Medical Science

To Cite:
Gadocha P, Graczyk S, Adamiec K, Prokop P, Wróbel Z, Jakub Sulima J. Diet as a non-pharmacological method of treating hypertension. *Medical Science* 2025; 29: e199ms3663
doi:

Authors' Affiliation:
[1]MedTech Association of Medical University of Silesia, Katowice, Poland
[2]Department of Neurology, Faculty of the Medical Sciences in Katowice, Medical University of Silesia, Katowice, Poland
[3]Association of the Department of Psychiatry and Psychotherapy, Medical University of Silesia, Katowice, Poland

***Corresponding author:**
Szymon Graczyk,
Leśna 4A/24, 41-100 Siemianowice Śląskie, Poland,
email: szymongraczyk@interia.pl
Phone number: +48691299466, Orcid: 0009-0002-9107-3071

ORCID List:

Piotr Gadocha	0009-0004-8421-2904
Szymon Graczyk	0009-0002-9107-3071
Ksawery Adamiec	0009-0006-0867-9291
Przemysław Prokop	0009-0001-9731-8351
Zuzanna Wróbel	0009-0002-7921-4599
Jakub Sulima	0009-0006-8031-4027

Peer-Review History
Received: 27 April 2025
Reviewed & Revised: 09/May/2025 to 21/September/2025
Accepted: 27 September 2025
Published: 03 October 2025

Peer-review Method
External peer-review was done through double-blind method.

Medical Science
pISSN 2321–7359; eISSN 2321–7367

DISCOVERY SCIENTIFIC SOCIETY

Diet as a non-pharmacological method of treating hypertension

Piotr Gadocha[1], Szymon Graczyk[1*], Ksawery Adamiec[1], Przemysław Prokop[1], Zuzanna Wróbel[2], Jakub Sulima[3]

ABSTRACT

Hypertension is a primary global health concern and a paramount risk factor for cardiovascular diseases and premature mortality. Similar to worldwide trends, this issue affects almost one-third of adults in Poland. This review is based on the most recent recommendations from the European Society of Cardiology and the European Society of Hypertension. It investigates the role of diet as a non-pharmacological strategy for controlling hypertension. We gathered results from population studies, narrative reviews, and meta-analyses mostly published between January 2020 and March 2025, accentuating the evidence-based dietary recommendations. The article highlights the importance of modifiable risk factors in managing blood pressure, including obesity, poor nutritional habits, alcohol consumption, and sodium and potassium intake. We demonstrated two dietary patterns to lower blood pressure: the DASH and Mediterranean diets. Research shows that even tiny lifestyle changes can significantly lower blood pressure, reducing the need for pharmacological treatment at the same time. Complex hormonal, vascular, and renal interactions are involved in the mechanisms underlying dietary influence.

Keywords: hypertension, diet, obesity, non-pharmacological treatment methods.

1. INTRODUCTION

Around the globe, high blood pressure is a leading contributor to cardiovascular disease and early mortality. It is among the group of civilization diseases, frequently occurring worldwide (GBD 2017 Risk Factor Collaborators, 2019). The National Health Fund 2019 study revealed that around 9.9 million adults in Poland suffer from high blood pressure. It is 32.5% of the overall adult population in the country. Individuals between 55 and 74 years old are the most impacted group. According to the World Health Organization data, the disease affects as much as 1.28 billion adults aged 30-79 years around the world. Over 46% of people may not even be aware of living with hypertension. Nowadays, monitoring blood pressure at regular daily intervals is a strong predictor of cardiovascular diseases and deaths caused by them. The threshold values for increased risk in 24-hour ambulatory blood pressure monitoring differ. The American Heart Association defined the value as 125/75 mmHg. However, according to the European Society of Cardiology, a recommendation to initiate treatment of hypertension is 130/80 mmHg (Saco-Ledo et al., 2020; Powell-Wiley et al., 2021).

Objective

The study presents the role of diet as one of the non-pharmacological methods of treating hypertension based on the guidelines of the European Society of Cardiology and the European Society of Hypertension.

