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REVIEW

Some considerations about healthy food consumption in diabetics

Algunas consideraciones sobre el consumo saludable de alimentos en diabéticos

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ABSTRACT

Introduction: diabetes is a chronic pathology that has a high death rate worldwide and is one of the chronic non-communicable diseases. It occurs when the level of glucose in the blood is higher than normal.
Objective: characterize aspects related to healthy food consumption in diabetics.
Method: a review of the literature available in databases such as SciELO, Scopus and ClinicalKey was carried out, of which a total of 15 related articles were consulted, empirical methods such as logical history and analysis and synthesis were used.
Results: diet is an important aspect that must be educated on how to adjust food intake. Stevia is a natural sweetener with 0 calories, an alternative to sugar and artificial sweeteners. The leaves of the plant are 30 times sweeter than cane sugar, and the sweetener obtained is 300 times sweeter than sucrose. Cranberry contains anthocyanosides, powerful antioxidants that strengthen blood vessels and capillary walls, improve red blood cells and stabilize collagen tissues, such as tendons, ligaments and cartilage, and have cholesterol-lowering effects.
Conclusions: this study highlights the positive effects of the implementation of stevia and blueberries in the production of healthy foods for diabetic people, also showing that society is becoming more aware every day of the production of foods that expand the nutritional possibilities for diabetics. diabetics.

Keywords: Diabetes; Glucose; Daily Requirement; Healthy Product; Quality of Life.

RESUMEN

Introducción: la diabetes es una patología crónica que tiene un alto índice de muerte a nivel mundial y se encuentra dentro de las enfermedades crónicas no transmisibles, se presenta cuando el nivel de la glucosa en la sangre es más alto de lo normal.
Objetivo: caracterizar aspectos relacionados con el consumo saludable de alimentos en diabéticos.
Método: se realizó una revisión de la bibliografía disponible en bases de datos como SciELO, Scopus y ClinicalKey de las cuales se consultaron un total de 15 artículos relacionados, se utilizaron métodos empíricos como el histórico lógico y de análisis y síntesis.
Resultados: la dieta es un aspecto importante que se debe educar sobre cómo ajustar la ingestión de alimentos. La stevia es un endulzante natural con 0 calorías, alternativo al azúcar y a los endulzantes artificiales. Las hojas de la planta son 30 veces más dulces que el azúcar de caña, y el edulcorante que se obtiene es 300 veces más dulce que la sacarosa. El arándano contiene antocianósidos, potentes antioxidantes que fortalecen los vasos sanguíneos y las paredes de los capilares, mejoran los glóbulos rojos y estabilizan los tejidos de colágeno, como los tendones, los ligamentos y el cartílago y tiene efectos reductores del colesterol.
Conclusiones: se resalta en el presente estudio los efectos positivos que tienen la implementación de stevia

y arándanos en la producción de alimentos sanos para personas diabéticas, evidenciándose además que la sociedad se concientiza cada día mas con la elaboración de alimentos que amplían las posibilidades alimenticias para los diabéticos.

Palabras clave: Diabetes; Glucosa; Requerimiento Diario; Producto Saludable; Calidad de Vida.

INTRODUCTION

Diabetes is the fourth leading cause of death in Ecuador; it affects all people of different ages and social statuses; taking into account the rates that are increasing in the country, the deficiency in the prevention and control of this disease has visualized a problem that needs a solution, Diabetes can be prevented and controlled. A healthy diet helps protect against poor nutrition in all its forms, as well as non-communicable diseases such as Diabetes, heart disease, stroke and cancer. Caloric intake should be commensurate with caloric expenditure. Available scientific data indicate that fats should not exceed 30 % of total caloric intake to avoid weight gain. This implies a shift from consuming saturated to unsaturated fats and phasing out industrial trans fats.[1]

There is no current research in Ecuador on the creation of healthy products, health personnel do not raise awareness about food, and people do not have the decision to want to change their eating habits; on the other hand, there are no specific food services for diabetics, which does not provide or encourage good lifestyles.[2]

