

The Role of Plant-Based Diets in Preventing Chronic Diseases: Current Trends and Evidence

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ARTICLE INFO	ABSTRACT
<p>Entered October 10, 2024</p> <p>Revised November 11, 2024</p> <p>Accepted November 20, 2024</p> <p>Published November 30, 2024</p>	<p>Chronic diseases such as type 2 diabetes mellitus, hypertension, heart disease and cancer are major challenges in global public health. Unhealthy diets, such as the consumption of foods high in saturated fat and low in fiber, contribute to the increasing prevalence of these diseases. Research shows that plant-based diets have significant potential in the prevention of these chronic diseases, thanks to their high fiber, antioxidant and phytonutrient content and low saturated fat. In addition to the health benefits, plant-based diets also support environmental sustainability by reducing greenhouse gas emissions, land use and natural resources compared to animal-based food production. While the adoption of plant-based diets is gaining popularity, challenges such as nutritional misconceptions, limited access to plant-based foods and cultural barriers need to be overcome. Stronger education and supportive public policies, such as subsidizing plant-based products and taxing animal products, are essential to expand their impact. Plant-based diets are not only a personal health solution, but also part of a global strategy to achieve the Sustainable Development Goals (SDGs), by reducing negative environmental impacts and increasing food security. This study aims to comprehensively explore the dynamics of adoption of plant-based diets as a chronic disease prevention strategy and its impact on health and the environment</p>
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INTRODUCTION

Chronic diseases, such as type 2 diabetes mellitus, hypertension, heart disease and cancer, have become major public health challenges in many countries. The prevalence of these diseases continues to increase, along with changes in lifestyle that tend to be unhealthy, such as the consumption of foods high in saturated fat and low in fiber. In this context, diet becomes one of the most significant aspects in the prevention and management of chronic diseases. Several recent studies have shown that plant-based diets have great potential to reduce the risk of these diseases. A study by Widiastuti et.al (2024) found that individuals who adopted a plant-based diet experienced a 25% reduced risk of cardiovascular disease. This is mainly due to the high fiber, antioxidant and phytonutrient content, as well as the low levels of saturated fat in plant-based foods. In addition, a plant-based diet can also help control weight, which is a major risk factor for many chronic diseases. Plant-based diets are therefore increasingly relevant to study as an effective chronic disease prevention strategy.



Plant-based diets are gaining global attention, driven by modern lifestyle trends that prioritize health and sustainability. The Global Food Trend 2024 report reveals that the adoption of plant-based diets has increased by 15% worldwide in the past five years. The role of social media and public figures, such as celebrities and influencers, has accelerated the adoption of this lifestyle across different age groups. In addition, the emergence of a global movement emphasizing the importance of environmental sustainability has also strengthened the appeal of plant-based diets (Alcorta et.al., 2021). Many individuals now view these diets as a way to support their health while protecting the planet. This trend is not only growing in developed countries, but is also starting to be seen in developing countries, albeit on a more limited scale. However, the adoption of plant-based diets is often characterized by barriers, such as access to diverse foodstuffs and education on proper diet. As awareness of the benefits of plant-based diets continues to rise, there is a great opportunity to expand their impact globally.

Despite the promise, the implementation of plant-based diets faces significant challenges across different walks of life. One of the main barriers is misconceptions about the adequacy of nutrients in these diets, especially regarding protein, iron and vitamin B12 intake. A survey in 2022 showed that 40% of people still think plant-based diets do not meet their daily protein needs, despite scientific evidence to the contrary. In addition, in some areas, the availability of high-quality plant-based foods is still limited, especially in rural areas. Cultural factors also play an important role, as some culinary traditions rely heavily on the consumption of animal products. Education on plant-based diets needs to be strengthened to overcome these challenges, whether through mass media, educational institutions or government programs. The development of supportive policies, such as subsidies for plant-based foods, can also help overcome the often prohibitive economic constraints (Gibbs & Cappuccio, 2022). With the right strategies, these barriers can be minimized, allowing plant-based diets to be more widely adopted.

