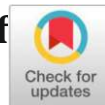


Review Article

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The role of mediterranean diet in chronic disease prevention: A review of the current evidence



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ABSTRACT

The Mediterranean diet has been extensively studied for its potential role in preventing chronic diseases. Characterized by high consumption of fruits, vegetables, whole grains, and healthy fats, such as those found in olive oil, this dietary pattern has been associated with reduced risks of major chronic diseases. Research suggests that adhering to the Mediterranean diet can lower the incidence of cardiovascular disease, type 2 diabetes, certain cancers, and cognitive decline. The diet's emphasis on whole, nutrient-dense foods and its anti-inflammatory properties are thought to contribute to its beneficial effects on overall health and longevity. The study on the Mediterranean diet's role in chronic disease prevention reveals significant health benefits. The diet has been associated with a reduced risk of mortality, with some studies showing a 23% reduced risk of dying from any cause in women with higher adherence. Long-term adherence to the diet has also been linked to a 20% lower risk of premature death. Additionally, the Mediterranean diet has been shown to support cognitive health, with associations found between the diet and better overall cognition and a decreased rate of learning and memory decline. The diet has also been found to reduce the incidence of cardiovascular events, including myocardial infarction and stroke, and has been linked to a decreased incidence of various cancers. Overall, the Mediterranean diet's anti-inflammatory properties and emphasis on whole, nutrient-dense foods contribute to its beneficial effects on overall health and longevity. The Mediterranean diet offers significant benefits in preventing chronic diseases, including cardiovascular disease, certain cancers, and cognitive decline. Its emphasis on whole, nutrient-dense foods and anti-inflammatory properties contributes to its health-promoting effects. Overall, adopting a Mediterranean-style diet can be a valuable strategy for reducing the risk of chronic diseases and promoting overall health and well-being, supporting a long and healthy life.

Keywords: Mediterranean diet, chronic diseases, unsaturated fats, antioxidants. and Diabetes.

Significance of the Study

This study is significant as it highlights the growing importance of dietary patterns in the prevention and management of chronic diseases. The Mediterranean diet, characterized by high consumption of fruits, vegetables, whole grains, legumes, olive oil, and moderate intake of fish and red wine, has been widely recognized for its protective effects against cardiovascular diseases, diabetes, obesity, and certain cancers. By reviewing current evidence, this study provides valuable insights into how adherence to the Mediterranean diet contributes to improved metabolic health, reduced inflammation, and enhanced longevity. The findings will inform public health policies, nutritional education, and clinical recommendations aimed at promoting healthier eating habits globally.

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Introduction

The Mediterranean diet is a dietary pattern originating from traditional eating practices of countries bordering the Mediterranean Sea, characterized by abundant consumption of fruits, vegetables, legumes, whole grains, nuts, and olive oil; moderate intake of fish and poultry; low consumption of red and processed meats; limited sweets; and moderate wine intake with meals¹. Its defining features emphasize unsaturated fats chiefly from extra-virgin olive oil, high dietary fiber, and a rich assortment of polyphenol-bearing plant foods, which together produce a nutritional matrix distinct from low-fat or Westernized diets and one that is hypothesized to confer broad metabolic and anti-inflammatory benefits². The concept of a coherent "Mediterranean" pattern was popularized and given epidemiological weight by Ancel Keys and collaborators through the Seven Countries Study, which linked dietary patterns in Mediterranean cohorts to lower coronary heart disease rates compared with cohorts consuming higher amounts of saturated fat and animal products, thereby motivating decades of research into the diet's potential for chronic disease prevention³. Subsequent observational studies across southern Europe and randomized interventions have

extended those early signals, with large-scale investigations reporting lower risks of cardiovascular events, improved metabolic profiles, and reductions in all-cause mortality associated with higher adherence to Mediterranean-style diets^{4,5}.

