Diet and Obesity and their Effects on Diabetes: Literature Review

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This literature review aims to find quantitative research articles to find statistics on how diet and obesity can affect a person with diabetes. If a person consumes a diet high in calories, cholesterol, and fat, it increases their risk of diabetes. A poor diet can lead to obesity (a risk factor for diabetes) which can cause an increase in fatty acid levels and inflammation that leads to insulin resistance (Hinkle & Cheever, 2018). The most important objectives in the nutritional and dietary management of diabetes are control of blood glucose levels, total caloric intake to attain or maintain reasonable body weight, and normalization of lipids and blood pressure to prevent heart disease (Hinkle & Cheever, 2018). Management of these things can result in hyperglycemia reversal in type 2 diabetes. A qualified registered dietician usually constructs a Medical Nutritional Therapy (MNT) plan for managing diabetes, but patients can find it challenging to achieve these goals (Hinkle & Cheever, 2018).

Do Patients Value Nutritional Therapy? A Quantitative Study in Type 2 Diabetes Patients

Nurses and health care team members need to be knowledgeable about nutritional therapy and supportive of patients who need to implement nutritional and lifestyle changes. Type 2 diabetes patients' adherence to nutritional therapy or lifestyle change behaviors is lower than pharmacotherapy because they find it more challenging and do not value nutritional therapy at the same level as other interventions (Ezequiel et al., 2017). This study aims to analyze the values that Type 2 Diabetes patients place on nutritional therapy and identify barriers to adherence to nutritional therapy (Ezequiel et al., 2017).

Key Points

The authors of this article use a quantitative study using a non-random sample of 62 patients receiving health care in a Diabetes Clinic in the municipality of Faro in the Portuguese region of the Algarve (Ezequiel et al., 2017). The criteria for the participants to be part of the study were to have a medical diagnosis of Type 2 Diabetes Mellitus for at least 12 complete weeks, age below 85 years, and have been at least in one individual consultation with a registered dietitian in the past year. The researchers use an anthropometric assessment using standard methods and data collection from the patient's clinical files (Ezequiel et al., 2017). The data consists of height, weight, waist circumference (using standardized methods), and additional clinical data (HbA1c and lipid profile) (Ezequiel et al., 2017). The four tables to calculate the data consist of: Anthropometric, dietary, and clinical characteristics of the sample; Perceptions on the quality of dietary intake and importance for diabetes control and management, assessed on 5-point Likert scales; Advice given by health professionals; Statements about barriers to comply with nutrition recommendations (Ezequiel et al., 2017). The data is significant and shows that patients show poor dietary intake, with a prevalence of 36% of overweight patients and 53% of obese patients (Ezequiel et al., 2017). The P-value for gender and age is 0.431, making it not statistically significant (Ezequiel et al., 2017). Dietary and clinical characteristics show that males' energy intake is higher than women's with a P-value of 0.006, and males' intake of carbohydrates is higher than women's with a P-value of 0.04 (Ezequiel et al., 2017). Both P-values for energy intake and carbohydrates are less than 0.5, making them statistically significant.

Assumptions

One assumption is that barriers cause patients with Type 2 Diabetes to be non-compliant with nutrition recommendations (Ezequiel et al., 2017). The barriers can be from a lack of knowledge

or that the patient finds it too difficult to follow the diet plan. Another assumption is that patients with Type 2 Diabetes are obese because of poor nutrition consisting of fats, cholesterol, and that are high in calories. The author discusses that barriers need to be known through more studies to improve adherence to nutritional therapy in patients with Type 2 Diabetes.

Deficit/Conclusion

This study concludes that Type 2 Diabetes patients perceive nutrition as an essential part of their treatment plan but find pharmacologic therapy more valuable because they find nutritional recommendations difficult (Ezequiel et al., 2017). There are clear guidelines for the construction of meal plans and sufficient evidence in the literature to support the effectiveness of nutritional therapy for Type 2 Diabetes patients (Ezequiel et al., 2017). Future research must address how educational, economic, cultural, or psychosocial characteristics may hinder compliance with nutritional recommendations (Ezequiel et al., 2017). The authors' line of reasoning is acceptable. If nursing fails to accept this line of reasoning, the results of poor nutrition and obesity will continue to rise in patients with diabetes.