In addition to the health benefits, plant-based diets also contribute significantly to environmental sustainability. Plant-based food production is known to produce much lower greenhouse gas emissions compared to the production of meat and animal products (Masturi et.al., 2021). This trend is further reinforced by the IPCC 2022 report which highlights that the adoption of plant-based diets can reduce global emissions by up to 20%. This makes plant-based diets a practical and effective climate change mitigation solution. On the other hand, these diets also support the preservation of natural resources, such as water and land, which are often depleted by the livestock industry. Several countries have started to integrate plant-based diets into public policy, both through educational campaigns and financial incentives. However, the adoption of plant-based diets as part of policy still requires further research to ascertain their impact on public health and the economy. With the growing evidence on the benefits of plant-based diets, strategic measures to encourage their adoption are becoming increasingly important. Plant-based diets are therefore not only a health solution, but also an integral part of global efforts to maintain environmental sustainability.

Plant-based diets also have a positive impact on an individual's mental health and well-being. Several studies have shown that consumption of plant-based foods, especially those rich in vitamins, minerals and antioxidants, can help reduce symptoms of depression and anxiety. A 2023 meta-analysis study, for example, found that a plant-based diet was associated with an 18% reduction in the risk of mental disorders. This is due to the link between nutrients contained in plant-based foods and optimal brain function (Wang et.al., 2023). In addition, this diet can improve sleep and energy,

contributing to daily productivity. With a growing body of scientific evidence supporting these benefits, plant-based diets are now part of a holistic approach to maintaining overall health. However, more education is needed to explain the connection between plant-based diets and mental health to get more people interested in adopting them.

Plant-based diets are also relevant in the context of developments in food technology and industrial innovation. The emergence of innovative plant-based food products, such as plant-based mock meat and plant-based milk, reflects the growing public demand for healthy and sustainable food alternatives. The 2024 Future of Food report shows that the plant-based mock meat market grew 23% per year since 2020, indicating rapid adoption by the global community. These food technologies not only expand access to plant-based foods but also offer flavors and textures that more closely resemble animal products. This makes the transition to a plant-based diet easier for the general public. However, it is important to ensure that these innovations maintain optimal nutritional content and do not contain additives that are detrimental to health. Collaboration between government, industry and academia is needed to encourage the development of food technologies that support plant-based diets.

In a global context, plant-based diets can be one of the solutions to address hunger and food security. The production of plant-based foods, such as grains, legumes and vegetables, requires fewer resources than intensive livestock farming. A 2023 FAO analysis suggests that plant-based food production could meet global calorie needs up to 1.5 times that of animal-based consumption patterns. This makes plant-based diets more efficient and has the potential to provide more affordable food to vulnerable populations. In developing countries, the adoption of plant-based diets based on local resources can help improve food security while reducing dependence on food imports. However, implementing this strategy requires an approach that takes into account cultural aspects and resource availability in each region. With the right approach, plant-based diets can be an important instrument in supporting sustainable development.

The importance of plant-based diets is also aligned with global efforts to achieve the Sustainable Development Goals (SDGs). These diets directly support goals related to good health (SDG 3), responsible consumption and production (SDG 12), and action on climate change (SDG 13). The UN 2022 report underlines that the transition to plant-based diets could be key in meeting the SDG targets, especially in countries with high carbon footprints. In this case, plant-based diets are not only an individual choice, but also part of a collective strategy to achieve a balance between human health and environmental sustainability. Achieving optimal impact requires the integration of health advocacy, public policy and community engagement. By supporting plant-based diets, the global community can move towards a healthier, more sustainable and inclusive future.

As such, plant-based diets are not just a trend, but a multidimensional solution that addresses health, social and environmental challenges. Through comprehensive research, trend analysis, and supportive policy development, the adoption of these diets can be maximized to benefit individuals and society at large. This approach is expected to make a real contribution to creating a healthier and more sustainable life.

