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# Can We Solve the Problem of Global Syndemic? Mediterranean Diet as a Potential Solution

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## Abstract

Healthy diets and sustainable food systems, in general, are among the key players to achieve sustainable planet and welfare of all people, and at the same time, to be in line with the Sustainable Development Goals (SDGs, UN 2015). These food systems offer not only a way towards ending the hunger, but also enable healthier nations and less environmental pollution. A good representative of a sustainable food system and a healthy diet is the Mediterranean diet that is affordable and transferable even in the regions far from the Mediterranean basin. Mediterranean diet could be a solution to overcome the global syndemic, which is becoming an emerging problem for the whole planet. This study proposes Mediterranean Diet as an example of a healthy and sustainable diet that could be introduced to children and young generations from early stages of their lives for the welfare and better human health and socio-economic status, as well as a way to reduce the impact of food production on the climate change.

Keywords: Mediterranean Lifestyle; Global Syndemic; Healthy Diet; Sustainable Food Systems

# Abbreviations

AIDs: Auto-immune Diseases; CVDs: Cardiovascular Disease; GHGs: Greenhouse Gas Emissions; MD: Mediterranean Diet; NCDs: Noncommunicable Diseases; SDGs: Sustainable Development Goals

# Introduction

In the last decades, the demand for food, energy and water has increased significantly. Traditional diets cannot support the whole population on the Earth; they are being replaced by unhealthy energy-rich diets comprising ultra-processed industrial foods, meat products, fast and ready-to-eat food choices rich in high salt content, preservatives, refined sugars and trans fats. The natural resources are highly attacked and affected by human activities and if they continue to be spent in such uncontrolled ways, then serious consequences on the public health and the environment would happen [1-4]. On the other hand, the adherence to healthy nutrientrich diets with beneficial health effects and positive environmental impacts is a real challenge for today's busy professional lives of the people in developed world, but also for the people suffering with poverty and malnutrition in the developing world. The UN Decade of Action on Nutrition (2016 – 2025) pays a specific attention on the transformation of food systems to promote healthy diets that are sustainably produced. Most of the actions, commitments and recommendations of FAO/WHO on healthy diets are also in line with the 2030 Agenda for Sustainable Development (UN, 2015). At the same time, enhancing the nutritive label of a healthy diet and lifestyle is helping to overcome diet-related non-communicable diseases (NCDs), such as diabetes, heart diseases, cancers, and obesity, which are the leading risk factors for mortality worldwide. For example, over 800 million individuals globally remain undernour-

**Citation:** Anka Trajkovska Petkoska. "Can We Solve the Problem of Global Syndemic? Mediterranean Diet as a Potential Solution". *Acta Scientific Nutritional Health* 5.2 (2021): 137-145. ished and do not have what to eat; "*while the poor starves, the rich gorges*": approx. 2 billion people are overweight or obese – they suffer from micronutrient deficiencies. For comparison, in 2018, 49 million children under five were affected by wasting, while 40 million were overweight. In addition to these "non-senses", it is remarkable that the food waste counts around one-third of the global food production [2,5-12].

Alternative diets have been proposed as solutions; they offer great health benefits, and if widely adopted, they would result in reduced impact on the climate changes, reduction in global agricultural greenhouse gas emissions (GHGs), reduced land clearing and species extinctions, and last but not less important, they will help in prevention of diet-related chronic non-communicable diseases, as well as diseases resulting from a polluted planet.

#### The global syndemic

The three pandemics - *obesity, undernutrition and climate change* - represent the *global syndemic* that affects the people worldwide [13]. It is a synergy of epidemics that co-occur in time and place with complex consequences (The Lancet Countdown is an international collaboration established to provide an independent, global monitoring system dedicated to tracking the emerging health profile of the changing climate) [13-19].

