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THE EFFECT OF THE MEDITERRANEAN DIET PATTERN ON CHOLESTEROL LEVELS AND CARDIOVASCULAR HEALTH IN URBAN ADULTS

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Abstract

Cardiovascular disease is one of the main causes of death in urban areas, which is triggered by unhealthy lifestyles, including unbalanced diets. The Mediterranean diet has been known as a dietary approach that is rich in healthy fats, fiber and antioxidants which play a role in maintaining heart health. However, its effectiveness in reducing cholesterol levels and improving cardiovascular health in urban communities still needs to be studied further. This research uses a systematic literature review method by analyzing various journals and scientific articles from trusted databases such as PubMed, ScienceDirect, and Google Scholar over the last 10 years. The collected data was analyzed thematically and comparatively to evaluate the impact of the Mediterranean diet on LDL, HDL cholesterol levels and the risk of cardiovascular disease. Studies show that the Mediterranean diet significantly lowers LDL levels, increases HDL levels, and reduces the risk of atherosclerosis. Additionally, this diet has been shown to be effective in reducing inflammation and improving blood vessel function, which contributes to a reduced risk of heart disease. Large studies such as PREDIMED support these findings by showing a 30% reduction in the risk of cardiovascular disease in individuals who adopt a Mediterranean diet. However, its implementation in urban areas faces challenges such as limited time, access to healthy food ingredients, and different eating habits. The Mediterranean diet has been proven to be beneficial in maintaining cardiovascular health and lowering cholesterol levels, making it an effective dietary strategy for urban communities. However, flexible adaptation is needed by considering the availability of local food ingredients and the lifestyle of urban communities so that this diet can be implemented sustainably.

Keywords: Mediterranean Diet, Cholesterol, Cardiovascular Disease, Heart Health, Urban.

INTRODUCTION

Cardiovascular disease (CVD) is one of the main causes of death in the world, especially in urban areas. Rapid urbanization has caused changes in people's lifestyles, including increasingly unhealthy eating patterns. Excessive consumption of foods high in saturated fat, sugar and salt, as well as lack of physical activity, contributes to the increasing prevalence of obesity, hypertension and dyslipidemia. The combination of these factors is the main trigger for the high incidence of cardiovascular disease in urban communities (Poli et al., 2022).

One of the main risk factors for cardiovascular disease is uncontrolled cholesterol levels. High LDL (low-density lipoprotein) cholesterol and low HDL (high-density lipoprotein) cholesterol levels have been associated with an increased risk of atherosclerosis, which can lead to coronary heart disease and stroke. Unhealthy diets, such as high consumption of trans fats and processed foods, have been shown to worsen a person's lipid profile (Filippin et al., 2023). Therefore, intervention through healthier eating patterns is an important step in preventing and managing the risk of cardiovascular disease.

The Mediterranean diet is an eating pattern that has been widely studied in the context of cardiovascular health. This diet focuses on consuming natural foods such as fruit, vegetables, whole grains, nuts, fish, and olive oil as the main source of fat. Apart from that, this diet also limits consumption of red meat and processed foods, and emphasizes a balanced diet with an intake of antioxidants and healthy fats (Desmawati et al., 2023). Various studies show that this diet pattern has the potential to reduce levels of bad cholesterol (LDL) and increase good cholesterol (HDL).

A number of epidemiological studies and clinical trials have proven that the Mediterranean diet has a protective effect on heart health. These studies found that individuals who adopted a Mediterranean diet had a significantly reduced risk of cardiovascular disease compared with those who consumed a Western diet rich in processed foods and saturated fats. The main mechanism of this diet in reducing the risk of heart disease involves anti-inflammatory effects, improving vascular endothelial function, and reducing oxidative stress (Hammer et al., 2024).

Although there is a lot of scientific evidence supporting the benefits of the Mediterranean diet, its implementation in urban environments still faces various challenges. Changes in the eating patterns of urban communities are often influenced by socio-economic factors, the availability of healthy food, and eating habits that have been formed for a long time. Apart from that,

limited access to fresh and natural food ingredients is also an obstacle in adopting this eating pattern optimally (Puca, 2024). Therefore, a deeper understanding is needed regarding the effectiveness and ways of adapting the Mediterranean diet in the context of urban society.