METHODOLOGY

In this study, a qualitative approach was used to deeply understand the phenomenon of adopting a plant-based diet as a chronic disease prevention strategy, and how it relates to current trends and evidence. This approach was designed to explore

individual experiences, community perceptions and socio-cultural dynamics that influence plant-based consumption patterns. This study used phenomenology methods to explore the subjective experiences of individuals who have adopted plant-based diets, especially in the context of health benefits and sustainability. The research subjects included 20 participants selected by purposive sampling, consisting of individuals who have been on a plant-based diet for at least one year, health practitioners such as nutritionists and doctors, plant-based food industry players, and members of vegan or vegetarian communities who actively promote this diet.

Data was collected through three main techniques: in-depth interviews, participatory observation, and document analysis. Semi-structured interviews were designed to explore participants' motivations, challenges and perceived benefits, as well as their views on global trends and current scientific evidence. Participatory observation was conducted by attending community activities such as cooking workshops, health seminars and social media campaigns to observe social interactions and educational strategies. In addition, document analysis of recent research reports, plant-based food market trends and policies related to food sustainability was conducted to enrich and verify field data.

The data obtained was analyzed using the thematic analysis method. The analysis process began with the transcription of interviews and field notes, followed by initial coding to identify key themes such as health benefits, adoption constraints, and innovation trends. These themes were then categorized based on the relationship between health benefits, sustainability, and plant-based diet trends. The results of the analysis were organized into in-depth qualitative narratives to explain the phenomenon under study in a structured and logical manner.

Data validity was maintained through triangulation of methods, by comparing the results of interviews, observations and document analysis. In addition, group discussions with health and sustainability experts were conducted to ensure that the data obtained were relevant and valid. With this approach, the research is expected to provide a comprehensive insight into the dynamics of plant-based diet adoption, while supporting the arguments presented in the introduction, especially regarding health benefits, social challenges, and the relevance of these diets to current trends and evidence.

RESULTS AND DISCUSSION

Relationship between Plant-based Diet and Chronic Disease Prevention

Plant-based diets, which focus on the consumption of plant-derived foods, have been shown to provide great benefits in the prevention of chronic diseases such as type 2 diabetes, heart disease, hypertension and cancer. Various scientific studies published in leading health journals show that this diet significantly reduces the risk of developing these diseases. For example, a study published in the *Journal of the American Heart Association* (2022) revealed that a plant-based diet can reduce the risk of heart disease by 32%. This reduction was attributed to a reduction in LDL cholesterol (bad cholesterol) and an increase in HDL cholesterol (good cholesterol), which works to reduce the risk of heart disease. In addition, plant-based diets help lower blood pressure, which is important for the prevention of hypertension and related heart diseases. This diet has also been shown to help regulate blood sugar levels, which reduces one's chances of developing type 2 diabetes. This is supported by findings in *Diabetes Care* (2021) in Permatasari et.al (2023) which showed that a fiber-rich plant-based diet can reduce the risk of type 2

diabetes by 30%. This reduced risk is associated with improved insulin sensitivity, which helps prevent metabolic disorders. Thus, a plant-based diet has a wide-ranging positive impact on cardiovascular and metabolic health.

One of the main factors supporting the benefits of a plant-based diet is its high fiber content. Fiber from vegetables, fruit, whole grains and legumes plays an important role in slowing the absorption of blood sugar, which helps control blood glucose levels. Research published in *Diabetes Care* (2021) shows that consistent consumption of fiber from plant-based sources can improve insulin sensitivity, which is crucial in preventing type 2 diabetes. Fiber also plays a role in maintaining digestive health by improving bowel movements and preventing constipation. Research in *The American Journal of Clinical Nutrition* (2020) in Widiasturi et.al (2024) also found that high fiber consumption from plant-based foods helps manage weight by providing a longer feeling of fullness. In the study, participants who consumed more fiber from plant sources had a more stable body weight and were less likely to develop obesity or other metabolic disorders. In addition, dietary fiber helps maintain a healthy microbial flora in the digestive tract, which contributes to strengthening the immune system and preventing chronic inflammation.

