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Therapeutic Potential of Plant-Based Dietary Interventions in Chronic Disease Remission: Mechanisms, Clinical Evidence, and Practical Implementation

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Abstract

Background: Chronic diseases such as type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), hypertension, obesity, and certain cancers represent a large burden of morbidity and mortality worldwide, and many are affected by lifestyle including diet. Unrestricted plant-based diet (PBD), high in whole plant foods and low or no animal foods, has emerging data related to their association with prevention and reversal of chronic disease, including anti-inflammatory, anti-oxidative, and metabolic impact.

Aim: To systematically review the evidence for PBD association with remission or substantial improvement in chronic disease, including documenting clinical outcomes, quality of life (QoL), cost-effectiveness, and implementation considerations associated with any PBD.

Methods: A literature search was completed from 2000 to 2024 using keywords for plant-based diets, vegetarianism, chronic disease, and other disease-specific keywords. Eligible peer-reviewed studies included adult populations, reported clinical outcomes, QoL, and implementation considerations, with no restrictions on dietary or intervention duration. Study quality was independently assessed with the Cochrane Risk of Bias Tool and Newcastle-Ottawa Scale.

Results: Vegan diets produced beneficial clinical outcomes across a range of conditions, including type 2 diabetes (T2DM), cardiovascular disease (CVD), hypertension, obesity, and cancer progression. They improved HbA1c and LDL cholesterol and led to weight loss while preventing or reducing cancer progression. The only challenges, for example, non-adherence and insufficient nutrients, were found. The estimated annual cost savings for the recovery of T2DM and CVD management is $50-100 billion.

Conclusion: The evidence shows that PBDs can be effective at managing and possibly inducing remission in chronic diseases, and provide benefits in clinical outcomes, quality of life, and healthcare costs. The barriers to adherence, nutritional deficiencies, and scalability will need to be examined further and require education, infrastructural support, and more research to understand how best to maximize implementation.

Keywords: Plant-based diet, chronic disease, remission, type 2 diabetes, cardiovascular disease, hypertension, obesity, cancer, quality of life, cost-effective.

Introduction

The burden of chronic diseases, including type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), hypertension, obesity, and some cancers, is responsible for more than 60% of deaths worldwide and is a significant burden on healthcare systems internationally, costing over $3.8 trillion every year in the United States (1). These diseases are heavily influenced by lifestyle, with diet being a critical factor in the development and progression of disease (2). Plant-based diets (PBDs) (such as a vegetarian,

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vegan, or flexitarian diet) emphasize whole, unprocessed plant foods, such as fruits, vegetables, whole grains, legumes, nuts, and seeds, and restrict or avoid foods obtained from animals (3). There is now compelling evidence that PBDs can not only prevent but induce remission of chronic disease by targeting the underlying pathophysiological processes of inflammation, oxidative stress, and insulin resistance (4).

Action mechanisms of PBDs include their fiber, antioxidant, and phytonutrient content that optimize metabolic well-being, reduce systemic inflammation, and enhance gut microbiota diversity (5). For example, consumption of plant-based fiber in minimally processed foods has been correlated with glycemic control in T2DM and reduced LDL cholesterol in CVD (6). In addition, PBDs' low saturated and unsaturated fats help cardiovascular health and are also beneficial for weight control by their low caloric density (7). Induction of remission—described by sustained leveling of disease-specific biomarkers on withdrawal of pharmacologic treatment or with reduced pharmacological treatment—has proven to occur in the clinic, particularly for T2DM and early-stage CVD (8).

PBD consumption has also benefited from increased acknowledgment of their health, environmental, and ethical benefits and backing by entities such as the American Heart Association and the American Diabetes Association (9, 10). Nevertheless, adherence to diet, cultural acceptability, and likelihood of nutrient deficiencies (e.g., vitamin B12, iron) are continued challenges to implementation (11). The purpose of this systematic review is to evaluate PBDs' effectiveness in inducing remission or considerable improvement of chronic disease according to clinical outcomes, patient-centered outcomes, challenges to implementation, and limitations of the current evidence base. This review aims to draw pragmatic inferences for clinicians, policymakers, and researchers.

