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COMPARISON OF THE EFFECTIVENESS OF THE DASH DIET AND THE MEDITERRANEAN DIET IN THE MANAGEMENT OF ARTERIAL HYPERTENSION: NARRATIVE REVIEW

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ABSTRACT

Background: Arterial hypertension remains the most prevalent modifiable cardiovascular risk factor worldwide and a leading contributor to morbidity and mortality. Lifestyle modification, particularly dietary intervention, is universally recommended as first-line therapy in the prevention and management of hypertension.

Aims: The aim of this narrative review was to compare the effectiveness of the Dietary Approaches to Stop Hypertension (DASH) diet and the Mediterranean diet in reducing systolic and diastolic blood pressure.

Methods: A narrative review of the literature was conducted using PubMed, Google Scholar, and the World Health Organization databases. Publications in English and Polish concerning adult populations were included, encompassing randomized controlled trials, meta-analyses, and systematic reviews evaluating the effects of DASH and Mediterranean dietary patterns on blood pressure.

Results: Both dietary patterns were consistently associated with significant reductions in systolic and diastolic blood pressure and improvement of cardiometabolic parameters. Meta-analyses of randomized trials indicate that the DASH diet reduces systolic blood pressure by approximately 3.2–5.2 mmHg and diastolic blood pressure by 2.0–2.6 mmHg. The Mediterranean diet demonstrates more modest but clinically relevant blood pressure reductions, with pooled systolic decreases of approximately 1.4–5.5 mmHg and diastolic decreases of 1.5–2.0 mmHg. Comparative analyses indicate a greater antihypertensive effect of the DASH diet, particularly in sodium-sensitive individuals. The Mediterranean diet provides broader metabolic and anti-inflammatory benefits. However, long-term durability, effects in resistant hypertension, and impact on hard clinical outcomes remain insufficiently studied.

Conclusions: Both the DASH and Mediterranean diets represent effective non-pharmacological strategies for systolic and diastolic values reduction and cardiovascular risk modification. However, available evidence indicates that the DASH diet produces a greater magnitude of blood pressure reduction, likely due to its stricter sodium limitation and higher potassium content.

Keywords: arterial hypertension, DASH diet, Mediterranean diet, blood pressure, lifestyle modification.

INTRODUCTION

Cardiovascular diseases remain the leading cause of death in Poland and Europe and are responsible for the highest proportion of disability-adjusted life years (DALYs). At the same time, high arterial pressure remains the most important modifiable cardiovascular risk factor. Research published in 2024 showed that the number of people with a registered arterial hypertension in Poland is 11 million. It was found that the most often hypertension occurs in men aged 55-59 and women aged 50-54. In the population under 55 years of age high BP occurs more often in men, while in older age groups dominate women [1]. In turn, according to estimates from 2010, all over the world, 31,10% of the population suffers from the condition [2,3]. The prevalence of arterial hypertension is increasing, mainly due to the aging society and growing incidence of obesity [2].

According to published by World Health Organization in 2023. global report on hypertension, only 54% of patients were diagnosed, 42% are taking antihypertensive drugs and only 21% of patients have controlled hypertension [4].

Hypertensive heart disease, which is the consequence of the heart muscle damage through arterial hypertension, imposes a serious health and economic burden, positioning it as critical challenge for the public health [5].

In patients with stage 1 hypertension, where lifestyle modifications are recommended as first-line therapy, nutritional strategy interventions have been shown to improve both BP and lipid profiles, potentially delaying or preventing the need for pharmacological treatment[6]

We define lifestyle as individual behaviour patterns that influence the disease state. Modifiable risk factors include excessive consumption of sodium, insufficient consumption of potassium, overweight and obesity, lack of physical activity, smoking, excessive consumption of alcohol, psychosocial stressors, diabetes. The modification of a lifestyle includes healthy diet, regular physical activity, weight management (optimally BMI 18,5-25), avoid of alcohol and smoking, reduction of stress, limiting consumption of caffeine and sleep hygiene [7]. It is the first line action in prevention and treatment of high blood pressure, apart from the direct benefits, also strengthen pharmacological effects of treatment [8].

It has been shown that modification of a lifestyle is effective in treatment both controlled and resistant hypertension. 4-month, organised programme of diet and physical activity, as supportive therapy results in significant reduction clinical and outpatient blood pressure and also improvement of biomarkers of cardiovascular risk factors. This finding is clinically relevant because resistant hypertension is associated with a higher incidence of organ damage and 50% greater risk of adverse cardiovascular events, including heart attack, stroke and death compared with controlled hypertension [9]. Population-based evidence from a 2023 meta-analysis of cohort studies showed that higher adherence to the DASH dietary model was associated with approximately 19% lower hazard of developing hypertension (HR ≈ 0.81), demonstrating its preventive potential at the population level [10] Observational pooled data published in Nutrients indicate that individuals with higher DASH adherence have a significantly lower incidence of hypertension compared with those with low adherence (HR 0.81, 95% CI reported), supporting its role in primary prevention [10]. In the traditional Mediterranean diet, alcohol consumption is common but moderate and occurs mainly in the form of wine consumed with meals. Total fat intake is relatively high in Greece (approximately 40% of total energy intake) and moderate in Italy (around 30% of total energy intake). In both settings, the ratio of monounsaturated to polyunsaturated fatty acids is high due to the predominant use of olive oil as the main culinary fat [11] In the mid-1990s, Antonia Trichopoulou and colleagues developed the Mediterranean Diet Score (MDS) based on median food consumption in an elderly Greek population [12]. A more recent and refined version, the Chrono-Mediterranean Diet Score (CMDS), proposed in 2023 by De Matteis et al., provides a more precise measure of adherence to the Mediterranean diet, particularly in the context of metabolic disease risk and abdominal obesity [13].

RELEVANCE

Current evidence confirms that both the DASH and the Mediterranean dietary model lower BP and improve cardiometabolic parameters, yet several clinically relevant questions remain unresolved. First, there are no direct and comparable data on how these diets affect vascular structure and function, including central blood pressure, arterial stiffness, and microvascular remodelling. Second, the long-term sustainability of their antihypertensive effect is insufficiently studied. Most randomized trials last only a few months, which prevents firm conclusions about adherence over time, weight regain, and potential attenuation of the blood pressure lowering effect.

