



Review / Derleme

## The Mediterranean Diet's Role and Sustainability in Healthy Nutrition

### Sağlıklı Beslenmede Akdeniz Diyetinin Rolü ve Sürdürülebilirliği

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#### ABSTRACT

Nutrition has a direct impact on health. The main cause of this effect is the food diversity. A good diet can help to keep diseases at bay. With its strong nutritional content and sustainability benefits, the Mediterranean diet receives more attention than other diet models. Due to climate change and population growth, the concept of sustainability has recently gained traction. One of the most important aspects of a long-term future is nutrition. In comparison to other diet models, the Mediterranean diet has a lower environmental footprint. This diet should be implemented in more populations in order to improve the environmental advantage. New studies should be used to explain the benefits of the Mediterranean diet in order to promote its global acceptance. The goal of this review is to illustrate the Mediterranean diet's importance and long-term viability in terms of healthy eating.

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#### ÖZET

Beslenmenin sağlık üzerinde doğrudan bir etkisi mevcuttur. Besin çeşitliliği bu etkinin ana sebebinin oluşturmaktadır. Sağlıklı bir beslenme ile hastalıklardan korunmak mümkündür. Akdeniz tipi beslenme zengin besin içeriği ve sürdürülebilirlik yönünden avantajları ile diğer diyet modellerinden daha fazla dikkat çekmektedir. Sürdürülebilirlik kavramı, iklim değişikliği ve nüfus artışı sebebi ile son zamanlarda önem kazanmıştır. Beslenme sürdürülebilir bir gelecek için kilit noktalardan biridir. Akdeniz diyeti, diğer diyet modellerine kıyasla daha iyi bir ekolojik ayak izine sahiptir. Çevresel faydanın artması için bu diyetin daha fazla popülasyonda uygulanması gerekmektedir. Akdeniz diyetinin küresel olarak tercih edilebilirliğini artırmak için yeni çalışmalar ile faydaları açıklanmalıdır. Bu derleme çalışmasının amacı, sağlıklı beslenmede Akdeniz diyetinin rolünü ve sürdürülebilirliğini iletmeektir.

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#### 1. Introduction

Eating habits play a significant effect in one's overall health. The impact of nutrition on health is determined by the variety of foods available. The strong nutritional content of the Mediterranean diet (MD) is one of its key characteristics (1).

Many diseases can be prevented with a healthy and balanced diet, according to studies in the literature. Fish, fruits, vegetables, and fiber-rich diets have been linked to improved health. These foods are also an important part of MD (2).

MD is a sustainable, evidence-based special nutrition approach for good health (3). It's a low-glycemic-index diet that's high in antioxidants and bioactive components having anti-inflammatory properties (4). Many chronic diseases (5), particularly cardiovascular ailments, are prevented by MD (3).

Mediterranean nutrition, which is a product of culture and customs rather than a diet, made its way into medical science around half a century ago and has since been recognized as one of the healthiest lifestyle models (6). The purpose of this review is to examine the

Mediterranean diet, which is considered healthy and sustainable, within the scope of health and sustainability goals and also to evaluate the sustainable life and health effects of Mediterranean diet that is accepted as sustainable healthy diet model.

**2. Mediterranean Diet**

MD is the name given to the typical cuisine of people living in the Mediterranean region. When the overall diet of 22 Mediterranean-bordering countries is evaluated, non-starchy foods, diverse vegetables, whole grains, legumes, nuts, seeds, fibrous foods and minimally processed items are found. Meat is consumed infrequently, usually once or twice a week, and sugar and potato consumption are minimal. It is well known that butter and cream are rarely used, and olive oil is favoured as the primary source of fat. It is said that they consume a moderate amount of red wine and consume enough fruit (7,8).

It was first proposed by Ancel Keys et al. (9) in the 1960s as a low-saturated-lipid diet that could help to control low blood cholesterol levels and protect the cardiovascular system. It was then explained as a diet model comprised of highly protective foods that provides protection from a variety of ailments in subsequent years. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) designated it as a cultural heritage in 2010 (10).

MD reflects the general lifestyle of individuals living in the Mediterranean region, which is not restricted to nutrition. As a result, Mediterranean people's eating habits vary greatly depending on the country and location. To discover common characteristics, a nutrition pyramid was required (7,10).

To demonstrate adherence to an MD, compliance scales are used. In general, an assessment is based on the consumption of nine dietary components. Vegetables, legumes, fruits, nuts, grains, and fish have beneficial components, while meat, poultry and dairy products contain toxic components. Consumption that surpasses the sex-specific median for beneficial components and falls below the median for detrimental components receives a score. A higher total score implies a greater dedication to MD (12,13).

