



The Efficacy of Plant-Based Dietary Interventions in the Prevention and Management of Type 2 Diabetes: The Integral Role of Nursing Professionals

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Abstract

Background: Type 2 diabetes has emerged as a critical global health issue, affecting millions and significantly impacting healthcare systems. The rising prevalence is closely linked to dietary patterns characterized by increased consumption of animal-derived and processed foods, alongside decreased intake of fruits and vegetables. This study explores the potential of plant-based diets as a preventive measure against type 2 diabetes and examines the role of nursing professionals in promoting these dietary changes.

Methods: A comprehensive literature review was conducted, analyzing observational and interventional studies that assess the relationship between plant-based dietary patterns and the incidence and management of type 2 diabetes. The review included findings from various cohorts, including the Adventist Health Study and the Nurses' Health Study, focusing on dietary impacts on glycemic control, weight management, and cardiovascular risk factors.

Results: The review revealed that individuals adhering to plant-based diets, particularly vegan and vegetarian diets, exhibited significantly lower risks of developing type 2 diabetes. Meta-analyses indicated that plant-based diets resulted in improved glycemic control, with reductions in HbA1c levels and enhanced insulin sensitivity. Furthermore, these diets were associated with lower body mass indexes and reduced cardiovascular risks.

Conclusion: The evidence supports the notion that plant-based dietary regimens can effectively prevent and manage type 2 diabetes. Healthcare professionals, particularly nurses, play a pivotal role in educating patients about the benefits of such diets, thus contributing to improved health outcomes. Future research should further investigate the mechanisms through which plant-based diets impact diabetes and explore strategies for enhancing patient adherence.

Keywords: Type 2 diabetes, plant-based diet, glycemic control, nursing role, dietary intervention.

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1. Introduction

Diabetes is a significant global health concern impacting people, families, communities, and governments. In 2019, the International Diabetes Federation reported that 463 million individuals, constituting 9.3% of the global population, were afflicted with diabetes. The prevalence is projected to rise to 578 million (10.4%) by 2030 (1). In 2015, diabetes resulted in 15 million fatalities and accounted for 12% of healthcare costs worldwide. Besides impacting mortality, macrovascular and microvascular consequences of diabetes significantly diminish the quality of life (2).

The incidence of diabetes has risen in recent decades with substantial dietary changes, characterized by a decreased intake of vegetables, fruits, and legumes, and an increasing consumption of animal-derived and processed food items. A plant-based diet is linked to a markedly reduced incidence of type 2 diabetes compared to nonvegetarian diets, and robust evidence supports the use of a plant-based dietary approach in clinical settings for patients with type 2 diabetes (3, 4). The American Association of Clinical Endocrinologists, the American College of Endocrinology, and the American College of Lifestyle Medicine advocate adopting a plant-based dietary regimen as an essential element of lifestyle intervention for individuals with type 2 diabetes (5). The American and Canadian Diabetes Associations recognize vegetarian and vegan diets as effective in enhancing glycemic control, managing body weight, and reducing cardiovascular risk factors (6, 7). Alongside these groups advocating for a plant-based diet for diabetes, the USDA identifies a Healthy Vegetarian Dietary Pattern as a model for a nutritious meal plan in the 2020–2025 Dietary Guidelines for Americans (8).

This article aims to present an overview of the evidence regarding the prevention and treatment of type 2 diabetes through a plant-based diet, the mechanisms by which such a diet enhances insulin sensitivity and weight management, and factors to consider when recommending a plant-based dietary approach. This article presents prior evidence that underpins more recent studies. It also encompasses new research on the molecular processes indicating that a plant-based diet improves clinical results for diabetes.

2. Vegetarian diets

“Plant-based” is a broad word that denotes diets mostly composed of cereals, vegetables, legumes, fruits, nuts, seeds, and their derived products. Vegetarian diets exclude meat. Vegetarian diets include subsets such as lacto-ovo vegetarian diets, which incorporate dairy products and eggs, and vegan diets, which eliminate all animal products. In this article, the word “plant-based” shall denote vegetarian diets, including both lacto-ovo vegetarian and vegan diets, unless specified otherwise (9).