Beyond cardiovascular outcomes, growing evidence implicates the Mediterranean dietary pattern in reducing incidence and progression of multiple chronic conditions that dominate modern disease burdens, including type 2 diabetes, metabolic syndrome, certain cancers, and neurodegenerative disorders⁶. The diet's combination of favorable fatty-acid composition, abundant antioxidants and anti-inflammatory phytochemicals, and beneficial effects on gut microbiota plausibly mediates these multi-system benefits, supporting mechanistic pathways that extend from endothelial function and lipid metabolism to insulin sensitivity and modulation of chronic low-grade inflammation^{7,8}. Importantly, randomized evidence such as the PREDIMED trial demonstrated substantial reductions in major cardiovascular events among individuals at high risk when randomized to a Mediterranean diet supplemented with extra-virgin olive oil or nuts, providing stronger causal support than observational data alone⁹. These findings have prompted professional guidelines and public-health recommendations that endorse Mediterranean-style patterns as a practical, evidence-based approach to chronic disease prevention and health promotion.

Relevance in contemporary health contexts rests on both the rising global prevalence of non-communicable diseases and the limitations of single-nutrient approaches to prevention. The Mediterranean diet's whole-diet perspective aligns with modern shifts toward dietary patterns research and personalized nutritional strategies, offering a culturally adaptable template that can be tailored to local food environments while preserving core beneficial elements¹⁰. As populations age and multimorbidity becomes more common, the diet's capacity to simultaneously influence cardiovascular risk, metabolic health, cognitive aging, and inflammatory burden makes it a compelling target for integrated prevention efforts. Continued refinement of evidence through longer follow-up trials, mechanistic studies linking diet to molecular biomarkers and microbiome shifts, and implementation research that addresses adherence and equity will determine how broadly and effectively Mediterranean-style dietary recommendations can be translated into sustained public-health impact¹¹. This study aims to synthesize current evidence on the Mediterranean diet's role in chronic disease prevention by evaluating epidemiological, clinical trial, mechanistic, and implementation research to identify robust benefits, remaining uncertainties, and practical strategies for translating the Mediterranean dietary pattern into effective public-health interventions.

Nutritional Composition of Mediterranean Diet

Core foods: Olive Oil, Vegetables, Legumes, Fish, Whole Grains

The Mediterranean diet is fundamentally a plant-forward dietary pattern whose nutrient profile reflects emphasis on minimally processed plant foods and a deliberate replacement of saturated fats with unsaturated fats, principally from extra-virgin olive oil and oily fish¹². Core foods: vegetables, fruits, legumes, whole grains, nuts, seeds, herbs, and spices provide high dietary fiber, a broad spectrum of vitamins and minerals, and a dense array of polyphenols and other phytochemicals that together confer antioxidant and anti-inflammatory capacity^{13,14}. Regular consumption of fish and moderate intake of poultry supply high-quality protein and omega-3 long-chain polyunsaturated fatty acids, while dairy is usually limited to low-fat or fermented forms (yogurt, cheese) and red and processed meats are consumed sparingly, producing a nutrient pattern distinct from Western dietary models that are higher in red meat, refined grains, and added sugars¹⁵.

Macronutrient Balance

Macronutrient balance in Mediterranean-style diets typically favors a higher proportion of total energy from monounsaturated and polyunsaturated fats, a moderate proportion from carbohydrates (with a focus on low-glycemic whole grains and legumes), and adequate protein mostly from fish, legumes, and poultry rather than from red meat¹⁶. This balance produces a favorable serum lipid and insulin sensitivity profile in randomized and observational studies, with extra-virgin olive oil and nuts contributing monounsaturated fats and bioactive phenolics that modulate lipoprotein oxidation and inflammatory signaling¹⁷. The pattern's emphasis on whole foods also raises dietary fiber intake, which benefits glycemic control, colonic health, and the composition and metabolic activity of the gut microbiome pathways increasingly implicated in cardiometabolic and immune regulation.

Antioxidant and Anti-inflammatory Components

Antioxidant and anti-inflammatory components are central mechanistic features. Daily intake of polyphenol-rich foods (olive oil, vegetables, fruits, nuts, legumes, coffee and tea, and moderate wine) supplies a diverse mix of flavonoids, phenolic acids, and secoiridoids that reduce oxidative stress, modulate endothelial function, and influence cellular signaling networks tied to inflammation and metabolic homeostasis¹⁸. These phytochemicals act synergistically with omega-3 fatty acids from fish and with micronutrients (vitamin C, vitamin E, carotenoids, magnesium, and potassium) to lower chronic low-grade inflammation, improve endothelial responsiveness, and support neuroprotective processes implicated in reduced risk for cardiovascular disease, type 2 diabetes, and cognitive decline observed in Mediterranean-pattern cohorts and trials¹⁹. Table 1 below contrasts the typical macronutrient profile of a Mediterranean dietary pattern with a representative Western diet to highlight the major compositional differences that underlie divergent health outcomes.

