# The Event of Hypertension Based on Salt, Fruit and Vegetable Consumption Habits in The Coastal Area of Belawan Sicanang

**Ikhwan[1]\*, Mutiara Husna Sari Dewi[2], Ryzka Aini Hutabarat[3], Selia Puspita Sindi Anisyah Caniago[4],Yulia Afnasari Siregar[5], Yulia Khairina Ashar[6]**

[1,2,3,4]Faculty of Public Health, State Islamic University Of North Sumatra, Medan

## Article Info

## ABSTRACT

*The habit of consuming processed seafood which contains much sodium, is one of the risk factors for hypertension in coastal areas. High sodium levels in the blood will disrupt the fluid balance, so the heart will continue to pump vigorously, which causes an increase in blood pressure. This study aimed to determine the incidence of hypertension based on the level of salt, fruit and vegetable consumption in the coastal area of Belawan Sicanang. This study is a rapid survey research with univariate analysis conducted in 20 Belawan Sicanang Village, Medan Belawan Medan City, in October 2021. The sample of this study was 210 local people with a history of hypertension and aged 17 years. Data was collected by distributing questionnaires adopted from household questionnaires and basic health research questionnaires in 2018. Based on the results of the study, the majority of hypertension sufferers (18.5%) were in the neighbourhood of 19, female (63.0%), aged 42- 46 years old (33.3%), high school education (77.8%) and working as a housewife (35.2%). The average consumption of salt per day exceeds the optimal dose (2.57 teaspoons/day), with the average consumption of vegetables (1.48 servings/day) and fruit (0.78 servings/day) still low. Salt consumption in the community is still relatively high, and consumption of vegetables and fruit is still relatively low.*
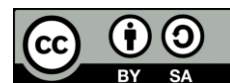
*Corresponding Author:*

Ikhwan,
Faculty of Public Health
State Islamic University Of North Sumatra

Email: ikhwan2899@gmail.com

## 1. INTRODUCTION

The World Health Organization (WHO) states that 1.28 billion adults aged 30-79 years worldwide suffer from hypertension, most of them (two thirds) live in low- and middle-income countries. Patients with hypertension will continue to grow by 29%, in line with the population that continues to grow in 2025 (World Health Organization, 2013). Indonesia has a population prevalence of hypertension reaching 34.11%, with the prevalence of high blood pressure in women (36.85%) higher than men (31.34%) (Ministry of Health, 2018d). A study shows that hypertension sufferers are more in coastal areas compared.

Mountains (Rusliafa et al., 2014). This happens because of the habit of consuming processed seafood that contains much sodium; sodium consumption is one of the risk factors for hypertension (Aristi et al., 2020). Consumption of foods that contain high sodium causes the diameter of the arteries to narrow, and the heart pumps harder, causing blood pressure to rise (Salman et al., 2016). Based on the Basic Health Research (Riskesdas) in 2018, the prevalence of hypertension sufferers in Indonesia increased from 2013 (25.8%) to 34.1% in 2018 in the >18 year age group (Ministry of Health, 2018d). The prevalence range of hypertension in North Sumatra is (28.46-29.94) (Ministry of Health, 2018d). Based on the 2016 Medan City Health Profile, hypertension in Medan Belawan reaches 4.03%.

Hypertension can occur due to two factors, non-modifiable risk factors (Age, Gender, Genetics) and modifiable risk factors (Smoking, low fibre diet, dyslipidemia, excessive salt consumption, lack of physical activity, stress, obesity and consumption of alcohol) (Ministry of Health, 2018c). Consumption restrictions the salt recommended by the Ministry of Health for a person in a day is no more than one teaspoon (1000 mg/5 grams) (Ministry of Health, 2018b). Consumption of small amounts of salt is needed to regulate the water content in the body, if excessive salt will cause high blood pressure (hypertension) and even stroke (Ministry of Health, 2019).

The absorption of salt from household consumption to the industry has reached 1.1 million tons (Ministry of Industry of the Republic of Indonesia, 2019). Research conducted by Farapti F et al. (2020) in the Kenjeran coastal area, Surabaya, stated that 62.8% of coastal communities consume <6 grams of salt/day. Salt consumption is a risk factor for hypertension in coastal areas (Farapti et al., 2020).

Habits have an important role in shaping health behaviour. Every human being instinctive carries out routine activities such as choosing the food to be consumed, resting, bathing, defecating, urinating, and other activities carried out from childhood to old age and will form habits. Suharjana, 2012). These habits greatly affect health behaviour that determines a person's health status (Notoadmodjo, 2010).

