



# THE EFFECT OF DARK CHOCOLATE CONSUMPTION TO LOWERING BLOOD PRESSURE IN THE ELDERLY WITH HIPERTENSION: CASE REPORT



Sahla Nurannisa<sup>1\*</sup>, Annas Sumeru<sup>2</sup>, Akhyarul Anam<sup>2</sup>

<sup>1</sup>Department of Nutrition, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto

<sup>2</sup>Department of Nursing, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto

## ABSTRACT

**Introduction:** Hypertension is a disease of the cardiovascular system with a prevalence that continues to increase rapidly, especially in several developing countries including Indonesia. The incidence of hypertension tends to be high in the elderly as a degenerative effect that occurs with age. The main cause of uncontrolled hypertension in the elderly is that elderly people with hypertension refuse to undergo treatment, so the blood pressure in their body becomes uncontrollable. This is because elderly people cannot tolerate the side effects experienced after taking blood pressure medication. Therefore, it is necessary to introduce another alternative therapy to treat hypertension in the elderly, namely by consuming dark chocolate. **Purpose:** Knowing the effect of eating dark chocolate to reduce blood pressure in elderly people with hypertension. **Methods:** Case study by applying implementation according to evidencebased practice in nursing care. In the intervention session, respondents will be asked to consume 72% dark chocolate as much as 30 grams for 7 consecutive days. The tool used to measure blood pressure is an automatic Sphygmomanometer. **Keywords used:** dark chocolate, hypertension, and elderly. **Discussion:** Dark chocolate contains flavonoids that are thought to increase endothelial nitric oxide, improve the elasticity of blood vessels and blood circulation. The benefits of flavonoids can also lower blood pressure in elderly people suffering from high blood pressure. **Conclusion:** There is an effect of giving dark chocolate on lowering blood pressure in elderly people with hypertension based on the results of blood pressure measurements before and after the intervention during the intervention period. the results of blood pressure measurements before and after giving the intervention for 7 days.

**Keywords:** Dark chocolate, hypertension, and elderly

**Citation:** Nurannisa, S., Sumeru, A., & Anam, A. 2024. 'The Effect of Dark Chocolate Consumption to Lowering Blood Pressure in The Elderly with Hipertension: Case Report'. International Journal of Biomedical Nursing Review. 3(1). p33-36. <https://doi.org/10.20884/1.ijbnr.2024.3.1.10798>

## INTRODUCTION

Hypertension or high blood pressure is a disease of the cardiovascular system with a state of blood pressure exceeding normal limits (Shin & Kim 2022; Wardani & Adriani 2022) A person is categorized as hypertensive when blood pressure is more than 140/90 mmHg after two measurements with an interval of five minutes under calm conditions (Hari et al. 2021; Shin & Kim 2022). Hypertension is a disease with a high incidence rate experienced by the elderly (Widyarani 2019). Hypertension in the elderly occurs when arterial flexibility decreases and there is stiffness in the blood vessels (Rosari 2014).

The WHO indicates that one billion people worldwide suffer from high blood pressure, two-thirds of whom live in developing countries with middle and lower-middle incomes. The prevalence of hypertension is expected to continue to rise rapidly, with approximately 29% of adults worldwide expected to have hypertension by 2025. Hypertension causes approximately 8 million deaths annually, with 1.5 million deaths occurring in Southeast Asia, where one-third of the population suffers from hypertension (Khotimah 2023). According to the 2013 Basic Health Survey report data, the prevalence of hypertension in Indonesia tends to increase with age. Thus, the prevalence of hypertension in the age group

\*Correspondence Author :

Sahla Nurannisa;

Department of Nutrition, Faculty  
of Health Sciences, Jenderal  
Soedirman University,  
Purwokerto.