Impact of a Ketogenic Diet on Metabolic Parameters in Patients with Obesity or Overweight and with or without Type 2 Diabetes: A Meta-Analysis of Randomized Controlled Trials

Obesity is a primary underlying risk factor for chronic disorders such as Type 2 Diabetes, and the rate of obese people worldwide has tripled since the 1970s (Choi et al., 2020). The current treatment guidelines for obesity recommend a dietary restriction as the first nutritional modification for weight loss (Choi et al., 2020). The ketogenic diet is a low-carbohydrate, high-

fat diet that limits the carbohydrate intake to 5% to 10% of total daily dietary requirements (Choi et al., 2020). Before the discovery of insulin in the early 20th century, the ketogenic diet was the principal therapeutic option for diabetes (Choi et al., 2020). The researchers believe that a ketogenic diet can safely promote weight loss in obese people, reducing their chance of Type 2 Diabetes.

Key Points

The authors of this article use quantitative research to conduct a meta-analysis to explore the efficacy of a ketogenic diet in metabolic control in patients with obesity and with or without Type 2 Diabetes (Choi et al., 2020). The authors use the libraries of Cochrane, PubMed, and Embase to find fourteen random control trials with patients that are overweight or obese and that are on the ketogenic diet for metabolic control (Choi et al., 2020). The results show that the effects of ketogenic diets on glycemic control were more significant for diabetic patients than for low-fat diets. They are indicated by having lower glycated hemoglobin with a P-value of < 0.001 and a homeostatic model assessment index with a p-value of 0.02 (Choi et al., 2020). Ketogenic diets led to substantial weight reduction with a p-value of 0.04 no matter the patients' diabetes status at baseline and improved lipid profiles in terms of lower triglyceride with a p-value of 0.01 and more significant high-density lipoprotein with a p-value of 0.005 for diabetic patients (Choi et al., 2020). The study findings confirm that ketogenic diets are more effective in improving metabolic parameters associated with weight, glycemic, and lipid controls in patients that are overweight or obese, especially those with preexisting diabetes, compared to low-fat diets (Choi et al., 2020).

Assumptions

One assumption is that ketogenic diets are more effective than low-fat diets for patients that are obese with diabetes. The ketogenic diet dates to the early 20th century and has effectively helped with weight loss and diabetes (Choi et al., 2020). The authors discuss that the effects of the ketogenic diet may contribute to improvements in metabolic dysfunction related to mortality and morbidity in these patient populations (Choi et al., 2020).

Deficit/Conclusion

This study concludes that a ketogenic diet is more effective in improving weight control and metabolic parameters related to lipid and glycemic controls in patients that are overweight or obese, especially with preexisting Type 2 Diabetes, compared to low-fat diets (Choi et al., 2020). The authors suggest further studies to determine the long-term sustainability of a ketogenic diet and its effects on obesity-related mortality and morbidity for diabetic and non-diabetic patients (Choi et al., 2020). The authors' line of reasoning is acceptable. If nursing fails to accept this line of reasoning, the rate of obesity and death can continue to rise for diabetic patients.

Screening Risk Factors for Type 2 Diabetes in Overweight and Obese Adolescents in School Settings of Hungary: A Population-Based Study

Obesity resulting from poor nutrition and lack of exercise is a risk factor for developing type 2 diabetes. Diabetes and the complications from having diabetes have been a public health dilemma for decades (Lukács et al., 2018). There needs to be action to mitigate risk factors because the increasing rates of type 2 diabetes and prediabetes among young adults and adolescents can become a public health crisis (Lukács et al., 2018). Type 1 diabetes is most common amongst children, but because of the epidemic of obesity and lack of exercise among

adolescents and children, diabetes and prediabetes are a growing public health concern (Lukács et al., 2018). Early identification of children at risk for diabetes can allow interventions to delay or prevent the onset of type 2 diabetes. This study explores the proportion of at-risk children and adolescents developing type 2 diabetes (Lukács et al., 2018).