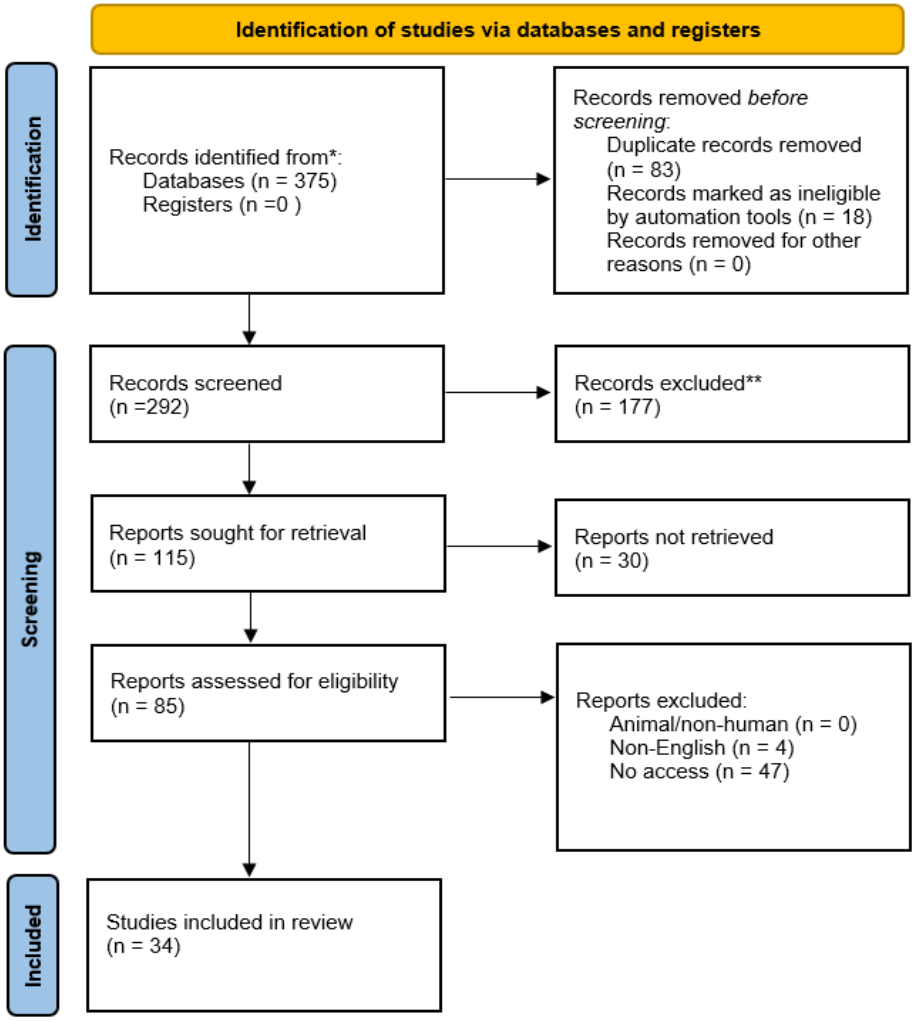

Figure 1. PRISMA flowchart

2. REVIEW METHODS

This work is a review focusing on the role of diet in hypertension management. The article involves the current guidelines and studies, especially from January 2020 to March 2025. To complement the discussion, it is also essential to take older publications into consideration. The oldest one dates back to 1996. The European Society of Hypertension and the American Heart Association guidelines and recommendations are the basis of the presented overview. The cited publications refer to systematic reviews offering a thorough overview of the current guidelines for hypertension treatment and prevention (Figure 1). To further enhance the objectivity of the presented data, the paper includes six meta-analyses covering a wide range of studies on diet-related prevention and regulation of hypertension. Additionally, findings from randomized, epidemiological, and observational population studies investigating the relationship between diet and hypertension supplement the data.

3. RESULTS & DISCUSSION

Hypertension

In the guidelines from 2024, the European Society of Cardiology and the European Society of Hypertension defined hypertension as repeated systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg in a doctor's office. At some point, the need

to introduce a new category of blood pressure arose. It is called elevated BP. The term refers to a situation when systolic pressure is between 120 and 139 mmHg or diastolic pressure values between 70 and 89 mmHg. It is worth noting that blood pressure values strongly correlate with cardiovascular events and kidney diseases. However, the definition of hypertension is subjective and serves mainly a practical purpose, which is to facilitate the diagnosis process and decisions on hypertension treatment. It also aims to determine the pressure threshold at which lifestyle changes or pharmacological intervention holds more benefits compared to inaction (Prejbisz et al., 2024; Mancia et al., 2023).