Diabetes is of great importance for Ecuador since it is considered a public health problem. Part of the state's intervention in this problem is to guarantee the quality of care these patients receive.[3]

Diabetes mellitus has increased its frequency; it is stated that there are more than 347 million people with the disease in the world. In addition to this figure, the number of pathologies related to Diabetes mellitus has also increased. The prevalence of Diabetes Mellitus type 2 increases from 2,6 % between 20 and 44 years old to 11,7 % between 45 and 64 years old and reaches 18,9 % in people over 65 years old. The estimated number of adults living with Diabetes is around 366 million; this corresponds to 8,3 % of the world's adult population.[4]

The main complications of Diabetes are avoidable and preventable by controlling glucose levels, as well as blood pressure and cholesterol. This requires that people with Diabetes be highly educated about managing their condition and access to insulin, oral medication, and monitoring equipment. People with Diabetes must have the support of a well-educated healthcare workforce and healthcare systems that provide regular blood tests and eye and foot exams.[2]

A good lifestyle is based on a set of activities and habits that promote health, prevent the risk of new diseases and control health, as in the case of Diabetes, for example in the treatment of Diabetes, physical exercise, diet and pharmacological treatment are the pillars for optimal treatment, the new acquisition of routines establishes a greater commitment to health, not only by following the rules set by the doctor but by the need to be constant in the treatment, based on this, it is observed that people can identify and explain the dynamics that exist in their routines, mainly about the care they must follow according to their treatment.[5]

It should not be thought that what is eaten and performed with the human body is of little importance just because, on principle, we discard foods that irritate the stomach and destroy health. An impoverished diet is not recommended; it should be rich in nutrients. Many who need the benefits of a healthy life and who, for conscientious reasons, adopt what they consider to be a healthy diet are deluded into supposing that a diet by the principles of health reform consists of a small amount of food prepared without careful thought.[6]

Therefore, this review article aims to characterize the nutritional properties of healthy foods for diabetics.

METHOD

The available literature was reviewed using articles retrieved from databases such as SciELO, Scopus and ClinicalKey. Filters were used to select articles in English and Spanish, and empirical methods such as logical history, lysis, and synthesis were used to collect and understand the information obtained. The terms "Diabetes", "Glucose", "Daily Requirement", "Healthy Product", and "Quality of Life" were used as keywords in the article. A total of 15 references were selected addressing different considerations on healthy diabetic nutrition.

RESULTS

The main goal of diabetes treatment is to maintain the amount of glucose in the blood as close to normal figures as possible; in this way, it is considered that the appearance of symptoms and complications of the disease can be prevented or delayed. The pillars on which the treatment of Diabetes has been based in recent years are diet, physical exercise, patient education, insulin and oral hypoglycemic agents. These aspects continue to evolve and develop to truly achieve the basic objective of treating these patients.[6]

Diet is an important aspect; they consider that for a correct diet, one should be educated on how to adjust the time, size, frequency and composition of food so that you can avoid diseases that can have negative

consequences if not controlled in time, the ideal is to perform frequent measurements before each meal time and a correct follow-up that will allow greater flexibility for caloric intake, it is important to consider that in the case of type 1 diabetes, the patient should frequently monitor their blood glucose levels, which will allow a rational adjustment in the doses of insulin to be injected with similar frequency. People comment that an important part of their treatment is to maintain healthy eating habits, explaining that these involve the consumption of balanced meals five times a day, following the indications of a medical specialist.[5]