3. A plant-based dietary regimen correlates with a decreased risk of type 2 diabetes

Observational studies in several locations have shown significant decreases in diabetes risk in communities adhering to vegan and vegetarian diets, in contrast to other dietary patterns. A significant number of Seventh-day Adventists restrict or eschew meat and other animal products, while others do not, creating a unique opportunity to examine the impacts of varying dietary patterns (10). In 1985, Snowdon and Phillips first documented a robust positive correlation between meat intake and diabetes prevalence among 25,698 men and women from California, who were monitored for 21 years in the Adventist Mortality Study (11). Fifty percent of this group indicated adherence to a vegetarian diet. The age-adjusted diabetes prevalence ratios for people consuming meat six or more times weekly were 1.9 for men and 1.6 for women, in comparison to vegetarians (11). Fraser reported analogous results from the Adventist Health Study, indicating that male and female meat eaters exhibited a 97% (OR: 1.97; 95% CI: 1.56, 2.46, $P = 0.0001$) and 93% (OR: 1.93; 95% CI: 1.65, 2.25, $P = 0.0001$) increased risk of diabetes, respectively, in comparison to vegetarian individuals (10). Vang et al. (12) monitored 8,401 Adventists, all of whom were devoid of diabetes at the commencement of the trial, for 17 years. After adjusting for variations in body weight, those who ingested any kind of meat (including poultry) at least weekly exhibited a 38% heightened risk of

acquiring diabetes throughout the follow-up period, in contrast to those who abstained from meat consumption (12).

The Adventist Health Study 2 (AHS-2), initiated in 2002, included 22,434 men and 38,469 women residing in the USA and Canada; 65.5% identified as non-Hispanic white and 26.9% as black (13). In comparison to nonvegetarians, the odds ratio (OR) for diabetes prevalence was 49% (0.51; 95% CI: 0.40, 0.66) lower among vegans and 46% (0.54; 95% CI: 0.49, 0.60) lower among lacto-ovo vegetarians, after controlling for BMI and other lifestyle factors (13). The prevalence of diabetes among those who restricted meat intake to fish was 30% (0.70; 95% CI: 0.61, 0.80) lower, while those consuming meat less than once per week exhibited a 24% (0.76; 95% CI: 0.65, 0.90) reduction compared to nonvegetarians. The vegan participants ingested 33% more fruits and vegetables than the non-vegetarians and refrained from animal items rich in saturated fat, which is linked to insulin resistance (13).

A prospective study of the AHS-2 cohort, including 15,200 men and 26,187 women (17% black) without diabetes at baseline, revealed that vegan and lacto-ovo vegetarians saw a 77% and 54% decrease in the risk of acquiring diabetes, respectively (4). After adjusting for BMI and other lifestyle variables, the risks were reduced by 62% for vegans and 38% for lacto-ovo vegetarians. The decreased risk was most notable among black vegans, who exhibited a 70% reduction in risk in the adjusted analysis, and black lacto-ovo vegetarians, who showed a 52% reduction, in comparison to nonvegetarians. Adventist studies indicate a significant decrease in diabetes risk associated with the avoidance of animal-derived products, partially irrespective of the diet's positive impact on body weight.

Other cohort studies have shown similar results. A Harvard study involving 26,357 men from the Health Professionals Follow-Up Study (1986–2006), 48,709 women from the Nurses' Health Study (1986–2006), and 74,077 women from the Nurses' Health Study II (1991–2007) discovered that an increase of half a serving of meat per day correlated with a 48% (1.48; 95% CI: 1.37, 1.59) rise in diabetes risk over a four-year duration (14). Reducing meat consumption by half a serving daily correlated with a reported 14% (0.86; 95% CI: 0.80, 0.93) decrease in diabetes risk. Further analysis including more than 200,000 male and female health professionals from the same Harvard cohorts indicated that 16,162 individuals got diabetes during 4,102,369 person-years of follow-up (15). Participants adhering to a healthy plant-based diet rich in whole grains, fruits, and vegetables, yet low in refined grains, sugar-sweetened drinks, and red and processed meats, had a 34% decrease in diabetes risk.

The InterAct Project of the European Prospective Investigation into Cancer and Nutrition (EPIC) research monitored 340,234 people across 8 European nations over 11.7 years, revealing substantial correlations between meat intake and the incidence of type 2 diabetes. In males, the intake of red and processed meat elevated the risk of diabetes, but in women, there was a significant correlation between overall meat and poultry consumption (16).

