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A Comparative Review of the DASH and Mediterranean Diets on Cardiovascular Risk Factors among Middle-aged and Elderly Populations: Impact on Blood Pressure

Xiangqi Yang[1], Yinuo Liu[2], Mochen Bai[2*]

[1]School of Biological Science, University of California Irvine, Irvine, USA
[2]Ren Chao Fen Experimental School, Beijing, China
**Corresponding Author. Email: baimochen@rdfzcygj.cn*

Abstract. DASH diet and Mediterranean Diet. Two kinds of diets that are proof to have certain benefits to people with cardiovascular diseases, hypertension, high blood lipid profile, and obesity. These metabolic syndromes and diseases mentioned above are affecting people's life negatively. According to data from NHS and American Heart Association, more than 19 million people worldwide died from CVD and yet more percentage of the world are suffering from other metabolic syndromes. These metabolic syndromes are affecting people worldwide, both males and females. Starting from the age of 40, each ten years as a group, CVDs are affecting people in different age groups no less than 5% of the total population in the group. Although there are certain effective drugs proved to be useful to mitigate or treat certain diseases, but long-term medication is not ideal for patients of above metabolic syndromes, a healthy and beneficial diet, on the other hand, can be the long-term strategy to stay healthy. This review chooses two type of diets, DASH and Mediterranean Diet, elucidating their effects on metabolic syndromes mentioned above and a comparison of effectiveness between these two diets. Risk factors leading to metabolic disease are also discussed in this review.

Keywords: DASH Diet, Mediterranean Diet, Diet, Cardiovascular Diseases, Metabolic Syndromes, Metabolic Syndromes Risk Factors, Review

1. Introduction

1.1. The prevalence of CVD and CHD

Cardiovascular disease is the primary cause of morality problems worldwide. About 19,414,853 fatalities in 2021 were attributed to CVD, according to American Heart Association estimates [1]. At the start of the 20th century, coronary heart disease (CHD) was a rare cause of death, but it is now the most frequent kind of CVD [2]. Although the number of deaths from CHD declined after reaching a peak in the middle of the 1960s, the condition remains the world's top cause of mortality [3]. In the US, it affects 31% of males and 25.4% of females over 80, 19.7% of males and 12.6% of females aged sixty to seventy-nine, and 6.1% of males and 6.2% of females aged forty to fifty-nine

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between 2013 and 2016 [4]. Furthermore, among an estimated of 71.3 million American adults with one or more types of cardiovascular disease, 27.4 million were age sixty-five or older from 1999 to 2002 [2].

1.2. Blood pressure is one prominent risk factor for Cardiovascular Diseases and coronary heart diseases

High blood pressure (BP), being one of the risk factors for Cardiovascular Diseases, has a high exposure level [5]. Particularly for those with blood pressure readings above 140 mmHg, the incidence and morality of cardiovascular heart disease rise in tandem with systolic blood pressure [6]. (Fig. 1)

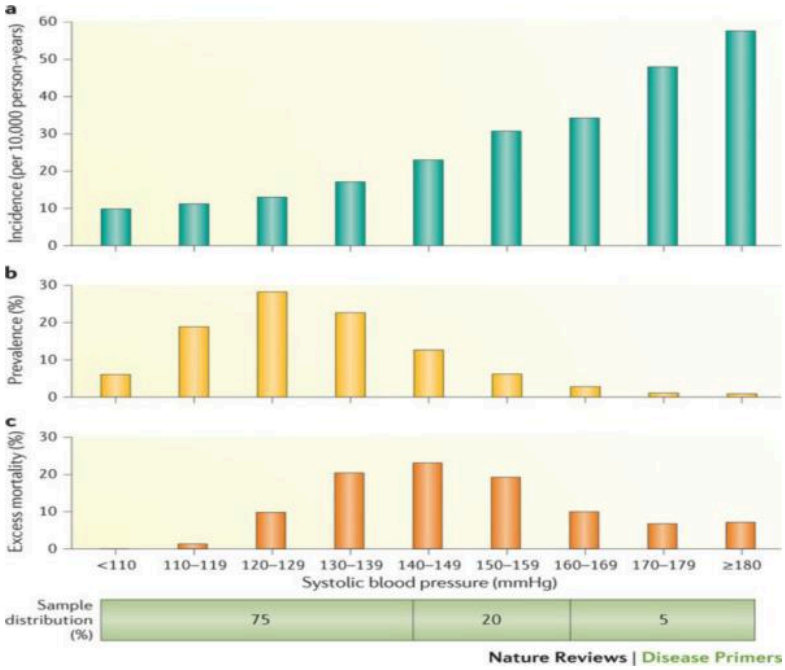

Figure 1. Relationship between systolic blood pressure and coronary heart disease mortality [5]