Risk factors for hypertension

The leading risk factors for hypertension include obesity, increased sodium intake, stress, and genetic factors. There is growing evidence regarding the interactions between multiple genes and environmental factors that influence an individual's risk of developing various diseases. It is believed that hypertension arises due to disturbances in precisely functioning blood pressure regulation systems. Abnormalities in blood pressure-controlling processes (molecular, biochemical, genetic) may consequently lead to an increase. These disturbances are usually minor, and as a result, their identification is often challenging (Kunes & Zicha, 2009). Hypertension is turning out to be an increasingly common health problem within an aging society. There are many more concerning factors, such as increase in average body weight, and prevalence of a sedentary lifestyle. Current efforts focus on the prevention and management of hypertension. Changing one's lifestyle plays a significant role in treatment. Most information, such as risk of suffering from hypertension in the future or the diagnosis of an already existing condition, may be obtained from an initial interview with the patient (Williams et al., 2018).

Non-pharmacological treatment

Lifestyle changes have a significant influence on patients' health and well-being. Many factors contribute to deaths from cardiovascular causes. Around the world, the responsibility for nearly 61% of deaths lies with poor diet, alcohol consumption, smoking, high blood pressure, high body mass index (BMI), high cholesterol levels, high blood glucose levels, low fruit and vegetable consumption, and lack of physical activity. The observations show that patients who maintain a healthy lifestyle have lower blood pressure by about 4-5 mmHg compared to those with a poor lifestyle. Appropriate health-promoting behaviors lower blood pressure and reduce the number of pharmacological interventions and cardiovascular events (Mancia et al., 2023; Pescatello et al., 2021). For this reason, the European Society of Cardiology (ESC) highlights the role of lifestyle intervention in the guidelines. However, it should never delay the implementation of pharmacological treatment. The effectiveness of non-pharmacological methods is primarily based on observational studies and meta-analyses. Some of them, i.e. normalization of body weight, proper diet, limitation of table salt intake, adequate potassium intake, restriction of alcohol consumption, smoking cessation, and appropriate physical activity, seem to be the most essential elements (Mancia et al., 2023; Filippou et al., 2020; He et al., 2020).

Normalization of body weight

Overweight and obesity affect approximately 1.5 billion people throughout the world. Body fat is a highly active and dynamic tissue. Due to its biochemical activity leading to multifactorial disturbances in signaling pathways and hormonal secretion, the amount and distribution of body fat are risk factors for cardiovascular disease (Koenen et al., 2021). Visceral fat releases free fatty acids into plasma, directly influencing the development of atherosclerotic lesions in blood vessels. The increase in its concentration also stimulates sympathetic ganglia in the lumbar spine and other central nervous system pathways, directly affecting the rise in blood pressure. Adipocytes, the fundamental component of adipose tissue, increase the production of leptin, interleukin-6, and plasminogen activator inhibitor, which are responsible for changes in the endothelium and vascular lining (El Meouchy et al., 2022; Fantin et al., 2019). Receptors for leptin, which activate the hypothalamus, are also located within large vessels, mainly the aorta. It affects the proliferation of vascular smooth muscle. It leads to arterial stiffness (Fantin et al., 2019). By putting pressure on the kidney, excessive kidney fat leads directly to an increased renin secretion which further activates the renin-angiotensin-aldosterone system (Dinh Cat et al., 2016). ESC guidelines indicate a correlation of a 3.6-4.4 mmHg decrease in average blood pressure for every 5.1 kg reduction in excess weight, leading to the decline of obesity or overweight and thus restoring normal body weight (Williams et al., 2018; McEvoy et al., 2024).

