

Hypertension was more prevalent among the pre-elderly and elderly groups than aged 18-24 years, with rates of 45,32% for ages 45-54 years; 55,23% for ages 55-64, year; 63,22% for ages 65-74 years; and 69,63% for those aged > 75 years. These numbers are higher when compared to the 13,22% prevalence among those aged 18-24 years (Riskesdas, 2018) Furthermore, according to Riskesdas of DKI Jakarta, North Jakarta has a prevalence of hypertension based on measurement results, is 31,97% (Kementerian Kesehatan RI, 2018). Based on patient data from October to December 2021 in the Tanjung Priok Public Health Center, 376 of 505 (74%) pre-elderly patients (46-59 years) were diagnosed with hypertension. Approximately 231 of 530 (43,6%) elderly patients were diagnosed with hypertension (Aris, 2022).

According to the Joint National Committee (JNC) VIII, hypertension is a condition in which an individual's blood pressure measurement shows a systolic pressure ≥140 mmHg and diastolic pressure ≥90 mmHg when measurements are repeated (Azkiya & Fairuza, 2023). The treatment of hypertension is divided into two categories: pharmacological treatment, which is usually aimed at patients with severe hypertension who require antihypertensive medications, and nonpharmacological treatment, which focuses on adopting a healthier lifestyle. Non-pharmacological treatment is typically offered through nutritional education, primarily targeting patients with prehypertension, mild hypertension, or hypertension prevention. However, it can also be helpful in individuals with severe hypertension (Azkiya & Fairuza, 2023). As found in research by Pratama, a patient's lifestyle can influence their knowledge and attitude towards hypertension (Pratama, 2019). Therefore, educational interventions related to hypertension will influence patients' behavior in preventing or controlling hypertension (Al Rahmad et al., 2023).

The American Institute of Medicine describes health literacy as "individuals' ability to obtain, understand, and process basic health information and services needed to make appropriate health-related decisions" (Speros C, 2015). Patients with low health literacy cannot find information on health, disease prevention and health care knowledge (Lin et al., 2019) Researches show that people with low health literacy are more likely to have adverse health outcomes than those with high health literacy (Dewalt, 2019; Mulyani et al., 2023). However, interventions for patients with low health literacy can effectively improve their health status. In Indonesia, Malini's research was showed that health literacy of patients relatively low, 33% were on problematic level and 16,2% inadequate (Malini et al., 2023)

Providing materials or information for education or counseling can improve the comprehensiveness and acceptance of patients with both high and low health literacy (Pignone et al., 2005). In educational media, pictures can prompt patients to engage in discussions and facilitate understanding when answering questions. Various types of pictures can be adapted in health education for diseases, which enhances the acceptance of patients with low health literacy (Rahmad et al., 2022).

Improving educational materials and intervention strategies is a potentially successful approach for patients with low health literacy,

especially when utilizing visual aids, such as pictures. One of the educational media commonly used to educate individual patients is flipcharts. According to Damayanti's research, nutrition and hypertension flipchart media were better and more attractive than leaflets, specifically the pictures, images, colors, and layouts of flipchart media when evaluated by nutritionists for counseling patients (Damayanti et al., 2017); however, this nutrition and hypertension flipchart has not yet been implemented in counseling for hypertensive patients. Therefore, this study aimed to determine the differences in the level of knowledge and consumption patterns of patients with hypertension after counseling using nutrition and hypertension flipchart media at Tanjung Priok Public Health Center.

## Methods

The method used in this research was a pre-experimental design with a one-group pretest-posttest research design. This research design involves using one subject group. The form of treatment in this research includes providing counseling with flipchart media, followed by filling in a test before and after the counseling session by the subjects of research (UNM, 2018).

According to Sharma et al. (2020), calculations for an unknown population size can be performed using the Lemeshow formula approach, as shown below.

$$n = \frac{Z^2 \,.\, \mathrm{P}\,(1-\mathrm{P})}{d^2}$$

n = Total sample size
z = Z-score regarding confidence of 80% =1,28
p = Max estimination
d = Error value

Based on this formula, the sample was determined using the Lemeshow formula, with a maximum estimation of 75% and a 10% error rate.

$$n = \frac{1{,}28^2 \,.\, 0{,}75\,(1-0{,}75)}{0{,}10^2}$$

$$n = \frac{1{,}6384 \,.\, 0{,}75 \,.\, 0{,}25}{0{,}10^2}$$

$$n = \frac{0{,}3072}{0{,}01} = 30$$

Therefore, based on the Lemeshow formula above, the sample in this research included 30 respondents who were diagnosed with hypertension by a doctor. The respondents in this research consisted of 11 male and 19 female respondents obtained through the Accidental Sampling method. The respondents were in the age range–46-65 years.