1.3. Key components of DASH and Mediterranean diet and their potential advantages

The main reason of able to find fat in the traditional Mediterranean diet is because it contains a kind of plant based oil, the olive oil, particularly extra-virgin olive oil, and a high consumption of plant foods for example certain kinds of fruits and vegetables. This trend has been linked to Mediterranean social behaviors and lifestyles and showed to have positive effects on cardiovascular health by lowering the incidence and mortality of cardiovascular disease as well as risk factors like obesity, hypertension, dyslipidemia, and metabolic syndrome [7]. Similarly, when used alone or in conjunction with other lifestyle modifications, like limiting sodium intake or engaging in physical activity, the Dietary Approaches to Stop Hypertension (DASH) dietary pattern is functional properly for lowering blood pressure. It emphasizes a high consumption of vegetables, fruits, and fat-free or low-fat concentration dairy products while limiting total and saturated fat, red meat and processed meats, candies, cholesterol, added sugars, and sugar-sweetened drinks [8].

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1.4. Aim

This review is aimed at synthesizing existing evidence on the effects of DASH and Mediterranean diets among middle-aged to older adults on blood pressure, and therefore, compare their effectiveness.

2. Method

2.1. Date sources and search methods

The search will be implemented in the electronic databases, the PubMed(primary source), Cochrane Library and Web of Science with defined search terms: DASH diet, Mediterranean diet, middle-aged, elderly, hypertension, hyperlipidemia, metabolic syndrome, cardiovascular disease and inclusion/exclusion criteria applied to assess the differential effects of the Dietary Approaches to Stop Hypertension (DASH) diet and the Mediterranean diet on the blood pressure specifically in middle-aged to older adults.

2.2. Inclusion criteria

Studies will be included if samples meet the following threshold:(1)Participants aged ≥45 years. (2)Intervention involves the DASH or Mediterranean diet. (3)Outcome: changes in systolic and/or diastolic blood pressure. (4)Study design: randomized controlled trials (RCTs), cohort studies, or
(5)Published in English between 1997 and 2025
Full-text available

2.3. Population

Studies were included if participants were older than 45 years old and at increased risk for cardiovascular disease (including individuals with hypertension, hyperlipidemia, or metabolic syndrome) and followed either the DASH or Mediterranean diet for a minimum duration of four weeks. Both male and female participants from diverse ethnic and regional backgrounds will be considered for participation.

2.4. Outcome

Outcomes of this study were changes in: Systolic and Diastolic Blood Pressure (mmHg),

2.5. Exclusion criteria

(1)Studies on children, pregnant individuals, or populations without reported blood pressure outcomes.
(2)Non-human studies.(3)Studies not involving dietary interventions.

2.6. Data analysis

Mean changes in systolic blood pressure and diastolic blood pressure before and after the food intervention are among the quantitative data on blood pressure outcomes that will be taken from each chosen study. These results will be collated and arranged in unique tables for comparison.

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The tables will provide a summary of the dietary regimen (Mediterranean or DASH), reported blood pressure changes, and important study features (e.g., sample size, intervention duration, population age group).

The tables will be accompanied by a narrative summary that will explain general patterns, point out recurring results, and go over potential explanations for observed effects, including the DASH diet's reduction of salt or the Mediterranean diet's emphasis on antioxidants and olive oil. This method makes it possible to compare diets in an organized way and identify which one has more evidence of decreasing blood pressure in middle-aged and older persons.2.7Limitations and Considerations

Potential limitations include variability in study design, sample size, duration of dietary interventions, and participant adherence. Confounding factors, such as concurrent medication use, baseline dietary habits, and physical activity levels, will be considered when interpreting the results. Where applicable, subgroup analysis may be conducted to explore the effects of diet across age brackets or health statuses within the target population.

3. Test results and discussions

3.1. Summary of the search results

A complete and comprehensive literature search was conducted to find out relevant studies examining the impact of the DASH diet and the Mediterranean diet on systolic and diastolic blood pressure in middle-aged and elderly adults. A total of 499 publications were identified from the PubMed electronic database. 425 records were excluded because they were irrelevant to the study objectives. For instance, studies involving populations without reported blood pressure outcomes that only report lipid profiles, as well as studies that did not target middle-aged or elderly individuals. Subsequent full-text review of the remaining 24 publications. Of these, 18 did not meet the inclusion criteria, leaving six studies for comparative analysis: four on the DASH diet and two on the Mediterranean diet.

