

Use of technology in the dissemination of diabetes promotion and prevention programmes

Uso de la tecnología en la difusión de programas de promoción y prevención de la Diabetes

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ABSTRACT

Diabetes mellitus, a common endocrine pathology in these times of the 21st century, where many people of different etiological groups present it due to different risk factors. This pathology changes the life of the person, even more, if they do not carry out an adequate management of diabetes mellitus, because in the long term it increases the risks of presenting other chronic pathologies that can complicate the state of health and the prognosis of the individual's life. For this literature review research project: "Use of technology in the dissemination of diabetes promotion and prevention programmes" with the general objective: To promote the use of technology in the dissemination of diabetes promotion and prevention programmes; a qualitative and analytical approach was used, using databases such as google scholar, elsevier, pubmed, Taylor & Francis, Scielo, etc. At the end of the

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research it was concluded that the application of technology in programmes for the promotion and prevention of Type 2 Diabetes Mellitus has had a positive impact on its use, allowing a greater possibility for the population to take part in the programmes and reduce their risk of developing Type 2 Diabetes Mellitus.

Keywords: Technology, Prevention, Promotion, Factors

RESUMEN

La diabetes mellitus, una patología endocrina común en estos tiempos del siglo XXI, donde muchas personas de distintos grupos etiológicos la presentan por distintos factores de riesgo. Patología que cambia la vida de la persona, más aún, si no realiza un manejo adecuado de la diabetes mellitus, porque a largo plazo aumenta los riesgos de presentar otras patologías crónicas que pueden complicar el estado de salud y el pronóstico de vida del individuo. Para este proyecto de investigación de revisión bibliográfica: "Uso de la tecnología en la difusión de programas de promoción y prevención de la diabetes" con objetivo general: Promover el uso de tecnología en la difusión de programas de promoción y prevención de la Diabetes; Se utilizó un enfoque cualitativo y analítico, utilizando bases de datos como google académico, elsevier, pubmed, Taylor & Francis, Scielo, etc. Culminando la investigación se concluyó que la aplicación de la tecnología en los programas de promoción y prevención de la Diabetes Mellitus Tipo 2, ha tenido un impacto positivo en su uso, permitiendo una mayor posibilidad a las poblaciones de acogerse a los programas y reduzcan su riesgo de desarrollar Diabetes Mellitus Tipo 2.

Palabras clave: Tecnología, Prevención, Promoción, Factores

INTRODUCTION

Chronic diseases such as diabetes are the world's leading cause of death. The World Health Organisation (WHO) estimates that by 2030, diabetes will be the seventh leading cause of death worldwide. A chronic disease that leads to a considerable loss of quality of life for patients and, despite treatment, has serious health consequences. Diabetes is appearing at an increasingly younger age, especially type 2 diabetes, which accounts for 90% of cases (Vespucio, 2024).

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The role of the media in Health Promotion is an issue that has been contemplated since 1986. The Ottawa Charter defined Health Promotion as "the process of empowering people to increase their control over their health and to improve their health", further stating that the media are key actors in health promotion. Communication and education are increasingly becoming an inseparable binomial, over and above the very means, techniques and communicative instruments used, and this strengthens, enriches and modifies, in a conscious and informed way, knowledge, attitudes and/or behaviours in favour of health. (PS AND SC BLOG, 2018)

The use of new technologies adapted to health promotion is revolutionising the user. It is changing the way we take care of ourselves, whether it is by tracking what we eat, monitoring the physical exercise we do, or monitoring our sleep or heart rate through health apps or other technological devices. They are helping us shift towards healthier habits. The use of telemedicine applied to health also has advantages if we suffer from a chronic disease or a specific pathology, as they provide us with better knowledge and management of our health condition. (C, 2019)

The research was developed with the general objective: To promote the use of technology in the dissemination of Diabetes promotion and prevention programmes. Telemedicine is highly effective in patients with hypertension and diabetes. It has been proven that telephone support for these chronic diseases has reduced the number of hospital admissions, emergency admissions and even the level of mortality in patients with these causes. It is clear that the use of ICTs can increase prevention by patients with less access to extensive treatment or rehabilitation. Both chronic diseases with public health implications are pertinent motivation to consider the issue of educational strategies that technology can mediate to ensure outcomes in promotion, education and adherence to treatment and prevent health risks and complications. (LR, 2022)

A complex and chronic pathology, described as a metabolic disorder of multiple aetiologies, characterised by chronic hyperglycaemia with disturbances in nutrient metabolism, resulting in impaired insulin secretion and/or insulin action, requiring continuous medical action with the application of various strategies to reduce the complications that may occur in the long term. There are different types of diabetes mellitus: (ALAD, 2019) (Association A. D., 2023)