Methods

The search of the literature included a systematic search of PubMed, EMBASE, the Cochrane Database of Systematic Reviews, Web of Science, Scopus, and CINAHL from January 2000 to February 2024. The search terms included "plant-based diet," "vegan diet," "vegetarian diet," "chronic disease," "remission," "type 2 diabetes," "cardiovascular disease," "hypertension," "obesity," "cancer," and their synonyms, and Boolean operators. Inclusion criteria were: (1) English peer-reviewed studies, (2) controlled trials or studies comparing a PBD (vegan, vegetarian, primarily plant-based) with another control diet or intervention, (3) reported clinical outcome (e.g., remission rates, change in biomarker), a patient-centered outcome (e.g., QOL), or implementation outcome, and (4) adult populations with chronic disease. Exclusion criteria included studies with only prevention outcomes and studies focused only on pediatric populations. Study quality was assessed using the Cochrane Risk of Bias Tool for RCTs and the Newcastle-Ottawa Scale for observational studies. Data was extracted on disease-specific outcomes, remission rates, QOL, adherence, and barriers. Narrative synthesis was utilized due to heterogeneity of study designs (controlled trials), studies (different interventions), and outcomes, with meta-analytic data reported.

Type 2 Diabetes Mellitus

Plant-based diets (PBDs) appear to have good efficacy for T2DM management and potential T2DM remission. They provide an alternative to pharmacological means of enhancing glycemic control and reducing disease load. A meta-analysis of veg* and vegetarian diet RCTs showed a significant -0.4% reduction in glycated hemoglobin (HbA1c) compared to standards of care (e.g., diets supported by USA-based organizations including the American Diabetes Association (12)).

This type of effect was clinically meaningful in the sense that little reductions in HbA1c are correlated with decreased probabilities of microscopic diabetic complications such as retinopathy and nephropathy (13). Further, it was notable that some participants in the RCTs had entered remission, that is, they achieved an HbA1c of < 6.5% without medication for glucose-lowering, demonstrating the ability of PBDs to actually reverse T2DM in some individuals (12). This potential for remission was summarized by Barnard et al.'s landmark RCT, which reported a 28% remission rate at 12 months in T2DM subjects consuming a low-fat vegan diet compared to a 14% remission rate in participants consuming a standard diabetic dietary approach at 12 months (13). The hypothesized mechanisms of action for the improvement in glycemic control through PBD were hypothesized to be increased insulin sensitivity due to decreased visceral adiposity and intramyocellular lipid, and reduced systemic inflammation as shown by reduced C-reactive protein (CRP) and inflammatory markers (14).

Such effects are also attributed to PBDs' high fiber content, slowing down insulin absorption, and lack of saturated fats hampering insulin signaling (15). Such promising results are, nevertheless, countered by attendant challenges, particularly the sustainability of T2DM remission in the long term. Limited evidence is available for remission lasting longer than 12–24 months, and few studies extend follow-up durations to test durability (16). Furthermore, compliance with PBDs has proved to be a real issue with 20–30% of the participants describing difficulty due to social pressures, cultural food traditions, and perceived complexity in plant food preparation (17). Such compliance issues allude to the requirement of intensive diet counseling and group support for maximizing the therapeutic effect of PBDs in the management of T2DM.

Cardiovascular disease

PBDs are very effective at lowering cardiovascular risk factors and in certain cases, reversing early stages of CVD, and thus they represent a fundamental component of preventive and therapeutic cardiology. A systematic review of 15 RCTs showed that vegetarian diets significantly lowered LDL cholesterol by 10–15 % and total cholesterol by 5–10 % vs omnivorous diets, comparable to

low-dose statin therapy (18). These dietary cholesterol-lowering effects are attributed to low saturated fat and high unsaturated fat content in PBDs and polyunsaturated fatty acids (PUFAs), and their high dietary fiber, phytosterols, and antioxidant content, suppressing dietary cholesterol absorption and reducing oxidative stress (19). The Lifestyle Heart Trial, carried out by Ornish et al., showed regression of coronary atherosclerosis by coronary angiography in 82 % of subjects over 5 years of follow-up, using lifestyle and diet interventions (combination of a low-fat vegetarian diet combined with lifestyle modification of exercise and stress reduction) in the treatment phase (20). This regression rate is especially significant when identifying and treating early-stage coronary artery disease, as stabilizing or reversing plaque reduces the likelihood of myocardial infarction or heart failure (21).

