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Review Article

Implementing dietary counselling in family practice for diabetes control and prevention

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ABSTRACT

The importance of dietary counselling in family practice for managing and preventing diabetes is the focal point of this review, highlighting its integral role in chronic disease management. With diabetes increasingly prevalent worldwide, there is a critical need for effective management strategies, with dietary interventions playing a key role. Family practitioners, often the initial point of contact for patients, have a unique opportunity to implement these dietary changes, which are pivotal in influencing diabetes outcomes and averting long-term complications. Despite facing challenges such as limited time and the need for specialized knowledge, dietary counselling in family practice stands as a proactive measure focused on prevention and early intervention. It adopts a patient-centered approach, where dietary habits and preferences are assessed, and personalized, evidence-based advice is provided. The inclusion of dietitians in primary care teams, utilization of technology for support, and advocacy for policy reforms are recommended to enhance the effectiveness of dietary counselling. Despite various obstacles, integrating dietary counselling into routine care remains a significant advantage, promoting healthier lifestyle choices and effectively managing the increasing burden of chronic diseases.

Keywords: Dietary counselling, Family practitioners, Diabetes control, Diabetes prevention, Chronic disease management, Nutrition

INTRODUCTION

Implementing dietary counselling in family practice as a pivotal strategy for diabetes control and prevention represents a critical intersection of nutrition, healthcare, and chronic disease management. This comprehensive approach underscores the essential role of primary care in addressing the dietary factors associated with diabetes, a condition that continues to affect millions worldwide, with its prevalence alarmingly on the rise.[1,2] Diabetes mellitus, characterized by chronic hyperglycemia due to insulin resistance or deficiency, poses significant health risks and burdens, including cardiovascular disease, renal failure, vision loss, and neuropathy. The increasing incidence of diabetes globally necessitates proactive and effective management strategies, with dietary management being paramount.[3] Family practitioners play a pivotal role in the healthcare system, often acting as the initial point of contact for patients. This positions them uniquely to implement dietary interventions early in the disease process, which can significantly influence the trajectory of diabetes and its myriad complications. The proactive involvement of family practitioners in dietary counselling can lead to early identification and management of

diabetes, promoting healthier dietary practices among patients. This approach not only aids in the direct management of diabetes by optimizing blood glucose levels but also contributes to the prevention of long-term complications.[4]

The role of dietary counselling in diabetes management cannot be overstated. Tailored dietary advice helps patients understand and implement lifestyle changes essential for managing blood glucose levels, weight, and associated risk factors. However, the implementation of such counselling in family practice involves navigating various challenges, including time constraints, patient adherence, and the need for specialized knowledge. Despite these challenges, the integration of dietary counselling into routine care offers a proactive approach to diabetes management, emphasizing prevention and early intervention.[1]

Effective dietary counselling in family practice requires a structured and patient-centered approach. It involves assessing individual dietary habits, preferences, and barriers to change; providing personalized, evidence-based dietary advice; setting realistic goals; and offering ongoing support and follow-up. Such an approach not only addresses the immediate dietary needs of patients with diabetes but also fosters long-term health and well-being.[5]

The evidence supporting the efficacy of dietary counselling in diabetes management is robust, highlighting significant improvements in glycemic control, weight management, and overall cardiovascular risk factors. However, the translation of this evidence into practice requires concerted efforts to overcome existing barriers. Strategies to enhance the implementation of dietary counselling in family practice include providing practitioners with additional training in nutrition, integrating dietitians into the primary care team, utilizing technology for monitoring and support, and advocating for policy changes that support preventive care models.[6]

Furthermore, patient engagement and education are crucial elements of successful dietary counselling. Empowering patients with the knowledge and skills to make informed dietary choices leads to better adherence to dietary recommendations and improved health outcomes. The use of individualized care plans, motivational interviewing, and culturally sensitive dietary advice can enhance patient engagement and support behavior change.[7]

METHODS

This study is based on a comprehensive literature search conducted on 24 January 2024, in the Medline and Cochrane databases, utilizing the medical topic headings (MeSH) and a combination of all available related terms, according to the database. To prevent missing any possible research, a manual search for publications was conducted through Google Scholar, using the reference lists of the previously listed papers as a starting point. We looked for valuable information in papers that discussed implementing dietary counselling in family practice for diabetes control and prevention. There were no restrictions on date, language, participant age, or type of publication.