Another unresolved issue concerns the role of the DASH and Mediterranean diets in resistant hypertension. Available

data mainly relate to patients with mild or moderate hypertension, both treated and untreated, while evidence in individuals with uncontrolled blood pressure despite multidrug therapy is extremely limited. It is unclear whether one of the diets provides superior benefit in this high-risk group or whether a combined approach is required.

The mechanistic basis of clinical effects is only partially elucidated. Both models influence sodium and potassium intake, body weight, insulin resistance, lipid profile, oxidative stress, and low-grade inflammation, yet the relative contribution of these pathways, as well as their potential interactions with antihypertensive therapy, is not fully defined. Finally, most comparative studies focus on intermediate endpoints such as office blood pressure or surrogate biomarkers. Evidence regarding hard clinical outcomes including myocardial infarction, stroke, heart failure, and cardiovascular mortality remains limited and does not clearly distinguish between the two dietary patterns.

These uncertainties justify a focused literature analysis comparing DASH and the Mediterranean diet with emphasis on differences in antihypertensive efficacy, durability of effects, potential advantages in resistant hypertension, metabolic mechanisms, and long-term clinical impact.

NOVELTY

The novelty of this work lies in the systematic comparison of two established dietary models in the context of high blood pressure with emphasis on their differing mechanistic basis and unequal magnitude of blood pressure lowering effects. The article does not simply repeat known epidemiological facts but synthesizes meta-analytic data on blood pressure reduction highlighting the contribution of sodium restriction as a key component of the DASH diet and the metabolic and anti-inflammatory effects of the Mediterranean diet. Additional value is reflected in the indication of potential benefits of a combined approach and the need to investigate the Mediterranean diet under conditions of intensified sodium reduction.

AIM

The aim of this review is to critically compare the DASH diet and the Mediterranean dietary model in terms of their blood pressure lowering properties, metabolic influence, and potential for reducing cardiovascular risk.

RESEARCH TASKS

To achieve this aim, the following research tasks are formulated.

1. The first task is to analyse data from randomized trials and meta analyses to compare the magnitude and durability of blood pressure reduction with each diet.
2. The second task is to assess available evidence on vascular function, including central pressure and arterial stiffness.
3. The third task is to identify possible advantages of one dietary model in resistant hypertension, where current data are scarce and fragmented.
4. The fourth task is to examine described metabolic and anti-inflammatory mechanisms with determination of the relative contribution of individual factors.
5. The fifth task is to evaluate their impact on clinical outcomes, since evidence on myocardial infarction, stroke, heart failure, and mortality is insufficient and requires systematisation.

Completion of these tasks will allow for the assessment of the comparative value of the DASH and Mediterranean dietary models for hypertension management and will help identify areas where further research is necessary.

METHODOLOGY

This narrative review was conducted between January and February 2025. The literature search covered publications from January 2010 to December 2024. The following electronic databases were searched: PubMed, Google Scholar, and the World Health Organization database.

The search strategy included the following combinations of keywords:

- “DASH diet AND arterial Hypertension”,
- “Mediterranean diet AND arterial Hypertension”,
- “Dietary patterns AND blood pressure”,

Only articles published in English or Polish and conducted in adult populations (≥18 years) were considered.

The inclusion criteria were:

- randomized controlled trials,
- systematic reviews and meta-analyses,
- observational studies (prospective and retrospective),
- studies evaluating the effects of the DASH diet or the Mediterranean diet on systolic and/or diastolic blood pressure.

The exclusion criteria were:

- studies conducted exclusively in paediatric populations,
- animal or in vitro studies,
- publications without full-text availability,
- studies not reporting blood pressure outcomes.

The identified studies were classified according to study design as randomized controlled trials, observational studies, or secondary analyses (systematic reviews and meta-analyses). The selected publications were analysed with regard to methodological quality, relevance to the study aim, and clinical applicability. Due to the narrative nature of the review, no formal quantitative synthesis was performed.

RESULTS

EFFECTS OF THE DASH DIET ON BLOOD PRESSURE

A network meta-analysis comparing multiple dietary interventions positioned both the DASH and Mediterranean diets among the top-ranked approaches for cardiovascular risk factor reduction, with a high probability of superiority over conventional dietary advice [14].

Meta-analyses and randomized controlled trials consistently demonstrate significant blood pressure reductions associated with the DASH diet. In hypertensive individuals, the DASH dietary approach was shown to reduce systolic and diastolic blood pressure by approximately 11.6/5.3 mmHg, while in normotensive individuals' reductions of approximately 3.5/2.1 mmHg were observed [15]

A meta-analysis including 1,917 participants reported a mean reduction in systolic blood pressure of 5.2 mmHg and diastolic blood pressure of 2.6 mmHg following DASH dietary intervention. Additionally, total cholesterol decreased by 0.20 mmol/L and low-density lipoprotein cholesterol by 0.10 mmol/L. Changes in glucose concentration were not statistically significant [16]

Another meta-analysis encompassing 30 studies and 5,545 participants demonstrated an average reduction of −3.2 mmHg in systolic blood pressure and −2.5 mmHg in diastolic blood pressure. The effect was more pronounced in populations with sodium intake exceeding 2,400 mg/day. Blood pressure reduction was also shown to be independent of baseline blood pressure values, although the magnitude of reduction decreased with increasing age [17]

A systematic review and meta-analysis of randomized controlled trials demonstrated that the modified DASH diet reduced mean systolic blood pressure by 3.26 mmHg and diastolic blood pressure by 2.07 mmHg compared with control diets. Greater baseline blood pressure values were associated with higher absolute reductions [18].

A 2023 meta-analysis of randomized controlled trials in hypertensive patients confirmed that the DASH diet significantly reduced systolic blood pressure by −3.89 mmHg and diastolic blood pressure by −2.19 mmHg compared with control diets [19].