PBDs increase left ventricular ejection fraction and symptoms of dyspnea and fatigue in heart failure patients, with some patients attaining functional remission (i.e., normalization of cardiac function without any changes in medications) (22). These effects are likely due to a reduction in systemic inflammation, improvement in endothelial function, and reductions in blood viscosity with PBDs (23). Results, however, are dependent on dietary adherence with severity of disease at trial entry, as non-adherent patients or patients with advanced CVD do not seem to benefit as much (24). Variability in study designs, e.g., in intensity of intervention or types of PBDs (e.g., lacto-ovo vegetarian or vegan), further confounds interpretation of the results (25). Future studies would benefit from standardization of dietary protocols and determination of longer-term cardiovascular endpoints to more fully operationalize the overall potential of PBDs to improve management of CVD.

Hypertension

PBDs have provided consistent evidence that allows for persistently reduced blood pressure (BP), or having a diet-based treatment for, and preventing the complications caused by hypertension. A meta-analysis of 11 RCTs showed that PBDs could lower systolic BP by 5-7 mmHg and diastolic BP by 2-4 mmHg compared to standard omnivorous diets; this effect is comparable to first-line antihypertensive drug treatment (26). These are achieved by the elevated intake of potassium, magnesium, and fiber in foods and vegetables, leading to vasodilatation, sodium excretion, and a fall in vascular stiffness (27). Low sodium and saturated fats in PBDs are also responsible for improvement in endothelial function and a fall in arterial pressure (28). A huge cohort of >12,000 subjects reported a vegan eating pattern to confer a 20% reduced risk of complications of hypertension, such as stroke and myocardial infarction, on 10-year follow-up (29). Likewise, benefits are increased in cases of mild to moderate hypertension where diet-based measures can reduce drug requirements significantly (30). Long-term control of BP is, nevertheless, associated with long-term compliance to PBDs and is challenging by virtue of restriction of diets and also because for it, the patient needs to be motivated continuously (31). Research reports that 25% of subjects are faced with adherence issues of PBDs attributable to palatability issues with foods, unavailability of plant foods or foods with such diets, or unavailability of social support for such diets and therefore individualized intervention is needed to increase compliance (32). Overcoming such barriers by way of the availability of information and foods is necessary for obtaining maximum antihypertensive benefits of PBDs.

Obesity

PBDs are highly effective for obesity and weight loss maintenance and are an integral treatment intervention for obesity and comorbid conditions. Meta-analysis of 12 RCTs found PBDs to cause loss of 4.2 kg on average (95% CI -3.3 to -5.1) at 6 months of comparison with control diets and maximal effect in vegan diets by virtue of plant foods' low caloric density and satiating effect by virtue of fiber-containing foods of plant origin (33). Plant foods by virtue of their bulk and nutrient density – such as fruits and vegetables and legumes – cause satiation with reduced total intake of energy and are feasible for long-term control of weight (34). Weight loss by PBDs also results in remission of comorbidities of obesity like T2DM, osteoarthritis and non-alcoholic fatty liver disease by virtue of loss of visceral adiposity and improvement of metabolic function (35). For example, a whole-food plant-based diet trial observed marked improvement in body mass index and osteoarthritis pain in obese osteoarthritis patients and remission of symptoms in a few of them (36). Proportion of adherence is a limitation, with 10–25% drop-out in PBD trials – often on account of limitations on diet appearing restrictive and time for meal preparation or lack of experience in or around cookery of plant-based foods (37). Such is common in those with low access to fresh foods or cookery materials and highlights the need for pragmatic intervention to enhance adherence (38). Meal-making classes and meal-planning applications, and community-based programs are some of the interventions by virtue of which an increase in PBD feasibility for the treatment of obesity can be obtained.

Cancer

PBD use in remission from cancer is an emerging field of research with encouraging but less definitive evidence than for other chronic diseases. Observational evidence from large cohort studies indicates vegetarian diets to be related to a 10–12% reduced risk of cancer progression, particularly colorectal and prostate cancer, attributed to their high levels of antioxidants, fiber, and phytochemicals (39). These diet components reduce oxidative stress, inhibit tumor growth, modify gut microbiota, and influence cancer outcome (40). An RCT among survivors of prostate cancer demonstrated vegan dietary intake in addition to lifestyle interventions to enhance quality of life and reduce levels of prostate-specific antigen, a key tumor marker, at 12 months (41). Evidence for complete remission, however, defined by undetectable disease, is sparse, and most studies focus on risk reduction or symptom control rather than disease reversal (42). Confounding by simultaneous lifestyle interventions (e.g., exercise, stress-reduction) reduces inference to PBDs (43). Heterogeneity of cancer type and

stage further confounds generalizability of evidence with greater evidence for hormone-dependent cancers like prostate and breast and others (44). Prioritizing RCTs with longer duration and homogeneous diet interventions will distinguish effects of PBDs on cancer remission versus progression or provide evidence on when to use them for benefit.

