Health Leadership and Quality of Life. 2025; 4:613
doi: 10.56294/hl2025613

ORIGINAL

The Impact of a Mediterranean Dietary on the Variables Linked to an increased likelihood of Cardiac Diseases

El impacto de una dieta mediterránea en las variables relacionadas con un aumento de la probabilidad de enfermedades cardíacas

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Cite as: Yadav K, Xaviour Selvaraj BN, Mishra R, Kumar A, Bhushan B, Pandre K. The Impact of a Mediterranean Dietary on the Variables Linked to an increased likelihood of Cardiac Diseases. Health Leadership and Quality of Life. 2025; 4:613. https://doi.org/10.56294/hl2025613

Submitted: 05-06-2024 **Revised:** 02-11-2024 **Accepted:** 26-05-2025 **Published:** 27-05-2025

Editor: PhD. Prof. Neela Satheesh

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ABSTRACT

The Mediterranean eating routine is a good dieting plan. In the Mediterranean region, few prospective studies examine the association between these dietary model and nonfatal cardiovascular proceedings. It monitored 127 initially healthy individuals for four years. The participants in this research were candidates from universities throughout the who were enrolled in a prospective cohort investigation. The baseline diet was assessed using a 130-item validated food frequency questionnaire. A 9-point scale was used to evaluate adherence to the Mediterranean diet. Medical record analysis verified incident clinical occurrences. Numerous studies have shown that individuals who adhered to the Mediterranean diet the best had fewer cardiovascular risks than those who did not. For every additional two focuses for cardiovascular, coronary illness, and cardiovascular disease (CVD), the changed risk proportions were separately. In healthy middle-aged people, the Mediterranean diet negatively correlates with the development of both fatal and non-fatal cardiovascular disease.

Keywords: Mediterranean Diet; Risk Factor; Cohort; Cardiovascular Disease (Cvd); Middle-Aged People.

RESUMEN

La dieta mediterránea es un buen plan de alimentación. En la región mediterránea, hay pocos estudios prospectivos que examinan la asociación entre este modelo dietético y los eventos cardiovasculares no fatales. Se monitorearon a 127 individuos inicialmente sanos durante cuatro años. Los participantes en esta investigación eran candidatos de universidades de todo el país que estaban inscritos en una investigación de cohortes prospectiva. La dieta inicial se evaluó utilizando un cuestionario de frecuencia alimentaria validado de 130 ítems. Se utilizó una escala de 9 puntos para evaluar la adherencia a la dieta mediterránea. El análisis de los registros médicos verificó ocurrencias clínicas incidentes. Numerosos estudios han demostrado que las personas que se adhirieron mejor a la dieta mediterránea tenían menos riesgos cardiovasculares que aquellos que no lo hicieron. Por cada dos enfoques adicionales para las enfermedades cardiovasculares, enfermedades coronarias y enfermedad cardiovascular (ECV), las proporciones de riesgo modificadas fueron por separado.

En personas sanas de mediana edad, la dieta mediterránea se correlaciona negativamente con el desarrollo tanto de enfermedades cardiovasculares fatales como no fatales.

Palabras clave: Dieta Mediterránea; Factor de Riesgo; Cohorte; Enfermedad Cardiovascular (ECV); Personas de Mediana Edad.

INTRODUCTION

Cardiovascular disease (CVD) is the most significant hazard to public health in the twenty-first century.[1] According to a recent estimate, ambient PM2.5 exposure is accountable for more than 1,5 million ischemic heart disease deaths yearly, making it a significant contribution to mortality from cardiovascular disease worldwide. Ambient air pollution has been officially acknowledged as an important cardiovascular risk factor.[2] Given the rising global consumption of industrially processed food, the health effects of food processing have become an essential and urgent concern. Food that has been processed heavily makes up a significant component of the global food supply chronic kidney disease (CKD) and diabetes both raise the risk of CVD and other detrimental health effects.[3] There is confirmation that overall population outcomes are improved by Mediterranean-style diets.[4] According to the diet chart in figure 1, the Mediterranean diet is characterized by a low consumption of processed foods and a high intake of monounsaturated fats, vegetables, fruit, nuts, legumes, and whole grain cereals that include fiber, antioxidants, vitamins, minerals, and polyphones. A Mediterranean diet's health advantages are mostly due to its anti-inflammatory and anti-oxidative properties.[5]