The Rotterdam research indicated that a high consumption of plant-based products and a low consumption of animal products correlated with reduced insulin resistance, prediabetes, and type 2 diabetes (17). These results remained significant after adjustment for body weight (17). The authors suggested that dietary recommendations need to advocate for a plant-based diet to alleviate the prevalence of type 2 diabetes. The Tzu Chi Health Study in Taiwan showed substantial decreases in diabetes risk among vegetarian Buddhists. In comparison to the omnivorous cohort (N = 2900), the vegetarian cohort (N = 1484) exhibited a 51% reduced risk in males (OR: 0.49; 95% CI: 0.28, 0.89) and a 75% reduced risk in postmenopausal women (OR: 0.25; 95% CI: 0.15, 0.42) for type 2 diabetes, after adjusting for BMI and other lifestyle variables (18). It is important to acknowledge that "omnivores" in this group consume very little amounts of meat or fish according to Western norms. The vegetarian cohort ingested a greater quantity of soy products, total and green leafy vegetables, nuts, and whole grains while consuming less tea and a comparable amount of dairy products and fruits, in contrast to the omnivores (18). A minority of vegans (N = 69) within the vegetarian cohort had no instances of diabetes.

4. A plant-based dietary regimen is effective for managing type 2 diabetes

Plant-based diets, especially vegan diets, enhance glycemic regulation, body mass, and cardiovascular risk factors in persons with type 2 diabetes. Each of these elements is fundamental to diabetes control and is detailed below. A meta-analysis of six randomized controlled studies (N = 255) indicated that vegetarian diets were linked to a 0.4% larger decrease in glycated hemoglobin (HbA1c) compared to other recommended dietary patterns for diabetes (19).

Low-fat, plant-based diets enhance glycemic regulation. Diverse formulas have been evaluated over several years. In 1979, a 16-day, mostly plant-based dietary regimen aimed at weight maintenance was evaluated in a controlled environment. Nine of the 20 men with type 2 diabetes successfully discontinued insulin, while the other 11 reduced their insulin dosage by 60% after adhering to a high-fiber, high-carbohydrate diet (65 g of fiber, 70% of calories from carbohydrates, 21% from protein, 9% from fat) (20).

A 22-week randomized controlled experiment compared a low-fat vegan diet (N = 49) with a standard portion-managed diet (N = 50). The vegan diet included around 10% of calories from fat, 15% from protein, and 75% from carbohydrates, excluding animal products and emphasizing low-fat, low-glycemic-index foods. The portion-controlled diet (15–20% protein, <7% saturated fat, 60–70% carbohydrate, and monounsaturated fats) was tailored according to body weight and plasma lipid levels, according to the 2003 American Diabetes Association recommendations (21). Individuals with a BMI over 25 kg/m² were advised to maintain energy intake deficits of 500–1000 kcal per day. Among those who did not alter their medication, the vegan group had a considerably higher decrease in HbA1c (1.23% vs 0.38%, [P = 0.01]) (22). The Pearson correlation between weight change and HbA1c change was $r = 0.51$, $P < 0.0001$ in the vegan group, indicating that variables beyond weight changes affect glycemic management. The scientists suggested that high-fat diets increase lipid buildup in skeletal muscle, hence contributing to insulin resistance via diminished mitochondrial function.

Vegan diets have shown the capacity to enhance glycemic control in Asian communities who often consume diets abundant in plant-based foods. Korean research had 93 participants with type 2 diabetes, who were randomly allocated to either a vegan diet (N = 46) or a conventional diet as per the Korean Diabetes Association (KDA) 2011 guidelines (N = 47) for 12 weeks. The vegan diet included whole grains, vegetables, fruits, and legumes. The average HbA1c levels decreased in both cohorts, with a more significant drop seen in the vegan group (–0.5% vs –0.2%; P-interaction = 0.17). The findings were more pronounced in persons who adhered carefully to the suggested dietary patterns (–0.9% vs –0.3%) (23).

5. Possible Mechanisms Through Which Plant-Based Diets Influence Insulin Resistance and Weight Regulation

Insulin resistance and the ensuing deterioration of β -cell function are characteristic features of the pathophysiology of type 2 diabetes (24). Plant-based diets enhance insulin sensitivity and promote weight management in individuals with diabetes. Lipid buildup in muscle and liver cells often initiates insulin resistance many years before the diagnosis of type 2 diabetes. This fat buildup is significantly influenced by dietary modifications. High-fat diets suppress the genes necessary for mitochondrial oxidative phosphorylation in skeletal muscle (25). High-fat diets seem to impair the intestinal barrier to bacterial endotoxins, which, once entering the circulation, may interfere with glucose oxidation processes (26). Alterations in fat consumption impact glycemic regulation, evident not just during prolonged treatments but also after individual meals; high-fat meals may induce postprandial increases in plasma glucose that may persist for an extended duration (27).