**3. Effect of Mediterranean Diet on Health**

When it comes to health, following to MD offers numerous advantages. A Mediterranean diet appears to have a protective impact against mental problems such as cardiovascular disease, certain types of cancer, stroke, obesity, allergy diseases, diabetes, and depression according to growing data (14,15,16,17). In a study of 2339 older European participants, it was discovered that as adherence to MD increased, there was a 23 percent drop in all-cause death (18).

When it comes to cardiovascular illnesses, MD is just as effective as antihypertensives like aspirin, statins, physical activity, ACE inhibitors, or beta blockers in terms of lowering morbidity and mortality (3). Diet adherence was associated with a lower risk of sudden death and a lower mean heart rate. This link is assumed to be related to the omega-3 fatty acids in the diet as well as the presence of enough vegetables and fruits. MD can counteract the negative consequences of obesity-related inflammation (19). In a 16-week intervention research involving obese children and adolescents, significant reductions in body mass index, lean mass, fat mass, blood glucose, total cholesterol, triglyceride, HDL, and LDL cholesterol levels were identified in the MD group (20).

Koloverou et al. (21) found a 23 percent reduction in Type-2 diabetes risk in people with high MD compliance questionnaire scores in a meta-analysis. Neural tube abnormalities, premature birth, and fetal growth restriction were decreased as adherence to MD increased during pregnancy (22).

Loss of skeletal muscle mass and function in adults is thought to be reduced by MD. In older people, strict dietary adherence is linked to a lower risk of frailty and disability. Physical activity suggestions, which are part of the MD, can also help. Because of its anti-inflammatory and antioxidant qualities, MD, which includes high levels of vitamins C and E as well as minerals such carotenoids, is useful in supporting skeletal muscle health (23). Inflammatory disorders such as rheumatoid arthritis show positive benefits due to the anti-inflammatory qualities of the diet. Rheumatoid arthritis risk

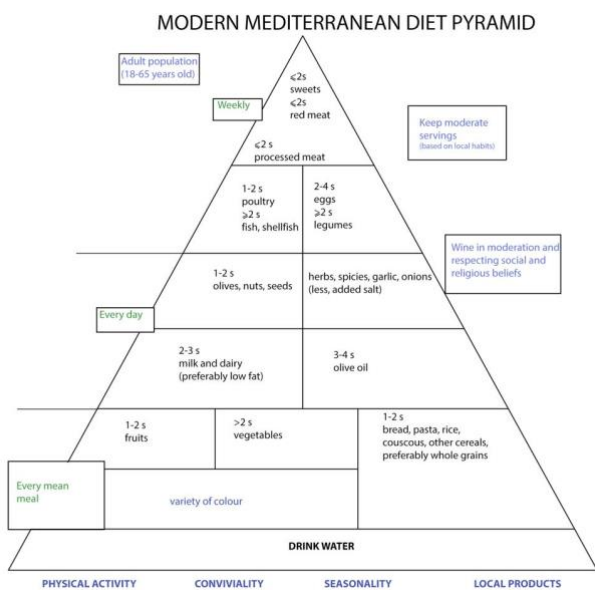


Figure 1. Mediterranean Diet Pyramid (11)

is reduced by 8% with even a one-unit rise in dietary compliance score (24).

MD has a balanced ratio of omega-6/omega-3 fatty acids, is high in antioxidants, fibre, and monounsaturated fatty acids, and is low in saturated fats and animal proteins. The diet's high antioxidant, fiber, phytosterol, probiotic, monounsaturated, and omega-3 fatty acid content explain the diet's good health effects (25).

In addition, when adherence to MD improves, *Lactobacillus*, *Bifidobacterium*, and *Prevotella* levels rise while *Clostridium* levels fall (26). Due to adequate consumption of polyphenols and micronutrients from the diet, positive changes in microbial characteristics have been reported. This microbial advantage plays a significant part in the cancer-preventive effect of diet. Adequate fiber intake, particularly from fruits, vegetables, and legumes, is important for the formation of a healthy microbiome (27).

#### **4. Sustainable Diet**

With the threat of climate change and its implications, sustainability has become more of a concern in recent years (28). In 2030, the global population is expected to reach 8.5 billion people; by 2050, it is expected to reach 9.7 billion people. It will be difficult to feed a growing population in a healthy way because it is necessary not only for adequate nourishment to exist, but also for environmental equilibrium. Food policies centered on health, dietary requirements, and food safety measures have recently prioritized topics including sustainability, environmentalism, economy, and sociality (29).