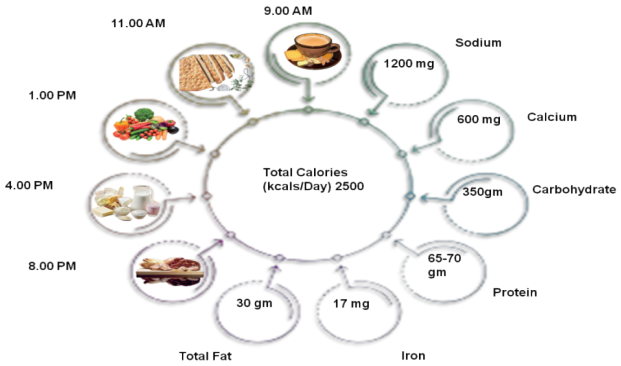

Figure 1. Diet Chart for the Mediterranean

Organization-variable hazardous behaviors, including unhealthy eating, tobacco use, unhealthy body weight, and inactivity, can prevent most CVDs, according to the report on Preventing the worldwide pandemic of CVD: Meeting the Challenges in poor nations.[6] An active organ, adipose tissue produces and releases provocative cytokines that alter the local tissue environment and promote systemic lip toxicity. The biology of inflammation in adipose tissue and the link between adipokines linked to obesity and CVD were addressed an estimated 9.5 million deaths are attributed to diabetes each year, making high blood pressure (BP) one of the main risk factors for CVD and all-cause mortality that can be changed.[7] According to estimates, both in industrialized and developing nations, hypertension illnesses will be the cause of more than 25 % of fatalities by the year 2030.[8] Compared to massive retail chains of supermarkets or convenience shops, the percentage of food markets and small specialty retailers is higher in Mediterranean food ecosystems. These little specialty shops include butchers, fruit and vegetable shops, and fishmongers. However, the relevance of these specialty food stores as additional sources of nutrient-dense foods has yet to be explored in research.[9] Dietary instructions and suggestions have effectively changed from single-nutrient and food-based methodologies and their impact on persistent illnesses to a whole-diet approach to acknowledge that eating habits are the most controllable risk factor for preventative medicine.[10] In a cohort of autonomous people at elevated risk for CVD, the research evaluates the impact of MD therapies over three years to a low-fat diet (LFD) on markers of inflammation linked to cholesterol.[11] Based on the recommended as-used severity rating for retinopathy, Micro aneurysm, intraregional hemorrhage, venous beading, revascularization, vitreous/pre-retinal hemorrhage, cotton wool patches, retinal thickness, and hard exudates are the lesions that make up the scale.[12] Diet can affect disease risk and decline in cognition; however, the data is still controversial. The Mediterranean diet (MedDiet), for

https://doi.org/10.56294/hl2025613

example, is believed to contain antibacterial and anti-oxidant substances that lower the risk of CVD.[13] The purpose of the article described the compile information from studies on the health advantages of medications, including those that have been the subject of much research (such as cancer and cardiovascular disease) as well as more contemporary topics like immunity, mental health, and quality of life.[14] In this research gap, they employ a population-level sample of adults to examine the individual and combination relationships between diet and physical activity and mortality from all causes, cardiovascular disease, and cancer.[15] They consider the significance of vigorous-intensity physical activity (VPA) in addition to moderate-to-vigorous intensity physical activity (MVPA) in light of the expanding body of research on the possible extra benefits linked to VPA, irrespective of overall exercise quantity.

METHOD

Study Population

The table 1 presents a detailed description of the participant selection procedure for a study that included 150 subjects. In total, 88,4 % of the original subjects were retained, yielding 132 subjects meeting two-year follow-up criteria. Some exclusions were made because of inconsistency in energy intake (three subjects) and a history of cardiovascular disease (two subjects). Thus, the final sample for analysis was reduced to 127 subjects, this being the sample adjusted for studying the outcomes.

Table 1. Participant breakdown and sample size calculation

Description	Number of participants
Total participants selected	150
Retention	88 %
Participants with follow -up (2 years)	132
Exclusions due to energy intake discrepancies	3
Exclusions due to pre-existing CVD	2
Final Sample Size	127

Assessment of Disclosure

The most current food component data were used at first, together with a 130-item confirmed partially quantitative food consumption assessment. The degree to which the typical Mediterranean diet was followed was assessed using a prior score. Individuals earned a certain point for superior the sample sex-specific average in monounsaturated to saturated fatty acids consumption for each of the six possibly beneficial elements. A point was awarded to those who drank fewer of the two ineffective substances than the median.[16] One point was awarded if males or women used 10e40 g or 5e20 g per day. Nine points represented the maximum degree of adherence, while zero points represented complete non-adherence. Recent research that validated the food-frequency assessment employed four 3-day eating data. Additionally, eating habits were experimentally identified using the approach. The 130 food items were organized into 35 different nutrition categories. The Medium plot analysis assessed the number of variables (or vectors) that needed to be retrieved. Varian rotation, an orthogonal rotation method, was utilized to enhance interpretability. The number of matrices preserved was decided by the volume of variance described and the original explanation. Food categories with stresses over 0,25 were thought to have increased the pathogen.[17] In this way, every member got a component score for each recognized example. The more closely a person adhered to the suggested diet, the higher their score. Westernized and post hoc Mediterranean classifications were applied to the results.

