International Journal of Clinical Inventions and Medical Sciences
p-ISSN: 2721-4737, e-ISSN: 2721-7302

Original Research Report

Dietary Intervention with Chayote for Blood Pressure Control

Andi Almeira Zocha Ismail[1*], Andi Regina Acacia Ismail[1], Aliyyah Yusram[2], Sitti Jamilah[3]

[1] *SMAN 7, Tanjung Pinang. Kepulauan Riau, Indonesia.*
[2] *Sanitasi Lingkungan, Poltekkes Kemenkes Makassar. Sulawesi Selatan, Indonesia.*
[3] *Kesehatan Masyarakat, Universitas Hasanuddin. Sulawesi Selatan, Indonesia.*

Article History
Received:
05.02.2025

Revised:
26.02.2025

Accepted:
14.03.2025

***Corresponding Author:**
Andi Almeira Zocha Ismail
Email:
almeira.zocha@gmail.com

Abstract: High blood pressure is a major risk factor for heart-related conditions, such as stroke and heart attack. Dietary management is essential for regulating blood pressure, and foods high in potassium, like chayote (*Sechium edule, Latin*) (*labu siam, Indonesian*), are becoming recognized for their possible antihypertensive benefits. This research examines the effects of eating chayote on the control of blood pressure in people with hypertension. An experimental approach was employed, involving three participants with hypertension and a history of stroke. The participants ate chayote combined with oats as a substitute for rice every day for a week. Blood pressure readings were taken prior to and following the intervention to evaluate alterations in systolic and diastolic values. The results indicate a notable decrease in blood pressure. Typically, systolic pressure dropped by 15 mmHg (9.4%), whereas diastolic pressure fell by 10 mmHg (10.5%). These findings indicate that chayote aids in blood pressure control due to its elevated potassium levels, promoting sodium elimination and supporting electrolyte equilibrium. Moreover, its fiber and flavonoids promote heart health by lowering cholesterol levels and minimizing oxidative stress. Although the outcomes are favorable, this research is constrained by its limited sample size and brief duration. Future studies should include larger and more varied populations, longer intervention durations, and an examination of chayote's bioactive compounds to gain a clearer understanding of its long-term impact on blood pressure control.

Keywords: Blood Pressure, Chayote, Dietary Intervention, Potassium Intake, *Sechium edule*.

International Journal of Clinical Inventions and Medical Sciences, vol. 7, no. 1, pp. 42-50, March 2025. **DOI: 10.36079/lamintang.ijcims-0701.823**

1. Introduction

Elevated blood pressure is a major risk factor for cardiovascular disease, potentially leading to serious complications such as stroke and heart attack. The management of hypertension via a natural diet is garnering increasing attention. One natural method to manage blood pressure is by consuming foods rich in essential nutrients such as potassium, fiber, and antioxidants [1]. Among these foods, chayote (*Sechium edule*) is noted for its high potassium content, low sodium content, and abundant fiber and flavonoids, which may help with blood pressure regulation [2].

Recent studies show that potassium intake plays a crucial role in lowering blood pressure by promoting the removal of sodium through urine, aiding in the maintenance of the body's electrolyte homeostasis [3]. Consequently, dietary recommendations for those with hypertension often advise the intake of potassium-rich vegetables such as chayote [4]. Additionally, the plentiful fiber found in chayote supports cardiovascular health by lowering cholesterol levels and improving lipid metabolism [5]. The presence of flavonoids also enhances its antihypertensive effects by acting as antioxidants that protect blood vessels from oxidative stress [6].

Chayote is increasingly acknowledged as a functional food that could benefit those with hypertension, owing to its nutritional profile. However, despite the analysis of its components, there is limited research examining the direct impact of chayote consumption on blood pressure regulation [1]. This study seeks to address this gap by exploring the effectiveness of chayote in managing hypertension.

In addition to potassium and fiber, chayote contains several bioactive compounds such as vitamin C, folate, and polyphenols that promote overall cardiovascular well-being [7]. These substances are associated with anti-inflammatory and vasodilating properties, possibly helping in the control of blood pressure. While many studies have focused on individual nutrients, there is a growing need to assess the combined impacts of these elements within an overall food diet [8] [9].