This is what underlies the researchers to examine the incidence of hypertension based on the consumption of salt, vegetables and fruit in the coastal area of Belawan Sicanang.

## 2.  RESEARCH METHOD

### Types of research

This study uses a rapid survey design (rapid survey). This research was conducted in Belawan Sicanang Village, Medan Belawan District, Medan City, North Sumatra Province, with 20 neighbourhoods. The research was conducted in October 2021.

### Research Instruments

This study used a questionnaire instrument adopted from the Household Questionnaire and the Basic Health Research Individual Questionnaire in 2018. The questions in this instrument consisted of 5 questions about demographic data, three questions about salt, vegetable and fruit consumption and three questions. About the history of hypertension in the last two weeks.

### Sample and population

The research population is people aged 17 years who live permanently in Belawan Sicanang Village, Medan Belawan District, Medan City, North Sumatra Province. The sample used in the study. This is a total of 210 samples. The calculation method uses the WHO rapid survey approach, 30 clusters x 7 samples using the C-Survey software. Sampling was carried out using two methods, namely the cluster sampling method where from 20 existing neighbourhoods were counted and obtained 30 clusters with details of Environment one 1 cluster (7 sample), Environment two 1 cluster (7 sample), Environment three 2 clusters (14 sample), Environment four 3 clusters (21 sample), Environment five 1 cluster (7 sample), Environment six 1 cluster (7 sample), Environment seven 2 clusters (14 sample), Environment eight 1 cluster (7 samples), Environment nine 3 clusters (21 samples), Environment ten 1 cluster (7 samples), Neighbourhood eleven 2 cluster (14 samples), Environment twelve 1 cluster (7 samples), Environment thirteen 1 sample (7 samples), Environment fourteen 1 cluster (7 samples), Environment fifteen 2 clusters (14 samples), Environment sixteen 1 cluster (7 samples), Environment seventeen 1 cluster (7 samples), Environment eighteen 1 cluster (7 samples), Environment Nineteen 3 clusters (21 samples), Environment twenty 1 cluster (7 samples). Then the second method uses simple random sampling with each cluster consisting of 7 samples.

The number of respondents obtained is 210 samples. Inclusion factors are permanent residents of Belawan Sicanang Village aged 17 years, and exclusion factors are residents aged ≤16 years, immigrants and non-permanent residents of Belawan Sicanang Village.

### Data collection

This study uses primary data. Primary data collection was performed with interviews using a research instrument, namely a questionnaire consisting of questions about the characteristics of the respondents, salt consumption, consumption of vegetables, fruits

and a history of hypertension for two weeks final. Before research, respondents first agreed to the study by signing an informed consent form.

### Data analysis

This study used univariate analysis. This analysis will describe the incidence of hypertension based on consuming salty food in the Belawan Sicanang village community. The incidence of hypertension was obtained from a questionnaire in the form of demographic data of respondents, consumption of salt, vegetables and fruit and a history of hypertension for the last two weeks.

## 3. RESULT AND ANALYSIS

The results of the distribution of characteristics of the variables and research subjects can be seen in the following table.

Table 1. Characteristics of Respondents in Belawan Sicanang Village (n=210)

| Variable | Frequency | Percentage | 95%CI |
|---|---|---|---|
| **Gender** | | | |
| Man | 85 | 40.5 | 33.8 - 46.7 |
| Woman | 125 | 59.5 | 53.3 - 66.2 |
| **Age (Years)** | | | |
| 17-21 | 67 | 31.9 | 25.7 - 38.6 |
| 22-26 | 27 | 12.9 | 8.6 - 17.6 |
| 27-31 | 10 | 4.8 | 1.9 - 7.6 |
| 32-36 | 12 | 5.8 | 2.9 - 9.0 |
| 37-41 | 21 | 10.0 | 6.2 - 14.3 |
| 42-46 | 33 | 15.7 | 11.0 - 21.0 |
| 47-51 | 19 | 9.0 | 5.2 - 13.3 |
| 52-56 | 9 | 4.3 | 1.9 - 7.1 |
| 57-61 | 10 | 4.8 | 1.9 - 8.1 |
| 62-66 | 2 | 1.0 | 0.0 - 2.4 |
| **Level of education** | | | |
| No school | 1 | 0.5 | 0.0 - 1.4 |
| finished elementary school | 10 | 4.8 | 1.9 - 7.6 |
| High school graduate | 31 | 14.8 | 10.5 - 20.0 |
| finished high school | 151 | 71.9 | 65.7 - 77.6 |
| Graduated College (S1/S2/S3) | 17 | 8.1 | 4.8 - 11.9 |
| **Work** | | | |
| Housewife | 71 | 33.8 | 27.6 - 40.5 |
| entrepreneur | 43 | 20.5 | 15.2 - 25.7 |
| Student/Student | 43 | 20.5 | 14.8 - 25.7 |
| Fisherman | 25 | 11.9 | 7.6 - 16.2 |
| Labourer | 18 | 8.6 | 4.8 - 12.4 |
| Factory worker | 6 | 2.9 | 1.0 - 5.2 |
| PNS/TNI-Polri/BUMN | 4 | 1.9 | 0.5 - 3.8 |
| **Hypertension Status** | | | |
| Hypertension | 54 | 25.7 | 20.0 - 31.9 |
| No Hypertension | 156 | 74.3 | 68.1 - 80.0 |