Examinations of Other Covariates

The pattern research mentioned data about anthropometric qualities (weight, level), wellbeing-related propensities (smoking status, busy work, inactive way of life), and clinical factors. The precision of communicated weight and weight record (BMI) estimations have been laid out in a subsample of this populace. BMI expressed weight and calculated weight had correlations of 0,99 – 0,93 as shown in table 2. The mean proportional importance fault was 2,3 %. A physical exercise assessment that had already undergone validation was utilized to evaluate physical movement. The correlation value between the self-reported data from the assessment and the objective measures of the research is positive with the correlation set at 0,91.[18]

Recognizing CVD Occurrences

The main result of this investigation was the combined effect evaluation of recurrent cardiovascular mortality, coronary artery disease, and angioplasty operations. Members who announced these determinations by doctors on subsequent polls were requested their clinical records.[19] An advisory board of doctors exposed to data on food and risk variables identified the incidents by applying the diagnostic standards for other endpoints

or the criteria for a heart attack to the hospital records. A systemic neuronal insufficiency with a sudden onset and persistent vasculature instrumentation lasting more than 24 hours is known as a mild stroke. If a fatal stroke occurred, records of the incident were kept only in case there was evidence of cerebral devices. Nearby relatives, coworkers, and postal workers responded to the research team's inquiries about passing. For participants who were found to follow up, the public demise record was used to recognize departed associate people.[20] With the consent of the people, a study of medical records confirmed fatal coronary heart disease.

Table 2. Examinations of Other Covariates

Covariate type	Details
Anthropometric Data	Weight, height
Lifestyle factors	Smoking status, physical activity, sedentary behavior
Clinical factors	Collected as part of the research
Accuracy of weight and BMI	Correlation between self-reported and measured weight: 0,99 – 0,93
Physical activity Assessment	Validated physical activity questionnaire

Statistical Analysis

The group that followed the Mediterranean diet the least closely served as model. There was an HR assessment for each 2-point increase in the score. Time-dependent factors were used to test the premise of proportionate risks. To get estimated back HRs, the assessment for 2-top employs a basic counted technique using skewed data averages, as recommended by Greenland. In a third model, used aspirin, a diabetes gauge, and a gauge for dyslipidemia while adapting to the typical BMI baseline history of using hypertension medication. The exposure was handled as a continuous variable for linear trend testing. The linear pattern analysis was calculated by considering the variable as constant and assigning the median of each quantile to each category when evaluating food items. The typical criterion of p 0,05 was used to assess statistical relevance for all paired p-values.

RESULTS

The median monitoring for the sample was 4,9 years. Sixty-six thousand five hundred seventy-seven person-years of follow-up revealed 120 incident CVD cases. Only eight events resulted in death, four strokes, and four myocardial infarctions. Concerning their compliance with the Mediterranean diet plan, table 3 displays the essential characteristics of the research participants. 8,5 % and 4,7 % of participants were in the highest extreme of adherence (7-9), respectively.

Table 3. Characteristics of the Mediterranean diet plan

	Observance of the Mediterranean diet				
	A moderate-high score (5-7)	A high score (8-10)	Low mode rate score (3-4)	p-value	A low score (0-2)
N	88,4	132	3	2	127
Sex (% women)	59	61	60	0,01	60
Smoking					
Current smokers (%)	26	27	30	<0,001	27
Ex-smokers (%)	31	33	34	0,02	33
Diabetes at baseline (%)	2,4	2,1	1,5	0,05	2,1
Hypertension at baseline (%)	11	13	14	0,03	12
Dyslipidaemia at baseline (%)	28	27	25	0,06	26
Age (y)	43 (12)	37 (11)	34 (10)	<0,001	39 (11)
Olive oil consumption(g/day)	29 (20)	20 (17)	14 (14)	<0,001	14 (14)
Body mass index 25-29,9 (%)	29	24	30	<0,001	27
Total energy intake (Kcal/days)	2679 (684)	2414 (763)	2295 (711)	<0,001	2295 (211)
Alcohol intake (g/day)	10 (11)	6(10)	4 (9)	<0,001	4 (9)
BMI (kg/m2)	24 (3)	23 (3)	23 (3)	<0,001	23 (3)
Ratio	1,58 (0,39)	1,23 (0,31)	1,08 (0,18)	<0,001	1,08 (0,1)
Physical activity (MET-h/week)	29 (24)	23 (20)	21 (20)	<0,001	21(20)