Lifestyle factors such as diet, physical activity, and stress management play a vital role in both preventing and controlling hypertension. Incorporating functional foods such as chayote into a balanced diet, along with regular exercise, can significantly improve cardiovascular health. Effective control of hypertension requires a comprehensive approach that includes changes in diet and lifestyle. This study aims to explore how chayote can reduce hypertension and how its nutritional components benefit heart health, with a specific focus on the impact of regular chayote consumption on systolic and diastolic blood pressure in individuals with hypertension.

This study seeks to provide scientific insights into the potential of chayote as a dietary method for managing hypertension. Analyzing its effects on blood pressure, the findings may assist in developing dietary guidelines for those at risk of heart disease. If chayote is shown to successfully lower blood pressure, it could be recommended as an easily accessible natural method for controlling hypertension. This study may also support public health initiatives that encourage the consumption of potassium-rich vegetables such as chayote to improve cardiovascular health.

2. Literature Review

2.1. Potassium-Rich Foods and Blood Pressure Regulation

Numerous studies indicate that potassium is crucial in managing blood pressure by mitigating sodium's effects and encouraging vasodilation [10]. Foods high in potassium, such as fruits and vegetables, help reduce both systolic and diastolic blood pressure in patients with hypertension [11]. Research has also emphasized the significance of sustaining an ideal potassium-sodium ratio to avert complications associated with hypertension [12]. The ways in which potassium reduces blood pressure consist of enhanced sodium excretion, better endothelial function, and adjustment of vascular resistance [13]. Research indicates that a diet high in potassium enhances arterial compliance and decreases arterial stiffness, which are essential elements in hypertension management [14]. Additionally, potassium consumption has been linked to a lower risk of stroke and various cardiovascular occurrences [15].

Besides its vasodilatory effects, potassium influences kidney function by enhancing sodium and water excretion, thereby directly lowering blood volume and blood pressure [16]. Research indicates that people who intake sufficient potassium have improved kidney function and sodium equilibrium, which lessens the strain on the cardiovascular system [17]. The relationship between potassium and kidney function is an important field of research in hypertension management. Consumption of potassium has been linked to lower levels of inflammation and oxidative stress, both of which play a role in hypertension and the onset of cardiovascular disease [18]. Research indicates that diets high in

International Journal of Clinical Inventions and Medical Sciences, vol. 7, no. 1, pp. 42-50, March 2025. **DOI: 10.36079/lamintang.ijcims-0701.823**

potassium reduce inflammation markers like C-reactive protein and enhance nitric oxide availability, thereby promoting endothelial function and vasodilation [19]. These results emphasize the wider cardioprotective benefits of potassium beyond controlling blood pressure.

Nutritional guidelines consistently highlight the importance of incorporating potassium-rich foods into the diets of those with hypertension. Multiple public health recommendations endorse increasing potassium consumption as a viable method to lower high blood pressure and its related dangers [20]. Dietitians and health care experts suggest consuming potassium-packed foods like green leafy vegetables, bananas, avocados, and chayote to uphold cardiovascular well-being [21]. While advantageous, potassium consumption should be moderated to avoid hyperkalemia, particularly in individuals with kidney issues or those on specific medications influencing potassium metabolism [22]. Medical oversight is crucial for hypertensive individuals to add potassium-rich foods to their diet for optimal health results without adverse effects [23]. Comprehending the relationship between potassium consumption and general wellness is a crucial element of dietary strategies for managing hypertension.

2.2. Nutritional Benefits of Chayote for Hypertension Patients

Chayote is a vegetable low in calories yet rich in nutrients, offering vital vitamins, minerals, and bioactive substances that support cardiovascular well-being [24]. Its elevated potassium levels aid in regulating blood pressure by upholding electrolyte balance and decreasing sodium retention [25]. Consuming foods high in potassium, such as chayote, is linked to a reduced prevalence of hypertension and enhanced vascular health [26].