Goff et al. (28) conducted case-control research comparing 24 healthy vegans with 25 healthy omnivores, matched for sex, age, BMI, percentage body fat, caloric consumption, and physical activity levels. Individuals adhering to a vegan diet exhibited markedly reduced intramyocellular lipid concentrations, correlated with a 32% enhancement in the homeostatic model evaluation of β -cell function (28). A randomized experiment including overweight nondiabetic people, with no restrictions on caloric or carbohydrate consumption, demonstrated that a low-fat vegan diet decreased hepatic lipid concentrations by 34.4% and intramyocellular lipid concentrations by 10.4%. The alterations in hepatocellular and intramyocellular lipid levels were associated with variations in insulin resistance (both $r = 0.51$; $P = 0.01$)

(29). These data indicate that low-fat, plant-based (particularly vegan) diets enhance glycemic management due to their capacity to diminish lipid buildup in muscle and liver, alongside their impact on body weight.

Plant-based diets may enhance β -cell functionality. In a randomized experiment, 75 overweight or obese adults were allocated to either a low-fat plant-based diet or no dietary modifications for 16 weeks. Insulin production triggered by meals was significantly elevated in the intervention group relative to the control group (interaction between group and time, $G \times t$ [$P < 0.001$]) (30). This research illustrates the capacity of a plant-based diet to reverse β -cell malfunction and peripheral insulin resistance in individuals with type 2 diabetes.

Weight management is crucial for enhancing insulin sensitivity, regulating glycemic control, and mitigating cardiovascular disease (CVD) risk factors (30, 31). Excess body weight correlates with an increased risk of cardiovascular disease and all-cause mortality in individuals with type 2 diabetes (32). Individuals adhering to vegetarian, particularly vegan, diets have lower average BMIs in comparison to nonvegetarians (33). Population research indicates that body weight escalates gradually with heightened meat intake (10, 34).

A plant-based diet not only inhibits weight growth but also serves as an excellent strategy for weight control (35, 36). Randomized trials indicate that plant-based interventions for patients with type 2 diabetes yield greater weight loss than control diets comprising animal products, primarily due to a reduction in visceral fat, which significantly mitigates insulin resistance and inflammation (22, 23, 37). The BROAD trial showed substantial weight reduction by a low-fat (about 7–15% of caloric intake from fat), plant-based diet in overweight patients with at least one of the following comorbidities: type 2 diabetes, ischemic heart disease, hypertension, or hypercholesterolemia (38). Sixty-five people (aged 35–70 years) were randomly allocated to either a plant-based diet or standard treatment. The decrease in BMI at 6 months was more significant in the plant-based group than in the usual-care group (4.4 vs 0.4, difference: 3.9) (95% CI: ± 1 , $P < 0.0001$). At 12 months, the decrease in BMI in the plant-based group was 4.2 (± 0.8). The program did not impose limitations on portion sizes; nonetheless, participants indicated feelings of satisfaction, which may improve adherence (38).

A randomized experiment including adults with type 2 diabetes showed that a low-fat vegan diet, implemented without energy intake constraints, resulted in significantly better weight reduction after 22 weeks compared to a conventional diet that mandated energy intake limitations (-6.5 kg vs -3.1 kg [$P < 0.001$]). At 74 weeks, weight reduction was substantial within each dietary group, however not substantially different across groups (-4.4 kg in the vegan group and -3.0 kg in the conventional diet group, $P = 0.25$) (39).

In a 24-week trial, researchers evaluated the effects of plant-based diets in conjunction with other interventions, comparing an isocaloric vegetarian diet (restricting animal products to one serving of low-fat yogurt daily) with a conventional diabetes diet adhering to the guidelines established by the Diabetes and Nutrition Study Group of the European Association for the Study of Diabetes. Aerobic exercise was included in both research groups during the second 12 weeks of the trial. The macronutrient composition consisted of 60% kcal from carbohydrates, 15% from protein, and 25% from fat for the vegetarian intervention, whereas the conventional group included 50% from carbohydrates, 20% from protein, and 30% from fat (with $\leq 7\%$ saturated fat and < 200 mg/d of cholesterol). Both diets limited caloric intake by 500 kcal per day, tailored according to indirect calorimetry (37). Participants in both groups were served with meals, facilitating compliance with the designated dietary modifications. The vegetarian intervention led to a larger weight reduction (-6.2 kg; 95% CI: $-6.6, -5.3$) compared to the control (-3.2 kg; 95% CI: $-3.7, -2.5$; interaction group \times time $P = 0.001$) and enhanced insulin sensitivity (30%; 95% CI: 24.5, 39) relative to the control (20%; 95% CI: 14, 25). The vegetarian group had considerably higher reductions in visceral and subcutaneous fat ($P = 0.007$ and $P = 0.02$, respectively) (37).