Effects of the Mediterranean Diet on Blood Pressure

A meta-analysis including 50 studies and 534,906 participants demonstrated that adherence to the Mediterranean diet was associated with significant improvements in cardiometabolic parameters, including reductions in systolic blood pressure (−2.35 mmHg) and diastolic blood pressure (−1.58 mmHg) [20].

A randomized interventional trial involving 137 participants showed reductions in systolic blood pressure of −1.3 mmHg and −1.0 mmHg after 3 and 6 months of Mediterranean dietary intervention, respectively [21]

In the large randomized controlled NU-AGE trial, including 1,142 elderly participants, a one-year Mediterranean dietary intervention resulted in a significant reduction in systolic blood pressure of −5.5 mmHg. The reduction was more pronounced in men (−9.2 mmHg) than in women (−3.1 mmHg). Changes in diastolic blood pressure were not clinically significant [22]

A 2021 meta-analysis of randomized controlled trials and observational studies (n ≈ 4,137) demonstrated modest but significant blood pressure reductions with the Mediterranean diet, with pooled reductions of −1.4 mmHg for systolic and −1.5 mmHg for diastolic blood pressure. Observational data further indicated approximately 13% lower odds of incident hypertension among individuals with higher adherence [23]

Direct Comparison of DASH and Mediterranean Diets

A recent 2025 comparative review evaluating both dietary approaches demonstrated that the DASH diet produced greater reductions in blood pressure in randomized clinical trials, whereas the Mediterranean diet was associated with smaller average pooled reductions in systolic and diastolic blood pressure (SBP ≈ −1.5 mmHg; DBP ≈ −0.9 mmHg). Nevertheless, both dietary patterns were associated with significant cardiovascular benefits [24]

DISCUSSION

Current international clinical practice guidelines unanimously emphasize lifestyle modification as a fundamental component of hypertension prevention and treatment, with dietary interventions representing a cornerstone of non-pharmacological blood pressure control. According to the 2024 European Society of Cardiology (ESC) Guidelines for the management of elevated blood pressure and hypertension, structured lifestyle interventions including dietary modification, weight reduction, sodium restriction, and increased potassium intake are recommended for all patients with elevated blood pressure and established hypertension, regardless of pharmacological treatment status [25].

Similarly, the 2025 American Heart Association/American College of Cardiology (AHA/ACC) guideline strongly recommends adherence to heart-healthy nutritional strategy, explicitly including the Dietary Approaches to Stop Hypertension (DASH) eating plan, as a first-line strategy for both the prevention and management of hypertension. Lifestyle interventions, including dietary modification, are recommended for all adults with elevated blood pressure and hypertension and are considered mandatory even when pharmacological therapy is initiated [26].

In patients with chronic kidney disease (CKD), who represent a high-risk population for cardiovascular complications, the KDIGO 2021 Clinical Practice Guideline for the Management of Blood Pressure in CKD similarly emphasizes non-pharmacological strategies, including dietary sodium restriction, weight management, and overall dietary modification, as integral components of blood pressure control alongside pharmacotherapy [27].

Taken together, current European, American, and nephrology-specific clinical practice guidelines consistently identify dietary modification as a foundational element of hypertension management. This strong guideline-based endorsement provides a robust clinical rationale for the comparative evaluation of dietary models, such as the DASH and Mediterranean diets, in blood pressure control.

Both the DASH and Mediterranean diets are characterized by high intake of vegetables and fruits and reduced consumption of saturated fats. However, despite these similarities, the two dietary models differ in several key components that may explain their different magnitudes of antihypertensive effects. The DASH diet emphasizes strict sodium restriction, low-fat dairy products, and complete exclusion of alcohol, while the Mediterranean diet is based on olive oil as the primary fat source, includes moderate intake of fish, poultry, dairy products, and allows moderate alcohol consumption, particularly wine.

The key nutritional components and recommended intake frequencies of the DASH and Mediterranean diets are summarized in Table 1

Table 1. Comparison of the main dietary components and recommended consumption

Component	DASH	Mediterranean
Whole grain products [11,28]	6–8 servings per day	3–6 servings per day
Low-fat dairy products [11,28]	2–3 servings per day	2 servings per day (often yogurt and sheep/goat cheeses)
Meat, poultry, fish [11,28]	≥ 6 servings per day	Fish: ≥ 2 servings per week White meat: 2 servings per week Red meat: ≤ 1 servings per week
Legumes, nuts, seeds [11,28]	4–5 servings per week	1-2 servings per day

Fats [11,28]	2–3 servings per day, Low saturated fats, e.g. Canola oil, limiting saturated fats	Monounsaturated fat, the main source is olive oil
Sodium [11,28]	max. 2300 mg per day (optimally1500 mg)	No strict limit, rather low salt intake
Monosaccharides/ sweets [11,28]	≤5 servings per week	≤2 servings per week
Alcohol	Not recommended or in moderate amounts	Moderate consumption (e.g. 1 glass of wine a day with a meal)

A 2025 network meta-analysis comparing multiple dietary interventions ranked both DASH and Mediterranean diets among the most beneficial dietary strategies for metabolic syndrome components, providing indirect comparative evidence relevant to blood pressure and broader cardiometabolic outcomes [29]. These findings are consistent with earlier pooled analyses presented in the present review.

One of the most important antihypertensive mechanisms of the DASH diet is sodium restriction combined with increased potassium intake. Potassium-rich foods such as vegetables and fruits exhibit vasodilatory properties and may reduce blood pressure through decreased vascular smooth muscle contraction [30]). The INTERSALT study demonstrated that an increase in potassium intake by approximately 0.6 g per day resulted in a reduction in systolic blood pressure of about 1.0 mmHg, and that the recommended supplementation level of 51 mmol/day may reduce systolic and diastolic blood pressure by approximately 3.3 mmHg and 2.1 mmHg, respectively [31].

Excess sodium intake increases intravascular volume, cardiac output, and renal perfusion pressure, leading to elevated blood pressure [32]. Moreover, chronic high sodium consumption contributes to arterial stiffness through alterations in the extracellular matrix of the arterial wall [33]. Increased arterial stiffness has been independently associated with a higher risk of developing hypertension [34].