Table 1: Macronutrient composition vs Western diet

Macronutrient / feature	Mediterranean diet (typical)	Western diet (typical)
Total fat (% energy)	35–45%; high MUFA (olive oil); moderate PUFA	35–45%; higher SFA from red/processed meats and dairy
Carbohydrate (% energy)	40–50%; emphasis on whole grains, low GI	45–55%; higher refined grains and added sugars
Protein (% energy)	15–20%; mainly fish, legumes, poultry	15–20%; higher red/processed meat proportion
Dietary fiber	High (fruits, vegetables, legumes, whole grains)	Lower (refined carbohydrates predominate)
Phytonutrients / antioxidants	High (polyphenols, carotenoids, flavonoids)	Low to moderate

Source: Franchini⁴

Mechanisms in Chronic Disease Prevention

Cardiovascular Disease: Lipid lowering and Endothelial Function

The Mediterranean diet reduces chronic disease risk through integrated metabolic, vascular, immune, and molecular pathways that converge on lowered inflammation, improved cellular resilience, and favorable shifts in systemic metabolism. At the cardiovascular level, replacing saturated fats with monounsaturated and polyunsaturated fats chiefly from extra-virgin olive oil, nuts, and fatty fish lowers low-density lipoprotein oxidation, improves the ratio of atherogenic to protective lipoproteins, and reduces triglycerides, effects that translate into less atherogenesis and fewer ischemic events²⁰. Beyond simple lipid lowering, bioactive components of the diet enhance endothelial function by increasing nitric oxide bioavailability, attenuating oxidative stress, and downregulating endothelial adhesion molecules and prothrombotic signaling, thereby reducing vascular inflammation and improving arterial compliance and microvascular perfusion²¹. The combined influence on lipid metabolism and endothelial health explains why randomized and observational studies consistently report reductions in coronary events and stroke with sustained adherence to Mediterranean-style patterns^{22,23}.

Metabolic Disease (Diabetes/Obesity): Glycemic Control, Insulin Sensitivity

Metabolic disease prevention under the Mediterranean paradigm rests on improved glycemic control, enhanced insulin sensitivity, and favorable body-composition effects mediated through multiple dietary features acting in concert²⁴. High dietary fiber from whole grains, legumes, fruits, and vegetables slows carbohydrate absorption and blunts postprandial glycemia, while the dietary pattern's low glycemic load and emphasis on minimally processed carbohydrates reduce insulin demand and glycemic variability. Monounsaturated fats and omega-3 long-chain polyunsaturated fatty acids improve insulin signaling in muscle and liver, reduce hepatic steatosis, and favorably modulate adipocyte inflammation, contributing to lower insulin resistance and reduced progression from impaired glucose tolerance to type 2 diabetes²⁵. Moreover, frequent intake of nuts and legumes provides plant protein and satiety, supporting weight control and limiting adiposity-driven metabolic dysfunction. These mechanistic pathways are supported by randomized evidence showing improved glycemic endpoints and lower incidence of type 2 diabetes among participants randomized to Mediterranean interventions compared with control diets^{26,27}.

Cancer: Oxidative Stress Reduction, Epigenetic Modulation

Cancer prevention through Mediterranean-pattern adherence appears to operate via antioxidant, anti-inflammatory, and epigenetic mechanisms that together limit DNA damage, carcinogenic signaling, and tumor-promoting microenvironments. Polyphenols, carotenoids, and other phytochemicals abundant in olive oil, vegetables, fruits, nuts, and legumes scavenge reactive oxygen species, reduce lipid peroxidation, and modulate xenobiotic-metabolizing enzymes in ways that decrease the formation and persistence of DNA lesions implicated in carcinogenesis²⁸. Concurrently, reduced intake of red and processed meats lowers exposure to heme iron

and cooking-related carcinogens, and higher fiber intake promotes beneficial gut microbiota metabolites such as short-chain fatty acids that exert anti-inflammatory and antineoplastic effects in the colon and beyond. Emerging data indicate that dietary components of the Mediterranean pattern can influence epigenetic regulation of DNA methylation, histone modifications, and noncoding RNA expression, thereby altering oncogene and tumor suppressor gene expression and potentially reducing cancer initiation and progression^{29,30}.