This research was conducted in Tanjung Priok Public Health Center in 2022, with 30 outpatients diagnosed with hypertension by a doctor as a respondent. The respondents had their blood pressure measured before the start of the research, and the measurement of the respondents' blood pressure showed that the systolic pressure was ≥140 mmHg and diastolic pressure was ≥90 mmHg based on JNC VIII (Azkiya & Fairuza, 2023). The data used in this research are respondents' characteristics, including age, gender, occupation, and education. Then, for the respondents' knowledge data, they were asked to fill out the pre-test and post-test sheets.

And later, the scores of knowledge will be grouped into categories of knowledge levels namely: a.) Good (Score: 76 – 100); b.) Average (Score: 56 – 75); c.) Less (score ≤ 56) (Mail et al., 2020). Next, respondents' data regarding consumption patterns of foods high in sodium, fat, and potassium over the past week were recorded using the Food Frequency Questionnaire (FFQ) sheet. FFQ was chosen because it can accommodate various types of foods that can be adjusted to this research objective, and can help to identify the food habits of the respondents (Syagata et al., 2022).

The results of this univariate analysis are presented in a frequency distribution table that includes respondents' characteristics, blood pressure measurements, consumption patterns, and knowledge levels. In addition, descriptive univariate analysis was also carried out on the respondents' consumption patterns, which are related to the consumption patterns of foods high in sodium, saturated fat, and potassium. Next, bivariate analysis was carried out to examine the trend of two variables that were assumed to have a relationship in the statistical tests. Bivariate analysis in this study used a sample paired t-test, which will be used to see differences in knowledge scores before and after counseling. However, a

normality test was performed to determine the distribution of the data.

All respondents in this research were given an explanation and gave their consent before the research was conducted, and the privacy of the respondents in this research was maintained because the researchers have full responsibility that this research is safe and does not have a negative effect on the conditions of all respondents. Ethical approval was obtained from the Ethics Commission of Health Polytechnic Jakarta II (number LB.02.01/I/KE/31/224/2022 on March 24, 2022.

## Result and Discussion

The characteristics of the respondents with respect to blood pressure are shown in Table 1. Characteristics of respondents, including age and sex, can be influential factors in the occurrence of hypertension. Blood pressure tends to increase with age because it is caused by physiological changes in the body, such as decreased arterial flexibility. In addition, women who have entered the menopausal phase will also have a higher risk of hypertension than men (Nuraini, 2015).

**Table 1.** Distribution frequency of the characteristics of respondents to categories of blood pressure (n = 30)

| Characteristics of Respondents | Categories of Blood Pressure | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | Pre-HT*[1] | | HT grade 1[2] | | HT grade 2[3] | | |
| | % | n | % | n | % | n | % |
| Age | | | | | | | |
| 46-59 | 31,8 | 7 | 31,8 | 8 | 36,4 | 22 | 100 |
| 60-65 | 12,5 | 4 | 50,0 | 3 | 37,5 | 8 | 100 |
| Gender | | | | | | | |
| Male | 27,3 | 2 | 18,2 | 6 | 54,5 | 11 | 100 |
| Female | 26,3 | 9 | 47,4 | 5 | 26,3 | 19 | 100 |

From the table above, it can be observed that the characteristics of respondents based on age show that most respondents aged 46-59 years had measurement results in the category of hypertension grade 2, with 8 respondents (36,4%). Meanwhile, most respondents aged 60-65 years had blood pressure measurement results in the category of hypertension grade 1, with four respondents (50,0%). Regarding the characteristics of respondents based on sex, the majority of male respondents had measurement results indicating grade 2 hypertension, with six respondents (54,5%). Most female respondents had blood pressure measurement results in the hypertension grade 1 category, with nine respondents (47,4%).