For example, stevia (stevia rebaudiana Bertoni) is a natural sweetener with 0 calories, an alternative to sugar and artificial sweeteners. The leaves of the plant are 30 times sweeter than cane sugar, and the sweetener obtained is 300 times sweeter than sucrose at a sucrose concentration of 0,4 % and 110 times sweeter than sucrose at a sucrose concentration of 10 %. Stevia contains 11 steviol glycosides. Steviol glycosides are responsible for the sweet taste of the stevia plant leaves. The three main steviol glycosides in the stevia plant tissue are 5-10 % stevioside, 2,4 % rebaudioside A (the sweetest and least bitter), 1-2 % rebaudioside C. The use of stevia in beverage and food applications is complex due to the number of steviol glycosides in the stevia extract. Rebaudioside A (Reb-A) and stevioside (STV) are steviol glycosides that taste similar to sugar. At the same time, rebaudioside B (Reb-B) and rebaudioside D (Reb-D) are the main causes of the bitter aftertaste. To achieve a taste as close as possible to sugar, it is necessary to purify Reb-A and STV as much as possible and eliminate Reb-B and Reb-D as much as possible until only traces are left.[7]

Stevia reduces blood glucose levels by up to 35 % and is in high international demand in Japan, China, Korea, Taiwan, Israel, Paraguay, Uruguay and Brazil. In this sense, the work included the study of stevia as a functional food, especially for its natural sweetening power, its use as a sugar substitute, and its impact on health benefits. The compounds responsible for the sweetness of Stevia rebaudiana are steviol glycosides isolated and identified as stevioside, steviolbioside, rebaudioside A, B, C, D, E and F and dulcoside. These are found in the plant leaves in varying percentages, depending on the species, growth conditions and agronomic techniques, reaching up to 15% of its composition.[7]

In the city of Bogota, Colombia, researchers (Nayibe et al., 2018) proposed to carry out the production and marketing of cupcakes sweetened with stevia, which is why there is a need to solve public that is affected by these diseases or feels that they must take care of their health. DÓCIL TENTACIÓN is presented as a food alternative that markets cupcakes sweetened with stevia. This natural product contains no calories and is a source of other healthy nutrients for the human body. Thus, people who wish to consume a product generally associated with the intake of artificial sugars can do so without health risks.[8]

Limiting free sugar consumption to less than 10 % of total caloric intake is declared to be of vital importance as part of a healthy diet. To obtain greater benefits, reducing its consumption to less than 5% of total caloric intake is recommended. Keeping salt intake below 5 grams daily helps prevent hypertension and reduces the risk of heart disease and stroke in adults. WHO Member States have agreed to reduce salt consumption among the world's population by 30% and to halt the increase in obesity and diabetes in adults and adolescents and childhood overweight by 2025.[1]

On the other hand, whole wheat yields more than 72 % white flour and the rest is a by-product; in milling, the wheat grain undergoes various treatments before turning into flour. Through much research, it is feasible to partially replace imported wheat flour with substitute flour for producing bread, noodles and cookies. *Substitute flours* are defined as the product obtained from the milling of cereals, tubers, roots, legumes and others, obtained through a suitable process and milling that meets the appropriate characteristics for human consumption. However, this substitution will be at most 20 % in the best case for bread and noodles and 30% in the case of cookies. This means that research projects and, above all, industrialization projects for these flours are a priority from the point of view of food security, wheat shortage in the world and popular economy.[9]

The blueberry (Vaccinium myrtillus) is a subshrub plant of the ericaceae family. Native to Europe, it is very common in Scandinavian countries. It is a shrub that reaches a height of up to 1 m, with light green stems and leaves up to 3 cm long with finely toothed margins and deciduous and short petioles. The flowers are insignificant pinkish green with five petals and sepals, produced singly or in axillary pairs in hanging clusters. The fruit is a bluish-black berry with a pleasant, sweet, sour taste. Bilberry contains several biologically active constituents, including a class of compounds called anthocyanosides and flavonols. These have been the focus of recent research studies. It has multiple beneficial properties for health. It stands out for its high content of antioxidants, especially anthocyanins (a compound of the flavonoid family), which are responsible for the pigments that give blueberries their bright and fabulous colour. It also has phenolic acids, high fibre and nutritional content, is free of fat and sodium, and is low in calories.[10]