PBDs are associated with better quality of life (QoL), particularly in T2DM and CVD patients, through reduced symptom burden and physical function (31). With PBDs, patients have better energy and mood, and quality and satisfaction of diet, which are associated with plant food diversity and reduced medication dependency (32). Caregiver burden and social stigma, however, particularly in families with distinct cooking habits, lower satisfaction (33).

Implementation challenges

PBD compliance is a major hurdle, with 20–40% non-compliance based on taste, cultural acceptance, and restricted access to foods of plant origin (34). Poorly designed PBDs lead to several nutrient deficiencies, like vitamin B12, iron, and omega-3 fatty acids, for which supplements and teaching are needed (35). Individually taught eating and socio-economic status are barriers to scalability in general (36).

Table 1: Summary of Key Findings on Plant-Based Diets in Chronic

Condition	Key Findings	References
Type 2 Diabetes	0.4% HbA1c reduction; 28% remission rate in vegan diet RCTs.	12, 13, 14
Cardiovascular Disease	10–15% LDL reduction; 82% atherosclerosis regression in some trials.	16, 17, 18
Hypertension	5–7 mmHg systolic BP reduction; 20% lower complication risk.	20, 21, 22
Obesity	4.2 kg weight loss; improved BMI and comorbidities.	24, 25, 26
Cancer	10–12% lower progression risk; limited remission data.	28, 29, 30
QoL and Satisfaction	Improved energy, mood, and physical functioning; caregiver burden reported.	31, 32, 33
Challenges	20–40% non-adherence; nutrient deficiencies; socioeconomic barriers.	34, 35, 36

Patient-centred outcomes

Plant-based diets (PBDs) are associated with noticeable quality of life (QoL) benefits, particularly in type 2 diabetes mellitus (T2DM) and cardiovascular disease (CVD) patients by minimizing symptom load and enhancing physical and psychosocial well-being. Literature consistently shows fewer fatigue complaints, better physical functioning, and relief in disease-specific symptoms, e.g., T2DM-associated polyuria or CVD-associated angina, resulting in better quality of life (31). For example, a worksite-based vegan diet intervention found employees reported development of 20–30% better health-based quality of life scores by using valid measures like Short Form-36 (SF-36), with marked improvement in vitality and mental health components (31). Enhanced energy, enhanced mood, and better diet satisfaction are reported by many to be major benefits attributed to plant foods' flavor and texture diversity and less drug dependence with adverse effects of gastrointestinal disturbance or fatigue (32). Diversity of whole plant foods like fruits, vegetables, legumes, and whole grains allows for meal variety, empowering and enjoyable to most of the patients (33). Notwithstanding this, caregiver burden and social stigma surrounding patient satisfaction remain issues of concern concerning caregiver and patient

quality of life. In single-member families adapting to PBDs, caregivers are presumed to bear the extra load of meal preparation of foods of varied nature with potential increase in stress and time demand (34). In addition, bias related to vegetarian or vegan diet in cultures wherein meat is traditional may lead to judgments or feelings of isolation and overall lower satisfaction (35).

In order to overcome such barriers to acceptance, family and community-based support and diet counseling were found to improve acceptance and sustain patient-centered benefits to render PBDs acceptable to individual and cultural preferences (36).