The most common outcomes were a 6 (22,8 %) and a score of 7. During the enrolling years, there was a little improvement in the study participants' initial adherence to the Mediterranean diet, as seen in figure 2. As expected, older age, smoking cessation, presence of obesity, hypertension, dyslipidemia, and family history of cardiovascular disease were all associated with greater commitment to the diet. In addition, the better the complementary profile, the more active the lifestyle adopted by participants, which was also associated with higher adherence. According to statistical analyses, an 8,3 % and 14,2 % decrease in metabolic syndrome occurred in the Med + Olive Oil and Med + Nuts categories, respectively; however, only patients of Med + Nuts group exhibited statistical significance.

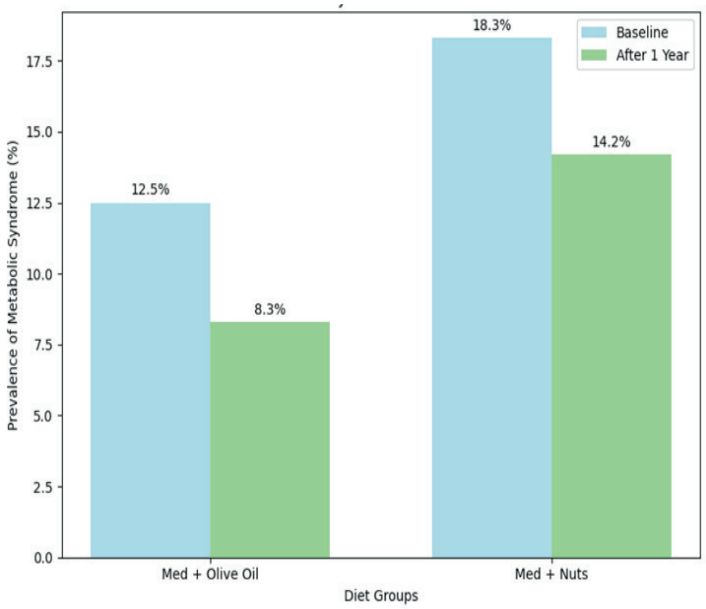

Figure 2. Prevalence of the metabolic syndrome at baseline and after a year, determined by diet assignment

Whatever the factors excluded for analyses in table 4, following the Mediterranean diet was statistically linked with decreased CVD risk in multivariable-adjusted studies. The p-value for the direct sequence was 0,72. When it comes to coronary artery disease, an examination of the extremes categories of compliance (8-10 as opposed to 0-2) generated comparable point estimates and higher assurance ranges. However, this connection demonstrated a statistically significant trend (p = 0,04).

Table 4. Risk ratios of cardiovascular disease based on how closely someone follows the Mediterranean diet

Following a Mediterranean diet	Moderate high (5-7)	*p* for trend	For each þ2 points	Low 0-2	Lowe moderate (3-4)	High (8-10)
N	132			3	88,4	127
Person-years	6000			200	3000	5500
Incident cases of heart disease	15	0,03	0,65 (0,42-1,02)	2	8	5
Incident cases of total CVD	25	0,04	0,56 (0,34-0,89)	3	12	8
Age and sex Adjusted HR	0,65(0,42-1,02)	0,03		1,2 (0,8-1,8)	1 (ref)	0,65 (0,32-0,88)
Multivariable HR (95 % CI)	0,72 (0,48-1,12)	0,04		1,15 (0,8-1,8)	1 (ref)	0,56 (0,34-0,89)
P-value	0,03	0,03		1,15 (0,8-1,6)	-	0,04

When the Mediterranean diet score increased by two points, there was a link through a 26 % decline in the prevalence of CVD. To embrace a surmised technique viewpoint, demonstrated the earlier thoughts regarding the association connecting Mediterranean eating routine and CVD expecting to be an earlier 95 % likelihood of an HR somewhere in the range of 0,69 and 0,99 (these qualities were the least of as far as possible and the most noteworthy of the upper cutoff points of the 95 % certainty time frames reads up assessing relative dangers for CVD in a past meta-examination. When performed the calculations with every element corrected for total calorie intake, the HR for myocardial heart disease dropped for a 2-point increase in the score, respectively, losing statistical importance. Figure 3 and table 5 depict the relationship between cardiovascular risk and each component of the Mediterranean diet. Consuming fruits and nuts were the only factor that could be used to predict a lower risk of cardiovascular disease in fully adjusted models.