Key Points

The authors of this article use a population-based quantitative study of at-risk adolescents for the development of type 2 diabetes in school settings in Hungary (Lukács et al., 2018). They use random sampling from two primary and four secondary schools from each region and ten from the capital (Lukács et al., 2018). They chose students with a body mass index (BMI) above the 85th percentile for the sample. The collection of data from the students' medical records consisted of the following: gender, age, weight (calculated BMI percentile), height, birth weight and length, residency (rural or urban), born term or preterm (before 36 weeks), and risk factors for type 2 diabetes (having first- or second-degree relatives with type 2 diabetes, acanthosis, dyslipidemia, hypertension, and polycystic ovary syndrome in females) (Lukács et al., 2018). The Pearson's chi-square test examines the relationship between categorical variables. The T-test compares the ages of females and males, and the F-test finds the relationship between age and increased risk (Lukács et al., 2018). The use of Statistical Package for Social Sciences (SPSS) 22.0 software is used to analyze the data and set the significance level of the p-value at ≤ 0.05 (Lukács et al., 2018). The total number of students assessed for type 2 diabetes risk factors is 3962, including 1925 females and 2037 males with BMI > 85th percentile (Lukács et al., 2018). If the students' have two risk factors and their BMIs are over the 85th percentile, they are at-risk individuals for developing type 2 diabetes. The p-value of 0.082 shows no significant difference

in age between females and males (Lukács et al., 2018). Adolescents born preterm with a p-value of 0.047 that live in rural areas with a p-value of 0.022 are more likely to be at risk for type 2 diabetes (Lukács et al., 2018).

Assumptions

One assumption is that children and adolescents with two or more risk factors are more likely to develop Type 2 Diabetes. The risk factors for Type 2 Diabetes include the following: first- or second-degree relatives with type 2 diabetes, acanthosis, dyslipidemia, hypertension, and polycystic ovary syndrome in females (Lukács et al., 2018). The authors discuss that early identification of adolescents at risk for Type 2 Diabetes can allow early intervention to delay or prevent the disease (Lukács et al., 2018).

Deficit/Conclusion

This study concludes that there needs to be a public health approach to preventing Type 2 Diabetes because many overweight adolescents risk developing the disease. School settings can allow for screening and preventive protocols for diabetes by school nurses instead of in a clinical setting (Lukács et al., 2018). Using the school for the most suitable location and the school nurses is easier and more cost-effective. Another benefit is that the school nurses can monitor the students throughout their years in school, allowing them to know to promote the prevention of modifiable risk factors of diabetes such as obesity (Lukács et al., 2018). The authors' line of reasoning is acceptable. If nursing fails to accept this line of reasoning, the results of children and adolescents developing Type 2 Diabetes will continue to rise.

Conclusion

Diet and obesity can have a significant impact on patients with diabetes. Patients with diabetes need to adhere to nutritional therapy. All healthcare members must be knowledgeable about nutritional therapy and supportive of patients who need to implement nutritional and lifestyle changes. There are clear guidelines for the construction of meal plans and sufficient evidence in the literature to support the effectiveness of nutritional therapy for type 2 diabetes patients (Ezequiel et al., 2017). Obesity is a primary underlying risk factor for chronic disorders such as type 2 diabetes, and the rate of obese people worldwide has tripled since the 1970s (Choi et al., 2020). A ketogenic diet can aid in improving weight control and metabolic parameters related to glycemic and lipid controls in obese patients with preexisting type 2 diabetes (Choi et al., 2020). Obesity resulting from poor nutrition and lack of exercise is a risk factor for developing type 2 diabetes. There needs to be action to mitigate risk factors because the increasing rates of type 2 diabetes and prediabetes among young adults and adolescents can become a public health crisis (Lukács et al., 2018). Early identification of children at risk for diabetes can allow interventions to delay or prevent the onset of type 2 diabetes. The information from these articles can improve patient outcomes and nursing practice through evidence-based practice/quality improvement efforts by gaining knowledge about the importance of nutritional therapy, ketogenic diets, and screening for risk factors for type 2 diabetes in overweight and obese adolescents in a school setting. Early prevention is the key to finding solutions to treat obesity and prevent type 2 diabetes. Healthcare can improve a patient's outcome and prevent death by taking these additional steps to gain the knowledge to provide better care for their patients.

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