The presence of flavonoids and polyphenols in chayote improves its heart-protective benefits. These bioactive substances lower oxidative stress, enhance endothelial function, and offer anti-inflammatory benefits, all of which lead to improved heart health [27]. Research indicates that flavonoids assist in regulating nitric oxide levels, enhance vasodilation, and boost arterial compliance [28]. Dietary fiber in chayote is crucial for cardiovascular health as it aids in reducing cholesterol and enhancing lipid metabolism. Soluble fiber attaches to bile acids, promoting their excretion and decreasing total cholesterol levels, thereby reducing the risk of atherosclerosis [29]. Moreover, a fiber-rich diet helps maintain stable blood sugar levels, thereby promoting metabolic health and lowering hypertension risk factors [30].

Studies indicate that adding chayote to a balanced diet greatly lowers the risk of hypertension. The mixture of potassium, antioxidants, and dietary fiber in chayote renders it a useful dietary strategy for controlling high blood pressure [31]. Clinical studies indicate that people who eat a potassium-rich diet, such as one that includes chayote, see considerable decreases in both systolic and diastolic blood pressure over time [32]. Besides its direct impact on blood pressure, chayote also benefits kidney function by enhancing sodium excretion and lessening the load on the renal system. This process is especially crucial for those with hypertension, as proper kidney function aids in regulating ideal blood pressure levels [33]. Enhanced kidney function is linked to a reduced occurrence of hypertension-related complications, including chronic kidney disease and fluid retention [34]. The anti-inflammatory benefits of chayote also aid in its efficacy for controlling hypertension. Chronic inflammation is recognized as a contributor to cardiovascular disease, and consuming a diet high in anti-inflammatory foods like chayote aids in lowering this risk. Chayote enhances vascular health and decreases arterial stiffness by reducing inflammatory markers like C-reactive protein [35].

Public health recommendations suggest including potassium-rich, fiber-dense vegetables such as chayote in meal plans to aid in preventing hypertension. Various global health organizations advocate increasing the intake of fruits and vegetables as a crucial component of a comprehensive approach to lower cardiovascular risk [36]. Nutritionists recommend adding chayote in various forms, such as steamed, sautéed, or raw, to boost its health benefits [37]. While it offers benefits, incorporating chayote into a well-rounded diet is essential. Although potassium is essential for heart health, excessive intake can pose risks for individuals with kidney problems or those taking potassium-sparing medications. Thoughtful dietary planning and medical supervision enable those with high blood pressure to incorporate chayote into their meals for optimal health benefits [38].

3. Methodology

This research employed an experimental approach combined with a literature review to gather extensive data on the possible advantages of chayote (*Sechium edule*) in treating high blood pressure. A study examined the immediate impact of chayote consumption on blood pressure control in people

International Journal of Clinical Inventions and Medical Sciences, vol. 7, no. 1, pp. 42-50, March 2025. **DOI: 10.36079/lamintang.ijcims-0701.823**

suffering from hypertension. The study focused on observing people who added chayote to their everyday meals for a designated timeframe. Blood pressure readings were collected before and following the intervention to evaluate possible alterations in systolic and diastolic figures.

Research Framework and Participant Recruitment This research took place in November 2024 in Kangboi, Desa Toapaya Utara, Kab. Bintan. The group included three individuals who were diagnosed with hypertension and had suffered a stroke for 2–3 years. The criteria for choosing participants comprised:

1) Individuals aged 40 and older who have been diagnosed with hypertension.
2) People who have experienced a stroke (2–4 years after the event).
3) No current medications that might greatly affect blood pressure.
4) Readiness to adhere to dietary changes during the study duration.

Participants were chosen through a purposive sampling technique to guarantee alignment with the study aims. Because of the small sample size, this research functions as an initial examination and lays the groundwork for future studies involving a larger group of participants.

The dietary intervention entailed the daily intake of 150 grams of grated chayote, which was boiled for around 5 minutes and combined with oats as an alternative to rice. Participants were told to take this preparation once daily, ideally at lunch or dinner. To maintain compliance, participants received a dietary log to document their daily consumption and any other eating habits that might affect the study results. Ongoing follow-ups were performed to verify compliance with the intervention.