Table 5. Risk ratios for cardiovascular disease depending on consumption of each Mediterranean diet component

Mechanism of Mediterranean Gain	Used as the "cut-off point" for HR of CVD or CHD		CHD risk ratio (95 % CI)	CVD risk ratio (95 % CI)
	Men	Women		
Fish	87	86	0,75 (0,46-1,24)	0,85 (0,56-1,28)
Dairy	182	143	1,51 (0,91-2,49)	1,09 (0,72-1,67)
Vegetables	401	501	0,82 (0,50-1,35)	1,09 (0,72-1,66)
Meat/meat products	177	170	1,01(0,60-1,70)	1,31 (0,86-2,00)
Alcohol	10-50	5,25	0,75 (0,43-1,32)	0,81(0,51-1,28)
Fruits and nuts	235	300	0,62 (0,37-1,04)	0,58 (0,38-0,89)
Cereals	90	81	1,36 (0,80-1,33)	1,19 0,76-1,85)
Legumes	21	21	0,70 (0,43-1,15)	0,80 (0,53-1,21)

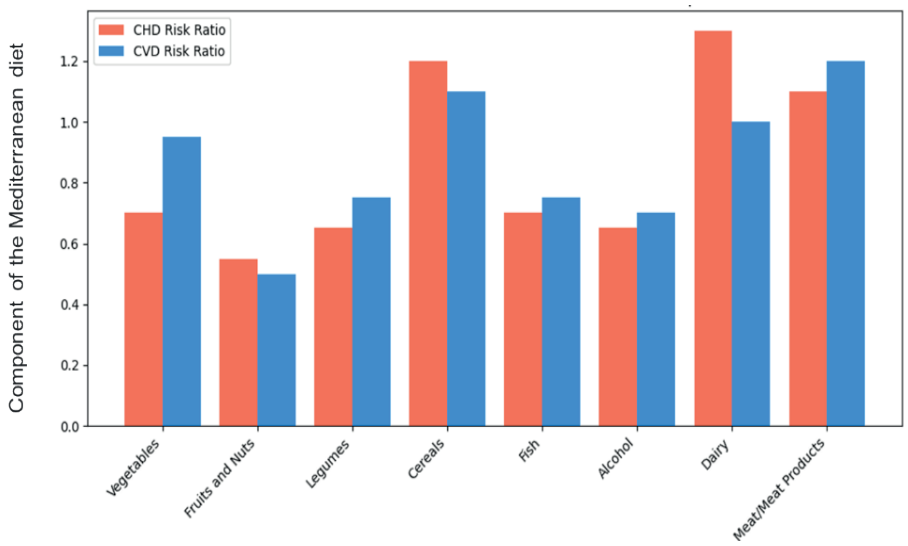

Figure 3. Component of the Mediterranean diet

The only predictor that might be utilized for predicting a decreased risk of CVD in completely modified analyses was eating fruits and nuts. Most estimated points were according to the anticipated guidance, except for cereals. As a result, the updated score contained ethanol, two ineffective sections, and five potentially defensive portions. This revised score excluding cereals was shown to have a stronger negative correlation with CVD. With for trend = 0,03, the fully adjusted HRs for moderate and high adherence were 0,4 and 0,41, respectively. With HR = 0,57 for moderate adherence and HR = 0,39 for high compliance, this was much more noticeable for coronary disease. It estimated the partial correlation coefficient between the cereals group and white bread. This item is consumed the most frequently by this group in investigate the potential impact of various cereal bowls in greater depth. In terms of partial association, it was 0,85. According to the linear trend, quintiles of grain consumption were linked to an increased risk of heart disease. After changing for traditional risk factors rather than overall energy consumption, white bread was 1,92. This estimation acquired value when adjusted the analyses for overall calorie consumption. The PCA identified two main vectors accounting for 23 % of the overall variation in calorie consumption. Table 6 and Table 7 displays the variable transferring vectors. Accordingly, these two vectors were referred to as "Westernized" and "post facto Mediterranean," respectively.