The following data supports the benefits of a plant-based diet based on relevant research:

Condition/Illness	Risk/Benefit Reduction	Data Source
Heart Disease	32% risk reduction related to consuming plant-based foods	Journal of the American Heart Association (2022)
Type 2 Diabetes	30% risk reduction through plant-based diets rich in fiber	Diabetes Care (2021)
Hypertension	Significant reduction in blood pressure in those consuming plant-based foods	American Journal of Clinical Nutrition (2020)
Digestive Health	Improved digestive health and reduced risk of complications for those consuming more plant-based foods	The American Journal of Clinical Nutrition (2020)
Body Weight & Obesity	Stable weight reduction and reduced obesity risk through consuming plant-based foods	The American Journal of Clinical Nutrition (2020)

Global Trends and Lifestyle Changes

The global trend towards plant-based diets is increasing as people realize the health benefits that can be derived from these diets. Studies conducted by Ramadhan (2024) show that a plant-based diet can reduce the risk of chronic diseases such as heart disease, type 2 diabetes, and some cancers. Plant-based diets are rich in fiber, antioxidants, and vitamins that are beneficial for the body. In addition, consumption of plant-based foods can support healthy weight loss and boost the body's energy. This has led many people to switch from a meat-based diet to a more plant-based diet. Apart from health reasons, environmental factors are also a major driver behind this trend. Plant-based food production has a lower carbon footprint and requires fewer natural resources

compared to the livestock industry. Therefore, a plant-based diet is considered a more environmentally-friendly option.

This lifestyle change is further influenced by the growing awareness of sustainability and the environmental impact of consuming animal products. Plant-based diets are considered a solution to reduce greenhouse gas emissions and conserve finite natural resources. Studies show that the livestock industry contributes significantly to air pollution and deforestation, which contribute to climate change. Many individuals are choosing plant-based diets to contribute to reducing negative impacts on the planet. Consumption of plant-based foods is also associated with more efficient water use, as plant products require less water compared to livestock rearing (Lakitan, 2021). The environmental impact of the food industry has encouraged consumers to be more conscious in choosing products that are more environmentally friendly. This trend is also followed by many restaurants that now offer plant-based menu options to attract consumers who care about sustainability. In some countries, plant-based products have grown rapidly and are now easily found in the market.

The influence of social media plays a big role in accelerating the adoption of plant-based diets, especially among the younger generation. Platforms such as Instagram, TikTok and YouTube have become effective mediums to spread the trend of healthy eating. Celebrities and social media influencers have also contributed to the introduction of plant-based diets by sharing their personal experiences. Celebrities such as Beyoncé, Ariana Grande and Lewis Hamilton often post content about plant-based diets and how it supports their healthy lifestyle. When celebrities with great influence choose to adopt a plant-based diet, many of their followers feel inspired to do the same (Wilson, 2019). In addition, many restaurants and food products are now using social media to promote their plant-based menus, attracting more consumers to try this diet. This social media influence has made plant-based diets more popular and a more common choice among the general public. This trend includes not only celebrities, but also ordinary individuals who have great influence through these platforms.

Apart from celebrities, the environmental movement has also had a great impact on the adoption of plant-based diets around the world. Environmental organizations such as Greenpeace and World Wildlife Fund (WWF) have been campaigning for plant-based diets as a way to reduce the negative impact of the livestock industry on the environment. They educate the public on how the consumption of animal products can exacerbate the climate crisis and cause extensive environmental damage. Campaigns such as Meatless Monday, which encourages people to reduce their meat consumption on a certain day, have successfully captured the attention of the public in many countries. These movements are gaining support from individuals who are concerned about climate change and planetary sustainability. These campaigns not only help reduce the consumption of animal products but also raise awareness about the importance of a plant-based diet. Many people now feel that a plant-based diet is not only good for personal health, but also an important step in taking care of the earth. These movements are increasingly influencing people to switch to a more eco-friendly and sustainability-conscious diet.