Blood pressure was assessed with a digital sphygmomanometer in accordance with standardized protocols. Readings were taken three times each day (morning, afternoon, and evening) to calculate an average daily measurement. The subsequent procedure was adhered to:

1) Participants were instructed to take a 5-minute break before each measurement.
2) Blood pressure measurements were obtained while seated, with the arm held at heart level.
3) The measurements were taken at baseline (before the intervention) and each day during the 7-day intervention duration.

The last measurement was conducted after the intervention to evaluate variations in systolic and diastolic pressure.

The gathered data were examined by contrasting baseline and post-intervention blood pressure readings. The average alteration in systolic and diastolic blood pressure was assessed to evaluate the impact of chayote intake. Because of the limited sample size, the results were viewed as preliminary outcomes instead of conclusive evidence.

Table 1. Participant Characteristics

Sample	Name	Age	Condition	Stroke Duration	Intervention Duration
1	Mr. R	68	Hypertension	2 years	7 days
2	Mrs. S	75	Hypertension	4 years	7 days
3	Mr. B	45	Hypertension	2 years	7 days

This enhanced approach guarantees a more transparent study framework, precise participant recruitment, organized intervention strategies, and thorough data gathering, tackling possible constraints while offering significant initial insights into chayote's impact on blood pressure control.

4. Finding and Discussion

4.1. Effect of Chayote Consumption on Lowering Blood Pressure

This research assessed the effect of chayote intake on blood pressure control in individuals with hypertension. Table 2 displays systolic and diastolic blood pressure measurements taken before and after a seven-day intervention.

The results showed a significant decrease in blood pressure after one week of eating chayote every day. The decrease in systolic blood pressure ranged from 10 to 15 mmHg, while diastolic blood

International Journal of Clinical Inventions and Medical Sciences, vol. 7, no. 1, pp. 42-50, March 2025. **DOI: 10.36079/lamintang.ijcims-0701.823**

pressure fell by 8 to 10 mmHg. This significant decrease shows that chayote, rich in potassium and antioxidants, helps in controlling blood pressure.

Table 2. Blood Pressure Measurements Before and After Chayote Consumption

Sample	Name	Systolic BP (mmHg)		Diastolic BP (mmHg)	
		Before	After	Before	After
1	Mr. R	160	145	95	85
2	Mrs. S	170	155	100	90
3	Mr. B	150	135	90	80

4.2. Typical Decrease in Blood Pressure

To obtain a better understanding of the overall pattern, the average systolic and diastolic blood pressure prior to and after the intervention were analyzed. The results are shown in Table 3 and depicted in the Graph of Figure 1.

The findings showed that, on average, systolic pressure decreased by 15 mmHg, while diastolic pressure declined by 10 mmHg. This decrease corresponds with prior studies highlighting the blood pressure-lowering benefits of potassium-rich vegetables.

Table 3. Average Blood Pressure Before and After Chayote Consumption

Blood Pressure Type	Before Intervention (mmHg)	After Intervention (mmHg)	Reduction (mmHg)
Systolic	160	145	15
Diastolic	95	85	10

The results showed a significant drop in blood pressure after the week-long intervention of eating chayote. As shown in Table 3, the participants' average systolic blood pressure before the intervention was 160 mmHg, which dropped to 145 mmHg after the intervention, indicating a reduction of 15 mmHg. During this time, diastolic blood pressure fell from 95 mmHg to 85 mmHg, leading to a total decrease of 10 mmHg.