Diet

The recommendations also say to maintain appropriate dietary patterns as a non-pharmacological hypertension treatment. Proper eating habits have a positive effect on blood vessel functioning, which may lower blood pressure. The DASH (Dietary Approaches to Stop Hypertension) and the Mediterranean diets have the most significant proven effectiveness (Mancia et al., 2023)

DASH diet

DASH focuses on consuming fruits, vegetables, nuts, fish, poultry, and low-fat dairy products and minimizing the intake of highly processed foods. The very distinctive feature of this diet is reduced consumption of fat, red meat, sweets, and sugar-sweetened beverages. While being limited in sodium, it is rich in potassium, calcium, magnesium, and dietary fibre. Studies conducted in the United States have shown that the use of the DASH diet, either high or low in potassium, lowers blood pressure. Combining this diet with low sodium intake has greater blood pressure-lowering effects than using these components separately (Sacks et al., 2001). Other studies have shown that DASH lowers blood pressure even in the group of people who do not suffer from hypertension. This effect is independent of the initial blood pressure values and ongoing antihypertensive drug therapy. Recommendations show the importance of appropriate dietary patterns in delaying the onset of hypertension. It is also important in supporting pharmacological therapy.

Mediterranean diet

In 2010, UNESCO acknowledged the Mediterranean diet as Intangible Cultural Heritage of Humanity due to its geographical roots (Guasch-Ferré & Willett, 2021; Gaforio et al., 2019). The diet is a reflection of the 1960s Mediterranean dietary patterns. It is famous for a plentiful consumption of fat plant-based products such as fruits, vegetables, bread, potatoes, beans, nuts, and many others. Minimally processed, seasonal, and locally grown foods are preferred. Fresh fruits often appear in the diet, while sweets containing sugar or honey are consumed only occasionally. The primary source of fat is olive oil. The distinctiveness of the Mediterranean diet lies in an abundance of nuts, olive oil, and balanced wine consumption, which distinguishes it from other healthy dietary patterns (Gaforio et al., 2019). It also includes fermented dairy products in reasonable amounts. Six studies revealed a positive relationship between the Mediterranean diet and blood pressure level. Unfortunately, this effect was small, and there is insufficient evidence to explain the role of this diet in the treatment of hypertension among European patients, where the risk of cardiovascular diseases is increasing (Nissensohn et al., 2016).

Sodium intake

Table salt contains 40% sodium ions and 60% chloride ions. Unfortunately, it is the main source of sodium in our diets (He et al., 2020). A small amount of salt is necessary for humans to preserve fluid balance and keep cells stable. Before understanding how salt preserves food and using it as preservative, the typical daily intake was around 0.5g. Following that discovery, table salt turned into an essential and highly sought-after item globally, and its use rose dramatically. Despite the development of refrigeration technologies, which also keep food away from going bad, salt is still widely used. An average intake is about 10g per person a day in most countries (He et al., 2020; MacGregor and de Wardener, 1999; Powles et al., 2013). A high-sodium diet alters Na+/K+-ATPase activity in the renal tubules via hormonal mediators such as dopamine and angiotensin II. Sodium also stimulates the adrenal glands to release endogenous ouabain-like compounds (OLCs). This inhibition of Na+/K+-ATPase activity results in rising intracellular Na+ and Ca2+ concentrations of vascular smooth muscle cells, thereby increasing vascular tone and blood pressure (Jaitovich and Bertorello, 2010). There are suspicions that chlorine may also affect blood pressure by influencing the brain, kidneys, and smooth muscles. Erythrocytes low level of chloride ions and their decreased activity are standard features in patients with hypertension. It may result from chlorine metabolic disorders that lead to development of hypertension (Sulibурska, 2010).

Many studies showed that high sodium intake is linked to increased blood pressure values. By limiting sodium intake, we may achieve lowering blood pressure, better control, and reducing the amount of antihypertensive drugs taken. According to the 2023 ESC guidelines, a recommendation for salt intake is to consume <5g/day, which contains about 2g of sodium (Mancia et al., 2023).

Potassium intake

Adequate dietary potassium intake helps to lower blood pressure values but it is essential to avoid excessive consumption (Filippini et al., 2020). Studies on vegetarians eating patterns, featuring greater potassium and reduced sodium consumption, have indicated a decreased occurrence of high blood pressure. An elevation in blood potassium levels, even when still within normal ranges, causes

endothelium-dependent vasodilation. This mechanism works through hyperpolarizing endothelial cells, which is the consequence of the sodium pump stimulation and opening of the potassium channels. Other proposed mechanisms by which potassium can affect blood pressure are natriuresis, modulation of baroreceptor sensitivity, reduced sensitivity to norepinephrine and angiotensin II, elevated serum and urinary kallikrein levels, increased sodium-potassium ATPase activity, changes in DNA synthesis and proliferation of smooth muscle cells in vessels, and the sympathetic nervous system (Houston & Harper, 2008; Haddy et al., 2006). The 2023 ESC guidelines recommend an appropriate dietary modification, including an increased potassium intake, for people with hypertension. This indication does not include patients with advanced chronic kidney disease (Mancia et al., 2023).