The knowledge levels of respondents before and after counseling with the flipchart media are shown in the Table 2. Based on the Table 2, the results of the respondents's knowledge level before receiving counseling showed 18 respondents (60%) had knowledge in the "good" category, followed by 10 respondents (33,3%) in the "average" knowledge category, and the remaining 2 respondents (6,7%) had knowledge in the "less" category.

There was an improvement in the respondents' knowledge levels after counseling. It can be seen that there was an increase in the number of the respondents who have knowledge in "good" category to 27 respondents (90%). The number of respondents in the "average" knowledge category decreased to three (10%). In addition to the category of knowledge level, an increase can also be seen in the mean value obtained by respondents when answering the questions.

**Table 2.** Distribution frequency of the respondents's knowladge level (n = 30)

| Category | Before Counseling | | After Counseling | |
|---|---|---|---|---|
| | n | % | n | % |
| Good[1] | 18 | 60 | 27 | 90 |
| Average[2] | 10 | 33,3 | 3 | 10 |
| Less[3] | 2 | 6,7 | 0 | 0 |
| Total | 30 | 100 | 30 | 100 |
| Mean | 76,67 | | 93,00 | |
| SD | 0,629 | | 0,305 | |
| Min | 50 | | 60 | |
| Max | 100 | | 100 | |

Regarding the normality test of knowledge values before and after counseling, the results

obtained a p-value of 0,095 (p > 0,05), indicating that the data followed a normal distribution. A Paired Sample t-test was used to determine the level of difference in respondents' knowledge. The differences in knowledge levels before and after counseling are shown in Table 3.

**Table 3.** Differences in knowledge level of respondent about hypertension (n = 30)

| | Mean ± SD | Mean of Diff-erece | 80% CI | | p-value |
|---|---|---|---|---|---|
| | | | Lower | Upper | |
| Pre-test | 76,67 ± 14,223 | 16,33 | 12,47 | 20,19 | 0,000 |
| Post-test | 93,00 ± 10,875 | | | | |

Based on the table of paired sample t-test results above, the result was p= 0,000 (p<0,001). Thus, it was concluded that there was a significant difference in the knowledge of the respondents between the pre-test and post-test.

The results of this study were in line with the research conducted by Anggie, which indicated an increase in knowledge among respondents after receiving counseling using flipchart media (Fitriani, 2017). This improvement is due to the use of flipcharts to capture respondents' attention through the use of images and explanations. The results of this study were similar to those of Rahmawati et al., who showed that nutrition education can improve the knowledge level of patients with hypertension. It also showed that nutrition education improved patient compliance, including compliance with diet, among hypertensive patients in the intervention group but not in the control group (Rahmawati et al., 2022).

Hypertension can also be influenced by consumption patterns. Examples of foods that can affect blood pressure include high sodium, fat, and potassium levels. In this study, consumption patterns are focused on foods that consume with "frequent" categories (≥ 5 times/week). The consumption pattern of respondents in the "frequent" category and a list of foods that were considered in making the FFQ form, which has been adjusted to the population's circumstances (Sugawara & Nikaido, 2014), can be seen in Table 4 below.

Based on the Table 4, can be seen the high-sodium foods that are the most consumed in "frequent" category both before and after counseling is flavoring with 19 respondents (63,3%) before counseling and decreased to 2 respondents (6,7%) after counseling. A high number of respondents consume flavoring because they often add flavoring to their dishes as flavors. Consumption of high-sodium foods can increase blood pressure (Shanty & Farmadiani, 2011). According to Fitri et al. (2022), there is also a relationship between sodium consumption and hypertension.