A unifying mechanism across cardiovascular, metabolic, and oncologic prevention is the diet's capacity to lower chronic low-grade inflammation, which is both a driver and a mediator of noncommunicable diseases¹. The Mediterranean pattern reduces circulating inflammatory markers such as C-reactive protein, interleukin-6, and tumor necrosis factor-alpha via combined effects of antioxidant phytochemicals, omega-3 fatty acids, and improved adipose tissue biology; the resultant decline in systemic inflammation reduces endothelial activation, insulin resistance, and proliferative signaling that underpin many chronic pathologies². Gut microbiota modulation provides an additional, interconnected pathway: increased dietary fiber and polyphenol intake shifts microbial communities toward taxa that produce anti-inflammatory metabolites, strengthen gut barrier integrity, and limit systemic endotoxemia, thereby reinforcing metabolic and immune benefits³.

At the molecular level, the Mediterranean diet supplies substrates and cofactors that influence cellular redox balance, methylation capacity, and nutrient-sensing pathways. Adequate intake of one-carbon nutrients (folate, B12, choline) and dietary methyl donors supports appropriate DNA and histone methylation patterns involved in gene regulation, while bioactive lipids and polyphenols can modulate AMP-activated protein kinase, mTOR, and sirtuin pathways that govern metabolic homeostasis, autophagy, and cellular aging⁴. These intracellular effects provide mechanistic plausibility for observed clinical outcomes and suggest opportunities for personalized nutrition approaches that target specific pathways in at-risk individuals. Figure encapsulates these interlocking pathways by mapping how core dietary elements act on lipid metabolism, endothelial function, glycemic control, oxidative stress, microbiome composition, and epigenetic regulation to lower inflammation and disease risk⁵. The schematic highlights nodes where interventions can be tested: olive oil and nut intake for lipid and oxidative modulation, fiber and polyphenol intake for microbiome and inflammation effects, and targeted micronutrient optimization to support methylation and metabolic signaling, and it underscores that the diet's protective effects arise from the synergistic interplay of its components rather than from isolated nutrients⁶.

Translation of these mechanistic insights into public-health impact requires continued rigorous research: longer and larger randomized trials with diverse populations to confirm efficacy across disease endpoints, mechanistic studies linking dietary exposure to tissue-specific biomarkers and epigenetic changes, and implementation science to enhance adherence and equity. Integrating molecular biomarkers, microbiome profiling, and systems biology into dietary trials will accelerate understanding of who benefits most and why, enabling more precise, effective dietary prescriptions for chronic disease prevention^{7,8}.

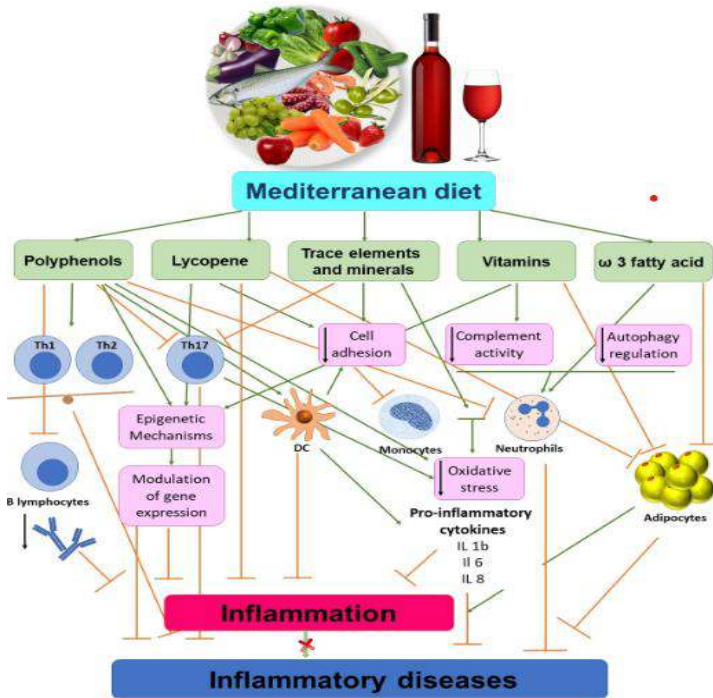


Figure 1: Pathways mapping core dietary elements acting on lipid metabolism, endothelial function, glycemic control, oxidative stress, microbiome composition, and epigenetic regulation to lower inflammation and disease risk.
Source: Xiao¹²