Based on Table 1. it is known that the highest proportion of respondents is in women (59.5%) with age most are 17-21 years old (31.9%), high school education level (71.9), housewife work (33.8%), and have hypertension status.

Table 2. Characteristics of Respondents in Belawan Sicanang Village with hypertension status (n=54)

| Variable | Frequency | Percentage | 95%CI |
|---|---|---|---|
| **Environment** | | | |
| 1 (One) | 2 | 3.7 | 0.0 - 9.3 |
| 2 (Two) | 2 | 3.7 | 0.0 - 9.3 |
| 3 (Three) | 3 | 5.6 | 0.0 - 13.0 |
| 4 (Four) | 5 | 9.3 | 1.9 - 16.7 |
| 5 (Five) | 1 | 1.9 | 0.0 - 5.6 |
| 6 (Six) | 2 | 3.7 | 0.0 - 9.3 |
| 7 (Seven) | 7 | 13.0 | 3.8 - 22.2 |
| 8 (Eight) | 1 | 1.9 | 0.0 - 5.6 |
| 9 (Nine) | 3 | 5.6 | 0.0 - 13.0 |
| 10 (Ten) | 2 | 3.7 | 0.0 - 9.3 |
| 11 (Eleven) | 2 | 3.7 | 0.0 - 9.3 |
| 12 (Twelve) | 1 | 1.9 | 0.0 - 5.6 |
| 13 (Thirteen) | 1 | 1.9 | 0.0 - 5.6 |
| 14 (Fourteen) | 0 | 0 | 0.0 - 0.0 |
| 15 (Fifteen) | 1 | 1.9 | 0.0 - 5.6 |
| 16 (Sixteen) | 0 | 0 | 0.0 - 0.0 |
| 17 (Seventeen) | 3 | 5.6 | 0.0 - 11.1 |
| 18 (Eighteen) | 6 | 11.1 | 3.7 - 20.4 |
| 19 (Nineteen) | 10 | 18.5 | 9.3 - 29.6 |
| 20 (Twenty) | 2 | 3.7 | 0.0 - 9.3 |
| **Gender** | | | |
| Man | 20 | 37.0 | 24.1 - 50.0 |
| Woman | 34 | 63.0 | 50.0 - 75.9 |
| **Age (Years)** | | | |
| 17-21 | 1 | 1.9 | 0.0 - 5.6 |
| 22-26 | 0 | 0.0 | 0.0 - 0.0 |
| 27-31 | 1 | 1.9 | 0.0 - 5.6 |
| 32-36 | 2 | 3.7 | 0.0 - 9.3 |
| 37-41 | 9 | 16.7 | 7.4 - 27.8 |
| 42-46 | 18 | 33.3 | 22.2 - 46.3 |
| 47-51 | 9 | 16.7 | 7.4 - 29.6 |
| 52-56 | 6 | 11.1 | 3.7 - 20.4 |
| 57-61 | 7 | 13.0 | 56.6 - 22.2 |
| 62-66 | 1 | 1.9 | 0.0 - 5.6 |
| **Level of education** | | | |
| No school | 1 | 1.9 | 0.0 - 5.6 |
| finished elementary school | 1 | 1.9 | 0.0 - 5.6 |
| High school graduate | 8 | 14.8 | 5.6 - 24.1 |
| finished high school | 42 | 77.8 | 66.7 - 88.9 |