Alcohol consumption

Modern science says it is not true that alcohol has cardioprotective properties. It still remains a widely held belief in public opinion. Epidemiological studies indicate that consumption of 30 grams of pure ethanol per day is associated with an increased frequency of hypertension development and a higher risk of cardiovascular diseases. Blood pressure values in people who consume large amounts of alcohol are, on average, 5-10 mmHg higher than the population average. Contemporary research indicates a complex, multifactorial pathogenesis of hypertension caused by chronic, excessive alcohol consumption (Chobanian et al., 2003; Wexler & Aukerman, 2006; Husain et al., 2014). The theory developed by the World Hypertension League indicates an imbalance between a significant effect on the central nervous system affecting cardiac output and a peripheral impact on blood vessels, which is explained by a consistently greater increase in systolic blood pressure than diastolic blood pressure in groups of patients who excessively consume alcohol (Husain et al., 2014). Alcohol weakens the sensitivity of baroreceptors located in the brainstem and increases the secretion of corticotropin-releasing hormone, which is responsible for increasing heart rate and peripheral vasoconstriction. It also increases the activity of the RAA system and the secretion of cortisol, which can lead to increased levels of specific vasoconstrictors such as endothelin-1, norepinephrine, and nitric oxide. It also plays a significant role in the pathogenesis of hypertension (Rupp et al., 1996; Marchi et al., 2014). The summaries are presented in Table 1.

Table 1. Summary of key factors influencing blood pressure reduction.

Factor	Degree of reduction in arterial hypertension	Sources
Normalization of body weight.	A decrease in mean arterial pressure of 3.6–4.4 mmHg for every 5.1 kg of excess weight loss, leading to a reduction in obesity or overweight and restoration of a healthy body weight	(Williams et al., 2018)
DASH diet.	Following the DASH diet, with either high or low potassium levels, lowers blood pressure. Combining this diet with low sodium intake results in a greater blood pressure-lowering effect than using either component separately. Studies also show a reduction in blood pressure in people without hypertension.	(Sacks et al., 2001)
Mediterranean diet.	Studies suggest a positive correlation between the Mediterranean diet and blood pressure. The effect is minor, and there is insufficient evidence to support its use in non-pharmacological treatment of hypertension in Europe.	(Nissensohn et al., 2016)
Sodium intake.	Reducing sodium intake contributes to better blood pressure control and reduced drug demand. Guidelines recommend consuming <5g of salt per	(Mancia et al., 2023)

	day, which contains 2g of sodium.	
Potassium intake.	Adequate potassium intake may lower blood pressure. Too much potassium intake should be avoided. Guidelines recommend increasing potassium intake by diet modifications. It does involve patients with advanced kidney disease.	(Filippini et al., 2020) (Mancia et al., 2023)
Alcohol consumption.	Consumption of 30 grams of pure ethanol per day is associated with an increased incidence of hypertension and a higher risk of cardiovascular disease.	(Chobanian et al., 2003) (Wexler & Aukerman, 2006) (Husain et al., 2014)

Lifestyle changes and the implementation of dietary modifications in the treatment of hypertension are essential ways to prevent the exacerbation of negative factors associated with hypertension. Patient education regarding diet and limiting the consumption of stimulants that increase the risk of cardiovascular diseases is of significant importance.

4. CONCLUSION

The Mediterranean and vegetarian diets have been shown to offer practical health benefits in treating hypertension. They contain significantly higher amounts of vegetables. Remembering the limited consumption of red meat in favour of fish or plant-based protein substitutes is also essential. Minimizing table salt in the diet and increasing the proportion of plant-based products helps to balance the intake of sodium and potassium. The reduction of the risk of hypertension complications, related to overweight or obesity, can be obtained by assessing the patient's body weight, an appropriately adjusted diet, and maintaining a proper caloric balance. Limiting or stopping the use of stimulants such as alcohol and cigarettes will allow for more effective normalization of blood pressure, especially in people who do not have atherosclerosis. All the above-mentioned factors significantly inhibit the progression of the disease, which may result in limited pharmacotherapy.