[sahlanurannisa1@gmail.com](mailto:sahlanurannisa1@gmail.com)

Received: 15-02-2023

Approved: 13-06-2023

Published: 02-01-2024

55-64 years was 45.9%, 57.6% aged 65-74 years, as much as 63.8% in the age group 75 years and over (Ministry of Health RI, 2019). Central Java Province has the highest incidence of hypertension in Indonesia at 13.4% (Ministry of Health, 2019). The incidence of hypertension in the elderly is relatively high in the age group of 65 years and over, which is 60-80% of the total number of diseases in Central Java. According to data from the Banyumas Regency Health Office in 2019, the prevalence of essential hypertension in the elderly was 68%, and the prevalence of hypertension due to other factors was 32% (Banyumas Regency Health Office, 2021).

Lack of awareness regarding the treatment of hypertensive patients is another reason why hypertension rates are still high in Indonesia (Wirakhmi & Purnawan 2021). Treatment programs for hypertensive patients, especially the administration of chemical drugs such as diuretics, beta blockers, and calcium channel blockers, can help control patients' blood pressure. However, as long as hypertensive patients take their medications according to the program, hypertensive patients often experience side effects from drug therapy. Side effects include headache, dizziness, weakness, and nausea, and are very common in elderly people who feel unwell. Some elderly people cannot tolerate these side effects, so many do not take their high blood pressure medication regularly. Therefore, there is a need for additional treatments or interventions in addition to the administration of drugs in people with hypertension that are easy to do. One of the measures that can be taken is the alternative complementary therapy treatment of dark chocolate consumption.

Chocolate is a popular food around the world. The health benefits of chocolate have been epidemiologically proven in people living on Kuna Island, Panama with a lower prevalence of hypertension. The secret is to consume chocolate regularly. Antioxidants found in high concentrations in chocolate include flavonoids, epicatechin, catechin, and procyanidins. Flavonoids are highest in dark chocolate. This is because milk in milk chocolate can reduce flavonoid absorption in the gut (Carolia & Ayuning 2016).

Flavonoids are thought to increase serum NO in blood endothelial cells and lower systolic and diastolic blood pressure through endothelial function (Hooper et al. 2008). The nitrogen components contained in chocolate are methylxanthine, theobromine, protein, and caffeine. These components are important for stimulating the nervous system, causing smooth muscle relaxation and regulating diuretic function (Carolia & Ayuning 2016).

Based on data from the Sumbang I Health Center, the number of elderly people suffering from hypertension in Banteran Village is estimated to be 60 out of 67 elderly people or 89.6%. The results of research conducted on elderly people showed that the most common cause of hypertension in this population was due to the lack of regular monitoring and infrequent use of appropriate hypertension medication. Clients do not routinely take high blood pressure medications because they have side effects such as dizziness and weakness, and do not have support from their families to take them to health facilities. Therefore, the researcher is interested in introducing another method to control blood pressure in clients. The researcher will investigate whether dark chocolate food type therapy has an effect on reducing the blood pressure of elderly people with hypertension.

## METHOD

The research method used is the case-report analysis method based on nursing intervention with an intervention duration of 7 days. In the intervention session, respondents will be asked to consume 72% dark chocolate as much as 30 grams for 7 days. Blood pressure measurements were taken before the respondents consumed dark chocolate, and after 10 minutes of consuming dark chocolate. Re-measurement of blood pressure is done again with an interval of 5-10 minutes until the results of 2 consecutive measurements do not change. The tool used to measure blood pressure is an automatic Sphygmomanometer.

## RESULT

Mrs. R and Mrs. K had high blood pressure in the stage 3 hypertension category, namely Mrs.

R 208/123 mmHg and Mrs. K 202/123 mmHg. Mrs. R and Mrs. K have normal GDS levels and have no previous history of gout. Meanwhile, the subjective data obtained is that both of them complain about the side effects of taking antihypertensive drugs and do not routinely control the nearest health facility or routinely participate in the elderly posyandu. The complaints felt by Mrs. R and Mrs. K were pain in the nape area and extremities, insomnia, dizziness, and insomnia. Based on the data analysis conducted, the nursing problem of Ineffective Peripheral Perfusion is related to Increased blood pressure (D.0009).