Challenges in Implementing a Plant-Based Diet

While plant-based diets are gaining popularity, their implementation is not without its challenges. One of the main obstacles faced is cultural factors. In many cultures, the consumption of animal products such as meat, eggs and dairy has become an integral part of traditions and daily eating habits (Tuhuteru et.al., 2019). For example,

in some countries, eating meat is considered a symbol of social status and success. Therefore, a shift towards a plant-based diet can be considered a major challenge, especially among older generations or those who are strongly attached to their culinary traditions. In addition, social factors also play an important role, as a plant-based diet is still perceived by some as an impractical or inadequate option. Eating habits that have been deeply ingrained over the years are one of the barriers to transitioning to a plant-based diet, despite evidence supporting its benefits.

In addition to cultural constraints, access to plant-based foods is also a major challenge in implementing this diet, especially in resource-constrained or hard-to-reach areas. While plant-based products are increasingly available in large markets, there are still many areas of the world, including in developing countries, that have limited access to healthy and nutritious plant-based foods. Geographical factors and inadequate infrastructure make the distribution of plant-based foods uneven (Arifiani et.al., 2023). In some countries, products such as nuts, seeds or fresh vegetables may be difficult to find or too expensive, hindering the adoption of plant-based diets. This leaves many individuals feeling that a plant-based diet is not a practical or affordable option for them. Without adequate access to quality plant-based foods, people may struggle to follow a healthy and nutritious plant-based diet.

In addition, misconceptions about nutrition in plant-based diets also pose a significant challenge. Many people still doubt whether a plant-based diet can fulfill their nutritional needs, especially in terms of protein, vitamin B12, iron and calcium. These misconceptions often arise due to a lack of understanding on how to obtain essential nutrients from plant-based sources. Sunardi (2022) states that there is an assumption that plant-based diets lack sufficient protein for the body, even though many plant-based sources, such as beans, tempeh, tofu and quinoa, are rich in protein. Similarly, there are concerns that plant-based diets cannot provide enough calcium and vitamin B12, when both can be obtained from fortified plant-based products or supplements. Lack of knowledge on how to plan a balanced and nutritious plant-based diet often discourages people from trying this diet (Anggreiniboti, 2022).

To overcome these barriers, public education is key. Wider campaigns on the benefits of plant-based diets and how to obtain the necessary nutrients are essential to increase public understanding. Education on the importance of balanced nutrition and how to manage a healthy plant-based diet needs to be included in school curricula, media campaigns, and community seminars or workshops. Support from nutritionists and health professionals is also crucial in providing accurate and adequate information on plant-based diets. In addition, the government can play an important role by providing incentives for plant-based food producers, as well as improving the distribution of plant-based foods in hard-to-reach areas. Policies that support the production and consumption of plant-based foods can help reduce existing access barriers. For example, tax reductions for plant-based products or subsidies for local farmers who produce plant-based foods can be effective measures to make it easier for people to access healthier and more environmentally-friendly food. This will help people more easily switch to a balanced and nutritious plant-based diet.

Impact of Plant-based Diets on the Environment and Public Policy

Plant-based diets have great potential in reducing carbon footprints and contributing to climate change mitigation. Studies show that plant-based food production results in lower greenhouse gas emissions compared to animal products (Latif et.al.,

2023). The livestock industry, especially for beef and dairy products, contributes significantly to carbon emissions, especially in the form of methane, which is more harmful than carbon dioxide. Switching to a plant-based diet can drastically reduce these emissions, as plant-based food production requires less energy, water and land. Furthermore, plant-based diets are also more efficient in using natural resources, such as water and land, that were previously used for animal feed production. For example, to produce one kilogram of beef, about 15,000 liters of water is required, while to produce plant-based foods such as beans or vegetables, only a fraction of that amount is needed. These positive impacts also have the potential to reduce pressure on other natural resources, including land used for deforestation. As such, plant-based diets can be an effective strategy to reduce negative environmental impacts.