Evidence from Clinical and Cohort Studies

The body of clinical and epidemiological evidence linking Mediterranean-style dietary patterns to lower incidence and better outcomes for major chronic diseases is substantial and has matured from early observational signals into a framework supported by randomized trials, pooled analyses, and population cohorts⁹. The PREDIMED randomized controlled trial remains the landmark trial in this literature: a large Spanish multicenter primary-prevention RCT that randomized individuals at high cardiovascular risk to a Mediterranean diet supplemented with extra-virgin olive oil, a Mediterranean diet supplemented with mixed nuts, or a low-fat control diet, and observed a significant reduction in major cardiovascular events in the Mediterranean arms, providing strong causal evidence that a whole-diet Mediterranean intervention can reduce atherosclerotic outcomes in at-risk adults¹⁰. Subsequent reanalyses and methodological clarifications of PREDIMED have reinforced its principal findings and spurred numerous mechanistic and secondary-outcome studies showing consistent benefits for cardiometabolic biomarkers, blood pressure, and inflammatory indices (Nutrients review of PREDIMED outcomes)¹¹.

Table 2: Summary of key trials, sample size, outcomes

Study / Analysis	Design	Sample size	Primary outcomes / key findings
PREDIMED (Estruch et al., 2013)	Randomized controlled trial	~7,447 (re-analyzed)	Mediterranean diet (extra-virgin olive oil or nuts) reduced major CV events vs low-fat control
Nutrients review of PREDIMED RCT outcomes	RCT secondary analyses/reviews	—	Benefits for BP, lipids, inflammation, and metabolic syndrome components
Meta-analysis: MD in T2D (BMC Nutrition, 2024)	Meta-analysis of RCTs	1,371 (7 RCTs included)	Improvements in HbA1c, fasting glucose, BP, and modest weight loss vs control diets
Umbrella review on MD and CVD (2024)	Umbrella review of meta-analyses	238 RCTs across reviews	Overall reduction in CVD events and mortality; varied certainty across outcomes
Cohort pooled analyses	Prospective cohorts, pooled	Tens of thousands across studies	Higher MD adherence associated with lower CVD, diabetes incidence, and mortality (dose-response)

Source: Woodside¹¹

Beyond PREDIMED, randomized trials and meta-analyses have extended evidence for the Mediterranean pattern to glycemic control and weight management in people with or at risk for type 2 diabetes. Systematic reviews and meta-analyses of randomized controlled trials report improvements in HbA1c, fasting glucose, blood pressure, and modest weight loss for Mediterranean-style diets relative to comparator diets, although effect sizes and heterogeneity vary by study duration, comparator diet, and population characteristics¹². The cumulative randomized evidence points to clinically meaningful improvements in intermediate cardiometabolic endpoints and supports Mediterranean dietary advice as an effective intervention for metabolic risk reduction in diverse clinical settings.

Population-Based Evidence

Population-based cohort studies and prospective cohorts add external validity and breadth to trial evidence by demonstrating consistent associations between higher adherence to Mediterranean dietary scores and lower risks of cardiovascular disease, overall mortality, incident type 2 diabetes, and slower cognitive decline across different countries and populations¹³. Large prospective cohorts show dose-response relationships in which incrementally higher adherence scores correspond to progressively lower disease risk and mortality, and pooled prospective analyses underscore robustness across sex, age, and baseline risk strata (umbrella review of MD and CVD prevention). Cohort data also suggest protective associations for colorectal and other cancers, although associations are modest and vary by cancer subtype and dietary assessment method¹⁴.