Implementation Challenges

Broadly applied PBDs are faced with imposing implementation challenges, of which adherence is a major barrier. Non-compliance is reported by studies to be between 20–40% for reasons of taste, cultural practices for diet, and unaffordable access to plant-based foods (37). For instance, adherence to PBD may not be welcome for meat-based diet accustomed individuals particularly without culinary proficiency or exposure to plant-based foods (38). Cultural practices also pose adherence challenges because most traditional diets are based on animal foods and would subsequently stigmatize PBDs as restrictive or limiting (39). Access to fresh foods is also a major challenge, particularly in low-income areas or food deserts, where access to and consumption of plant-based foods may not be affordable (40). Nutritional deficiencies are also of highest concern in poorly planned PBDs and are recognized in literature to pose dangers of low intake of vitamin B12, iron, omega-3 fatty acids, and zinc, and could lead to fatigue, anemia, or neurologic impairments if not remedied (41). For instance, a systematic review found 20–60% of vegans to be deficient in vitamin B12, not on supplements emphasizing training and monitoring (42). Scalers are also affected by individualized diet counseling requiring a trained dietician and resources not feasible in poor-resource settings (43). Socio-economic inequalities exacerbate these challenges because poor-income areas lack access to affordable plant-based foods and healthcare providers to manage diet transition among them (44). Sustaining these challenges necessitates multi-faceted solutions of highly subsidized access to plant-based foods, plant-based foods-sponsored meal programs offering evidence-based solutions, and PBD training incorporated in primary healthcare units to increase equitable implementation (45).

Clinical Effectiveness

Clinical effectiveness of PBDs for management and induction of remission of chronic disease is well-established, with the greatest evidence for T2DM and CVD. The content of fiber, antioxidants, and phytonutrients of PBDs acts on fundamental pathophysiologic mechanisms of root causes of much of chronic disease, including insulin resistance, systemic inflammation, and oxidative stress (46). For T2DM, a landmark RCT reported a 28% remission on a low-fat vegan diet for HbA1c <6.5% off medication after 12 months vs 14% on a control diet driven by improvement in insulin sensitivity and reductions in visceral adiposity (13). A meta-analysis is supported in demonstrating a 0.4% improvement in HbA1c on PBDs per month of diet adherence, a clinically valuable effect, having halved diabetes complication risk (12). For CVD, regression of coronary atherosclerosis was reported in 82% of Lifestyle Heart Trial participants on a low-fat vegetarian diet by 10–15% reductions in LDL and improvement in endothelial function (17). Such findings attest to PBDs' capacity to reverse disease when it is early stage, particularly when combined with lifestyle intervention (47). For cancer, much weaker evidence exists for remission, so most studies are focused on preventing the acceleration of cancer rather than the reversal of the disease. Observational data suggest a 10–12% reduced prevalence of cancer acceleration with vegetarian diets, but RCTs of remission are hampered by sample sizes too few and by confounding by concurrent lifestyle intervention (30). Heterogeneity of levels of adherence in studies and variability of diet definition in strict veganism to lacto-ovo vegetarianism prohibit comparison and generalizability (48).

Also, data on longer-term sustained remission is scarce, and studies are of 6–24-month duration, with further research needed using longer periods of follow-up and standard regimens to assess the stability of these improvements (49).

Economic Benefits

PBDs are of significant economic benefit by reducing healthcare costs associated with managing chronic disease, making them a cost-saving strategy for healthcare systems. Through reduction of medication, hospitalization, and invasive treatments, PBDs can potentially reduce direct costs of care by a significant percentage (50). A cost-effectiveness estimation estimated that widespread use of PBDs has the potential to save $50–100 billion on U.S. costs of healthcare for T2DM and CVD alone, fueled by reduced medication, hospitalizations, and complication incidence such as myocardial infarction or diabetic retinopathy (51). For example, a study demonstrated that T2DM patients following a vegan diet reduced medication cost by 20–30% annually compared to those on conventional diets due to improved glycemic control and reduction in insulin requirements (52). In addition, PBDs' capacity to delay disease advancement reduces the need for costly interventions such as coronary artery bypass grafting or dialysis (53). These benefits are, however, tempered by upfront costs, e.g., cost of dietary advice, patient education, and supplementation to prevent harmful nutrient deficiencies, which can be significant in resource-constrained settings (54). Scalability within disadvantaged populations is also limited by disparities in the ability to access low-cost plant-based foods, with fresh produce and fruits being costlier than processed or animal-based foods (55). Policy reform, e.g., subsidies on plant foods or tax credits to healthcare centers offering PBD counseling, will be required to counteract these detriments to achieve maximum economic benefit (56). Implementation of PBDs in public health programs has the potential to increase cost

savings while reducing disparities in healthcare on the basis of socioeconomic status.