Bilberries contain anthocyanosides, potent antioxidants that strengthen blood vessels and capillary walls, improve red blood cells and stabilize collagen tissues such as tendons, ligaments and cartilage. It has cholesterol-lowering effects; it also increases retinal pigments that allow the eye to tolerate light and helps maintain the flexibility of red blood cells. Bilberry may be particularly useful in improving night vision and macular degeneration, preventing cataracts and diabetic retinopathy; it is also used to improve varicose veins

and has anti-ageing effects on collagen structures. In folk medicine, bilberry leaf has been used to treat several conditions, including diabetes. Limited evidence from a few animal studies shows it may have a lowering effect on blood sugar.[10]

In Cuba, Calle Domínguez J,[11] proposed to make foods for people with diabetes, referring to the fact that just as it happens with obesity, the incidence of diabetes is increasing in all parts of the world. Today's trend is to reduce the consumption of foods rich in fats, sugars and fast-digesting carbohydrates to prevent the risk of chronic non-communicable diseases. This review aims to describe the technology used to develop sugar and fat substitutes and other alternatives that include lowering the glycemic index of wheat flour from mixtures with legume and tuber flour to develop foods suitable for people with diabetes.

In Quito, Terán (2016) proposed to carry out a business plan focused on the production and marketing of pastries for diabetics in the city of Quito; the business consists of launching a microenterprise dedicated to the production and marketing of homemade desserts without sugar with sweeteners of 0 % calories and 0 % sugars; in addition to taking care of the carbohydrate rations that people with diabetes and-or people who wish to prevent it, should consume under healthy conditions, offering the consumer two types of desserts: yoghurt sponge cake and apple candy.[12]

In Quito, a business plan focused on producing and marketing soy-based cakes and desserts was proposed to produce and market soy-based cakes and desserts since Ecuador generates healthy products such as soy that help health care. A marketing plan is proposed, concentrating its differentiation strategy on having a product different from those that already exist in the market, with more than 50 % of respondents willing to consume the new idea of soy-based cakes and pie, entering the market directly through distribution that will position the product in major supermarkets, informing them through social networks, fairs, tastings in naturist centres and gyms.[13]

In the city of Quito, a business plan focused on manufacturing and marketing quinoa and flaxseed-based cookies and cookies for people with diabetes was carried out. The main objective of the work presented was to demonstrate the feasibility of implementing a business plan. In order to carry out this research, the external environment and industry were first studied and found to be favourable. There are two important factors: one is that the number of people with diabetes in Latin America is increasing, and it is expected to grow by more than 80 % by 2030. The second is that consumption habits towards baked products have increased in Ecuador.[14]

In Chile, they developed a business plan to create a cafeteria for people with food intolerance. For this business plan, restrictions related to wheat and lactose are analyzed, and those related to diabetics are also considered; given that these are people who must also follow a low-sugar diet along with other restrictions, this business plan is developed to create a gourmet cafeteria aimed at meeting the needs of people with food restrictions related to gluten, lactose intolerance and diabetics.[15]

Diabetes is a serious and costly public health problem that affects everyone regardless of age or socioeconomic level; the diabetes program should be framed within the policies and health plans of each country and fundamentally should be adapted and integrated into the administrative structures of each one of them, millions of people do not know they have the disease or some even though they know they do not receive appropriate treatment. The impact of diabetes on societies and individuals is underestimated. Many diabetic patients whose disease is poorly controlled have an increased risk and high incidence of heart attacks, strokes, blindness, kidney failure, amputation and premature death; this disease not only shortens productive life but has serious repercussions on the quality of life of the patient and his or her family.[4]

CONCLUSIONS

It is important to know the possibilities of healthy food for diabetic patients that allow them to keep their basic diseases under control. This study highlights the positive effects of the implementation of stevia and blueberries in producing healthy food for diabetic people, also showing that society is becoming increasingly aware of the elaboration of foods that broaden the nutritional possibilities for people with diabetes.

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The authors declare that there is no conflict of interest.

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