"Type I diabetes is caused by an autoimmune reaction (the body mistakenly attacks itself). This reaction prevents your body from producing insulin. Approximately 5-10% of people who have diabetes have type I. Symptoms of type I diabetes usually appear quickly. It is usually diagnosed in children, adolescents, and young adults." (Chronic, CDC, 2022)

"Insulin secretion is inadequate because patients have developed insulin resistance. Hepatic insulin resistance inhibits suppression of hepatic glucose production, and peripheral insulin resistance impairs peripheral glucose uptake. This combination results in fasting and postprandial hyperglycaemia. Insulin levels are often very high, especially

early in the disease. Later in the course of the disease, insulin production may fall, exacerbating hyperglycaemia." (Brutsaert, 2022)

According to CDC (Chronicles, CDC, 2022) "Insulin resistance is the causative factor in Type II Diabetes Mellitus, as high amounts of glucose in the blood release insulin, and with prolonged insulin, cells begin to become insulin resistant, In addition, other risk factors influence at the same time, so the pancreas secretes more insulin in order to lower hyperglycaemia, but this causes the pancreas to stop secreting insulin over a long period of time, leading to the pathology. "

According to NIDDK (Basu, 2017) polydipsia, oliguria, hyperphagia, fatigue, blindness, paraesthesia in hands and feet, weight loss are symptoms of type II diabetes mellitus
Gestational Diabetes Mellitus

"Gestational diabetes mellitus is included in type II diabetes mellitus and usually appears between 24-28 weeks of pregnancy. This type of diabetes occurs due to a blockage of the hormone insulin by pregnancy hormones and, as a consequence, blood glucose levels increase." (Gomez, 2022).

If a person with this disease does not regulate their sugar intake it can have serious consequences on their health, including: (Health, 2023) (nutricionvidaysalud.org, 2019)

- Diabetic foot: this is undoubtedly the most common consequence of this disease, it starts with a neuropathy of the feet or loss of sensitivity due to nerve damage. In addition to the loss of sensation there is a significant reduction in blood flow, problems that together increase the risk of ulcers, wounds and infections, which if not treated in time lead to amputation of the affected limb.
- Blindness: Known as diabetic retinopathy, this is one of the most common consequences over time for a person with diabetes. It is caused by damage to small blood vessels in the retina of the eyes.
- On the other hand, people with the disease are at increased risk of developing heart disease and stroke.
- Diabetes is also a major cause of kidney failure.

According to the American Heart Association, some non-modifiable factors that increase the risk of diabetes are inherited from parents or close relatives, as well as race or ethnicity. People of African American, Asian American, Latino/Hispanic American, Native American or Pacific Islander origin are more likely to develop diabetes. In terms of age, the older you are, the higher your risk of developing pre-diabetes and type 2 diabetes. Type 2 diabetes usually occurs in middle-aged adults, most often after the age of 40. And gestational diabetes occurs if a woman had diabetes during pregnancy, she will have an increased risk of developing diabetes again later in life." (Association A. H., 2021)

There are modifiable risk factors according to the American Heart Association being overweight or obese increases the risk of developing diabetes, lack of physical activity is a key modifiable risk factor for pre-diabetes and type 2 diabetes, as well as causing damage to the cardiovascular system, untreated hypertension has been associated with

diabetes complications. People with diabetes and hypertension should maintain a blood pressure below 130/80 mmHg, with normal blood pressure being 120/80 mmHg or lower. Diabetes is associated with atherosclerosis (hardening of the arteries) and vascular disease. Low HDL ("High Density Lipoprotein") cholesterol and high triglycerides can increase the risk of Type II diabetes and cardiovascular disease. People who smoke and drink alcohol are more likely to develop diabetes as it can cause inflammation in the pancreas and limit its ability to produce enough insulin. Alcohol can cause liver damage and add more sugar and starch to the diet that the body must use or otherwise store as fat. Research has also shown that too little or too much sleep is linked to a high Hemoglobin A1C level in people with Type II diabetes." (Association A. H., 2021)

The different platforms, tools and social networks allow an infinite number of actions to be carried out in terms of health information and communication, which we could differentiate between those that are synchronous in time (messaging, video-conferencing and chat), and others that are asynchronous (blogs, websites, forums, social networks, email, etc.) These would be the main theoretical tools that would be used in the case of developing health promotion projects. (The PS Y SC blog, 2018)

These measures can provide us with very valuable and important information, allowing us to act on the most affected dimensions, thus achieving the best possible state of well-being of these patients (Rebollo-Rubio, 2014).