Patient-centered care

PBDs closely stick to ideals of patient-centered health by maximizing QoL, minimizing symptom burden, and enabling patients to take an active role in individual healthcare. T2DM and CVD patients report a marked improvement in physical function and energy level and overall mental status, enhancing overall QoL and reducing medication dependency on drugs with adverse effects (31). Adjustability and choice in PBDs enable eating to be individualized to personal taste and enjoyment of meals and induce a sense of personal efficacy and enjoyment of eating (32). Efficacy of PBDs in patient-centered health is contingent on the removal of barriers to adherence, moderated by social and cultural context. For example, patients in cultures where meat is central to diet report stigmatization or opposition by family members, which may lead to feelings of isolation or demotivation (33). Caregiver burden is also of particular relevance where PBDs require special meal handling or expenditure and require feeding arrangements that could estrange people in a household setting (34). Up to 20% of patients are estimated to refuse or drop PBDs because of such social pressures, and therefore, targeted intervention would be recommended (35). Individualized programs of education involving exposure to culturally adapted recipes or counseling within the family setting are proven to enhance acceptance and adherence (36). Community-based support programs, including access to peer groups and cookery classes, are also proven to increase access and sustain long-term adherence to PBDs and to keep the model working and patient-centered (44).

Implementation and Scalability

Scaling PBDs is not possible without surmounting a complex interplay of barriers, including low compliance, insufficiencies in diet based on nutrition, and economic and social inequalities. Multidisciplinary teams including dietitians, physicians, and behaviour specialists are needed for delivering individualized counseling and monitoring of insufficiencies and compliance of patients (57). For example, dietitians can prepare meal plans individualized to taste and reduce common insufficiencies in 20–60% of vegans without supplements, e.g., vitamin B12 or iron (42). Technology, e.g., meal-planning mobile apps, nutrient tracking apps, or e-consultations, could facilitate adherence by virtue of convenient mechanisms for regulating diets by oneself (58). Such steps would require expenditure on user-friendly interfaces and programs to enhance digital literacy, particularly among elderly people or low-income sections (59). Socio-economic barriers, e.g., economic costs of fresh produce and fruits and vegetables, and unavailability of them in urban 'food deserts', also act against scalability, particularly in low-resource settings (60). Policy interventions, e.g., subsidization of plant foods, inclusion of PBDs in clinical guidelines, and payment for nutrition counselling, would be needed to surmount such barriers and deliver equitable access (47). Partnerships with the private sector, including with food sellers, could further facilitate scalability and drive mass acceptance in different sections of society (56).

Limitations

This review is limited by a number of factors that influence the robustness and generalizability of its results. Heterogeneity in PBD definitions—ranging from strict vegan to flexitarian diets—precludes between-study comparisons, as does heterogeneity in study designs, intervention durations, and outcomes (48). For example, some trials include lifestyle interventions such as exercise that confound the exclusive effects of PBDs (30). Most studies are conducted in high-income countries with access to plentiful plant foods and healthcare services, whose generalizability to low- and middle-income settings with greater food insecurity and micronutrient deficiencies is doubtful (49).

Publication bias is also likely, as studies with positive results are likely to be published and will thus likely overestimate the benefits of PBDs (50). Many trials are also underpowered due to small sample size or short follow-up, so long-term outcomes like sustained remission and prevention of micronutrient deficiencies cannot be assessed (51). These limitations require more rigorous standardized research and additional evidence to establish PBD approaches in managing chronic disease.

Recommendations

To achieve the therapeutic potential of PBDs, a number of actionable recommendations are provided. First, policymakers must integrate PBDs into national nutrition guidelines and establish subsidies on plant foods to increase affordability and availability, particularly among disadvantaged groups (52).

Second, health professionals must be trained to provide PBD counseling, and PBD practice, in multidisciplinary teams, to provide tailored dietary care and acknowledge and address nutritional and behavioral needs of their patient populations (53). Third, large randomized controlled trials (RCT) of standardized PBD protocols with long-term follow-up for assessing long-term remission rates and addressing gaps in the evidence base, especially for cancer (54), are required. Finally, investment in or use of accessible technological digital tools, including mobile apps for meal planning or tracking of nutrient intake, will improve patient adherence and involvement in PBD, making it easier for PBD application and future sustainability (55). Collectively, these suggestions can help scale addressing PBD approaches into clinical practice and public health policy.