Acknowledgments
The authors have no acknowledgments to disclose.

Author contributions
Conceptualization: Piotr Gadocha, Szymon Graczyk, Ksawery Adamiec
Methodology: Piotr Gadocha, Szymon Graczyk, Przemysław Prokop
Software: Jakub Sulima, Ksawery Adamiec, Szymon Graczyk
Check: Jakub Sulima, Zuzanna Wróbel, Ksawery Adamiec, Szymon Graczyk
Formal analysis: Przemysław Prokop, Piotr Gadocha, Jakub Sulima
Investigation: Ksawery Adamiec, Jakub Sulima, Piotr Gadocha, Przemysław Prokop, Zuzanna Wróbel
Writing – rough preparation: Piotr Gadocha, Jakub Sulima, Zuzanna Wróbel
Writing – review, and editing: Szymon Graczyk, Ksawery Adamiec,
Visualization: Piotr Gadocha, Szymon Graczyk, Przemysław Prokop, Zuzanna Wróbel
Supervision: Jakub Sulima, Ksawery Adamiec, Zuzanna Wróbel, Piotr Gadocha
All authors have read and agreed with the published version of the manuscript.

Informed consent
Not applicable.

Ethical approval
Not applicable. This article does not contain any studies with human participants or animals performed by any of the authors.

Funding
This study has not received any external funding.

Conflict of interest
The authors declare that they have no conflicts of interests, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Data and materials availability
All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES

1. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, Jones DW, Materson BJ, Oparil S, Wright JT Jr, Roccella EJ; Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Heart, Lung, and Blood Institute; National High Blood Pressure Education Program Coordinating Committee. Seventh report of the Joint National Committee on prevention, Detection, Evaluation, and treatment of High Blood Pressure. Hypertension 2003; 42(6): 1206–52. doi: 10.1161/01.HYP.0000107251.49515.c2
2. Dinh Cat AN, Friederich-Persson M, White A, Touyz RM. Adipocytes, aldosterone and obesity-related hypertension. J Mol Endocrinol 2016;57(1):F7–21. doi: 10.1530/JME-16-0025
3. El Meouchy P, Wahoud M, Allam S, Chedid R, Karam W, Karam S. Hypertension related to obesity: Pathogenesis, characteristics and factors for control. Int J Mol Sci 2022; 23(20): 12305. doi: 10.3390/ijms232012305
4. Fantin F, Giani A, Zoico E, Rossi AP, Mazzali G, Zamboni M. Weight loss and hypertension in obese subjects. Nutrients 2019; 11(7): 1667. doi: 10.3390/nu11071667
5. Filippini T, Naska A, Kasdagli M-I, Torres D, Lopes C, Carvalho C, Moreira P, Malavolti M, Orsini N, Whelton PK, Vinceti M.Potassium intake and blood pressure: A dose-response meta-analysis of randomized controlled trials. J Am Heart Assoc 2020; 9(12): e015719.doi: 10.1161/JAHA.119.015719
6. Filippou CD, Tsioufis CP, Thomopoulos CG, Mihas CC, Dimitriadis KS, Sotiropoulou LI, Chrysochoou CA, Nihoyannopoulos PI, Tousoulis DM. 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 2020; 11(5): 1150–60. doi: 10.1093/advances/nmaa041
7. Gaforio JJ, Visioli F, Alarcón-de-la-Lastra C, Castañer O, Delgado-Rodríguez M, Fitó, Hernández AF, Huertas JR, Martínez-González MA, Menendez JA, Osada J, Papadaki A, Parrón T, Pereira JE, Rosillo MA, Sánchez-Quesada C, Schwingshackl L, Toledo E, Tsatsakis AM. Virgin Olive oil and health: Summary of the III international conference on virgin Olive oil and health consensus report, JAEN (Spain) 2018. Nutrients 2019; 11(9): 2039. doi: 10.3390/nu11092039
8. GBD 2017 Risk Factor Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet 2018; 392(10159): 1923–94. doi: 10.1016/S0140-6736(18)32225-6
9. Guasch-Ferré M, Willett WC. The Mediterranean diet and health: a comprehensive overview. J Intern Med 2021; 290(3): 549–66. doi: 10.1111/joim.13333
10. Haddy FJ, Vanhoutte PM, Feletou M. Role of potassium in regulating blood flow and blood pressure. Am J Physiol Regul Integr Comp Physiol 2006; 290(3): R546-52. doi: 10.1152/ajpregu.00491.2005
11. He FJ, Tan M, Ma Y, MacGregor GA. Salt reduction to prevent hypertension and cardiovascular disease: JACC state-of-the-art review. J Am Coll Cardiol 2020; 75(6): 632–47. doi: 10.1016/j.jacc.2019.11.055
12. Houston MC, Harper KJ. Potassium, magnesium, and calcium: their role in both the cause and treatment of hypertension. J Clin Hypertens (Greenwich) 2008; 10(7 Suppl 2): 3–11. doi: 10.1111/j.1751-7176.2008.08575.x
13. Husain K, Ansari RA, Ferder L. Alcohol-induced hypertension: Mechanism and prevention. World J Cardiol 2014; 6(5): 245–52. doi: 10.4330/wjc.v6.i5.245
14. Jaitovich A, Bertorello AM. Salt, Na+,K+-ATPase and hypertension. Life Sci 2010; 86(3–4): 73–78. doi: 10.1016/j.lfs.2009.10.019
15. Koenen M, Hill MA, Cohen P, Sowers JR. Obesity, adipose tissue and vascular dysfunction. Circ Res 2021; 128(7): 951–68. doi: 10.1161/CIRCRESAHA.121.318093