Climate change is a pandemic - it has sweeping effects on the health of the humans and the natural systems, we all depend on. In fact, malnutrition in all its forms (obesity, undernutrition, and other dietary risks) is the leading cause of poor health globally - it has been coined as a "globalisation of obesity" [13,14,17,18]. Malnutrition is costly - it is detrimental for the health of individuals, their wellbeing and productivity. It has also costly socio-economic consequences for societies throughout the world. Poor diets are a major contributory factor to the rising prevalence of malnutrition in all its forms. Moreover, unhealthy diets and malnutrition are among the top ten risk factors contributing to the global burden of diseases (United Nations Decade of Action on Nutrition, 2016-2025). Malnutrition, in all its forms, increases the risk of NCDs, such as heart disease, stroke, diabetes and certain types of cancers. They are a major cause of disability and death in almost all countries in the world [6,17,20,21].

The Global Syndemic covers a multidimensional set of factors that are implicated in the global rise of obesity, undernutrition, and climate change. The global industrial system, the food production, its transportation and consumption contribute and harms the human health, as well as affects the social cohesion, and the environment. One example of such multifold damage is agricultural drive towards higher value products, such as processed food, animal-based foods that are energy-consumable and generate methane and other waste products and emissions, and are usually consumed in unhealthy quantities. Such manufactured (ultra-processed) food is less healthy because it is high in trans fats, refined sugars, salt, and additives. On the other side, nutritious and fresh foods are less available and more expensive. For instance, several research studies have indicated that increased levels of CO<sub>2</sub> in the atmosphere are reducing the levels of micronutrients, such as zinc, iron, calcium, and potassium in e.g. wheat, potatoes, rice, etc., which are important for a good health. Also, there is an evidence that climate changes contributed to increased hunger and undernoursihment in the last decade(s); their direct effects reflected on food availability and accessibility to the rural and poor populations [14,17,22].

Rising the public awareness for healthy and sustainable diets could have positive effects of re-directing the global focus on facing and overcoming the issues of climate changes, at least to reduce the obesity and undernutrition portion of the global syndemic, as well as saving the planet [16,19,23-25]. In this context, there are many worldwide actions on promoting healthy eating, improving food systems, and strengthening the ability of civil societies to achieve prosperous and sustainable dietary and manufacturing changes [16,25,26].

Healthy diet is one that promotes growth and development of nations and whole societies, and at the same time prevents malnutrition and other diet-related disorders and diseases. In the global nutrition policy sphere, the term "malnutrition" no longer refers only to undernutrition, such as wasting, stunting, underweight or deficiencies in vitamins or minerals, but it is looked on from much bigger picture. According to Berry, the healthy diet is not just a list of "do's" and "don'ts", but rather should be a pleasurable, social and tasty experience, which should be instilled in children from a young age, similar as the Proverbs 22:6 says: "Train up a child in the way he should go: and when he is old, he will not depart from it"; so the earlier the younger generations are taught and practice a healthy diet, the more likely they are to take root and persist to the instilled

**Citation:** Anka Trajkovska Petkoska. "Can We Solve the Problem of Global Syndemic? Mediterranean Diet as a Potential Solution". *Acta Scientific Nutritional Health* 5.2 (2021): 137-145. healthy habits [27,28]. Moreover, many recent studies point out to synergies between healthy diets and reduced environmental pressures, leading to the notion of sustainable diets not only for healthy lives but also for healthy ecosystems.

In 2010, in a Food and Agriculture Organization report on biodiversity in sustainable diets was stated: *Countries, communities and cultures that maintain their own traditional food systems are better able to conserve local food specialties, with a corresponding diversity of crop varieties and animal breeds.* They are also more likely to show a lower prevalence of diet-related chronic diseases. The mainly plant-based Mediterranean diet is a good example; it is an example of sustainable and healthy diet and lifestyle [6,26]. It has the best scientific evidence for being nutrient-packed diet, which along with its economic and socio-cultural benefits positively affects the overall wellbeing and health of the people adhering to this diet [20,29-33].

#### Mediterranean diet vs. Western diet

Adequate and appropriate nutrition is required for the immune system to function in an optimal way, to make an effective response against pathogens but also to respond rapidly when necessary and avoid any chronic inflammation. During the infection and/or inflammation, the immune system is "activated" and that means increased demand for energy. These demands for energy and nutrients are usually taken from exogenous sources i.e., from the diet, but if the dietary sources are inadequate, then demands are taken from endogenous sources, such as the body "storages". Also, undernutrition can impair immune function; it is a key underlying feature for a range of chronic NCD conditions: cardiovascular disease (CVD), stroke, autoimmune disorders, etc. [34].