A review of the literature regarding the Mediterranean diet and its effects on cholesterol levels and cardiovascular health is important to provide a stronger scientific basis for recommending this eating pattern as part of a heart disease prevention strategy. By analyzing the various studies that have been conducted, a more comprehensive insight can be obtained regarding the extent to which this diet can help control cholesterol levels and improve heart health, especially among adults living in urban areas (Baig et al., 2024).

Apart from that, this study also aims to identify factors that can support or hinder the implementation of the Mediterranean diet in everyday life. Understanding the social, cultural and economic aspects that influence the eating patterns of urban communities will help in designing more effective intervention strategies. Thus, this research can be a reference for health practitioners, policy makers, and individuals who want to adopt a healthy eating pattern to improve quality of life and prevent the risk of cardiovascular disease (Hageman, 2022).

With the increasing incidence of cardiovascular disease in big cities, preventive measures through a scientifically based dietary approach are becoming increasingly relevant. It is hoped that this literature review can contribute to disseminating information about the Mediterranean diet and its benefits, as well as encouraging more individuals to adopt a healthier diet to maintain their heart health.

RESEARCH METHOD

This study uses a systematic literature review method to analyze the influence of the Mediterranean diet pattern on cholesterol levels and cardiovascular health in urban adults. The articles and journals used in this research were selected based on certain criteria, such as relevance to the research topic, publication in reputable journals, and focus on studies examining the relationship between the Mediterranean diet and heart health. This study also prioritizes literature published within the last 10 years to ensure that the information studied remains current and relevant to developments in nutritional science and cardiovascular health.

The data sources used come from various scientific databases such as PubMed, ScienceDirect, and Google Scholar, which provide peer-reviewed

journals with high credibility. The data analysis method used is thematic and comparative analysis, where the studies that have been collected will be categorized based on main themes, such as the effect of the Mediterranean diet on LDL, HDL and triglyceride cholesterol levels, as well as its impact on cardiovascular health in general. The results of the analysis will be presented in table or graphic form if necessary, to make it easier to compare findings from various studies and clarify the conclusions obtained (Earley, M.A.2014; Snyder, H.2019).

RESULT AND DISCUSSION

Impact of the Mediterranean Diet on Cholesterol Levels

The Mediterranean diet has been widely studied in relation to heart health, especially in lowering cholesterol levels and improving lipid profiles. Various studies show that this diet can significantly reduce levels of LDL (low-density lipoprotein) cholesterol, which is often referred to as "bad cholesterol", while increasing levels of HDL (high-density lipoprotein) cholesterol, which plays a role in protecting heart health (Fakhoury et al., 2022). A meta-analysis research combining results from several clinical studies found that individuals who adopted a Mediterranean diet experienced a 10-15% reduction in LDL levels, while HDL levels increased, contributing to better cardiovascular function.

The main mechanism behind the positive effect of the Mediterranean diet on cholesterol levels is its nutritional composition which is rich in healthy fats, especially from olive oil, nuts and fish. Monounsaturated fatty acids (MUFA) in olive oil have been shown to reduce LDL levels without reducing HDL, while omega-3 fatty acids in fish help reduce triglycerides and have anti-inflammatory effects that protect blood vessels from atherosclerosis. In addition, the high fiber content in fruits, vegetables and whole grains helps reduce cholesterol absorption in the intestine, thereby reducing cholesterol levels in the blood (Anggie et al., 2024).

Apart from its nutritional components, the effect of the Mediterranean diet on cholesterol levels is also influenced by the individual's compliance with this eating pattern. Studies show that those who consistently follow a Mediterranean diet for more than 6 months experience a more significant reduction in LDL levels than those who only follow this diet for a short period of time. Consistency in replacing sources of saturated fat (such as butter and red meat) with healthy fats from olive oil and nuts is the main key to optimally lowering cholesterol levels (Salma, 2024).

In addition, genetic factors also play a role in the effectiveness of the Mediterranean diet on cholesterol levels. Some individuals have a genetic predisposition to respond better to a diet high in healthy fats, while others may experience no significant changes (Hashiguchi et al., 2022). Studies show that individuals with certain gene variants in the APOA1 and LDLR genes are more likely to experience greater increases in HDL after adopting a Mediterranean diet. Therefore, the response to this diet can vary between individuals.