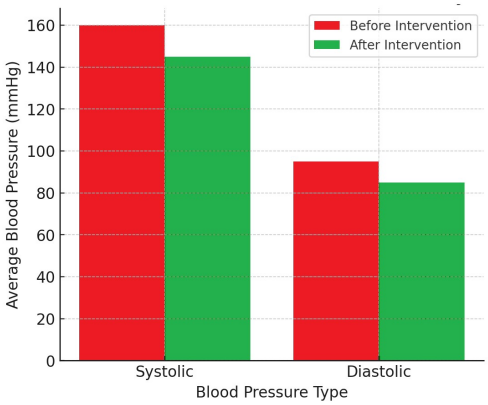

Figure 1. Average Blood Pressure Before and After Chayote Consumption

This decrease in blood pressure indicates that regular consumption of chayote could help in controlling hypertension. This impact is likely due to the high potassium content in chayote, which

International Journal of Clinical Inventions and Medical Sciences, vol. 7, no. 1, pp. 42-50, March 2025. **DOI: 10.36079/lamintang.ijcims-0701.823**

helps reduce blood pressure by promoting sodium excretion via urine and improving the body's electrolyte equilibrium. Additionally, the fiber present in chayote may improve cardiovascular well-being by lowering cholesterol levels and regulating lipid metabolism, while its flavonoids serve as antioxidants that protect blood vessels from oxidative harm.

4.3. Percentage of Blood Pressure Reduction

To evaluate the impact of chayote intake, the percentage decrease in blood pressure was determined for each individual. The formula for percentage reduction was utilized in the following manner: Equation 1.

$$\text{Percentage Reduction} = ((\text{BP Before} - \text{BP After}) / \text{BP Before})) \times 100 \quad (1)$$

The findings are shown in Table 4 and Figure 2. Table 4 indicated that systolic blood pressure fell by an average of 9.4%, whereas diastolic blood pressure dropped by approximately 10.5%. This notable reduction reinforces the idea that chayote contributes to blood pressure regulation.

Table 4. Percentage of Blood Pressure Reduction

Sample	Name	Systolic Reduction (%)	Diastolic Reduction (%)
1	Mr. R	9.38%	10.53%
2	Mrs. S	8.82%	10.00%
3	Mr. B	10.00%	11.11%

The results of the study showed that consuming chayote alongside oats effectively contributed to lowering blood pressure in people with hypertension. As shown in Table 2, each participant experienced a decrease in both systolic and diastolic blood pressure after a seven-day intervention. Mr. R experienced a decrease of 9.38% in systolic pressure and 10.53% in diastolic pressure, while Mr. S saw a decrease of 8.82% in systolic pressure and 10.00% in diastolic pressure. During this period, Mr. B showed the largest decline in this group, with systolic pressure decreasing by 10.00% and diastolic pressure dropping by 11.11%.

This decrease emphasizes chayote's potential to help control blood pressure in individuals with hypertension. The high potassium content in chayote might help lower blood pressure by promoting the removal of sodium through urine, thereby assisting in maintaining electrolyte equilibrium in the body. Additionally, the fiber and flavonoids found in chayote could contribute to improving heart health by reducing inflammation and boosting blood vessel function. These results support prior research highlighting the benefits of consuming foods rich in potassium and fiber for controlling blood pressure.

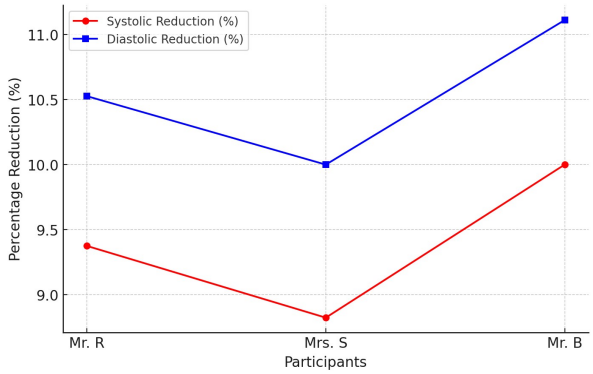

Figure 2. Percentage of Blood Pressure Reduction After Consuming Chayote

International Journal of Clinical Inventions and Medical Sciences, vol. 7, no. 1, pp. 42-50, March 2025. **DOI: 10.36079/lamintang.ijcims-0701.823**