Weight reduction on plant-based diets seems to result from two primary dietary impacts. Initially, an increase in fiber and carbohydrate consumption, coupled with a decrease in fat intake, results in a reduced energy density of the diet. Secondly, plant-based diets have shown an enhancement in postprandial

metabolism (the thermic impact of food) (36). In a randomized experiment, people diagnosed with overweight or obesity (BMI 28–40) were allocated to either a low-fat vegan diet or to maintain their current eating habits for 16 weeks. The vegan cohort saw a weight reduction of 5.9 kg (95% CI: 5.0, 6.7 kg; $P < 0.001$), and its thermic impact of food, assessed by indirect calorimetry, increased by 14.1% (95% CI: 6.5, 20.4; $P < 0.001$). These modifications correlated with decreases in hepatocellular and intramyocellular fat, as well as enhanced insulin sensitivity (29).

6. Plant-Based Dietary Regimen for Macrovascular and Microvascular Complications of Diabetes

Plant-based diets positively influence glycemia, body weight, plasma lipids, and blood pressure, hence decreasing the risk of cardiovascular disease, the primary cause of morbidity and death among diabetes patients. Cardiovascular disease (CVD) includes coronary heart disease, cerebrovascular disease, and peripheral arterial disease (32). A meta-analysis of nine randomized controlled trials including patients with type 2 diabetes ($N = 664$), which compared vegetarian therapies to control diets, showed substantial enhancements in cardiovascular disease risk variables, including lipid profiles, blood pressure, glycemic management, body weight, and abdominal adiposity (40).

A plant-based diet is linked to a decreased risk of cardiovascular disease and may aid in the reversal of atherosclerotic plaques. Ornish et al. exhibited substantial regression in coronary artery stenosis among individuals with mild to severe coronary artery disease. Participants were randomly allocated to either standard care or a low-fat vegetarian diet accompanied by exercise, stress management, and smoking cessation interventions. After five years, the vegetarian group had a mean decrease in atherosclerotic stenosis, whereas the control group saw the progression of atherosclerosis. The control group had a higher likelihood of necessitating coronary angioplasty and bypass surgery compared to the vegetarian group (41).

Chronic kidney disease is becoming more common, with diabetes responsible for 44% of all new cases; 20–40% of individuals with diabetes are affected by chronic renal disease (42). A Western dietary pattern, marked by elevated intake of red meat, fats, salt, and sugars, significantly contributes to metabolic disorders that exacerbate renal disease development (43). In the Nurses' Health Study, women with moderate renal insufficiency at baseline saw a much higher decline in renal function with increased intake of animal protein, particularly from meat, for 11 years (44). A 24-year follow-up of 14,868 participants in the Atherosclerosis Risk and Communities Study indicated that greater adherence to a healthy plant-based diet correlated with a reduced risk of chronic kidney disease (45).

Numerous studies have shown a decrease in urine albumin excretion among individuals with diabetic nephropathy after a plant-based or decreased red meat diet (46–48). Research demonstrated a 54% reduction in urine albumin among individuals with type 1 diabetes after 8 weeks of a plant-based diet (48). The aforementioned research by Barnard et al. indicated that individuals with type 2 diabetes adhering to a low-fat vegan diet saw a significant decrease in urine albumin, but no change was seen in the control group on a portion-controlled diet (22).

Over 50% of patients with diabetes get neuropathy (49). Typical clinical signs include pain, insensitivity to injury, orthostatic hypotension, cardiac autonomic neuropathy, gastroparesis, and erectile dysfunction (50). Diabetic neuropathy may result in sleep difficulties, melancholy, anxiety, and ultimately amputations (51, 52). The contemporary management of diabetic neuropathy encompasses glycemic regulation to mitigate disease advancement and pharmacological interventions for neuropathic pain (42). No pharmaceutical intervention exists that may cure nerve damage resulting from neuropathy, save for strategies aimed at enhancing glycemic management.