DISCUSSION

Incorporating dietary counselling within a family practice environment for managing and preventing diabetes requires a holistic and varied strategy, centered on educating patients, creating tailored nutritional plans, and providing continuous support.

Training healthcare professionals in the latest diabetes management and prevention guidelines encourages an interdisciplinary team approach for comprehensive care.[8] Initial patient assessments, including screening for prediabetes and diabetes and evaluating dietary habits, set the foundation for individualized dietary advice, emphasizing carbohydrate management and the glycemic index.[9]

Technology, such as mobile apps and telehealth, enhances follow-up and patient engagement. Support groups and cooking classes provide practical, communal support, while regular monitoring and evaluation ensure the plan's effectiveness. Community engagement, through partnerships and public health campaigns, further supports healthy eating. Addressing implementation challenges, such as time constraints, patient compliance, and access to healthy foods, is critical for success. This strategy underscores the pivotal role of family practice in diabetes prevention and management through dietary counselling.

Medical nutrition therapy for type 1 and type 2 diabetes

Carbohydrate and diabetes

Whole grains, fruits, vegetables, and low-fat milk are advised due to their positive impact on blood sugar levels, emphasizing that the quantity of carbohydrates ingested is more crucial than their variety.[5] Adjusting insulin doses in type 1 diabetes based on meal carbohydrate content and considering the substitution of carbohydrates with monounsaturated fats in type 2 diabetes can improve glycemic control. While the debate around the glycemic index continues, dietary fiber is universally acknowledged for its positive impact on diabetes management. Sweeteners like sucrose, fructose, and sugar alcohols require careful consideration due to their varying effects on blood sugar and lipid levels, but non-nutritive sweeteners are deemed safe for consumption.[10]

According to dietary reference intakes (2002), published by the US Institute of Medicine on the glucides requirements per day among healthy individuals, the minimum allowable amount of digestible carbohydrates is 130 g/day.[11] Overall, personalized dietary planning, focusing on carbohydrate quality and quantity, plays a critical role in effectively managing diabetes and enhancing overall health outcomes.

Protein and diabetes

Research indicates that while moderate hyperglycemia in type 2 diabetes may increase protein turnover, suggesting a higher protein need, most adults consume more protein than necessary, mitigating the risk of protein malnutrition in diabetes.[10,12,13] Studies have shown that protein does not contribute to increased plasma glucose levels or affect the absorption of carbohydrates, even in those with diabetes. However, the impact of high protein intake on diabetic nephropathy and the long-term effects of high-protein, low-carbohydrate diets remain uncertain. Guidance indicates that individuals with well-managed type 2 diabetes do not require modifications to their protein consumption if kidney function is normal. However, the effectiveness and safety of diets that are high in protein and low in carbohydrates remain to be conclusively determined. There are specific worries about the long-term effects of such diets on weight control and levels of low-density lipoprotein (LDL) cholesterol.[10]

Dietary fat and diabetes

When managing diabetes, an essential dietary priority is the reduction of saturated fats and dietary cholesterol intake, since these elements significantly contribute to increased levels of plasma LDL cholesterol. Individuals with diabetes exhibit an increased sensitivity to these dietary components.[5] Despite the lack of diabetes-specific studies, the general guideline remains to limit saturated fat to less than 10% of energy intake and dietary cholesterol to less than 300 mg/day, with stricter limits for individuals having LDL cholesterol levels above 100 mg/dl.[10] Although low saturated fat diets can elevate postprandial glucose and triglycerides while potentially lowering HDL cholesterol compared to diets high in monounsaturated fats, the latter have not demonstrated improvements in fasting glucose or HbA1c levels. Additionally, there is worry that diets high in monounsaturated fats might result in elevated calorie consumption and weight gain if not carefully supervised. The role of polyunsaturated fats, including n-3 fatty acids, in diabetes management is less clear, though they may lower triglycerides without adversely affecting glucose metabolism. Trans fats, like saturated fats, negatively impact LDL and HDL cholesterol levels and should be minimized. Plant sterols and stanols can help reduce cholesterol absorption and LDL levels. Low-fat, high-carbohydrate diets may lead to modest weight loss and improvements in dyslipidemia over time. Fat intake can also be reduced with fat replacers, although their impact on total energy intake and weight management requires further study.[10]

Recommendations support reducing saturated fat intake, minimizing trans fats, and considering carbohydrate or monounsaturated fat as replacements, depending on weight management goals, with an emphasis on long-term adherence to reduced-fat diets for weight loss and improved lipid profiles.[14,15]