Overall lifestyle also influences the effectiveness of the Mediterranean diet in regulating cholesterol levels. Those who combine this diet with regular physical activity tend to experience more significant improvements in their lipid profile than those who only change their diet without increasing physical activity. Aerobic activities such as walking, cycling, or swimming help increase lipid metabolism, speed up the breakdown of triglycerides, and increase the effectiveness of HDL cholesterol in cleaning blood vessels from atherosclerotic plaque (Ecarnot & Maggi, 2024).

Social and cultural factors also play a role in adopting the Mediterranean diet and its impact on cholesterol levels. The availability of foods that suit this dietary pattern, such as extra virgin olive oil, fresh fish, and nuts, can influence a person's success in adopting this dietary pattern in a sustainable manner. In some urban areas, access to healthy food may be more limited compared to fast food which is more convenient and cheaper (Radu et al., 2023). Therefore, education and public health policies are important in supporting the adoption of the Mediterranean diet on a wider scale.

Overall, scientific evidence shows that the Mediterranean diet has a clear impact on reducing cholesterol levels and improving lipid profiles. However, its effectiveness is influenced by various factors such as individual compliance, genetic factors, physical activity, and the availability of healthy food ingredients. Therefore, for urban communities who want to adopt the Mediterranean diet, a holistic approach is needed that does not only focus on diet, but also considers lifestyle and environmental factors so that the benefits for heart health can be maximized.

Effects of the Mediterranean Diet on Cardiovascular Health

The Mediterranean diet has long been associated with improved cardiovascular health, particularly reducing the risk of coronary heart disease, stroke and hypertension. One of the main mechanisms explaining the benefits of this diet is its anti-inflammatory and antioxidant effects. Foods rich in

monounsaturated fatty acids (MUFA) from olive oil and omega-3 fatty acids from fish play a role in reducing systemic inflammation, which is a major factor in the development of atherosclerosis (Wang et al., 2024). Additionally, high consumption of fiber from vegetables, fruits, and whole grains helps control blood sugar levels and improves overall metabolic health.

The Mediterranean diet also plays a role in improving the function of the blood vessel endothelium, namely the inner lining of blood vessels which plays a role in regulating blood pressure and blood flow. Studies show that individuals who follow a Mediterranean diet consistently have more stable blood pressure than those who consume a diet high in saturated fat and sodium. This diet helps increase the production of nitric oxide, a compound that helps blood vessels stay relaxed and reduces the risk of hypertension (Schmidt et al., 2023).

A large study known as PREDIMED (Prevención con Dieta Mediterránea) conducted in Spain involved more than 7,000 participants at risk of heart disease. This study found that individuals who adopted a Mediterranean diet enriched with olive oil or nuts experienced a 30% reduced risk of cardiovascular disease compared to the group consuming a low-fat diet (Mattavelli et al., 2022). These results indicate that a diet based on natural foods and rich in healthy fats is more effective in protecting the heart compared to a dietary approach that only limits fat consumption in general.

When compared with other dietary patterns, such as low-fat diets or high-protein diets, the Mediterranean diet is superior in reducing cardiovascular risk without compromising nutritional balance. Low-fat diets often reduce the intake of healthy fats which are actually needed to maintain lipid balance in the body (Beauchamp, 2023). Meanwhile, high-protein diets such as the keto diet or a diet high in red meat can increase LDL levels if the protein source comes from foods high in saturated fat, which can increase the risk of heart disease in the long term.

Additionally, the Mediterranean diet is easier to maintain long term compared to other restrictive diets. Many people have difficulty sticking to low-carb or other extreme diets because of the limitations in food variety and the metabolic side effects that can occur. In contrast, the Mediterranean diet allows for the consumption of healthy carbohydrates from whole grains as well as diverse plant and animal protein sources, making it easier to adopt and sustainable for long-term health (Dines, 2022).

In addition to the physiological benefits, the Mediterranean diet also has a positive impact on mental health and quality of life, which also indirectly

contributes to heart health. This eating pattern is associated with reduced levels of stress and depression, which are additional risk factors for cardiovascular disease. Antioxidants in vegetables and fruit, as well as healthy fats from nuts and fish, have neuroprotective effects that help maintain brain health and reduce inflammation that can affect heart health (Beauchamp, 2023).