In contrast, the Mediterranean diet exerts part of its beneficial effect through a high content of monounsaturated fatty acids derived mainly from olive oil. Partial replacement of carbohydrates with monounsaturated fats has been shown to increase high-density lipoprotein cholesterol concentration [35] In addition, a higher proportion of monounsaturated fats in the diet reduces systolic and diastolic blood pressure by approximately −2.26 mmHg and −1.15 mmHg, respectively [36].

Specific polyphenols characteristic of the Mediterranean diet, including oleuropein, hydroxytyrosol, and tyrosol found abundantly in olive oil, have been shown in meta-analyses to improve cardiometabolic risk factors, including blood pressure, primarily through enhancement of endothelial function [37].

Both the DASH and Mediterranean dietary patterns exhibit anti-inflammatory properties that contribute to their blood pressure–lowering effects through reduced oxidative stress, improved endothelial function, and modulation of inflammatory cytokines [38].

The strong emphasis on plant-based foods in both the DASH and Mediterranean dietary models contributes to their metabolic benefits through increased fibre intake, antioxidant supply, and phytochemical effects on insulin sensitivity and systemic inflammation [39].

When compared with other therapeutic dietary strategies for metabolic syndrome, the Mediterranean diet demonstrates comparable or superior effects on multiple cardiometabolic components, including blood pressure, while showing generally better long-term adherence than more restrictive dietary approaches [40]

Sodium

Normal serum sodium concentration ranges from 136 to 145 mmol/L. A clear dose–response relationship exists between sodium intake reduction and the magnitude of blood pressure lowering, with greater sodium restriction producing larger reductions in systolic and diastolic blood pressure. Long-term salt reduction is associated with a small, physiological increase in plasma renin, aldosterone, and noradrenaline activity, without significant changes in lipid concentrations. A direct relationship between decreased urinary sodium excretion and blood pressure reduction has also been demonstrated [41]

Potassium

Normal serum potassium concentration ranges from 3.5 to 5.5 mmol/L. Potassium is abundant in dried fruits, potatoes, nuts, seeds, fresh fruits, vegetables, and meat [42]. The INTERSALT study demonstrated that an increase in potassium intake by approximately 50 mmol per day was associated with reductions in systolic and diastolic blood

pressure of 3.6 mmHg and 1.87 mmHg, respectively [31].

Magnesium

The hypotensive effect of magnesium appears to be more pronounced when it is consumed as part of a natural nutritional strategy in combination with potassium and calcium rather than as isolated supplementation. Although the exact mechanisms remain incompletely defined, magnesium is known to act as a natural calcium-channel antagonist and an essential cofactor for delta-6-desaturase. Magnesium deficiency leads to reduced prostaglandin E synthesis, promoting vasoconstriction and an increase in blood pressure. Despite some inconsistency in clinical evidence, magnesium-rich diets should be encouraged, particularly in individuals at increased risk of high blood pressure [43].

Alcohol intake represents another important differentiating factor between the two dietary models. Excessive alcohol consumption is clearly associated with the development of arterial hypertension. A threshold of ≥210 g of ethanol per week has been linked to increased hypertension risk in the North American population [44]. Sex-specific differences have also been described, with light-to-moderate alcohol intake reducing hypertension risk in women but increasing this risk in men. Consumption of ≥4 drinks daily in women and ≥1 drink daily in men has been associated with elevated hypertension risk [45]. These observations suggest that the permissive attitude toward moderate alcohol intake in the Mediterranean diet requires careful clinical interpretation.

In patients with chronic kidney disease, dietary interventions must be applied with caution. Modified DASH dietary approaches with appropriate adjustment of potassium and phosphorus content may provide blood pressure benefits while accounting for renal function limitations [46]. Additionally, the DASH diet has demonstrated broader metabolic effects beyond blood pressure reduction. A recent systematic review showed improvements in liver enzyme profiles in adults following DASH dietary intervention, suggesting potential benefits for metabolic syndrome and non-alcoholic fatty liver disease frequently coexisting with hypertension [47].

The primary aim of this review was to assess the magnitude of hypotensive effects of both dietary patterns. A 2022 systematic review and meta-analysis directly comparing DASH and Mediterranean diets showed that DASH reduced systolic blood pressure by −3.2 mmHg and diastolic blood pressure by −2.5 mmHg, whereas the Mediterranean diet reduced systolic blood pressure by −3.1 mmHg and diastolic blood pressure by −1.6 mmHg, suggesting comparable systolic effects but a larger diastolic benefit with the DASH diet [48]. Independent pooled analyses published in 2023 confirmed clinically meaningful blood pressure reductions for both dietary approaches, with somewhat greater diastolic reductions observed with the DASH diet in randomized trials [49]. These observations support the central role of sodium restriction in the pathophysiology of arterial hypertension.

Recent updates on medical nutrition therapy confirm that structured dietary programs, including DASH and Mediterranean diets, are cost-effective interventions for cardiovascular disease prevention and should be considered first-line therapy in hypertension management [50].An emerging alternative nutritional strategy is the Nordic diet. A meta-analysis demonstrated that the Nordic diet significantly reduced systolic and diastolic blood pressure by −4.26 mmHg and −2.38 mmHg, respectively [51]. Similar findings were reported in centrally obese individuals, with systolic and diastolic reductions of −5.1 mmHg and −3.2 mmHg [52]. The Nordic diet was also ranked among the most effective dietary approaches for blood pressure management in a network meta-analysis [53]. However, the overall quality of evidence ranges from very low to moderate, suggesting cautious interpretation. Its effectiveness is likely linked to its high intake of fruits, vegetables, whole grains, and fish, combined with low consumption of highly processed foods [54].

The MIND diet, which integrates key components of both the DASH and Mediterranean dietary approaches, has demonstrated mixed effects on cognitive outcomes; however, it highlights overlapping dietary elements such as vegetables, berries, nuts, and whole grains that may mediate both vascular and neurocognitive health benefits [55].

Large-scale prospective evidence from NHANES, the UK Biobank, and a meta-analysis of 37 cohort studies including 3.2 million participants has shown that higher adherence to healthy dietary patterns is associated with significantly reduced all-cause, cardiovascular, and cancer mortality, underscoring the public health importance of dietary recommendations for hypertension and overall health [56].