Micronutrients and diabetes

People with diabetes are advised to focus on getting vitamins and minerals from natural foods and to be mindful of the potential dangers linked to taking megadoses of vitamin and mineral supplements.[10] Supplementation can be advantageous in specific scenarios, particularly for individuals at risk of nutrient deficiencies, such as the elderly, pregnant or lactating women, strict vegetarians, and those following calorie-restricted diets. Although diabetes is associated with increased oxidative stress, leading to interest in antioxidant vitamins, there is no solid proof that megadoses of antioxidants like vitamin C, E, selenium, beta-carotene, and other carotenoids prevent cardiovascular disease, diabetes, or cancer. In fact, some research indicates they might have potential negative effects. The role of folate in reducing homocysteine levels to lower cardiovascular risks is still uncertain. Similarly, the effectiveness of vitamins B1, B6, B12, and nicotinamide in treating diabetic neuropathy or in preserving β-cell mass in type 1 diabetes has not been proven sufficiently for their endorsement. While deficiencies in minerals such as potassium, magnesium, zinc, and chromium can worsen carbohydrate intolerance, only the impact of chromium supplementation on glycemia has shown mixed outcomes, without definitive evidence of benefit.[16] Recommendations suggest a daily calcium intake of 1,000 to 1,500 mg to potentially lower the risk of osteoporosis in older adults with diabetes. However, the effectiveness of vanadium salts and herbal treatments for diabetes management remains uncertain and could carry potential risks. Overall, there is no strong evidence supporting the benefit of vitamin or mineral supplements in diabetic individuals without specific deficiencies, except for folate and calcium for the prevention of birth defects and bone disease, respectively. Routine antioxidant supplementation is not advised due to uncertain long-term efficacy and safety concerns.[10]

Alcohol and diabetes

For individuals with diabetes, the guidelines for alcohol consumption are similar to those for the general public, emphasizing moderation and careful consideration. Women during pregnancy and individuals with health conditions such as pancreatitis, advanced neuropathy, severe hypertriglyceridemia, or a history of alcohol misuse are advised to avoid alcohol. For those who choose to drink, the guidelines recommend a limit of no more than two drinks per day for men and one drink per day for women. A "drink" is defined as 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of distilled spirits, with each containing about 15 grams of alcohol. The type of alcoholic beverage does not alter the cardioprotective effects of alcohol.[10] Alcohol's impact on blood sugar levels in diabetics can vary, potentially leading to both hypoglycemia and hyperglycemia, depending on the amount consumed, whether it is taken with food, and the frequency of consumption. Moderate alcohol consumption alongside food has not demonstrated an immediate impact

on blood glucose or insulin levels in individuals with either type 1 or type 2 diabetes. This suggests that alcohol can be incorporated into their regular diet without replacing food. Furthermore, for adults with diabetes, light to moderate alcohol intake (5–15 g/day) has been associated with a reduced risk of coronary heart disease, likely because of elevated levels of plasma HDL cholesterol.[10]

Pregnancy and lactation with diabetes

In the context of diabetes during pregnancy and breastfeeding, medical nutrition therapy focuses on providing sufficient nutrition for both the mother and the fetus. It aims to guide appropriate calorie consumption for healthy weight gain and includes any necessary supplementation of vitamins and minerals to support the health of both the mother and the developing fetus.[17] In the initial stages of pregnancy, there is generally no increase in energy requirements unless the woman begins pregnancy with low body reserves. It is recommended that an additional 300 calories per day during the second and third trimesters can aid in supporting the expansion of maternal blood volume, growth of breast and uterine tissues, development of the placenta and fetus, and production of amniotic fluid. Nonetheless, it has also been observed that lower energy intakes can still be associated with successful pregnancy outcomes. Pregnant women, irrespective of diabetes status, should follow a balanced diet with sufficient energy and consume a variety of foods to get 400 µg/day of folic acid for the prevention of birth defects.[10] While a healthy diet during pregnancy generally provides all necessary vitamins and minerals, prenatal vitamin-mineral supplements are often recommended despite limited evidence of their necessity due to potential uncertainties in nutritional status and intake. The dietary patterns of pregnant women should be assessed to determine individual needs.