Global and environmental change is primarily caused by food production. While food production contributes 30% of greenhouse gas emissions, it also consumes 40% of available land and 70% of available fresh water. Food production errors can have negative consequences for biodiversity, such as overfishing and degradation of natural resources. Unless global diets high in refined sugars, fats, and meats alter by 2050, negative implications for agricultural land and climate change are projected (30).

Both the environment and public health may be safeguarded with the correct dietary adjustments. In 1986, Gussow and Clancy (31) proposed the concept of a sustainable diet. A sustainable diet is one that has a low environmental impact while both promoting food security and health. A sustainable diet must safeguard biodiversity and cultural values, respect ecosystems, be affordable and egalitarian, and be accessible. In terms of nutrition, it should also be characterized as adequate, safe, and healthy (32).

Animal source foods are responsible for over 75% of global warming. Wheat, rice and grains have a 30-50 percent influence. Plant-based diets are thought to have the least negative influence on

the environment. As a result, although it may appear utopian at the present, it is expected that in the future, protein sources obtained from insects (where culturally acceptable) or laboratory-grown meat would replace meat and milk consumption (33).

#### **5. Evaluation of Mediterranean Diet in Terms of Sustainability**

MD has been demonstrated to have a lower ecological footprint than other diet regimens. The fundamental reason for this is because local and seasonal plant-based foods are consumed more frequently whereas animal products are used less frequently (29). Animal husbandry has a greater negative impact on the environment than plant production. Organic farming is better for the environment than conventional farming. A Mediterranean-style eating model that includes organic farming can help to preserve soil fertility, biological variety, and natural resources (34). The connection between sustainability and MD is also founded on concepts like as biodiversity preservation, local production, traditions, and beliefs (35).

According to a survey of the Spanish public, adherence to the MD will result in large reductions in greenhouse gas emissions (72%), agricultural land usage (58%), energy use (52%), and water consumption (33%). These findings support MD's long-term viability in a globalizing society (36).

#### **6. Is It Possible to Globalize Mediterranean Diet?**

When looking at the eating patterns of Mediterranean countries, it is clear that they differ from those recorded in the 1960s and 1990s. In 1995, MD was even thought to be on the verge of extinction. Furthermore, with the effect of economic situations, a reduction in adherence to MD has been reported in Mediterranean nations. Taking the necessary safeguards and spreading the benefits of a healthy diet to the general public through various programs helped to the protection of MD (37). One example of these programs is the inclusion of MD recommendations in healthy meals in recent dietary standards (28).

One example of these programs is the inclusion of MD recommendations in healthy meals in recent dietary standards (28). Although it will be challenging to globalize this diet due to cultural differences, important measures can be performed. To practice traditional MD in the United States, the Harvard School of Public Health, Oldways, and many other organizations use practical materials such as cookbooks, blogs, and news articles. Restaurants and several hospitals are also involved in the collaboration. In the advertising sector, the media also plays a significant role. The primary purpose should be to promote Mediterranean cuisine and

culture. Clinicians should also ensure that the process is well managed by providing required dietary information (4).

### 7. Adherence to Mediterranean Diet in Turkey

The traditional diet of the Turkish people, who live in a Mediterranean country, is in line with MD standards. Examples of adherence to MD are demonstrated by not adding too much meat to meals, a low quantity of invisible fat in the diet, and widespread use of bulgur and legumes (38). Obesity, which has recently become a global issue, is, however, on the rise in Turkey. Changing dietary habits is a big part of it (39). In a 2017 study of university students, it was discovered that 47.5 percent of them did not have adequate nourishment for MD (40). Another study, which included women aged 19 to 60, discovered that 35.2 percent of participants had low compliance and 33.3 percent had moderate adherence to MD (41). Low MD adherence was linked to unfavorable health outcomes in both studies (40,41). Furthermore, water resources were better safeguarded with MD, according to a study done in 13 Mediterranean cities, including Ankara and Istanbul, and MD contributed to a sustainable future. For its health and sustainability benefits, Mediterranean diet should be preserved as a cultural treasure in Turkey (42).

### 8. Conclusion and Recommendations

Many chronic diseases can be prevented and treated by eating a healthy diet. In clinics, a wide range of diets are suggested, each of which reflects the society's traditions. One of them, Mediterranean-style nutrition, stands out for its health and sustainability benefits. According to recent research, MD should be favored because of its high nutritional content and herbal sources. Simultaneously, its easiness and cost effectiveness are two of its benefits. Some policies must be created in order for this diet to be adopted by a larger number of people around the world. Dietary benefits for health and the environment should be made available to the general people in a number of methods. New applications are required to boost the diet's widespread appeal, and more research is required at this time.

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GD: Data collection and processing data for research, literature review, writing of the article.

NS: Idea and design of the research, supervision and consultation, critical review, interpretation, final checks.

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