| | | | |
|---|---|---|---|
| Graduated College (S1/S2/S3) | 2 | 3.7 | 0.0 - 9.3 |
| **Work** | | | |
| Housewife | 19 | 35.2 | 22.2 - 46.3 |
| entrepreneur | 14 | 25.9 | 14.8 - 37.0 |
| Student/Student | 0 | 0.0% | 0.0 - 0.0 |
| Fisherman | 11 | 20.4 | 9.3 - 31.5 |
| Labourer | 9 | 16.7 | 7.4 - 25.9 |
| Factory worker | 1 | 1.9 | 0.0 - 7.4 |
| PNS/TNI-Polri/BUMN | 0 | 0.0 | 0.0 - 0.0 |

Based on Table 2. It is known that the highest proportion with hypertension status is in the neighbourhood of 19 (18.5%) in women (63.0%), the most age was 42-46 years (33.3%), high school education (77.8%) and worked as housewives (35.2%)

### Table 3. Habits of Consumption of Salt, Vegetables and Fruits in Belawan Sicanang Village (n=210)

| Variable | mean | Standard Deviation | 95%CI |
|---|---|---|---|
| Salt Consumption (per teaspoon/day) | 2.41 | 0.776 | 2.30 - 2.51 |
| Vegetable Consumption (per serving/day) | 1.97 | 1,130 | 1.81 - 2.13 |
| Fruit Consumption (per serving/day) | 1.51 | 0.934 | 1.38 - 1.64 |

Based on Table 3. it is known that the average consumption of salt per teaspoon exceeds the optimal dose (2.41 teaspoon/day) with an average consumption of vegetables (1.97 servings/day) and fruit (1.51 servings/day) which is still low.

### Table 4. Habits of Consumption of Salt, Vegetables and Fruits in Belawan Sicanang Exit (n=54)

| Variable | mean | Standard Deviation | 95%CI |
|---|---|---|---|
| Salt Consumption (per teaspoon/day) | 2.57 | 0.838 | 2.37 - 2.80 |
| Vegetable Consumption (per serving/day) | 1.48 | 1,225 | 1.15 - 1.80 |
| Fruit Consumption (per serving/day) | 0.78 | 0.634 | 0.61 - 0.94 |

Based on Table 4. it is known that the average consumption of salt per teaspoon exceeds the optimal dose (2.57 teaspoons/day), with the average consumption of vegetables (1.48 servings/day) and fruit (0.78 servings/day) being still low.

## 4. DISCUSSION

### Gender

Based on the study results, it was found that the proportion of female respondents (63.0%) suffered from hypertension more than male respondents. This is in line with the 2018 Basic Health Research (Riskesdas) data which states that hypertension is higher in the female gender than in the male gender. Hypertension in women can occur due to hormonal factors and the use of contraceptives; research by Nugraheni & Wijayanti (2017) states that young adult women who use contraceptives have three times the risk and women who have

used contraceptives have six times the risk of suffering from hypertension due to hormonal factors.

## Age

Based on the study results, it is known that the highest age proportion of hypertension sufferers is in the category of 42-46 years (33.3%). This is not in line with research conducted by Amanda & Martini (2018), which states that the incidence of hypertension is more common in the elderly (> 50 years) because they have entered old age. Hypertension in the elderly can occur with increasing age which causes stiffness in the arteries so that blood pressure in the elderly increases (Seke, 2016).

## Education

The results showed that the proportion of the education level of hypertension sufferers was high school (77.8%). This is not in line with research (Maulidina et al., 2019) Which states that the level of low education (no school, elementary and junior high school) 63.6% more experienced hypertension than respondents who have higher education (29.2%). A person's level of education greatly affects a person's knowledge of hypertension and the dangers that will arise; the higher a person's knowledge, the higher the participation in controlling hypertension risk factors (Pratama et al., 2020).

## Work

The results showed that the proportion of work with hypertension sufferers the most, namely housewives (35.2%). This is in line with Suseno's research (2017) that 31.3% of people with hypertension are mostly housewives. This is because homemakers have passive jobs, rarely do sports activities, causing obesity (Agung & Handayani, 2021). The higher the fat in a person's body will cause cholesterol levels to increase and cause fatty plaques to appear on the artery walls; the plate causes constriction. The heart pumps faster and causes hypertension (Suseno, 2017).