**Table 4.** Distribution frequency of consumption in "frequent" category

| Foods | Before | | After | |
|---|---|---|---|---|
| | n | % | n | % |
| High Sodium Foods | | | | |
| Flavoring | 19 | 63,3 | 2 | 6,7 |
| Chips | 6 | 20,0 | 0 | 0,0 |
| Sweet soy sauce | 5 | 16,7 | 0 | 0,0 |
| Instant seasoning | 4 | 13,3 | 0 | 0,0 |
| Salted fish | 2 | 6,7 | 0 | 0,0 |
| Dry anchovies | 2 | 6,7 | 0 | 0,0 |
| White bread | 2 | 6,7 | 0 | 0,0 |
| Margarine | 1 | 3,3 | 0 | 0,0 |
| Shrimp paste | 1 | 3,3 | 0 | 0,0 |
| High Saturated Fat Foods | | | | |
| Palm oil | 22 | 73,3 | 12 | 40,0 |
| Egg yolk | 6 | 20,0 | 0 | 0,0 |
| High-fat milk | 5 | 16,7 | 0 | 0,0 |
| Chicken w/ skin | 5 | 16,7 | 3 | 10,0 |
| Thick coconut | 3 | 10,0 | 0 | 0,0 |
| milk | 2 | 6,7 | 0 | 0,0 |
| Beef | 2 | 6,7 | 0 | 0,0 |
| Offal | 1 | 3,3 | 0 | 0,0 |
| Quail egg | | | | |
| High Potassium Foods | | | | |
| Tempeh | 15 | 50,0 | 10 | 33,3 |
| Tomato | 12 | 40,0 | 5 | 16,7 |
| Banana | 10 | 33,3 | 18 | 60,0 |
| Orange | 10 | 33,3 | 18 | 60,0 |
| Carrot | 10 | 33,3 | 11 | 36,7 |
| Cucumber | 9 | 30,0 | 6 | 20,0 |
| Spinach | 7 | 23,3 | 11 | 36,7 |
| Cabbage | 7 | 23,3 | 8 | 26,7 |
| Potato | 6 | 20,0 | 7 | 23,3 |
| Siamese gourd | 4 | 13,3 | 0 | 0,0 |
| Papaya | 4 | 13,3 | 7 | 23,3 |
| Melon | 3 | 10,0 | 0 | 0,0 |

Next is high-saturated fat foods that were most consumed with "frequent" category both before and after counseling is palm oil with 22 respondents (73,3%) before counseling and

decrease to 12 respondents (40%) after counseling. According to Anwar in Ramadhini, excessive saturated fat intake can lead to atherosclerosis, which is a risk factor for hypertension owing to an increase in blood vessel resistance. This is supported by Ramadhini's research, which found that out of 54 respondents who consumed excessive saturated fat, 32 had hypertension (Ramadhini & Yuliantini, 2019). In addition, as found in Elivia's research, 21 of 29 respondents consumed high-saturated fat foods and had hypertension. Therefore, it can be concluded that there is a relationship between the consumption of high-saturated fat foods and hypertension (Elivia, 2022).

In addition to high-sodium and saturated fat foods, potassium can affect blood pressure. According to Ramadhian & Hasibuan, (2016), the antihypertensive effect of potassium occurs by inhibiting the reabsorption of sodium in the proximal renal tubules, increasing urine excretion, relaxing smooth muscles through nitric oxide production, and suppressing the formation of free radicals. Therefore, a low intake of potassium can lead to an increase in blood pressure, whereas a high intake of potassium can decrease blood pressure due to a decrease in vascular resistance (Polii et al., 2016). Table 4 presents the high-potassium foods that most consumed with "frequent" category before counseling is tempeh with 15 respondents (50%) and tomato with 12 respondents (40%). However, the consumption of both foods decreased after counseling. There was an increase in the number of respondents who consumed banana and orange after counseling, with the number rising from 10 respondents (33,3%) to 18 respondents (60%).

Aprilia (2021) research also showed a similar result to this research, which showed a significant increase in knowledge of hypertension patients, a significant decrease in sodium intake of patients, and a significant increase in potassium intake of hypertensive patients after nutrition counseling using modified leaflet media. There was no explanation in this research whether the media implemented pictures or images that were more effective for patients with low education or low health literacy. Meanwhile, this research showed a different result from Isa et al. (2021), which showed that patients with higher health literacy had better blood pressure or hypertension knowledge. However, the relationship between health literacy with dietary salt intake has shown mixed and inconsistent findings (Isa et al., 2021).

## Conclusion

There was a significant increase in the patient knowledge scores after counselling using nutrition and hypertension charts. This increase was due to the use of flipcharts, which attracted respondents' attention through the use of pictures and explanations. In addition, after counselling, there was a decrease in eating foods high in sodium and saturated fat. The level of knowledge and eating habits of patients with hypertension can improve after counselling using nutrition and hypertension charts.

This research is expected to serve as a valuable reference for other researchers conducting further studies and to provide information about the effectiveness of counseling using flipcharts on hypertension. Therefore, it can be beneficial in helping reduce the prevalence of hypertension in the community. It is hoped that the community will pay more attention to their dietary patterns, thereby maintaining normal levels.

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