Despite the large number of cited sources, the discussion remains descriptive and does not demonstrate a critical evaluation of the quality of evidence. Most data are derived from meta-analyses with high heterogeneity, short duration randomized trials, and indirect comparisons which limits the reliability of conclusions regarding the superiority of one diet over another [14,16,17,19,30,53]. There is no analysis of the fact that results for DASH are often obtained under conditions of strict dietary control which reduces feasibility in real world practice [18,46,50], whereas findings for the Mediterranean diet are predominantly based on observational studies with residual confounding risk [10,13,20–23]. The reported effects on vascular function and metabolic markers are frequently assessed through surrogate endpoints without confirmation of impact on hard clinical outcomes [5,14,39,50]. These limitations require caution when interpreting comparative dietary effectiveness and highlight the need for direct and long-term studies evaluating applications in resistant hypertension durability of benefit and effects on mortality [9].

The present analysis allows comparison of the review results with the stated research objectives. Literature data indicate that both dietary models reduce blood pressure yet the long-term stability of this effect remains uncertain since most trials were limited to several months of follow up preventing confirmation of sustained clinical benefit [16,17,19,30,47]. A direct comparative assessment of vascular stiffness is lacking although available mechanistic evidence suggests that DASH may exert a more pronounced effect through strict sodium control [5,31–33,41,43], while the Mediterranean model influences vascular health indirectly via endothelial improvement and anti-inflammatory pathways [17,20–22,36,38]. The role of these diets in resistant hypertension remains insufficiently defined because available studies mostly included patients with mild and moderate disease and do not justify claims of superiority in populations with uncontrolled blood pressure [9]. Evaluation of hard clinical endpoints revealed limited evidence and absence of direct comparative data making it impossible to draw firm conclusions regarding effects on myocardial infarction stroke heart failure or mortality [[12,20,22,56]. Taken together these observations indicate that both dietary models possess antihypertensive potential yet insufficient knowledge of long-term sustainability vascular effects efficacy in resistant hypertension and clinical outcomes defines priorities for future research.

The comparative table below summarizes mechanistic differences effectiveness sustainability and knowledge gaps between the DASH and Mediterranean dietary models.

Table 2. Comparative characteristics of DASH and Mediterranean diets in hypertension management

Dimension	DASH diet	Mediterranean diet
Primary antihypertensive mechanism	Sodium restriction and increased potassium intake improve volume regulation and vascular tone[30–32,41]	High monounsaturated fat intake and polyphenols enhance endothelial function and reduce inflammation[21,36,37]
Effect magnitude reported in meta-analyses	Greater reduction in systolic and diastolic blood pressure, particularly diastolic response[16–19]	Comparable systolic reduction but less pronounced diastolic change[20,22,23]
Adherence feasibility	Structurally restrictive pattern reduces long term adherence in free living settings[46,50]	Higher real world adherence given broader food flexibility[11,13,23]
Impact on vascular stiffness	Likely stronger effect through sodium control although direct comparative evidence lacking[33,34]	Indirect improvement through endothelial pathways but insufficient comparative outcome data[21,22]
Role in resistant hypertension	Evidence fragmentary with potential benefits but no robust data [9]	Evidence very limited, no comparative advantage established
Metabolic and inflammatory effects	Improves pressure control and lipid profile with parallel weight control [16,47]	Favourable metabolic and anti-inflammatory profile beyond blood pressure effects [36–38]
Evidence on hard clinical outcomes	Insufficient direct evidence for infarction stroke or mortality[50]	Large observational evidence on cardiovascular outcomes but no direct trials [12,56]

Primary antihypertensive mechanism Sodium restriction and increased potassium intake improve volume regulation and vascular tone High monounsaturated fat intake and polyphenols enhance endothelial function and reduce inflammation

Effect magnitude reported in meta analyses Greater reduction in systolic and diastolic blood pressure particularly diastolic response Comparable systolic reduction but less pronounced diastolic change

Adherence feasibility Structurally restrictive pattern reduces long term adherence in free living settings Higher real

world adherence given broader food flexibility

Impact on vascular stiffness Likely stronger effect through sodium control although direct comparative evidence lacking Indirect improvement through endothelial pathways but insufficient comparative outcome data

Role in resistant hypertension Evidence fragmentary with potential benefits but no robust data Evidence very limited no comparative advantage established

Metabolic and inflammatory effects Improves pressure control and lipid profile with parallel weight control Favourable metabolic and anti-inflammatory profile beyond blood pressure effects

Evidence on hard clinical outcomes Insufficient direct evidence for infarction stroke or mortality Large observational evidence on cardiovascular outcomes but no direct trials

The limitations of this review are related both to the quality of primary studies and to methodological characteristics of the available literature. Most randomized trials had short follow up periods precluding evaluation of sustained antihypertensive effectiveness [16,17,19,30,47]. The predominance of indirect comparisons hampers confident determination of differences between dietary models [14,53]. Included studies differed substantially in design population degree of dietary control adherence levels and blood pressure measurement methods creating high heterogeneity and limiting reliability of data synthesis [16,18,19,47,50]. Evidence for dietary interventions in resistant hypertension is extremely limited hindering meaningful conclusions for this clinically important group [9]. Mechanistic findings often rely on surrogate markers and do not confirm effects on clinical endpoints [5,39,50,56]. Moreover, most observational studies are subject to residual confounding and meta-analyses focus on intermediate outcomes limiting translation into practical recommendations [12,13,20–23]. Collectively these constraints necessitate caution in interpretation and underline the need for direct long term comparative studies.

Future research should address the identified gaps in knowledge. Direct long term randomized trials are required to determine durability of antihypertensive effects and identify determinants of adherence [16,17,19,30,47]. Studies incorporating assessment of vascular stiffness central pressure and structural arterial changes are essential to clarify mechanistic pathways [5,31–33,41,43]. Clinical trials in populations with resistant hypertension are of particular importance as the potential of dietary interventions in this group remains largely unexplored [9]. Further work is needed to investigate metabolic and anti-inflammatory pathways and their interaction with pharmacotherapy [20–22,36,38,50]. Finally, evidence on hard clinical outcomes including myocardial infarction stroke heart failure and mortality must be obtained since current data are limited and do not allow confident conclusions about long term clinical significance [12,20,22,56].