DISCUSSION

The findings indicate a clear negative relationship between the Mediterranean diet and the risk of CVD. This defense is in line with other discoveries. The hypothesis' strong a priori plausibility will eliminate any possible adverse effects of its weak statistical strength.[21] Studies have shown that the Mediterranean eating regimen is exceptionally compelling in lessening cardiovascular gamble factors, metabolic disorder (MS), provocative pointers, and the working of the end.[22] As per the information, olive oil and dead myocardial tissue have severe areas of strength for a relationship. Although not mainly a weight-loss diet, the Mediterranean diet is nutritious and could help avoid heart disease and early mortality. The discovered an unanticipated non-significant positive relationship for the PHMP, which contrasts with the negative link between the Mediterranean diet and CVD established using the a priori definition.[23]

The traditional Mediterranean diet can have essential traits that the post hoc technique could not completely capture. For example, ethanol drinking was reduced in the top percentile of the PHMP, although meat eating was higher in the best quartile. They are aware of the drawback caused by the sparse sample size of incident occurrences.[24] It will make sense to anticipate a low incidence of CVD in a Mediterranean group if the Mediterranean diet is cardio-protective. The idea that the findings would not apply to other populations is not supported by any scientific evidence.[25] The estimations were also modified to account for the primary risk variables for CVD and race. More crucially, representativeness is unnecessary for scientific generalization.[26] Furthermore, the goal of precisely identifying causal relationships can be defeated in the quest of representativeness itself. It is advised that research groups be chosen based on their high levels of cooperation, homogeneity about significant confounders, and accessibility to correct information to optimize the validity of a cohort.[27]

Table 6. Food Westernized pattern ratings determined empirically: factor loading matrix

	"Westernized" pattern
Sauces	0,49
Processed meats	0,49
Eggs	0,36
Dairy products	0,49
Sugar	0,30
Fast food	0,55
Commercial Bakery	0,42
Sugar	0,40
Potatoes	0,51
Low-fat dairy	-0,76

Table 7. Food Post hoc Mediterranean pattern ratings determined empirically: factor loading matrix

	Post hoc Mediterranean
Low-fat dairy	0,39
Olive oil	0,33
Legumes	0,33
Vegetables	0,70
Fish	0,56
Fruits	0,61
Nuts	0,35

CONCLUSIONS

The Mediterranean eating regimen score doesn't separate between refined and entire-grain cereals. White bread, a processed grain, is the primary food. A high glycogenic weight in modified cereals has been associated with a reduction in HDL cholesterol, an increase in fasted circulating fatty acids, a rise in insulin sensitivity, and an increase in the level of protein. In any event, widely recognized whole grain foods are linked to a decreased cardiovascular risk, whereas processed grains are known to raise the glycogenic load. Therefore, the differential contributions of refined and unrefined grains may affect how the cereal category affects CVD risk. Whole grain intake is very high in Mediterranean nations today (89 percent of cohort members reported never or seldom eating whole grains, and 69 percent said doing so). MUFA intake mostly comes from olive oil in the Mediterranean region, but it typically comes from beef. Olive oil accounted for 38 % of all MUFA consumption in the sample, making it the primary source of MUFA. The Mediterranean region has distinct typical patterns of ethanol consumption. Several micronutrients are directly obtained via vitamin supplements as opposed to fresh, naturally occurring fruits and vegetables. These variations highlight the usefulness of the results as an addition to the Mediterranean-style diet dietary patterns. The results imply that the conventional Mediterranean diet gives significant cardiovascular protection among middle-aged people who are initially healthy.

REFERENCES

1. Morera LP, Marchiori GN, Medrano LA, Defagó MD. Stress, dietary patterns and cardiovascular disease:

A mini-review. Frontiers in neuroscience. 2019 Nov 12;13:1226. https://doi.org/10.3389/fnins.2019.01226.

2. Lim CC, Hayes RB, Ahn J, Shao Y, Silverman DT, Jones RR, Thurston GD. Mediterranean diet and the association between air pollution and cardiovascular disease mortality risk. Circulation. 2019 Apr 9;139(15):1766-75. https://doi.org/10.1161/CIRCULATIONAHA.118.035742.

3. Bonaccio M, Costanzo S, Di Castelnuovo A, Persichillo M, Magnacca S, De Curtis A, Cerletti C, Donati MB, de Gaetano G, Iacoviello L, Moli-sani Study Investigators. Ultra-processed food intake and all-cause and cause-specific mortality in individuals with cardiovascular disease: the Moli-sani Study. European Heart Journal. 2022 Jan 14;43(3):213-24. https://doi.org/10.1093/eurheartj/ehab783.

4. Picard K, Senior PA, Perez SA, Jindal K, Richard C, Mager DR. Low Mediterranean Diet scores are associated with reduced kidney function and health related quality of life but not other markers of cardiovascular risk in adults with diabetes and chronic kidney disease. Nutrition, Metabolism and Cardiovascular Diseases. 2021 May 6;31(5):1445-53. https://doi.org/10.1016/j.numecd.2021.02.002.