Meta-Analyses and RCTs

Meta-analyses and umbrella reviews integrating randomized and observational data generally support the Mediterranean diet as protective against major chronic endpoints but highlight variation in the certainty of evidence¹⁵. For cardiovascular disease, pooled randomized data (driven heavily by PREDIMED) indicate reductions in major adverse cardiovascular events, whereas for diabetes prevention and glycemic control the evidence is supportive but exhibits greater heterogeneity across trials and outcomes (umbrella review; BMC Nutrition meta-analysis). Evidence for cancer prevention is suggestive and biologically plausible via antioxidant, anti-inflammatory, and microbiome pathways, yet less definitive than for cardiovascular endpoints because of longer latency and etiologic heterogeneity across cancer types^{16,17}. Table 2 below summarizes key randomized trials and influential pooled analyses that underpin current conclusions, noting sample sizes and principal outcomes to guide readers toward the most impactful evidence.

Challenges and Future Directions

Sustained adoption of the Mediterranean dietary pattern faces persistent challenges that span individual behavior, food environments, cultural contexts, and planetary constraints. Adherence is the pivotal barrier: although randomized trials and cohort studies repeatedly show clinical benefit when the pattern is followed, real-world adherence is variable and often declines after intensive intervention periods¹⁸. Behavioral determinants such as taste preferences, habit inertia, time pressure, food cost, and limited culinary skills can undermine long-term maintenance, while measurement challenges reliance on self-reported instruments, variable scoring systems, and sparse biomarker validation complicate accurate assessment of who truly adheres and how adherence relates to clinical benefit^{19,20}. Intervention research, therefore needs to prioritize scalable strategies that move beyond short-term counseling: embedding Mediterranean principles into routine healthcare, leveraging digital coaching and behavioral economics, and using objective biomarkers and repeated measures to track sustained exposure and dose–response relations^{21,22}.

Cultural adaptation is the next necessary frontier for broadening impact. The Mediterranean pattern is a culturally rooted template rather than a prescriptive menu, and successful translation requires preserving core nutritional features high intake of plant foods, olive oil–type unsaturated fats, modest fish and poultry, low red and processed meat, and minimal ultra-processed foods while adapting recipes, food pairings, and procurement strategies to local tastes, food availability, and culinary traditions²³. Formal frameworks for cultural adaptation, co-designed with communities and informed by local food systems research, increase acceptability and uptake and help address socioeconomic inequities by identifying affordable local substitutes that deliver the same nutrient and phytochemical profile²⁴. Cross-national implementation studies indicate that culturally tailored versions of the pattern achieve higher adherence and better sustainability than direct transplantation of Mediterranean menus, underscoring that adaptation rather than imitation is the practical route to population health gains^{25,26}.

Environmental sustainability and food-system resilience further shape future directions. The Mediterranean pattern is often promoted as more sustainable than highly animal-based Western diets because of its plant-centric composition and lower greenhouse-gas intensity per unit of healthy calories; however, sustainability depends on production practices, seasonality, biodiversity, and local food-system infrastructure²⁷. Scaling Mediterranean-style recommendations at the population level requires integration with sustainable agriculture policies, reduction of food loss and waste, and support for diversified local supply chains to ensure year-round access to high-quality plant foods and sustainably caught or farmed fish²⁸. Policy levers subsidies for fruits, vegetables, legumes, and olive-oil analogues where appropriate; fiscal disincentives for ultra-processed and high-emission foods; investments in public procurement and school-feeding programs can align individual dietary guidance with systemic change^{29,30}.

To address these intertwined challenges, research and policy should converge on pragmatic implementation science that tests culturally adapted delivery models and real-world adherence supports across socioeconomic strata; rigorous evaluation of environmental footprints alongside health

outcomes to identify food-system configurations that optimize both human and planetary health; and improved measurement tools, including objective biomarkers and harmonized dietary indices, to strengthen causal inference and monitor population-level progress¹. By focusing on scalable adherence strategies, culturally sensitive adaptation, and sustainable food-system integration, the Mediterranean dietary paradigm can move from an evidence-based ideal to an equitable, durable public-health solution^{2,3}.