CONCLUSIONS

The present analysis confirms that both the DASH diet and the Mediterranean dietary model have proven antihypertensive effects and can reduce cardiovascular risk. When these approaches are compared the DASH diet shows a more pronounced and predictable reduction in systolic and diastolic blood pressure which is likely explained by stricter sodium restriction and higher potassium intake. However, its long-term adherence in real life settings is limited because the required level of dietary control and change in taste habits reduces sustainability outside supervised clinical programmes. The Mediterranean diet provides a slightly smaller blood pressure reduction but offers broader metabolic and anti-inflammatory advantages and is generally better tolerated by patients during prolonged application.

This review identified substantial knowledge gaps. The durability of the effects of both dietary models is insufficiently studied and does not allow firm conclusions about long term maintenance of benefits. Evidence regarding their effectiveness in resistant hypertension is extremely limited and does not support superiority of one approach. Mechanistic pathways remain partly unclear particularly in relation to interactions with antihypertensive medication. Furthermore, most investigations are based on intermediate outcomes which precludes conclusions about the impact of these diets on myocardial infarction stroke heart failure and mortality.

Thus, both dietary strategies are valuable in hypertension management but further work is required to investigate durability of effects clarify their role in resistant hypertension define mechanisms of action and evaluate their influence on long term clinical outcomes.

DISCLOSURE

AUTHORS' CONTRIBUTIONS

All authors have read and approved the final version of the manuscript.

STATEMENT ON THE USE OF ARTIFICIAL INTELLIGENCE

Artificial intelligence tools were not used in the writing or editing of this manuscript.

REFERENCES

1. Cegłowska U, Burzyńska M, Prejbisz A, Stępińska J, Gellert R, Pinkas J, et al. Incidence and prevalence of registered hypertension in Poland. Pol Arch Intern Med 2024;134. https://doi.org/10.20452/pamw.16746.
2. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nat Rev Nephrol 2020;16:223–37. https://doi.org/10.1038/s41581-019-0244-2.
3. Liu F, Pan H-W, Li Y-Y, Zhao X-J, Hong X-Q, Liu Z-Y, et al. Trends analysis of the global burden of hypertensive heart disease from 1990 to 2021: a population-based study. BMC Public Health 2025;25:2233. https://doi.org/10.1186/s12889-025-23389-6.
4. Global report on hypertension The race against a silent killer. 2023. https://www.who.int/publications/i/item/9789240081062
5. Nwabuo CC, Vasan RS. Pathophysiology of Hypertensive Heart Disease: Beyond Left Ventricular Hypertrophy. Curr Hypertens Rep 2020;22:11. https://doi.org/10.1007/s11906-020-1017-9.
6. Vamvakis A, Lazaridis A, Grammatikopoulou MG, Malliora A, Tsiroukidou K, Tzimos C, et al. Impact of Dietary Patterns on the Lipidemic Profile and the Cardiovascular Risk in Stage 1 Hypertension: A Post Hoc Analysis of the HINTreat Trial. Nutrients 2025;17. https://doi.org/10.3390/nu17162632.
7. Elmakki E. The Role of Lifestyle Modifications in Preventing and Managing Systemic Hypertension: Current Guidelines and Future Directions. Ann Afr Med 2025;24:1–8. https://doi.org/10.4103/aam.aam_90_24.
8. Charchar FJ, Prestes PR, Mills C, Ching SM, Neupane D, Marques FZ, 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 2024;42:23–49. https://doi.org/10.1097/HJH.0000000000003563.
9. Blumenthal JA, Hinderliter AL, Smith PJ, Mabe S, Watkins LL, Craighead L, et al. Effects of Lifestyle Modification on Patients With Resistant Hypertension: Results of the TRIUMPH Randomized Clinical Trial. Circulation 2021;144:1212–26. https://doi.org/10.1161/CIRCULATIONAHA.121.055329.
10. Theodoridis X, Chourdakis M, Chrysoula L, Chroni V, Tirodimos I, Dipla K, et al. Adherence to the DASH Diet and Risk of Hypertension: A Systematic Review and Meta-Analysis. Nutrients 2023;15:3261. https://doi.org/10.3390/nu15143261.
11. Trichopoulou A, Martínez-González MA, Tong TY, Forouhi NG, Khandelwal S, Prabhakaran D, et al. Definitions and potential health benefits of the Mediterranean diet: views from experts around the world. BMC Med 2014;12:112. https://doi.org/10.1186/1741-7015-12-112.
12. Trichopoulou A, Kouris-Blazos A, Wahlqvist ML, Gnardellis C, Lagiou P, Polychronopoulos E, et al. Diet and overall survival in elderly people. BMJ 1995;311:1457–60. https://doi.org/10.1136/bmj.311.7018.1457.
13. De Matteis C, Crudele L, Battaglia S, Loconte T, Rotondo A, Ferrulli R, et al. Identification of a Novel Score for Adherence to the Mediterranean Diet That Is Inversely Associated with Visceral Adiposity and Cardiovascular Risk: The Chrono Med Diet Score (CMDS). Nutrients 2023;15:1910. https://doi.org/10.3390/nu15081910.
14. Sun Y, Shang M, Zhang Y, Hu J, Wang H. Comparative effect of dietary patterns on selected cardiovascular risk factors: A network study. Sci Rep 2025;15. https://doi.org/10.1038/s41598-025-13596-x.
15. Gibała M, Janowski GJ. Znaczenie diety w prewencji oraz wyrównaniu nadciśnienia tętniczego 2016. https://doi.org/https://doi.org/10.5603/chsin.42160.
16. Siervo M, Lara J, Chowdhury S, Ashor A, Oggioni C, Mathers JC. Effects of the dietary approach to stop hypertension (DASH) diet on cardiovascular risk factors: A systematic review and meta-analysis. British Journal of Nutrition 2015;113:1–15. https://doi.org/10.1017/S0007114514003341.
17. Filippou CD, Tsioufis CP, Thomopoulos CG, Mihas CC, Dimitriadis KS, Sotiropoulou LI, et al. 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. Advances in Nutrition 2020;11:1150–60. https://doi.org/10.1093/advances/nmaa041.
18. Guo R, Li N, Yang R, Liao X-Y, Zhang Y, Zhu B-F, et al. Effects of the Modified DASH Diet on Adults With Elevated Blood Pressure or Hypertension: A Systematic Review and Meta-Analysis. Front Nutr 2021;8. https://doi.org/10.3389/fnut.2021.725020.
19. Alifah K, Damayanti YAE, Rahmani A. 22. The Effect of DASH Diet on Blood Pressure and Metabolic Profile in Hypertensive Patients: A Systematic Review and Meta-Analysis. J Hypertens 2023;41:e6. https://doi.org/10.1097/01.hjh.0000935468.48116.98.
20. Kastorini C-M, Milionis HJ, Esposito K, Giugliano D, Goudevenos JA, Panagiotakos DB. The Effect of