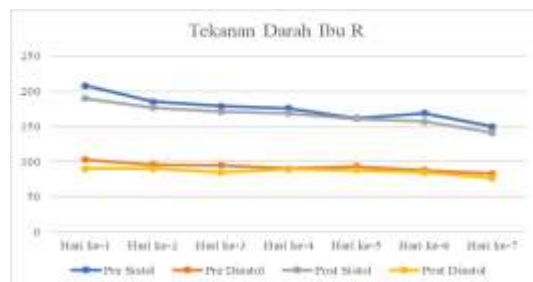


Figure 1 Blood Pressure of Mrs.R

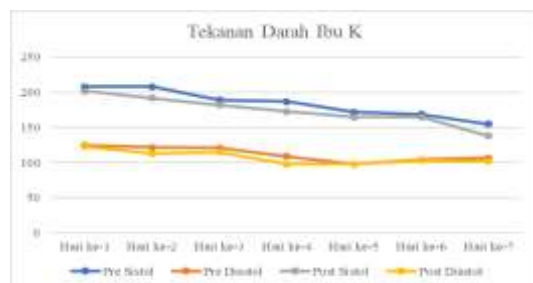


Figure 2 Blood Pressure of Mrs. K

There is a significant difference in blood pressure values after the administration of dark chocolate to the blood pressure of hypertensive elderly who received dark chocolate for 7 days. The results of blood pressure on the first day of pre consumption of dark chocolate were 208/103 mmHg in Mrs. R and 208/125 mmHg in Mrs. K. The results of post consumption of dark chocolate on the seventh day were 141/77 mmHg in Mrs. R and 138/102 mmHg in Mrs. K. So it can be concluded that there is an effect of giving dark chocolate to the blood pressure of the elderly.

## DISCUSSION

The characteristics of respondents in this study are both with stage 3 hypertension aged 70 years (Mrs. R) and 60 years (Mrs. K). As a person ages, the elasticity of the blood vessel wall also decreases and the arterioles narrow, decreases

and arterioles narrow. This makes blood flow difficult and increases blood pressure against the arterial wall. Increased blood pressure in the arteries that lasts for a long period of time will lead to hypertension. Hypertension that is not treated and controlled can lead to more serious complications and even increase the risk of death (Udjianti 2010).

Research by Nur Asmah, (2022) which states that as long as patients take drugs according to the program, hypertensive clients also often feel the side effects of pharmacological therapy. Side effects are felt in the form of headaches, dizziness, weakness, and nausea, especially in the elderly who have experienced a decrease in their body condition. Some sufferers are unable to withstand these side effects, so many are irregular in taking hypertension drugs.

Based on the results of the study, it was found that consuming dark chocolate can reduce blood pressure in Mrs. R and Mrs. K who are elderly people with hypertension. This condition is in accordance with the results of research that dark chocolate has several benefits, one of which is antioxidants (Saribu, Rahman & Wulandari 2021). The antioxidant content in dark chocolate is in the form of flavonoids, oligomers, especially procyanidin. The benefit of procyanidin is to lower blood pressure. The main flavonoid in dark chocolate is epicatechin, which is able to counteract free radicals (harmful molecules associated with various body disorders) and is associated with various bodily disorders) and is antithrombotic (anti-blood clotting).

Epicatechin found in dark chocolate is important in promoting arterial relaxation and can prevent clogging of the arterial walls, which is important in preventing blood pressure spikes. This relaxing effect is further enhanced by the flavonoids in dark chocolate that trigger the production of NO (Nitric Oxide). The cardiovascular system uses nitric oxide to control blood flow to all parts of the body. Nitric oxide maintains the elasticity of blood vessels, so they can relax and widen. The benefits of nitric oxide include lowering blood pressure, improving circulation, and increasing blood supply to vital organs. Nitric oxide can also support healthy blood pressure levels (Case 2013).