16. Kunes J, Zicha J. The interaction of genetic and environmental factors in the etiology of hypertension. Physiol Res 2009; 58(2): 33–42. doi: 10.33549/physiolres.931913
17. MacGregor GA, de Wardener HE. Salt, diet, and health. Lancet 1999; 353(9165): 1709–10. doi: 10.1016/s0140-6736(05)77020-3
18. Mancia G, Kreutz R, Brunström M, Burnier M, Grassi G, Januszewicz A, Muiesan ML, Tsioufis K, Agabiti-Rosei E, Algharably EAE, Azizi M, Benetos A, Borghi C, Hitij JB, Cifkova R, Coca A, Cornelissen V, Cruickshank JK, Cunha PG, Danser AHJ, Pinho RM, Delles C, Dominiczak AF, Dorobantu M, Doumas M, Fernández-Alfonso MS, Halimi JM, Járai Z, Jelaković B, Jordan J, Kuznetsova T, Laurent S, Lovic D, Lurbe E, Mahfoud F, Manolis A, Miglinas M, Narkiewicz K, Niiranen T, Palatini P, Parati G, Pathak A, Persu A, Polonia J, Redon J, Sarafidis P, Schmieder R, Spronck B, Stabouli S, Stergiou G, Taddei S, Thomopoulos C, Tomaszewski M, Van de Borne P, Wanner C, Weber T, Williams B, Zhang ZY, Kjeldsen SE. ESH Guidelines for the management of arterial hypertension The Task Force for the management of arterial hypertension of the European Society of Hypertension: Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA): Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA), 2023. J Hypertens 2023; 41(12): 1874–2071. doi: 10.1097/HJH.0000000000003480
19. Marchi KC, Muniz JJ, Tirapelli CR. Hypertension and chronic ethanol consumption: What do we know after a century of study? World J Cardiol 2014; 6(5): 283–94. doi: 10.4330/wjc.v6.i5.283
20. McEvoy JW, McCarthy CP, Bruno RM, Brouwers S, Canavan MD, Ceconi C, Christodorescu RM, Daskalopoulou SS, Ferro CJ, Gerdts E, Hanssen H, Harris J, Lauder L, McManus RJ, Molloy GJ, Rahimi K, Regitz-Zagrosek V, Rossi GP, Sandset EC, Scheenaerts B, Staessen JA, Uchmanowicz I, Volterrani M, Touyz RM. ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J 2024; 45(38): 3912–4018. doi: 10.1093/eurheartj/ehae178
21. Nissensohn M, Román-Viñas B, Sánchez-Villegas A, Piscopo S, Serra-Majem L. The effect of the Mediterranean diet on hypertension: A systematic review and meta-analysis. J Nutr Educ Behav 2016; 48(1): 42-53.e1. doi: 10.1016/j.jneb.2015.08.023\
22. Pescatello LS, Wu Y, Gao S, Livingston J, Sheppard BB, Chen M-H. Do the combined blood pressure effects of exercise and antihypertensive medications add up to the sum of their parts? A systematic meta-review. BMJ Open Sport Exerc Med 2021; 7(1): e000895. doi: 10.1136/bmjsem-2020-000895
23. Powell-Wiley TM, Poirier P, Burke LE, Després J-P, Gordon-Larsen P, Lavie CJ, Lear SA, Ndumele CE, Neeland IJ, Sanders P, St-Onge MP; American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; Council on Epidemiology and Prevention; and Stroke Council. Obesity and cardiovascular disease: A scientific statement from the American heart association. Circulation 2021; 143(21): e984–1010. doi: 10.1161/CIR.0000000000000973