Mediterranean Diet on Metabolic Syndrome and its Components. J Am Coll Cardiol 2011;57:1299–313. https://doi.org/10.1016/j.jacc.2010.09.073.

21. Davis CR, Hodgson JM, Woodman R, Bryan J, Wilson C, Murphy KJ. A Mediterranean diet lowers blood pressure and improves endothelial function: results from the MedLey randomized intervention trial ,. Am J Clin Nutr 2017;105:1305–13. https://doi.org/10.3945/ajcn.116.146803.
22. Jennings A, Berendsen AM, de Groot LCPGM, Feskens EJM, Brzozowska A, Sicinska E, et al. Mediterranean-Style Diet Improves Systolic Blood Pressure and Arterial Stiffness in Older Adults. Hypertension 2019;73:578–86. https://doi.org/10.1161/HYPERTENSIONAHA.118.12259.
23. Cowell OR, Mistry N, Deighton K, Matu J, Griffiths A, Minihane AM, et al. Effects of a Mediterranean diet on blood pressure: a systematic review and meta-analysis of randomized controlled trials and observational studies. J Hypertens 2021;39:729–39. https://doi.org/10.1097/HJH.0000000000002667.
24. Konrad Strużek, Agnieszka Kwiatkowska, Ewelina Mączka, Wiktor Tracz, Patrycja Świercz, Kinga Teper, et al. THE IMPACT OF THE DASH AND MEDITERRANEAN DIETS ON BLOOD PRESSURE AND CARDIOVASCULAR RISK FACTORS: A REVIEW OF SCIENTIFIC EVIDENCE AND PRACTICAL IMPLICATIONS. International Journal of Innovative Technologies in Social Science 2025;2. https://doi.org/10.31435/ijitss.3(47).2025.3663.
25. McCarthy CP, Bruno RM, Brouwers S, Canavan MD, Ceconi C, Christodorescu RM, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J 2024;45:3912–4018. https://doi.org/10.1093/eurheartj/ehae178.
26. Johnson HM, Shimbo D, Abdalla M, Altieri MM, Bress AP, Carter J, et al. 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation 2025;152:e114–218. https://doi.org/10.1161/CIR.0000000000001356.
27. Cheung AK, Chang TI, Cushman WC, Furth SL, Hou FF, Ix JH, et al. KDIGO 2021 Clinical Practice Guideline for the Management of Blood Pressure in Chronic Kidney Disease. Kidney Int 2021;99:S1–87. https://doi.org/10.1016/j.kint.2020.11.003.
28. Heart N, Institute B. What's on Your Plate? 1,800–2,000 calories a day. n.d. https://www.nhlbi.nih.gov/sites/default/files/publications/WhatsOnYourPlate-1800-2000cal.pdf
29. Lv J, Jiao S, Li W, Ding S, Ma L, Zhang Q. Network meta-analysis of the effects of different dietary patterns on patients with metabolic syndrome. Front Nutr 2025;12. https://doi.org/10.3389/fnut.2025.1634545.
30. Bazzano LA, Green T, Harrison TN, Reynolds K. Dietary Approaches to Prevent Hypertension. Curr Hypertens Rep 2013;15:694–702. https://doi.org/10.1007/s11906-013-0390-z.
31. Stamler J. The INTERSALT Study: background, methods, findings, and implications. Am J Clin Nutr 1997;65:626S-642S. https://doi.org/10.1093/ajcn/65.2.626S.
32. Guyton AC. Blood Pressure Control—Special Role of the Kidneys and Body Fluids. Science (1979) 1991;252:1813–6. https://doi.org/10.1126/science.2063193.
33. Oh YS. Arterial stiffness and hypertension. Clin Hypertens 2018;24. https://doi.org/10.1186/s40885-018-0102-8.
34. Kaess BM, Rong J, Larson MG, Hamburg NM, Vita JA, Levy D, et al. Aortic Stiffness, Blood Pressure Progression, and Incident Hypertension. JAMA 2012;308:875. https://doi.org/10.1001/2012.jama.10503.
35. Appel LJ, Sacks FM, Carey VJ, Obarzanek E, Swain JF, Miller ER, et al. Effects of Protein, Monounsaturated Fat, and Carbohydrate Intake on Blood Pressure and Serum Lipids. JAMA 2005;294:2455. https://doi.org/10.1001/jama.294.19.2455.
36. Schwingshackl L, Strasser B, Hoffmann G. Effects of Monounsaturated Fatty Acids on Cardiovascular Risk Factors: A Systematic Review and Meta-Analysis. Ann Nutr Metab 2011;59:176–86. https://doi.org/10.1159/000334071.
37. Frumuzachi O, Kieserling H, Rohn S, Mocan A. The impact of oleuropein, hydroxytyrosol, and tyrosol on cardiometabolic risk factors: a meta-analysis of randomized controlled trials. Crit Rev Food Sci Nutr 2025. https://doi.org/10.1080/10408398.2025.2453090.
38. Jiang R, Wang T, Han K, Peng P, Zhang G, Wang H, et al. Impact of anti-inflammatory diets on cardiovascular disease risk factors: a systematic review and meta-analysis. Front Nutr 2025;12. https://doi.org/10.3389/fnut.2025.1549831.
39. Jurek JM, Zablocka-Slowinska K, Pieczynska J, Clavero Mestres H, Auguet T. Systematic Review of the Effects of Plant-Based Foods on Metabolic Outcomes in Adults with MASLD and Comorbidities Such as Obesity, Metabolic Syndrome, and Type 2 Diabetes. Nutrients 2025;17. https://doi.org/10.3390/nu17183020.
40. Bruna-Mejias A, San Martin J, Arciniegas-Diaz D, Meneses-Caroca T, Salamanca-Cerda A, Beas-Gambi A, et al.