3.2. Blood pressure changes associated with the DASH diet

Table 1. Compares changes in systolic blood pressure and diastolic blood pressure from randomized controlled trials and meta-analyses of the DASH diet in middle-aged and older adults, highlighting differences in intervention duration, participant age, and magnitude of blood pressure reduction

Study(Author, Year)	Country	Sample Size	Gender	Age range	Intervention on duration	Δ SBP (mmHg) (95% CI)	Δ DBP (mmHg) (95% CI)
Apple et al.,1997 [9]	USA	459	M(49.0%)and F(51.0%)	45-75	8 weeks	-5.5±20.2	-3±14.8
Siervo et al.,2025 [10]	Muti-country	3240	M=1306 F=1934	≥45	2-24weeks	-5.2±46.5	-2.6±23.2
Çapar AG et al.,2025 [11]	Turkey	30	Both M and F	51.1 ± 8.1	2 months	-6.79±8.91	-3.47±8.26
Zhou X et al.,2024 [12]	China	37	Both M and F	48.34± 7.46	6 weeks	-5.595 ±4.072	-5.351±5.643

Note: SBP is the abbreviation for systolic blood pressure; DBP is the abbreviation for diastolic blood pressure; M is male; F is female.

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3.3. Blood pressure changes associated with the Mediterranean diet

Table 2. Compares changes in systolic blood pressure and diastolic blood pressure from randomized controlled trials and meta-analyses of the Mediterranean diet in middle-aged and older adults, highlighting differences in intervention duration, participant age, and magnitude of blood pressure reduction

Study(Author, Year)Country	Country	Sample Size	Gender	Age rage	Intervention on duration	Δ SBP (mmHg) (95% CI)	Δ DBP (mmHg) (95% CI)
Estruch et al.,2013 [13]	Spain	7,447	M=3165 F=4282	55-80	4.8years	-6.2±22.2	-3.1
Jennings et al.,2019 [14]	Europe	561	M=243 F=318	65-79	12 months	-4.7±38.1	-2.4±19.3

Note: SBP is the abbreviation for systolic blood pressure; DBP is the abbreviation for diastolic blood pressure; M is male; F is female.

3.4. Discussion

This review compared the effects of the DASH and Mediterranean diets have on lowering blood pressure in middle-aged and older individuals. Both diets reduce the SBP and DBP, but the Mediterranean diet appeared to show slightly greater and more consistent long-term benefits.

The DASH diet emphasizes reducing the amount of sodium ingested and the increasing in the intake of fruits, vegetables, and low-fat concentration dairy products. Decrease the amount of sodium intake is the key factor in decreasing th blood pressure. The reason is that excess sodium intake leads to increased water retention and arterial vasoconstriction, which in turn raises blood pressure [15]. This mechanism is supported by the study by Zhou X et al. [12], which reported a relatively significant reduction in DBP (-5.351 ± 5.643 mmHg) and SBP (-5.595 ± 4.072 mmHg) following the DASH diet, attributed to sodium restriction in the intervention group. However, in the long term, the blood pressure differences between the DASH and control groups were minor, even not change.

On the other hand, the Mediterranean diet, which has most of its component being olive oil, nuts, fish, and whole grains, seems to create more sustained blood pressure improvements. For example, in [13], SBP was decreased by 6.2 mmHg and DBP by 3.1 mmHg after about 5 years. The reason for that phenomenon is that olive oil contains high levels of oleic acid and polyphenols, which have been shown to enhance NO production in the endothelium. NO is a potent vasodilator that helps to taut the blood vessels and reduce peripheral vascular resistance, thereby lowering blood pressure [16]. Therefore, the Mediterranean diet may help lower blood pressure over time.

There are certain restrictions on this review. First off, the majority of DASH trials were brief (less than six months), and the sample size was small—just six studies were included. Second, while the majority of the Mediterranean diet research was done in Europe, the findings may not be generalizable to other regions (such as Asia). Furthermore, the DASH and Mediterranean diets have different conditions.

Future research should be lengthier and involve a wider range of groups. Trials should ideally employ uniform dietary guidelines, monitor individuals for several years, and evaluate cardiovascular outcomes other than blood pressure. The Mediterranean diet may offer a modest advantage in long-term blood pressure management, but until then, both the DASH and Mediterranean diets are still good choices.

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4. Conclusion

In conclusion, both the DASH and Mediterranean diets have a lot to offer in terms of lowering those factors leading to coronary heart disease (CHD) specifically in middle-aged and older adults, but the Mediterranean diet may be more consistently effective in lowering both SBP and DBP. Future randomized trials may help us better understand how different food combinations affect cardiovascular heart diseases, and implementing these diets into real-life medical practice for the prevention and management of cardiovascular disease may offer a sustainable and affordable way to lower cardiovascular risks.

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