Conclusion

The Mediterranean diet offers a robust, evidence-based framework for chronic disease prevention by combining a plant-forward composition, healthful fats, and rich antioxidant and anti-inflammatory components that together improve lipid profiles, endothelial function, glycemic control, and cellular resilience. Emphasizing whole foods over isolated nutrients yields consistent benefits across cardiovascular, metabolic, and some cancer endpoints, and the diet's effects on the gut microbiome and epigenetic and nutrient-sensing pathways provide mechanistic plausibility for long-term risk reduction. For public health, promoting Mediterranean-style patterns presents a scalable strategy to lower population burden of noncommunicable diseases when paired with culturally adapted interventions, supportive food environments, and policies that improve access and affordability of core foods. Implementation should prioritize objective adherence monitoring, equitable program design, and integration with sustainability goals so that health gains do not come at the expense of environmental resilience. Continued investment in large, diverse trials, mechanistic biomarker studies, and implementation science will sharpen guidance, tailor interventions to high-risk groups, and maximize the population health impact of this dietary paradigm.

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Conflict of Interest

The authors declared that there are no conflicts of interest.

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References

1. Barros, V. C., & Delgado, A. M. (2022). Mediterranean Diet, a Sustainable Cultural Asset. *Encyclopedia*, 2(2), 53. <https://doi.org/10.3390/encyclopedia2020053>
2. Castro-Quezada, I., Román-Viñas, B., & Serra-Majem, L. (2014). The Mediterranean Diet and Nutritional Adequacy: A Review. *Nutrients*, 6(1), 231–248. <https://doi.org/10.3390/nu6010231>
3. Estruch, R., Ros, E., Salas-Salvadó, J., Covas, M.-I., Corella, D., Arós, F., ... Martínez-González, M. A. (2013). Primary prevention of cardiovascular disease with a Mediterranean diet. *New England Journal of Medicine*, 368(14), 1279–1290. <https://doi.org/10.1056/NEJMoa1200303>
4. Franchini, C., Biasini, B., Sogari, G., Wongprawmas, R., Andreani, G., Dolgoplova, I., ... Rosi, A. (2024). Adherence to the Mediterranean Diet and its association with sustainable dietary behaviors, sociodemographic factors, and lifestyle: a cross-sectional study in US university students. *Nutrition Journal*, 23, 56. <https://doi.org/10.1186/s12937-024-00962-0>