Comparison of the Mediterranean Diet and Other Therapeutic Strategies in Metabolic Syndrome: A Systematic Review and Meta-Analysis. Int J Mol Sci 2025;26. https://doi.org/10.3390/ijms26125887.

41. He FJ, Li J, MacGregor GA. Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomised trials. BMJ 2013;346:f1325–f1325. https://doi.org/10.1136/bmj.f1325.
42. Rychlik E, Stoś K, Woźniak A, Mojskiej H. Normy żywienia dla populacji Polski. 2024. https://www.pzh.gov.pl/wp-content/uploads/2025/01/normy-02.01.pdf
43. Houston MC, Harper KJ. Potassium, Magnesium, and Calcium: Their Role in Both the Cause and Treatment of Hypertension. The Journal of Clinical Hypertension 2008;10:3–11. https://doi.org/10.1111/j.1751-7176.2008.08575.x.
44. Fuchs FD, Chambless LE, Whelton PK, Nieto FJ, Heiss G. Alcohol Consumption and the Incidence of Hypertension. Hypertension 2001;37:1242–50. https://doi.org/10.1161/01.HYP.37.5.1242.
45. Sesso HD, Cook NR, Buring JE, Manson JAE, Gaziano JM. Alcohol consumption and the risk of hypertension in women and men. Hypertension 2008;51:1080–7. https://doi.org/10.1161/HYPERTENSIONAHA.107.104968.
46. Aderoju YBG, Hayford FEA, Achempim-Ansong G, Duah E, Baloyi TV, Morerwa S, et al. Exploring the application of Dietary Approaches to Stop Hypertension (DASH) in the management of patients with Chronic Kidney Disease: A systematic review and meta-analysis. Clin Nutr ESPEN 2025;69:711–21. https://doi.org/10.1016/j.clnesp.2025.08.030.
47. Mohtashamian A, Aali Y, Nematolahi F, Ebrahimzadeh A, Ferns GA, Ghayour-Mobarhan M. The Effect of Dietary Approaches to Stop Hypertension (DASH) Diet on Liver Enzyme Level in Adults: A GRADE-Assessed Systematic Review and Meta-Analysis of Randomized Clinical Trials. Food Sci Nutr 2025;13. https://doi.org/10.1002/fsn3.71067.
48. Manta E, Thomopoulos C, Konstantinidis D, Tatakis F, Polyzos D, Drogkaris S, et al. EFFECT OF DIETARY APPROACHES TO STOP HYPERTENSION DIET OR MEDITERRANEAN DIET ON BLOOD PRESSURE IN INDIVIDUALS WITH OR WITHOUT HYPERTENSION: A SYSTEMATIC REVIEW AND META-ANALYSIS. J Hypertens 2022;40:e263. https://doi.org/10.1097/01.hjh.0000838216.38289.9e.
49. Kakouri N, Andrikou I, Konstantinidis D, Siafi E, Manta E, Polyzos D, et al. PS-C09-1: CORRELATION OF SYMPATHETIC NERVOUS SYSTEM ACTIVITY AND BLOOD PRESSURE IN HYPERTENSIVE PATIENTS WITH NONALCOHOLIC FATTY LIVER DISEASE. J Hypertens 2023;41:e207. https://doi.org/10.1097/01.hjh.0000914796.64437.f9.
50. Esmaeilinezhad Z, Torbahn G, Johnston BC. Medical Nutrition Therapy (MNT) Evidence Update: Comparative Effectiveness of Dietary Programs for Reducing Mortality and Cardiovascular Events in Adults with Increased Cardiovascular Disease Risk. Advances in Nutrition 2025;16. https://doi.org/10.1016/j.advnut.2025.100399.
51. Ndanuko RN, Tapsell LC, Charlton KE, Neale EP, Batterham MJ. Dietary patterns and blood pressure in adults: A systematic review and meta-analysis of randomized controlled trials. Advances in Nutrition 2016;7:76–89. https://doi.org/10.3945/an.115.009753.
52. Poulsen SK, Due A, Jordy AB, Kiens B, Stark KD, Stender S, et al. Health effect of the new nordic diet in adults with increased waist circumference: A 6-mo randomized controlled trial. American Journal of Clinical Nutrition 2014;99:35–45. https://doi.org/10.3945/ajcn.113.069393.
53. Sukhato K, Akksilp K, Dellow A, Vathesatogkit P, Anothaisintawee T. Efficacy of different dietary patterns on lowering of blood pressure level: An umbrella review. American Journal of Clinical Nutrition 2020;112:1584–98. https://doi.org/10.1093/ajcn/nqaa252.
54. Adamsson V, Reumark A, Cederholm T, Vessby B, Risérus U, Johansson G. What is a healthy Nordic diet? Foods and nutrients in the NORDIET study. Food Nutr Res 2012;56. https://doi.org/10.3402/fnr.v56i0.18189.
55. Kim S, Jang E-H, Lee S. Effects of the MIND Diet on the Cognitive Function of Older Adults: A Systematic Review. Clin Nutr Res 2025;14:318. https://doi.org/10.7762/cnr.2025.14.4.318.
56. Wang Y, Pan D, Zhang C, Xu D, Lu Y, Yin S, et al. Planetary Health Diet and risk of mortality and chronic diseases: Results from US NHANES, UK Biobank, and a meta-analysis. Sci Adv 2025;11:5147. https://doi.org/10.1126/sciadv.adq5147.

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