## Consumption of Salt, Vegetables and Fruits

Based on the study results, the average salt consumption per day in patients with hypertension exceeded the levels recommended by the Indonesian Ministry of Health, which was 2.57 teaspoons per day. The recommended salt consumption is one teaspoon (1000 mg/5 grams)/day (Ministry of Health, 2018b). This is in line with Farapti F et al. (2020) research in the Kenjeran coastal area, Surabaya, which states that local people consume <6 grams of salt/day. Consumption of excess salt will increase sodium levels in the blood and disrupt the fluid balance; the entry of fluid into cells will shrink the arteries so that the heart will continue to pump strongly, which causes an increase in blood pressure (Ministry of Health, 2018a).

Based on the study results, it is known that the average consumption of vegetables per day in patients with hypertension is still low, namely 1.97 servings/day. Meanwhile, based on balanced nutrition guidelines in the Minister of Health RI No. 41 of 2014 concerning balanced nutrition states that the adequacy of vegetable consumption is 3-4 servings a day. This is in line with Hamidah's research (2017) in the coastal area of Indramayu, which states that their environment strongly influences the consumption pattern of coastal communities, coastal communities who mostly have jobs as fishers tend to prefer food in the form of fish that is easily obtained rather than consuming vegetables.

Based on the study results, it was found that the average consumption of fruit per day in patients with hypertension was still very low, namely 0.78 servings/day. In fact, according to the guidelines for balanced nutrition in the Minister of Health of the Republic of Indonesia No. 41 of 2014 concerning balanced nutrition, the adequacy of fruit consumption is 2-3 servings/day. This is in line with Hamidah's research (2017) which states that fruit consumption patterns are still very low, with a frequency of "0" in a day as much as 75%. The very low consumption of fruit in coastal communities is caused by the low income they have,

and this is not only related to their socioeconomic but also affects the consumption patterns of coastal communities so that nutritional adequacy such as vegetables and fruit are often ignored and causes nutritional imbalances (Amiruddin et al. ., 2019).

## 5. CONCLUSION

Salt consumption in coastal communities of Belawan Sicanang is high and exceeds the recommended level, which is 2.57 teaspoons per day. Meanwhile, consumption of vegetables and fruit is still low, respectively 1.97 servings/day and 078 servings/day and is not under the guidelines for balanced nutrition in the Minister of Health of the Republic of Indonesia No. 41 of 2014.

Suggestions to the puskesmas and the Belawan Sicanang village head office can work together to hold continuous counselling regarding salt consumption as a risk factor for hypertension and the importance of consuming vegetables and fruit. The puskesmas can also hold screening activities for hypertension so that the public can know, prevent and be aware of the importance of controlling blood pressure in themselves.

## 6. REFERENCES

Agung, G. S., & Handayani, A. (2021). Pengaruh Aktivitas Fisik Rumahan Terhadap Tekanan Darah pada Ibu Rumah Tangga Yang memiliki riwayat hipertensi di kelurahan titi kuning. Jurnal Ilmiah Kohesi, 5(3).

Amanda, D., & Martini, S. (2018). Hubungan Karakteristik dan Obesitas Sentral dengan Kejadian Hipertensi. Jurnal Berkala Epidemiologi, 6(1), 43–50.

Amiruddin, M., Nuddin, A., & Hengky, H. K. (2019). Pola Konsumsi Sebagai Faktor Risiko Kejadian Penyakit Asam Urat Pada Masyarakat Pesisir Teluk Pare-Pare. Jurnal Ilmiah Manusia Dan Kesehatan, 2(2).

Aristi, D. L. A., Rasni, H., Susumaningrum, L. A., Susanto, T.,& Sisw, S. S. (2020). Hubungan Konsumsi Makanan Tinggi Natrium dengan Kejadian Hipertensi pada buruh tanu di Wilayah Kerja Puskesmas Panti Kabupaten Jember. Buletin Penelitian Sistem Kesehatan, 23(1).

F, F., AD, F., E, A., AC, H., & TN, R. (2020). Awareness of Salt Intake among Community-Dwelling Elderly at Coastal Area: The Role of Public Health Access Program. Journal of Nutrition and Metabolism, 2020. https://doi.org/10.1155/2020/8793869

Hamidah, I. (2017). Studi tentang Pola Konsumsi Masyarakat Pesisir Indramayu. Jurnal Mangifera Edu, 1(2).