5. Harvard T.H. Chan School of Public Health, the Nutrition Source. Diet Review: Mediterranean Diet. <https://nutritionsource.hsph.harvard.edu/healthy-weight/diet-reviews/mediterranean-diet/>
6. Menotti, A., & Puddu, P. E. (2025). Ancel Keys, the Mediterranean Diet, and the Seven Countries Study: A review. *Journal of Cardiovascular Development and Disease*, 12(4), 141. <https://doi.org/10.3390/jcdd12040141>
7. Sans, S. (2018). Mediterranean diet, active lifestyle and cardiovascular disease: A recipe for immortality? *European Journal of Preventive Cardiology*, 25(11), 1182–1185. <https://doi.org/10.1177/2047487318785745>
8. Tosti, V., Bertozzi, B., & Fontana, L. (2018). Health Benefits of the Mediterranean Diet: Metabolic and Molecular Mechanisms. *The Journals of Gerontology: Series A*, 73(3), 318–326.
9. Trajkovska-Broach, A., & Trajkovska Petkoska, A. (2021). Mediterranean Diet Ingredients: Their Antioxidant and Anti-Inflammatory Potential. *Austin Journal of Biotechnology & Bioengineering*, 8(2), 1114.
10. Tsigalou, C., Konstantinidis, T., Paraschaki, A., Stavropoulou, E., Voidarou, C., & Bezirtzoglou, E. (2020). Mediterranean Diet as a Tool to Combat Inflammation and Chronic Diseases: An Overview. *Biomedicines*, 8(7), 201.
11. Woodside, J., Young, I. S., & McKinley, M. C. (2022). Culturally adapting the Mediterranean Diet pattern a way of promoting more sustainable dietary change? *British Journal of Nutrition*, 128(4), 693–703. <https://doi.org/10.1017/S0007114522001945>
12. Xiao, Y., *et al.* (2024). Mediterranean diet in the targeted prevention and personalized treatment of chronic diseases: Evidence, potential mechanisms, and prospects. *EPMA Journal*, 15, 207–220.
13. Anih, D.C., O.E. Yakubu, A.K. Arowora, M.A. Abah and U.K. Chinekwu, 2025. Biochemical mechanisms of sleep regulation. *Sci. Int.*, 13: 35-45.
14. Chinonso, A.D., A.A. Kayode, M.A. Adondua and U.K. Chinekwu, 2025. Biochemistry of traditional herbal compounds and their molecular targets. *Pharmacogn. Rev.*, 19: 83-90
15. Anih, D.C., K.A. Arowora, K.C. Ugwuoke, M.A. Abah and B. Habibu, 2025. Nutritional modulation of epigenetic changes induced by mycotoxins: A biochemical perspective for at-risk populations in Africa. *Sci. Int.*, 13: 90-109.
16. Anih, D.C., A.K. Arowora, M.A. Abah and K.C. Ugwuoke, 2025. Biochemical effects of microplastics on human health: A comprehensive review. *Sci. Int.*, 13: 27-34.
17. Anih, D.C., A.K. Arowora, M.A. Abah and K.C. Ugwuoke, 2025. Biochemically active metabolites of gut bacteria: Their influence on host metabolism, neurotransmission, and immunity. *Sci. Int.*, 13: 46-57
18. Yashin, A., Y. Yashin, X. Xia and B. Nemzer, 2017. Antioxidant activity of spices and their impact on human health: A review. *Antioxidants*, Vol. 6. 10.3390/antiox6030070.25.
19. Juul, F., N. Parekh, E. Martinez-Steele, C.A. Monteiro and V.W. Chang, 2022. Ultra-processed food consumption among US adults from 2001 to 2018. *Am. J. Clin. Nutr.*, 115: 211-221
20. Srour, B., L.K. Fezeu, E. Kesse-Guyot, B. Allès and C. Méjean *et al.*, 2019. Ultra-processed food intake and risk of cardiovascular disease: Prospective cohort study (NutriNet-Santé). *BMJ*, Vol. 365.10.1136/bmj.l1451.11.
21. Miao, M. and B.R. Hamaker, 2021. Food matrix effects for modulating starch bioavailability. *Annu. Rev. Food Sci. Technol.*, 12: 169-191.12. Tekin, T. and E. Dincer, 2023. Effect of resistant starch types as a prebiotic. *Appl. Microbiol. Biotechnol.*, 107: 491-515.13.
22. Uribarri, J., S. Woodruff, S. Goodman, W. Cai and X. Chen *et al.*, 2010. Advanced glycation end products in foods and a practical guide to their reduction in the diet. *J. Am. Diet. Assoc.*, 110: 911-916.e12.
23. Jahan-Mihan, A., J. Leftwich, K. Berg, C. Labyak, R.R. Nodarse, S. Allen and J. Griggs, 2024. The impact of parental preconception nutrition, body weight, and exercise habits on offspring health outcomes: A narrative review. *Nutrients*, Vol. 16. 10.3390/nu16244276.2.
24. Bird, A., 2024. Transgenerational epigenetic inheritance: A critical perspective. *Front. Epigenet. Epigenomics*, Vol. 2. 10.3389/freae.2024.1434253.3.
25. Tian, Z., B. Zhang, Z. Xie, Y. Yuan and X. Li *et al.*, 2025. From fathers to offspring: Epigenetic impacts of diet and lifestyle on fetal development. *Epigenet. Insights*, Vol. 18. 10.48130/epi-0025-0004.4.
26. Camilleri, T.L., 2025. Clarifying the public misrepresentation of transgenerational epigenetic inheritance. *Theor. Med. Bioethics*, 10.1007/s11017-025-09717-2.5.
27. Fernando, K.K., J.M. Craig and S.L. Dawson, 2023. Relationships between the maternal prenatal diet and epigenetic state in infants: A systematic review of human studies. *J. Dev. Origins Health Dis.*, 14: 540-555.6.
28. Nakato, R. and K. Shirahige, 2017. Recent advances in ChIP-seq analysis: From quality management to whole-genome annotation. *Briefings Bioinf.*, 18: 279-290.
29. Gross, N., T. Taylor, T. Crenshaw and H. Khatib, 2020. The intergenerational impacts of paternal diet on DNA methylation and offspring phenotypes in sheep. *Front. Genet.*, Vol. 11.10.3389/fgene.2020.597943.8.
30. Donkin, I., S. Versteyhe, L.R. Ingerslev, K. Qian and M. Mechta *et al.*, 2016. Obesity and bariatric surgery drive epigenetic variation of spermatozoa in humans. *Cell Metab.*, 23: 369-378