5. Gutierrez-Mariscal FM, Cardelo MP, de La Cruz S, Alcala-Diaz JF, Roncero-Ramos I, Guler I, Vals-Delgado C, López-Moreno A, Luque RM, Delgado-Lista J, Perez-Martinez P. Reduction in circulating advanced glycation end products by mediterranean diet is associated with increased likelihood of type 2 diabetes remission in patients with coronary heart disease: from the cordioprev study. Molecular Nutrition & Food Research. 2021 Jan;65(1):1901290. https://doi.org/10.1002/mnfr.201901290.

6. Han Y, Zeng H, Jiang H, Yang Y, Yuan Z, Cheng X, Jing Z, Liu B, Chen J, Nie S, Zhu J. CSC expert consensus on principles of clinical management of patients with severe emergent cardiovascular diseases during the COVID-19 epidemic. Circulation. 2020 May 19;141(20):e810-6. https://doi.org/10.1161/CIRCULATIONAHA.120.047011.

7. Rana MN, Neeland IJ. Adipose tissue inflammation and cardiovascular disease: an update. Current Diabetes Reports. 2022 Jan;22(1):27-37. https://doi.org/10.1007/s11892-021-01446-9.

8. Rahimlou M, Grau N, Banaie-Jahromi N, Taheri M, Khosravi A, Mavrommatis Y, Mohammadifard N. Association of adherence to the dietary approach to stop hypertension and Mediterranean diets with blood pressure in a non-hypertensive population: Results from Isfahan Salt Study (ISS). Nutrition, Metabolism and Cardiovascular Diseases. 2022 Jan 1;32(1):109-16. https://doi.org/10.1016/j.numecd.2021.09.029

9. Diez J, Bilal U, Franco M. Unique features of the Mediterranean food environment: Implications for the prevention of chronic diseases Rh: Mediterranean food environments. European Journal of Clinical Nutrition. 2019 Jul;72(Suppl 1):71-5. https://doi.org/10.1038/s41430-018-0311-y.

10. Tierney A, Lordan R, Tsoupras A, Zabetakis I. Diet and cardiovascular disease: The mediterranean diet. InThe impact of nutrition and statins on cardiovascular diseases 2019 Jan 1 (pp. 267-288). Academic Press. https://doi.org/10.1016/B978-0-12-813792-5.00008-2.

11. Urpi-Sarda M, Casas R, Sacanella E, Corella D, Andrés-Lacueva C, Llorach R, Garrabou G, Cardellach F, Sala-Vila A, Ros E, Ruiz-Canela M. The 3-year effect of the Mediterranean diet intervention on inflammatory biomarkers related to cardiovascular disease. Biomedicines. 2021 Jul 22;9(8):862. https://doi.org/10.3390/biomedicines9080862.

12. Salinero-Fort MA, Andrés-Rebollo FS, Cárdenas-Valladolid J, Méndez-Bailón M, Chico-Moraleja RM, de Santa Pau EC, Jiménez-Trujillo I, Gomez-Campelo I, de Burgos Lunar C, de Miguel-Yanes JM. Cardiovascular risk factors associated with acute myocardial infarction and stroke in the MADIABETES cohort. Scientific reports. 2021 Jul 27;11(1):15245. https://doi.org/10.1038/s41598-021-94121-8.

13. Hosking DE, Eramudugolla R, Cherbuin N, Anstey KJ. MIND not Mediterranean diet related to 12-year incidence of cognitive impairment in an Australian longitudinal cohort study. Alzheimer's & Dementia. 2019 Apr 1;15(4):581-9. https://doi.org/10.1016/j.jalz.2018.12.011.

14. Serra-Majem L, Roman-Vinas B, Sanchez-Villegas A, Guasch-Ferre M, Corella D, La Vecchia C. Benefits of the Mediterranean diet: Epidemiological and molecular aspects. Molecular aspects of medicine. 2019 Jun 1;67:1-55. https://doi.org/10.1016/j.mam.2019.06.001.

15. Ding D, Van Buskirk J, Nguyen B, Stamatakis E, Elbarbary M, Veronese N, Clare PJ, Lee IM, Ekelund U, Fontana L. Physical activity, diet quality and all-cause cardiovascular disease and cancer mortality: a prospective study of 346 627 UK Biobank participants. British journal of sports medicine. 2022 Oct 1;56(20):1148-56. https://doi.org/10.1136/bjsports-2021-105195.

16. Martínez-González MA, Gea A, Ruiz-Canela M. The Mediterranean diet and cardiovascular health: A critical review. Circulation research. 2019 Mar 1;124(5):779-98. https://doi.org/10.1161/CIRCRESAHA.118.313348.