Conclusion:

Plant-based diets are a remarkably effective treatment and potential remission intervention in chronic disease, with strong evidence for effectiveness in T2DM, CVD, hypertension, obesity, and promising emerging evidence for cancer. The therapeutic effects are often accompanied by potential cost savings and improved QoL, but are also propagated by their anti-inflammatory, nutrient-

dense properties. To ensure scalability and equitable access, the barriers of non-adherence, nutritional deficiency, and socioeconomic disadvantages must be addressed. Several strategies can be employed to address barriers to non-adherence that will allow healthcare systems to capitalize on the potential of PBDs to reduce the global chronic disease burden and sustain patient-centred care. These strategies include embedding PBDs into clinical practice guidelines, investing in patient education, and leveraging technology and policy initiatives.

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الإمكانات العلاجية للتدخلات الغذائية القائمة على النباتات في علاج الأمراض المزمنة: الآليات والأدلة السريرية والتطبيق العملي

الملخص

الخلفية: تشكل الأمراض المزمنة مثل داء السكري من النوع الثاني، وأمراض القلب والأوعية الدموية، وارتفاع ضغط الدم، والسمنة، وبعض أنواع السرطان عبئا كبيرا على الصحة العامة عالميا، حيث تتأثر هذه الحالات بشكل كبير بعوامل نمط الحياة، بما في ذلك النظام الغذائي. تظهر النظم الغذائية النباتية غير المقيدة، التي تعتمد بشكل رئيسي على الأطعمة النباتية الكاملة مع القليل من الأطعمة الحيوانية أو بدونها، بيانات ناشئة تشير إلى ارتباطها بالوقاية من الأمراض المزمنة وعكس مسارها، بما في ذلك التأثيرات المضادة للالتهابات، ومضادات الأكسدة، والفوائد الأيضية.

الهدف: مراجعة منهجية للأدلة التي تربط النظم الغذائية النباتية بالتخفيف أو التحسن الكبير في الأمراض المزمنة، مع توثيق النتائج السريرية، وجودة الحياة، والفعالية من حيث التكلفة، والاعتبارات المتعلقة بالتنفيذ المرتبطة بأي نظام غذائي نباتي.

الطرق: تم إجراء بحث في الأدبيات من عام 2000 إلى 2024 باستخدام كلمات مفتاحية للنظم الغذائية النباتية، والنباتية، والأمراض المزمنة، وكلمات مفتاحية خاصة بالأمراض. شملت الدراسات المؤهلة المراجعة من قبل الأقران البالغين، و أبلغت عن النتائج السريرية، وجودة الحياة، واعتبارات التنفيذ، دون قيود على مدة النظام الغذائي أو التدخل. تم تقييم جودة الدراسات بشكل مستقل باستخدام أداة كوكرين لتقييم مخاطر التحيز ومقياس نيوكاسل-أوتاوا.

النتائج: أنتجت النظم الغذائية النباتية نتائج سريرية مفيدة عبر مجموعة من الحالات، بما في ذلك داء السكري من النوع الثاني، وأمراض القلب والأوعية الدموية، وارتفاع ضغط الدم، والسمنة، وتطور السرطان. حسنت هذه النظم مستويات HbA1c وكوليسترولLDL ، وأدت إلى فقدان الوزن مع منع أو تقليل تطور السرطان. تم تحديد التحديات مثل عدم الالتزام و افتقار العناصر الغذائية. تم تقدير توفير التكاليف السنوية لإدارة داء السكري من النوع الثاني وأمراض القلب والأوعية الدموية بما يتراوح بين 50-100 مليار دولار.

الاستنتاج: تشير الأدلة إلى أن النظم الغذائية النباتية يمكن أن تكون فعالة في إدارة الأمراض المزمنة وربما تحفيز التخفيف منها، وتوفر فوائد في النتائج السريرية، وجودة الحياة، وتكاليف الرعاية الصحية. يجب فحص العوائق المتعلقة بالالتزام، ونقص العناصر الغذائية، وقابلية التوسع بشكل أكبر، مع الحاجة إلى التعليم، والدعم البنيوي، والمزيد من الأبحاث لفهم كيفية تعظيم التنفيذ.

الكلمات المفتاحية: النظام الغذائي النباتي، الأمراض المزمنة، التخفيف، داء السكري من النوع الثاني، أمراض القلب والأوعية الدموية، ارتفاع ضغط الدم، السمنة، السرطان، جودة الحياة، فعالية التكلفة.