24. Powles J, Fahimi S, Micha R, Khatibzadeh S, Shi P, Ezzati M, Engell RE, Lim SS, Danaei G, Mozaffarian D. Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open 2013; 3(12): e003733. doi: 10.1136/bmjopen-2013-003733
25. Prejbisz A, Dobrowolski P, Doroszko A, Olszanecka A, Tycińska A, Tykarski A, Adamczak M, Begier-Krasińska B, Chrostowska M, Dzida G, Filipiak JK, Gaciong Z, Gąsecki D, Gierlotka M, Grabowski M, Grodzicki T, Jankowski P, Kamiński K, Kapłon-Cieślicka A, Klotzka A, Kozłowski D, Leszek P, Lewandowski J, Litwin M, Obrycki Ł, Mamcarz A, Mitkowski P, Naumnik B, Rajzer M, Stępińska J, Stolarz-Skrzypek K, Szyndler A, Tomaszuk-Kazberuk A, Uchmanowicz I, Wełnicki M, Wizner B, Wożakowska-Kapłon B, Zdrojewski T, Banasiak W, Januszewicz A, Mastalerz-Migas A, Narkiewicz K, Więcek A, Witkowski A, Gil R, Wolf J. Wytyczne postępowania w nadciśnieniu tętniczym w Polsce 2024 — stanowisko Ekspertów Polskiego Towarzystwa Nadciśnienia Tętniczego/Polskiego Towarzystwa Kardiologicznego. Nadciśnienie Tętnicze w Praktyce 2024; 10(3–4): 53–111.
26. Rupp H, Brilla CG, Maisch B. Hypertension and alcohol: central and peripheral mechanisms. Herz 1996; 21(4): 258–64.
27. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, Obarzanek E, Conlin PR, Miller ER 3rd, Simons-Morton DG, Karanja N, Lin PH; DASH-Sodium Collaborative Research Group. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. N Engl J Med 2001; 344(1): 3–10 doi: 10.1056/NEJM200101043440101
28. Saco-Ledo G, Valenzuela PL, Ruiz-Hurtado G, Ruilope LM, Lucia A. Exercise reduces ambulatory blood pressure in patients with hypertension: A systematic review and meta-analysis of randomized controlled trials. J Am Heart Assoc 2020; 9(24): e018487. doi: 10.1161/JAHA.120.018487

29. Suliburska J. Rola składników mineralnych w rozwoju i prewencji nadciśnienia tętniczego. Forum Zaburzeń Metabolicznych 2010; 1(4): 230–235.
30. Wexler R, Aukerman G. Nonpharmacologic strategies for managing hypertension. Am Fam Physician 2006; 73(11): 1953–6.
31. Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, Clement DL, Coca A, de Simone G, Dominiczak A, Kahan T, Mahfoud F, Redon J, Ruilope L, Zanchetti A, Kerins M, Kjeldsen SE, Kreutz R, Laurent S, Lip GYH, McManus R, Narkiewicz K, Ruschitzka F, Schmieder RE, Shlyakhto E, Tsioufis C, Aboyans V, Desormais I; ESC Scientific Document Group. 2018 ESC/ESH Guidelines for the management of arterial hypertension. Eur Heart J 2018; 39(33): 3021–104. doi: 10.1093/eurheartj/ehy339