Peraturan Menteri Kesehatan RI No. 41 Tahun 2014 Tentang Gizi Seimbang, (2014). http://hukor.kemkes.go.id/uploads/pr oduk_hukum/PMK    No.   41   ttg    Pedoman Gizi Seimbang.pdf

Kementerian Kesehatan RI. (2018a). Apa pengaruh konsumsi GARAM berlebih terhadap penyakit tidak menular? - Direktorat    P2PTM.http://p2ptm.kemkes.go.id/infographi c-p2ptm/hipertensi-penyakit-jantung-   dan-pembuluh-darah/page/41/apa-    pengaruh-konsumsi-garam-berlebih- terhadap-penyakit-tidak-menular

Kementerian Kesehatan    RI.    (2018b).Berapa anjuran konsumsi Gula, Garam, dan Lemak per harinya? - Direktorat P2PTM.http://p2ptm.kemkes.go.id/infographi   c-p2ptm/hipertensi-penyakit-jantung-   dan-pembuluh-darah/page/31/berapa-   anjuran-konsumsi-gula-garam-dan- lemak-per-harinya

Kementerian Kesehatan RI. (2018c). Faktor risiko Hipertensi - Direktorat P2PTM. http://p2ptm.kemkes.go.id/infographi c-p2ptm/hipertensi-penyakit-jantung- dan-pembuluh-darah/faktor-risiko- hipertensi

Kementerian Kesehatan RI. (2018d). Riset Kesehatan Dasar.

Kementerian Kesehatan RI. (2019). Terlalu Banyak Garam - Tanda dan Dampaknya bagi Tubuh - Direktorat P2PTM. Kementerian Kesehatan RI. http://p2ptm.kemkes.go.id/artikel- sehat/terlalu-banyak-garam-tanda- dan-dampaknya-bagi-tubuh

Kementerian Perindustrian RI. (2019). Kemenperin: Difasilitasi, Penyerapan Garam Lokal Sebanyak 1,1 Juta Ton. https://kemenperin.go.id/artikel/2092 6/Difasilitasi,-Penyerapan-Garam- Lokal-Sebanyak-1,1-Juta-Ton

Maulidina, F., Harmani, N., & Suraya, I. (2019). Faktor-faktor yang berhubungan dengan kejadian Hipertensi di Puskesmas Kranggan Temanggung. Arkesmas (Arsip Kesehatan Masyrakat), 4(1).

Notoadmodjo. (2010). Promosi Kesehatan dan Ilmu Perilaku. Rhineka Cipta.

Nugraheni, A. T., & Wijayanti, A. C. (2017). Faktor-faktor yang berhubungan dengan kejadian hipertensi pada perempuan dewasa muda di Kabupaten sukoharjo tahun 2017. Proceeding Urecol FMIPA Dan Kesehatan Universitas Muhamadiyah Purwokerto.

Pratama, I. B. A., Fathnin, F. H., & Budiono, I. (2020). Analisis Faktor yang Mempengaruhi Hipertensi di Wilayah Kerja Puskesmas Kedungmundu. Proceeding Seminar Nasional Pascasarjana 2020.

Rusliafa, J., R, A., & BN, N. (2014). Komparatif Kejadian Hipertensi pada Wilayah Pesisir Pantai dan Pegunungan di Kota Kendari Tahun 2014. Jurnal Kesehatan Masyarakat Universitas Hasanuddin.

Salman, Y., Anwar, R., & Muhaimin, A. (2016). Pola Konsumsi Natrium dan Lemak sebagai Faktor Risiko Terjadinya Penyakit Hipertensi di Wilayah Kerja Puskesmas Kandangan Kecamatan Kandangan Kabupaten Hulu Sungai Selatan. Jurnal Kesehatan Indonesia, 5(2).

Seke, P. A. (2016). Hubungan Kejadian Stres dengan Penyakit Hipertensi pada Lansia di Balai Penyantunan Lanjut Usia Senja Cerah Kecamatan Mapnget Kota Manado. E-Jurnal Keperawatan, 4(2).

Suharjana. (2012). Kebiasaan Berprilaku Hidup Sehat dan Nilai-Nilai Pendidikan Karakter. Jurnal Pendidikan Karakter, 3(2).

Suseno, B. (2017). Karakteristik Penderita Hipertensi pada Ibu Rumah Tangga Warga Desa Puncak RW 02 Kecamatan Bawang Kabupaten Banjarnegara Tahun 2016. Medsains, 3(2), 35–40.

World Health Organization. (2013). Global brief on Hypertension Geneva.