A 20-week randomized, controlled experiment using a low-fat, vegan intervention showed enhanced nerve activity, as assessed by electrochemical skin conductance in the foot, and less pain, in comparison to an untreated control group (53). The findings align with two smaller studies utilizing a vegan diet; one, in conjunction with exercise, resulted in the elimination of painful neuropathy symptoms in 17 out of 21

patients, while the other reported cutaneous reinnervation and diminished pain in 30 individuals with impaired glucose tolerance.

The impact of a plant-based diet on diabetic retinopathy remains unexamined. A plant-based diet effectively manages risk factors for diabetic retinopathy, such as glycemia, blood pressure, and lipids. Research has shown that diets rich in fruits, vegetables, and dietary fiber correlate with a decrease in diabetic retinopathy (54).

7. Mediterranean and Dietary Strategies for Hypertension Management

Both the Mediterranean and Dietary Approaches to Stop Hypertension (DASH) diets prioritize the consumption of plant-based meals while regulating quantities of animal items. Mediterranean diets have been evaluated for the prevention and management of diabetes (55). The Mediterranean diet, akin to a plant-based diet, prioritizes the intake of fruits, vegetables, whole grains, and legumes, while minimizing meat, refined grains, and sugar, permitting limited quantities of animal products (56-58). The phrase "Mediterranean diet" may be understood variably by individuals. In research studies, the phrase denotes a diet characterized by a predominance of plant-based foods, the preference for olive oil as the principal fat source, and the inclusion of low to moderate quantities of meat, dairy products, eggs, and wine (59). A high score (ranging from 0 to 9) for Mediterranean diet adherence, assessed through participants' consumption of fruits, vegetables, whole grains, legumes, nuts, and fish, as well as the ratio of monounsaturated fatty acids to saturated fatty acids, was linked to a 30% decreased risk of developing diabetes among over 25,000 women monitored for 20 years. Elevated Mediterranean diet scores correlated with reduced indicators of insulin resistance, including obesity, lipoprotein metabolism, and inflammation (60). A meta-analysis of nine randomized controlled studies including 1,178 individuals with type 2 diabetes compared a Mediterranean diet to control diets, yielding a significant decrease in HbA1c (mean difference, -0.30 ; 95% CI: $-0.46, -0.14$). Improvements were seen in body weight and cardiovascular risk factors (61).

The results of weight reduction with a Mediterranean diet have been inconsistent. A 2016 comprehensive review indicated that clinical trials using Mediterranean diets resulted in considerable weight reduction; however, all research used exercise or calorie restriction, so obscuring the impact of dietary modification (62). The rigorously conducted Lyon Diet Heart research and the *Prevención con Dieta Mediterránea* (PREDIMED) research resulted in no clinically meaningful weight reduction (63, 64). Crossover research including 62 overweight persons showed that a low-fat vegan diet resulted in considerably higher weight reduction during a 16-week intervention period compared to a Mediterranean diet.

The DASH diet was developed to reduce blood pressure without pharmacological intervention. The dietary regimen prioritizes fruits, vegetables, fat-free or low-fat dairy, whole grains, nuts, and legumes while restricting saturated fats, cholesterol, red and processed meats, sweets, added sugars, salt, and sugar-sweetened drinks. An umbrella review of systematic reviews and meta-analyses concerning cardiometabolic outcomes indicated that the DASH diet was linked to a significantly reduced risk of diabetes (RR: 0.82; 95% CI: 0.74, 0.92), alongside notable decreases in cardiovascular disease, coronary heart disease, stroke, blood pressure, and body weight. No notable alterations were seen in HDL cholesterol, triglycerides, fasting blood glucose, HOMA-IR, or C-reactive protein. This study included two controlled studies assessing the DASH diet in diabetic people, yielding a decrease in HbA1c (-0.53% ; 95% CI: $-0.62, -0.43$) and fasting insulin ($-0.15 \mu\text{U/mL}$; 95% CI: $-0.22, -0.08$) (65).