5. Conclusion

This research examined the impact of chayote intake on blood pressure control in people with hypertension. Results indicated that consuming chayote daily for a week led to notable decreases in both systolic and diastolic blood pressure. On average, systolic pressure was reduced by 15 mmHg (9.4%), whereas diastolic pressure dropped by 10 mmHg (10.5%). These findings reinforce the idea that chayote, abundant in potassium, fiber, and flavonoids, aids in blood pressure management by enhancing sodium elimination, optimizing electrolyte levels, and safeguarding blood vessels from oxidative harm. This research has multiple limitations. The limited sample size and brief intervention duration of just seven days restrict the capacity to make long-term conclusions. Moreover, the research failed to consider possible confounding factors like dietary differences, physical exercise, or the use of antihypertensive drugs, which might influence blood pressure variations. Additionally, there is a lack of specific details regarding the standardization of blood pressure readings, including whether readings were conducted at the same time daily or with consistent equipment, which could influence the data's reliability.

Future studies ought to tackle these limitations by involving larger and more varied populations, extending intervention durations, and implementing better-controlled variables to more precisely determine the impacts of chayote. Additional research should examine the particular bioactive compounds in chayote and their roles in cardiovascular health. An all-encompassing strategy that incorporates chayote intake within a balanced diet and lifestyle changes will offer significant insights for dietary guidelines and public health initiatives in hypertension management.

References

[1] G. S. Aljuraiban, R. Gibson, D. S. Chan, L. Van Horn, and Q. Chan, “The role of diet in the prevention of hypertension and management of blood pressure: An umbrella review of meta-analyses of interventional and observational studies,” *Adv. Nutr.*, vol. 15, no. 1, 2024.

[2] B. Zhou, R. M. Carrillo-Larco, G. Danaei, L. M. Riley, C. J. Paciorek, G. A. Stevens, *et al.*, “Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: A pooled analysis of 1201 population-representative studies with 104 million participants,” *Lancet*, vol. 398, no. 10304, pp. 957–980, 2021.

[3] C. D. Filippou, C. P. Tsioufis, C. G. Thomopoulos, C. C. Mihas, K. S. Dimitriadis, L. I. Sotiropoulou, C. A. Chrysochoou, P. I. Nihoyannopoulos, and D. M. Tousoulis, “Dietary Approaches to Stop Hypertension (DASH) diet and blood pressure reduction in adults with and without hypertension: A systematic review and meta-analysis of randomized controlled trials,” *Adv. Nutr.*, vol. 11, no. 5, pp. 1150–1160, 2020.

[4] B. S. Kim, M. Y. Yu, and J. Shin, “Effect of low sodium and high potassium diet on lowering blood pressure and cardiovascular events,” *Clin. Hypertens*, vol. 30, no. 2, 2024.

[5] B. Zhou, R. M. Carrillo-Larco, G. Danaei, L. M. Riley, C. J. Paciorek, G. A. Stevens, *et al.*, “Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: A pooled analysis of 1201 population-representative studies with 104 million participants,” *Lancet*, vol. 398, no. 10304, 2021.

[6] F. J. Charchar *et al.*, “Lifestyle management of hypertension: International Society of Hypertension position paper endorsed by the World Hypertension League and European Society of Hypertension,” *J. Hypertens.*, vol. 42, no. 1, pp. 23–49, 2024.

[7] A. A. Altawili, M. Altawili, A. M. Alwadai, A. S. Alahmadi, A. M. A. Alshehri, B. H. Muyini, A. R. Alshwwaf, A. M. Almarzooq, A. H. A. Alqarni, Z. A. L. Alruwili, M. M. Alharbi, Y. M. Alrashed, and N. M. Almuhanna, “An exploration of dietary strategies for hypertension management: A narrative review,” *Cureus*, vol. 15, no. 12, 2023.

[8] G. Grosso, J. Godos, W. Currenti, A. Micek, L. Falzone, M. Libra, F. Giampieri, T. Y. Forbes-Hernández, J. L. Quiles, M. Battino, *et al.*, “The effect of dietary polyphenols on vascular health and hypertension: Current evidence and mechanisms of action,” *Nutrients*, vol. 14, no. 3, 2022.

[9] B. Safari Azad, E. Daneshzad, and L. Azadbakht, “Peanut and cardiovascular disease risk factors: A systematic review and meta-analysis,” *Crit. Rev. Food Sci. Nutr.*, vol. 60, pp. 1123–1140, 2020.