The Western diet is characterized as a diet high in refined sugars, salt, trans and saturated fats, but low in complex carbohydrates, fibers, micronutrients, and other bioactive molecules, such as polyphenols and omega-3 polyunsaturated fatty acids (Table 1). This diet, in general, is recognized by the immune system as a threat to the organism due to the high content of proinflammatory foods, like ultra-processed foods and saturated fats. In particular, the Western diet and the metabolism-induced inflammation associated with obesity (metaflammation) are known risk factors and treats to the human immune system [35-38].

On the other side, the Mediterranean Diet (MD) is mainly a plant-based diet, rich in vegetables, fruit, nuts, legumes, seeds, fish,

Food	Mediterranean	Western
Fruits and vegetables (fresh, minimum -processed)	High	Low
Whole grains (unrefined cereals, oats, brown rice)	High	Low
Legumes (beans, lentils, chickpeas)	High	Low
Nuts (walnuts, hazelnuts, pistachio, peanuts)	High	Low/Moderate
Fish, seafood (salmon, tuna, shellfish)	Moderate	N/A
Poultry (chicken, turkey)	Moderate	Moderate High
Processed red meats (sausages, hamburgers)	Low	High
Refined sugars (sweets, sweetened beverages)	Low	High
Extra-virgin olive oil	High	Low
Red wine	Moderate	N/A

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 Table 1: Comparison of Consumption Level of Certain Foods in Mediterranean and Western Diets.

**Figure 1:** Schematic presentation of Mediterranean Diet Pyramid (© 2009 Oldways Preservation and Exchange Trust).

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and 'healthy' dietary fats, mostly provided by the hallmark of the MD - the extra-virgin olive oil (Figure 1). Milk and fermented milk products, eggs, fish and lean meat are usually consumed in moderation, while highly processed foods are limited to occasional uses or on special occasions. The traditional Mediterranean diet usually refers to the dietary and lifestyle habits and traditions of the people living in the Mediterranean basin. It became a part of the UNES-CO's intangible cultural heritage in 2010, where MD is defined as *"a set of skills, knowledge, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking, and particularly the sharing and consumption of* 

*food.*" Numerous studies have associated MD with a reduced risk of chronic diseases - NCDs, cancers, dementia, Alzheimer's disease, Parkinson's disease and have also linked it to improved longevity and quality of life of the people adhered to this diet. A range of bioactive compounds (phytochemicals) found in fruits and vegetables (Figure 2, Table 1) have been reported for their protective health benefits (anti-inflammatory, anti-oxidant), and thus, reduction of the risks for developing NCDs attributed to chronic inflammation. For example, the dietary polyphenols in MD are known to have a role in regulation of inflammation; they can be immunomodulatory and anti-inflammatory in reducing the risk of CVD, neurological diseases and cancer [34,39-43].

Figure 2: Selected Typical Foods in the Mediterranean Diet with Their Nutrients (MD Inspired™).

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MD has also been shown to improve gut microbiomes' diversity and stability; this is mainly achieved by consuming diverse phytochemicals originating from variety of plant-derived foods (fruit, vegetables, nuts, seeds and whole grains) in abundance and minimally-processed, healthy fats originating mainly from extra virgin olive oil, nuts, seeds, fish and poultry, and probiotics (live cultures) originating from fermented milk products, such as curds, yoghurt, cheeses, and fermented vegetable products usually used to preserve them for a longer time period [33,41,44-46].

## **Conclusion and Future Perspective**

Globalization, industrial development, population number increase and urbanization have changed food production and consumption in ways that affect both, the ecosystems and the human diets. The resulting trends are alarming, highlighting the inadequacy of the present food supply - dietary patterns - NCDs relationship [3,22,47,48]. Over the past decades, a remarkable change in the world's population habits in terms of dietary lifestyle has also occurred. Many households do not cook the food, some food cooking techniques vanished from the kitchen; people shift to purchase packaged or processed or ready-to-eat food at local grocery shops. In addition, poor diets have become the number one cause of health issues such as diet-related obesity, diabetes mellitus and CVDs; they present enormous health and economic burdens for every society. In general, the lower income countries are recognizing the growing issue of "double burden" - a combination of undernutrition and NCDs [49-51].