For women with pre-existing type 1 or type 2 diabetes, pre-pregnancy nutrition therapy involves creating a personalized prenatal nutrition plan aimed at optimizing blood glucose control. The allocation of energy and carbohydrates during pregnancy should be tailored to the individual's dietary habits, blood glucose readings, and the physiological changes brought on by pregnancy. Regular meals and snacks are crucial for avoiding hypoglycemia due to the constant glucose demand from the fetus. An evening snack may be necessary to mitigate the risk of nocturnal hypoglycemia and fasting ketosis. Monitoring blood glucose levels and keeping daily food diaries are essential for adjusting insulin doses and meal plans accordingly.

For gestational diabetes mellitus, nutrition therapy focuses on maintaining both maternal and fetal health, ensuring appropriate energy intake for healthy gestational weight gain, achieving normoglycemia, and preventing ketones. Carbohydrates should be spread evenly throughout the day, and an evening snack might be considered to avoid overnight ketosis. Typically, carbohydrate intake is less tolerated at breakfast than at other meals. Recommendations are personalized based on assessment and monitoring of blood glucose levels. Hypocaloric diets in obese women with gestational diabetes may lead to ketonemia and ketonuria, whereas a modest energy restriction can reduce blood glucose levels without these adverse effects. Keeping food records, monitoring weight, and testing for ketones are crucial for customizing individual energy recommendations. Regular aerobic exercise is beneficial for improving maternal glycemia, though no specific form is universally recommended.[18] Blood glucose monitoring is essential for assessing the effectiveness of nutrition therapy, physical activity, and determining the necessity for pharmacological intervention. Consistent carbohydrate intake becomes particularly important when insulin therapy is initiated to maintain blood glucose levels within target ranges. Postpartum, women who had gestational diabetes face a heightened risk of developing type 2 diabetes. To mitigate this risk, they are encouraged to focus on lifestyle changes such as effective weight management and regular physical activity.

Breastfeeding is strongly recommended for women with either pre-existing or gestational diabetes, as it can help lower blood glucose levels. This reduction in glucose may require women who are treated with insulin to consume carbohydrates before or during breastfeeding sessions to prevent hypoglycemia. The benefits of breastfeeding extend beyond blood glucose management, supporting both mother and infant health.[19] During the first six months of lactation, energy requirements are approximately 200 calories higher than those outlined in the pregnancy meal plan. Despite this increased need, a daily intake of around 1,800 kcal is often sufficient to meet the nutritional demands of lactation. This calorie level can also support gradual weight loss, balancing the mother's energy needs while providing adequate nutrition for breastfeeding.[10]

Diabetes prevention

The escalating global incidence of diabetes underscores the critical importance of prevention strategies, particularly among individuals at high risk (Table 1).

Table 1: Methods for prevention of diabetes.[10]

Aspect of prevention	Details
Lifestyle changes	Significant lifestyle changes such as reduced physical activity and increased caloric intake contribute to obesity, a major risk factor for type 2 diabetes.
Weight management	Moderate, sustained weight loss has been shown to significantly decrease the risk of type 2 diabetes, as evidenced by clinical trials in the USA and Finland.

Continued.

Aspect of prevention	Details
Physical activity	Adopting an active lifestyle that includes both moderate and vigorous exercises can help in preventing or delaying the onset of type 2 diabetes. Engaging in regular physical activity is a key factor in maintaining healthy blood sugar levels and overall health.
Dietary adjustments	Reducing the intake of total and saturated fats can lower diabetes risk, while increasing polyunsaturated fat intake and consuming diets rich in whole grains and dietary fiber can mitigate this risk.
Micronutrients and alcohol	The role of certain micronutrients in diabetes prevention is limited or inconsistent, but moderate alcohol consumption is associated with enhanced insulin sensitivity and a lower diabetes risk.
Prevention in youth	For type 1 diabetes, there are no specific dietary guidelines for prevention, but breastfeeding might offer some protective benefits. The growing incidence of type 2 diabetes among young people highlights the need for increased physical activity, reduced intake of energy and fats, and effective weight management strategies. These measures are crucial for preventing the onset of type 2 diabetes in the youth population.

CONCLUSION

Implementing dietary counselling in family practice for diabetes control and prevention is a vital strategy that addresses the root causes of diabetes and empowers patients to manage their health proactively. Despite the challenges, the benefits of integrating dietary counselling into routine care are profound, offering a path towards improved health outcomes, enhanced quality of life for patients with diabetes, and a sustainable approach to managing the growing burden of chronic diseases.

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