A low-fat vegan diet has the benefit of eliminating the need for portion management, distinguishing it from Mediterranean and DASH dietary patterns. The DASH diet does not seem to provide the same decrease in inflammation and enhancement in insulin sensitivity as seen in the vegan diet. Considering that even minimal consumption of animal products may elevate the risk of diabetes (as evidenced by the AHS-2, where a vegan diet significantly reduced diabetes risk compared to lacto-ovo vegetarian or semivegetarian diets, which permitted meat consumption at least once a month and less than once a week, respectively), there are theoretical benefits to completely eschewing animal products.

8. Conclusion

Observational research and randomized controlled trials corroborate the advantages of a plant-based diet for diabetes management. The intake of whole grains, legumes, fruits, and vegetables, together with the exclusion of animal products, diminishes the likelihood of acquiring type 2 diabetes. In persons with type 2 diabetes, a low-fat, plant-based diet improves body weight, glycemic regulation, plasma lipid levels, and blood pressure, while diminishing the risk of cardiovascular disease and microvascular consequences. Healthcare practitioners must possess confidence in advising their patients to adopt a plant-based dietary regimen and should be equipped to provide information and assistance to enhance their patients' diabetes management, overall health, and psychological well-being.

Additional investigation into the impact of a plant-based diet on the prevention of nephropathy and retinopathy, together with its efficacy in enhancing the treatment of type 1 diabetes, would be beneficial. Rigorous research comparing vegan and vegetarian diets with DASH and Mediterranean eating patterns would elucidate the impact of these dietary approaches on diabetes outcomes. Protocols for diminishing dependence on antihyperglycemic agents in light of plant-based lifestyle interventions would aid healthcare practitioners in mitigating the risk of hypoglycemia and other adverse consequences linked to excessive medication.

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فعالية التدخلات الغذائية النباتية في الوقاية من النوع الثاني من السكري وإدارته: الدور المحوري للتمريض

الملخص

الخلفية: أصبح النوع الثاني من السكري مشكلة صحية عالمية حرجة تؤثر على ملايين الأشخاص وتسبب ضغطاً كبيراً على الأنظمة الصحية. ترتبط الزيادة في انتشاره بأنماط غذائية تتميز بزيادة استهلاك الأطعمة المشتقة من الحيوانات والمعالجة، مع انخفاض استهلاك الفواكه والخضروات. تستكشف هذه الدراسة إمكانيات الأنظمة الغذائية النباتية كإجراء وقائي ضد النوع الثاني من السكري، وتفحص دور المتخصصين في التمريض في تعزيز هذه التغييرات الغذائية.

الطرق: تم إجراء مراجعة شاملة للأدبيات، وتحليل الدراسات الرصدية والتدخلية التي تقيم العلاقة بين الأنماط الغذائية النباتية وحدوث النوع الثاني من السكري وإدارته. شملت المراجعة نتائج من مجموعات دراسية مختلفة، بما في ذلك دراسة الصحة للأدفتست ودراسة صحة الممرضات، مع التركيز على تأثير الأنماط الغذائية على التحكم في مستويات السكر، وإدارة الوزن، وعوامل الخطر القلبية الوعائية.

النتائج: أظهرت المراجعة أن الأفراد الذين يتبعون الأنظمة الغذائية النباتية، وخاصة الأنظمة الغذائية النباتية الكاملة أو النباتية (فيغان)، أظهروا مخاطر أقل بشكل ملحوظ للإصابة بالنوع الثاني من السكري. أشارت التحليلات التلوية إلى أن الأنظمة الغذائية النباتية حسنت التحكم في مستويات السكر، مع انخفاض مستويات HbA1c وتحسين حساسية الأنسولين. علاوة على ذلك، ارتبطت هذه الأنظمة الغذائية بمؤشرات كتلة جسم منخفضة وتقليل مخاطر القلب والأوعية الدموية.

الاستنتاج: تدعم الأدلة فكرة أن الأنظمة الغذائية النباتية يمكن أن تكون فعالة في الوقاية من النوع الثاني من السكري وإدارته. يلعب المتخصصون في التمريض دورًا محوريًا في تثقيف المرضى حول فوائد هذه الأنظمة الغذائية، مما يساهم في تحسين النتائج الصحية. يجب أن تركز الأبحاث المستقبلية على دراسة الآليات التي تؤثر من خلالها الأنظمة الغذائية النباتية على مرض السكري، واستكشاف استراتيجيات لتعزيز التزام المرضى بها.

الكلمات المفتاحية: النوع الثاني من السكري، النظام الغذائي النباتي، التحكم في مستويات السكر، دور التمريض، التدخل الغذائي.