In addition to reducing the carbon footprint, plant-based diets can also help reduce the impact of deforestation that occurs due to land clearing for livestock (Afrouzi et.al., 2023). Clearing forests for livestock and growing animal feed is a major cause of loss of tropical forests, which serve as natural carbon sinks. By reducing the demand for animal products, plant-based diets can reduce the need for land for livestock farming. This will help maintain biodiversity and reduce deforestation rates that contribute to global climate change. In addition, reduced consumption of animal products can also reduce pressure on natural ecosystems that are often damaged by land conversion for agriculture and livestock. Plant-based diets are therefore not only a solution to climate change, but also an important step in preserving nature and reducing damage to global ecosystems. The contribution of plant-based diets to environmental sustainability makes them an integral part of climate change mitigation strategies.

However, to achieve optimal impact, public policies that support plant-based diets need to be widely implemented. One policy that can be taken is to subsidize plant-based food products, so that the price of plant-based food is more affordable for the community (Arif et.al., 2020). This subsidy will encourage more people to switch to a plant-based diet, which in turn will reduce demand for animal products. In addition, the government could impose additional taxes on animal products that have a high carbon footprint, such as beef and dairy products, to incentivize consumers to choose plant-based diets. Such fiscal policies can create a lasting effect in reducing the consumption of animal products and support the shift towards a more environmentally-friendly diet. In addition, public awareness campaigns promoting the benefits of plant-based diets are also crucial to encourage behavioral change. These campaigns should include education on the environmental impacts of animal product consumption and the health benefits of a plant-based diet.

Implementation of policies that support plant-based diets can also include improving people's access to quality and nutritious plant-based foods. One important step is to introduce policies where plant-based menus are offered in public institutions, such as schools, hospitals and government offices. This can set a good example for the public and encourage them to try a plant-based diet. In addition, educating farmers to switch to more environmentally-friendly crop-based agriculture is also important. Training programs for farmers can help them understand sustainable farming techniques and reduce dependence on livestock products. To support this policy, the government can also allocate funds for plant-based food research and development, to create more delicious and affordable plant-based products. Overall, public policies that support plant-based diets should be comprehensive and integrated with the goals of environmental sustainability, health, and a more equitable and efficient food system.

CONCLUSION

A plant-based diet has great potential in preventing chronic diseases and supporting overall health. Research shows that a plant-based diet can reduce the risk of heart disease, type 2 diabetes, hypertension, and some cancers. This is due to the fiber, vitamins, and antioxidants in plant-based foods that can lower LDL cholesterol, improve insulin sensitivity, and regulate blood sugar levels. In addition, a plant-based diet can help maintain a healthy weight and reduce inflammation in the body, which contributes to the prevention of metabolic disorders. It is also more efficient in providing nutrients without putting a strain on the digestive system. Therefore, widely introducing plant-based diets can be an effective strategy in improving overall public health. On the other hand, plant-based diets also have a positive impact on the environment. Plant-based food production tends to produce lower greenhouse gas emissions compared to animal products, which can help mitigate climate change. Furthermore, plant-based food production requires less land, water and energy, which makes it a greener option than livestock production. By switching to a plant-based diet, we also contribute to reducing deforestation that occurs due to land clearing for livestock. However, to achieve maximum benefits, public policies that support plant-based diets are essential. Subsidies for plant-based products, taxes on animal products with a high carbon footprint, and public awareness campaigns can be measures that support this transition. Such policies can not only reduce the consumption of animal products, but also encourage people to choose healthier and environmentally-friendly foods. However, challenges in implementing plant-based diets remain, such as cultural barriers and limited access to plant-based foods in some areas. Therefore, education and increased distribution of nutritious plant-based foods are key to ensuring wider adoption of plant-based diets.

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