The mechanism of lowering blood pressure when consuming dark chocolate is the same as the mechanism of lowering blood pressure when

using Captopril. Captopril is a drug commonly used to lower blood pressure. Captopril is a member of the ACE inhibitor drug group. Captopril works by inhibiting the production of the hormone angiotensin 2. The effect of this drug is to dilate the walls of blood vessels (widen blood vessels) so that it can reduce blood pressure while increasing the supply of blood and oxygen in the heart (Case 2013). Both lower blood pressure by dilating the blood vessel walls, making them more relaxed and elastic. This can lower blood pressure and increase blood and oxygen supply to the whole body (Saribu, Rahman & Wulandari 2021). The antioxidant-rich content of dark chocolate will help consumers maintain good arterial blood circulation and a very high vasodilating ability. This causes people who regularly consume dark chocolate (no more than 100 grams per day) to have stable blood pressure (Saribu, Rahman & Wulandari 2021).

## CONCLUSION

The intervention of consuming dark chocolate for seven days proved effective in reducing blood pressure in elderly people with hypertension during the seven-day intervention. The implementation was carried out according to the correct procedure and did not cause any side effects for the client.

The suggestion from this study is that further research can be done on the comparison of dark chocolate consumption in mild or moderate stage hypertensive clients who do not take antihypertensive drugs.

## REFERENCES

- Carolia, N. & Ayuning, L.G.I. 2016, 'Coklat Hitam untuk Mencegah Preeklampsia pada Kehamilan', *Jurnal Majority*.
- Case, D. 2013, *Captopril and hypertension*, Springer Science & Business Media.
- Hari, T.Y.S., Sudha, T.Y.S., Varghese, A.M., Sasanka, K.K. & Thangaraju, P. 2021, 'A study of risk factors and complications in elderly hypertensive subjects', *Journal of Family Medicine and Primary Care*, vol. 10, no. 6, p. 2230.
- Hooper, L., Kroon, P.A., Rimm, E.B., Cohn, J.S., Harvey, I., Le Cornu, K.A., Ryder, J.J., Hall, W.L. & Cassidy, A. 2008, 'Flavonoids, flavonoid-rich foods, and cardiovascular risk: a meta-analysis of randomized controlled trials', *The American journal of clinical nutrition*, vol. 88, no. 1, pp. 38–50.
- Khotimah, K. 2023, 'Gambaran Kejadian Hipertensi Pada Lansia Di Desa Adisara Kecamatan Jatilawang Kabupaten Banyumas Tahun 2022', *Jurnal Bina Cipta Husada*, vol. 19, no. 1, pp. 37–46.
- Rosari, F. 2014, 'Diagnosis and management of hypertension in the elderly patient', *Jurnal Majority*, vol. 3, no. 7.
- Saribu, H.J.D., Rahman, Z. & Wulandari, D. 2021, 'Pengaruh Pemberian Dark Chocolate Terhadap Tekanan Darah Lansia Penderita Hipertensi Di Rumah Bahagia Bintan', *Menara Medika*.
- Shin, J. & Kim, K. 2022, 'A clinical algorithm to determine target blood pressure in the elderly: evidence and limitations from a clinical perspective', *Clinical Hypertension*, vol. 28, no. 1, p. 17.
- Udjianti, W.J. 2010, 'Keperawatan kardiovaskular', *Jakarta: Salemba Medika*, vol. 2.
- Wardani, D. & Adriani, P. 2022, 'Aplikasi Pemberian Terapi Relaksasi Autogenik Terhadap Perubahan Tingkat Nyeri Akut Pasien Hipertensi', *Indonesian Journal of Professional Nursing*, vol. 3, no. 1, pp. 7–12.
- Widyanani, L. 2019, 'Pengaruh Pemberian Jus Tomat (*Solanum Lycopersicum*) terhadap Tekanan Darah pada Lansia Penderita Hipertensi Stadium I', *Jurnal Kesehatan Hesti Wira Sakti*, vol. 7, no. 1, pp. 1–8.
- Wirakhmi, I.N. & Purnawan, I. 2021, 'Hubungan kepatuhan minum obat dengan tekanan darah pada penderita hipertensi', *Jurnal Ilmu Keperawatan dan Kebidanan*, vol. 12, no. 2, pp. 327–33.



This work is licensed under a Creative Commons Attribution