Overall, the Mediterranean diet offers a holistic approach to maintaining heart health through a combination of balanced nutrition, anti-inflammatory effects, improved blood vessel function, and a positive impact on mental well-being. Scientific studies and comparisons with other diet patterns show that this diet is not only effective in reducing the risk of cardiovascular disease, but is also easier to implement in the long term (Amalia et al., 2024). Therefore, the Mediterranean diet is one of the main recommendations for individuals who want to maintain heart health, especially for those who live in urban areas with high risks due to modern lifestyles.

Implications for Urban Lifestyles

The implementation of the Mediterranean diet in urban environments faces various obstacles, especially because modern lifestyles tend to be fast-paced and practical. Many urban residents prefer ready-to-eat or processed foods that are high in saturated fat, salt and sugar because of limited time in preparing healthy meals. Busy work patterns, lack of time to cook, and the habit of eating outside the home are the main challenges in adopting a natural food-based diet such as the Mediterranean diet (Wong, 2024).

Apart from the time factor, the availability and accessibility of healthy food ingredients is also an obstacle. Some key ingredients in the Mediterranean diet, such as extra virgin olive oil, fresh fish, nuts and whole grains, often command a higher price compared to processed foods or flour-based products and red meat that are more commonly consumed in urban areas. Economic inequality also affects individuals' ability to implement this diet, especially for those who have financial limitations in purchasing healthy food ingredients (Mustofa et al., 2024).

Cultural factors and eating habits of urban communities also influence the adoption of the Mediterranean diet. In many urban cultures, consumption of rice and processed carbohydrate-based foods such as white bread and noodles is still very dominant (Primo et al., 2024). In addition, the habit of eating large portions with high red meat consumption is often difficult to

change, especially in societies where meat consumption is a sign of economic prosperity.

To overcome these obstacles, a Mediterranean diet adaptation strategy is needed that is more flexible and appropriate to the living conditions of urban communities. One way is to use local food ingredients that have similar characteristics to the main components in the Mediterranean diet (Chaudhary & Anwar, 2024). For example, pure coconut oil or canola oil can be an alternative to olive oil, while easily available freshwater fish can replace high-fat sea fish such as salmon.

In addition, urban residents can implement gradual dietary modifications, such as replacing processed snacks with nuts, increasing consumption of vegetables in every meal, and replacing processed carbohydrate sources with whole grains such as brown rice or quinoa. Reducing fast food consumption and increasing foods based on fresh ingredients can also help promote health benefits similar to those of the Mediterranean diet (Sultan et al., 2024).

It is also important to utilize modern technology and services to support healthy eating patterns. Healthy food applications, catering services based on the Mediterranean diet, and online grocery shopping can be a solution for those who have limited time to cook. In addition, education through social media and health communities can help increase awareness in urban communities about the benefits of the Mediterranean diet and how to adopt it easily (Bubeck et al., 2023).

Overall, although there are various challenges in implementing the Mediterranean diet in urban areas, flexible and innovative solutions can help people adopt this healthy eating pattern without having to drastically change their lifestyle. With a more adaptive approach and based on the availability of local ingredients, the Mediterranean diet can become part of a healthy lifestyle for urban communities to reduce the risk of cardiovascular disease and improve overall quality of life.

CONCLUSION

This literature review shows that the Mediterranean diet has a significant positive impact on cholesterol levels and cardiovascular health, especially in reducing LDL levels, increasing HDL, and reducing the risk of heart disease. The main mechanism that plays a role in this effect is the content of healthy fats, high fiber, as well as anti-inflammatory and antioxidant compounds found in the main foods of the Mediterranean diet such as olive

oil, fish, nuts, and fresh fruit and vegetables. The studies reviewed, including large studies such as PREDIMED, consistently show that individuals who adopt this diet experience a reduced risk of cardiovascular disease by up to 30%, making it one of the most effective diets for maintaining heart health.

Apart from its scientifically proven benefits, implementing the Mediterranean diet in an urban environment faces several challenges, such as time constraints, food costs, and different eating habits. However, with the right adaptations, such as using local food ingredients, replacing snacks with healthy foods, and utilizing modern technology and services, this diet can still be applied practically by urban communities. Therefore, the Mediterranean diet can be recommended as a long-term dietary strategy to improve heart health and reduce the risk of cardiovascular disease, especially for individuals who live in an environment with a fast-paced lifestyle and are at high risk of metabolic disease.

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