17. Li J, Guasch-Ferré M, Chung W, Ruiz-Canela M, Toledo E, Corella D, Bhupathiraju SN, Tobias DK, Tabung FK, Hu J, Zhao T. The Mediterranean diet, plasma metabolome, and cardiovascular disease risk. European heart journal. 2020 Jul 21;41(28):2645-56. https://doi.org/10.1093/eurheartj/ehaa209.

18. Mendonça RD, Carvalho NC, Martin-Moreno JM, Pimenta AM, Lopes AC, Gea A, Martinez-Gonzalez MA, Bes-Rastrollo M. Total polyphenol intake, polyphenol subtypes and incidence of cardiovascular disease: The SUN cohort study. Nutrition, Metabolism and Cardiovascular Diseases. 2019 Jan 1;29(1):69-78. https://doi.org/10.1016/j.numecd.2018.09.012.

19. Rosato V, Temple NJ, La Vecchia C, Castellan G, Tavani A, Guercio V. Mediterranean diet and cardiovascular disease: a systematic review and meta-analysis of observational studies. European journal of nutrition. 2019 Feb 1;58:173-91. https://doi.org/10.1007/s00394-017-1582-0.

20. Andreu-Reinón ME, Chirlaque MD, Gavrila D, Amiano P, Mar J, Tainta M, Ardanaz E, Larumbe R, Colorado-Yohar SM, Navarro-Mateu F, Navarro C. Mediterranean diet and risk of dementia and Alzheimer's disease in the EPIC-Spain dementia cohort study. Nutrients. 2021 Feb;13(2):700. https://doi.org/10.3390/nu13020700.

21. Fresán U, Martínez-González MA, Sabaté J, Bes-Rastrollo M. Global sustainability (health, environment and monetary costs) of three dietary patterns: results from a Spanish cohort (the SUN project). BMJ open. 2019 Feb 1;9(2):e021541. https://doi.org/10.1136/bmjopen-2018-021541.

22. Sánchez-Sánchez ML, García-Vigara A, Hidalgo-Mora JJ, García-Pérez MÁ, Tarín J, Cano A. Mediterranean diet and health: A systematic review of epidemiological studies and intervention trials. Maturitas. 2020 Jun 1;136:25-37. https://doi.org/10.1016/j.maturitas.2020.03.008s.

23. Battino M, Forbes-Hernández TY, Gasparrini M, Afrin S, Cianciosi D, Zhang J, Manna PP, Reboredo-Rodríguez P, Varela Lopez A, Quiles JL, Mezzetti B. Relevance of functional foods in the Mediterranean diet: the role of olive oil, berries and honey in the prevention of cancer and cardiovascular diseases. Critical reviews in food science and nutrition. 2019 Mar 26;59(6):893-920. https://doi.org/10.1080/10408398.2018.1526165.

24. Veronese N, Notarnicola M, Cisternino AM, Inguaggiato R, Guerra V, Reddavide R, Donghia R, Rotolo O, Zinzi I, Leandro G, Tutino V. Trends in adherence to the Mediterranean diet in South Italy: A cross sectional study. Nutrition, Metabolism and Cardiovascular Diseases. 2020 Mar 9;30(3):410-7. https://doi.org/10.1016/j.numecd.2019.11.003.

25. Alvarez-Alvarez I, Toledo E, Lecea O, Salas-Salvadó J, Corella D, Buil-Cosiales P, Zomeño MD, Vioque J, Martinez JA, Konieczna J, Barón-López FJ. Adherence to a priori dietary indexes and baseline prevalence of cardiovascular risk factors in the PREDIMED-Plus randomised trial. European Journal of Nutrition. 2020 Apr;59:1219-32. https://doi.org/10.1007/s00394-019-01982-x.

26. Liu X, Zheng Y, Guasch-Ferré M, Ruiz-Canela M, Toledo E, Clish C, Liang L, Razquin C, Corella D, Estruch R, Fito M. High plasma glutamate and low glutamine-to-glutamate ratio are associated with type 2 diabetes: case-cohort study within the PREDIMED trial. Nutrition, Metabolism and Cardiovascular Diseases. 2019 Oct 1;29(10):1040-9. https://doi.org/10.1016/j.numecd.2019.06.005.

27. Aoun C, Papazian T, Helou K, El Osta N, Khabbaz LR. Comparison of five international indices of adherence to the Mediterranean diet among healthy adults: similarities and differences. Nutrition research and practice. 2019 Aug 1;13(4):333-43. https://doi.org/10.4162/nrp.2019.13.4.333.

FINANCING

None.

CONFLICT OF INTERESTS

None.

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https://doi.org/10.56294/hl2025613