At the same time, in today's world, we also are facing numerous recommendations from professionals for healthy diet choices emphasizing plant-based diets against the animal-based foods; promoting better and healthy ways of food production and cooking practicies associated with lesser environmental impact - less GHGs generated, less energy consumption, and lower land and water usage. The perfect representative of such diet and lifestyle is the Mediterranean diet emphasizing mainly plant-based diet and a healthy lifestyle. MD comprises consumption of vegetables, fruits, nuts, legumes and seeds, virgin olive oil, fermented dairy and vegetable products, eggs, fish and lean meat, altogether providing abundance of diverse vitamins, minerals, probiotics, dietary fibers and other phytonutrients (Figure 3), which in combination with the physical activities and the socializing aspects of this lifestyle, conviviality and the "sense of community", are contributing to the overall wellbeing and good health. Simply, it is an eating and living style with a positive impact on the health, society, economy and environment all inline with global SDGs (Figure 4) [26].

Figure 3: Benefits of Mediterranean lifestyle: phytochemicals frequently found in MD could protect from a number of diseases.

**Figure 4:** Mediterranean Diet - a sustainable lifestyle with health benefits, supporting the society, economy, environment, all inline with the SDGs.

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The MD is the best compromise between the need to reduce the environmental impact of food consumption and still maintain a healthy food consumption behavior. The growing body of scientific evidence has shown the significant health benefits and the low environmental footprints of MD. It has been shown that MD is a diet that can be easily transferred outside the Mediterranean area and can be practiced in the modern "dynamic profession-oriented world". However, recent reports on potential "westernization" and departure from the MD, even in the Mediterranean countries, are disappointing. Therefore, there is an urgent need to reverse the ongoing erosion of this Mediterranean heritage and to promote it as a sustainable dietary model worldwide. The quote "*A well-fed nation is a healthy nation, it is a sustainable and productive nation*" seems very true [27,44,52-57].

Furthermore, the effects of climate change are a real threat. The climate change and pollution have become key global challenges threatening sustainability of lifestyles, economies and ecosystems. Agricultural food systems are the number one driver of environmental change. In this context, livestock production is the world's largest land user and responsible for half or more of GHGs from agri-food systems, and the source of repeated health crises. Growing competition for land, water, and energy, will affect our ability to produce food, and there is an urgent requirement to reduce the impact of the food systems on the environment. The humans need to move beyond understanding urbanization's direct effects on diet, but to assess its indirect effects on natural resources and the environment, such as the energy used for food production, transport, packaging, storage, and the rest of the entire food chain. Understanding the relationship "from farm to fork" will mean understanding the real global treat - the global syndemic - and start solving it [2,3,58-60].

Shifting dietary habits towards the healthy ones, presents a significant challenge for cultural, ecological and economic reasons, and will require actions from different entities, such as governments, businesses, and individuals that go beyond information and education programmes. In addition to this, the worldwide CO-VID-19 crisis will leave a lot of consequences on the overall "wellbeing" of the planet; according to Watts., *et al.* (2020): "*The public health and financial effects of COVID-19 will be felt for years to come, and efforts to protect and rebuild local communities and national*  economies will need to be robust and sustained. Despite concerning indicators across each section of this report, the 2021 UN Climate Change Conference presents an opportunity for course correction and revitalised NDCs....". Therefore, urgent actions are needed to attack the already present global syndemic and be prepared for the consequences from the COVID-19 pandemics. And what is the better way to start with that with the food we consume at home, the ways how it is made, stored and transported. Mediterranean diet seems to uniquely respond to all we need in time of pandemic and beyond without affecting the planet and leaving it intact for many generations to come.

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## **Conflict of Interest**

The author declares no conflicts of interest.

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