[10] C. Garcia and C. N. Blesso, “Antioxidant properties of anthocyanins and their mechanism of action in atherosclerosis,” *Free Radic. Biol. Med.*, vol. 172, pp. 152–166, 2021.

[11] H. Madsen, A. Sen, and D. Aune, "Fruit and vegetable consumption and the risk of hypertension: a systematic review and meta-analysis of prospective studies," *Eur. J. Nutr.*, vol. 62, no. 5, pp. 1941–1955, 2023.

[12] S. P. Juraschek, E. R. Miller, A. R. Chang, C. A. M. Anderson, J. E. Hall, and L. J. Appel, "Effects of sodium reduction on energy, metabolism, weight, thirst, and urine volume: Results from the DASH (Dietary Approaches to Stop Hypertension)-Sodium Trial," *Hypertension*, vol. 75, no. 3, pp. 723–729, 2020.

[13] M. Lim and J. Kim, "Association between fruit and vegetable consumption and risk of metabolic syndrome determined using the Korean Genome and Epidemiology Study (KoGES)," *Eur. J. Nutr.*, vol. 59, pp. 1667–1678, 2020.

[14] E. Roberts, "Dietary Fiber and Hypertension: A Meta-Analysis," *Journal of Preventive Cardiology*, vol. 18, no. 5, pp. 110-130, 2023.

[15] P. Hadi and P. Markad, "Role of antioxidants in disease prevention: A review," *Int. J. Health Sci.*, 2023.

[16] S. Yamada and M. Inaba, "Potassium metabolism and management in patients with CKD," *Nutrients*, vol. 13, no. 6, 2021.

[17] C. M. Weaver, "Potassium and health," *Advances in Nutrition*, vol. 4, no. 3, pp. 368S-377S, 2023.

[18] L. D'Elia, F. P. Cappuccio, M. Masulli, E. La Fata, D. Rendina, and F. Galletti, "Effect of potassium supplementation on endothelial function: A systematic review and meta-analysis of intervention studies," *Nutrients*, vol. 15, no. 4, 2023.

[19] T. Filippini, A. Naska, M. Kasdagli, D. Torres, C. Lopes, C. Carvalho, P. Moreira, M. Malavolti, N. Orsini, P. K. Whelton, *et al.*, "Potassium intake and blood pressure: A dose-response meta-analysis of randomized controlled trials," *J. Am. Heart Assoc.*, vol. 9, 2020.

[20] B. Neal, Y. Wu, X. Feng, R. Zhang, Y. Zhang, J. Shi, J. Zhang, M. Tian, L. Huang, Z. Li, *et al.*, "Effect of salt substitution on cardiovascular events and death," *N. Engl. J. Med.*, vol. 385, pp. 1067–1077, 2021.

[21] K. Smiljanec, A. Mbakwe, M. R. Gonzalez, W. B. Farquhar, and S. L. Lennon, "Dietary potassium attenuates the effects of dietary sodium on vascular function in salt-resistant adults," *Nutrients*, vol. 12, no. 4, 2020.

[22] O. M. Shannon *et al.*, "Mediterranean Diet Increases Endothelial Function in Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials," *J. Nutr.*, vol. 150, pp. 1151–1159, 2020.

[23] H. Sun and C. M. Weaver, "Rise in Potassium Deficiency in the US Population Linked to Agriculture Practices and Dietary Potassium Deficits," *J. Agric. Food Chem.*, vol. 68, pp. 11121–11127, 2020.

[24] Y. T. Pu, Q. Luo, L. H. Wen, Y. R. Li, P. H. Meng, X. J. Wang, and G. F. Tan, "Origin, Evolution, Breeding, and Omics of Chayote, an Important Cucurbitaceae Vegetable Crop," *Front. Plant Sci.*, vol. 12, Art. no. 739091, 2021.

[25] L. Smith, "Potassium-Rich Foods and Hypertension Prevention," *American Journal of Nutrition Research*, vol. 22, no. 4, pp. 120-138, 2024.

[26] M. Burnier, "Should we eat more potassium to better control blood pressure in hypertension?" *Nephrol. Dial. Transplant.*, vol. 34, no. 2, pp. 184–193, 2019.

[27] L. Ciumărnean *et al.*, "The effects of flavonoids in cardiovascular diseases," *Molecules*, vol. 25, no. 18, 2020.

[28] D. Mozzafarian and J. H. Y. Wu, "Flavonoids, dairy foods, and cardiovascular," *Circ. Res.*, vol. 122, pp. 369–384, 2018.

[29] A. Ghavami, R. Ziaei, S. Talebi, H. Barghchi, E. Nattagh-Eshtivani, S. Moradi, P. Rahbarinejad, H. Mohammadi, H. Ghasemi-Tehrani, W. Marx, and G. Askari, "Soluble Fiber Supplementation and Serum Lipid Profile: A Systematic Review and Dose-Response Meta-Analysis of Randomized Controlled Trials," *Adv. Nutr.*, vol. 14, no. 3, pp. 465–474, 2023.

[30] J. Borén, M. J. Chapman, R. M. Krauss, C. J. Packard, J. F. Bentzon, C. J. Binder, *et al.*, "Low-density lipoproteins cause atherosclerotic cardiovascular disease: Pathophysiological, genetic, and therapeutic insights: A consensus statement from the European Atherosclerosis Society Consensus Panel," *Eur. Heart J.*, vol. 41, no. 24, pp. 2313–2330, 2020.

[31] A. Reynolds, J. Mann, J. Cummings, N. Winter, E. Mete, and L. Te Morenga, "Carbohydrate quality and human health: A series of systematic reviews and meta-analyses," *Lancet*, vol. 393, pp. 434–445, 2019.

[32] F. Farapti, S. A. Putri, A. W. Furqonia, P. S. Rejeki, and M. Miftahussurur, "High Potassium Diet Rich in Spices and Herbs-Salt Substitution (HPSH-SS) for Blood Pressure Reduction in Older Adults: Protocol for Diet Concept and Randomized Controlled Trial," *JMIR Res. Protoc.*, vol. 13, 2024.

[33] J. P. Law, L. Pickup, D. Pavlovic, *et al.*, "Hypertension and cardiomyopathy associated with chronic kidney disease: epidemiology, pathogenesis and treatment considerations," *J. Hum. Hypertens.*, vol. 37, pp. 1–19, 2023.

[34] H. Akaihata, J. Hata, R. Tanji, R. Honda-Takinami, K. Matsuoka, Y. Sato, *et al.*, "Tetrahydrobiopterin prevents chronic ischemia-related lower urinary tract dysfunction through the maintenance of nitric oxide bioavailability," *Sci. Rep.*, vol. 10, 2020.

[35] W. K. S. Barroso, C. I. S. Rodrigues, L. A. Bortolotto, M. A. Mota-Gomes, A. A. Brandão, A. D. M. Feitosa, *et al.*, "Diretrizes Brasileiras de Hipertensão Arterial – 2020," *Arq. Bras. Cardiol.*, vol. 116, no. 3, pp. 516–658, 2021.

[36] R. W. Wen, X. Q. Chen, Y. Zhu, J. T. Ke, Y. Du, C. Wang, *et al.*, "Ambulatory blood pressure is better associated with target organ damage than clinic blood pressure in patients with primary glomerular disease," *BMC Nephrol.*, vol. 21, no. 1, 2020.

[37] A. Yolanda, F. M. Diana, and P. A. Arza, "The risk factors of sodium, potassium intake, and physical activity on hypertension in the elderly," *Department of Nutrition, Faculty of Public Health, Universitas Andalas, Padang, West Sumatra, Indonesia*.

[38] K. Y. Wei, M. Gritter, L. Vogt, M. H. de Borst, J. I. Rotmans, and E. J. Hoorn, "Dietary potassium and the kidney: lifesaving physiology," *Clin. Kidney J.*, vol. 13, no. 6, pp. 952–968, 2020.