Information and communication technologies (ICT) are a tool and an opportunity for both the patient, the caregiver and the professional. For the patient and their caregiver, they facilitate access to health information, generating positive effects aimed at improving the quality of life of these two actors. For the professional, it allows timely follow-up in a practical and reliable way, since, in the scenario of chronic diseases, efficient communication between patients, carers and health professionals is essential. ICTs allow contact with other people suffering from the same problem, exchange ideas, experiences, difficulties, share emotions, feelings, form support groups where not only concerns are expressed but also where mutual emotional support can be given (MSCd, 2014).

MATERIALS AND METHODS

For the investigation of the literature review project with a qualitative and analytical approach, the Boolean operators "AND, OR AND NOT" will be used in the different academic databases such as google academic, elsevier, pubmed, Taylor & Francis, Scielo, etc; In addition, at the time of the search, inclusion criteria and exclusion criteria will be applied to filter the documents obtained to extract the information that is in accordance with the research topic, also applying the prism method.

Inclusion Criteria: Articles from the last 5 years of publication Articles on diabetes mellitus

Exclusion Criteria: Articles on other areas of study at university level.

RESULTS

Based on the research and data collection in relation to specific objective 1, the use of technology in health promotion and prevention programmes for Type 2 Diabetes Mellitus has had a positive impact; enabling a wider range of outreach to the population and population groups, as indicated by Arora S, Lam C et al. (LCea, 2023) Mobile health (SmHealth) promises to engage patients with pre-diabetes in lifestyle modification programmes by decreasing referral burden, centralising remote enrolment, eliminating the physical requirement of a brick-and-mortar location, reducing operational costs through automation, and reducing time and transportation barriers. ", further positive evidence of the use of technology in promotion and prevention programmes, we can consider the interventions conducted in the research by Rhoon L et al, (BMea, 2020) indicates "Interventions that contained digital features that facilitated health and lifestyle education, behavioural/outcome tracking and/or online health coaching were more effective.". Patients without diabetes who presented to Type 2 Diabetes promotion and prevention programmes had positive outcomes for their health status, as indicated in research by Rhoon L, Byrne M et al. (BMea, 2020) "63% of interventions were effective in the short term (achieving 3% weight loss over 6 months) using an average of 5.6 behaviour change techniques more than non-effective interventions. 33% were effective in the long term (achieving 5% weight loss at 12 months), using 3.7 behaviour change techniques more than non-effective interventions"; followed by the research of Arora S, Lam C et al. (28) "Of the 163 participants included in the primary analysis, participants had a mean predicted weight loss of 5.5% at 6 months (P = 0.001) and 4.3% at 12 months (P = 0.001)". Furthermore, it should be considered that programmes that implement the use of technology, the population sees it as something new and different that captures their attention and motivates them to follow prevention programmes, as expressed by Griauzde D et al. (KJea..., 2019) "Among all participants, mean autonomous motivation measures were relatively high at baseline (6.0 on a scale of 7.0), in addition, participants identified reasons they enjoyed using the app (e.g., encouraged self-reflection), but so indicated reasons they did not enjoy using the app (e.g., did not 18 consider personal circumstances), and strategies to improve the intervention (e.g., increased interpersonal contact)." Consequences of Type 2 Diabetes Mellitus Based on the data collected, the most prevalent consequences of Type 2 Diabetes Mellitus according to studies by, Faselis C. (KAea, 2020), Suarez J. (LJea., 2023), Vines R. (VOea, 2019) and Laiteerapong N. (34), diabetic nephropathy, retinopathy and diabetic neuropathy are prevalent, followed by cardiovascular disease and high blood pressure. Risk Factors for Type 2 Diabetes Mellitus The risk factors with the highest incidence were overweight/obesity and hypertension, as indicated by the studies of Rodas J. (JAR.... 2022) "Obesity favours the development of diabetic nephropathy, retinopathy and diabetic neuropathy, 2022) "Obesity favours a state of lipotoxicity in various organs of the body, leading to a series of events that initially decrease insulin sensitivity in tissues and subsequently produce compensatory metabolic changes that culminate in β -cell dysfunction and manifestation of diagnostic values of diabetes.", followed by Rodriguez. (R., 2018) "The main risk

factors that presented statistically significant relationship ($p=0.00$) were: physical inactivity (74.84%), abdominal obesity (62.77%), overweight and obesity (60.43%)", finally, Farre. (J., 2019) in his research indicated that "The risk factors with the highest incidence were arterial hypertension and elevated Body Mass Index."

DISCUSSION

Based on the research obtained, we conclude that the application of technology in programmes for the promotion and prevention of Type 2 Diabetes Mellitus has had a positive impact on its use, as it allows a greater possibility for the population to take part in the programmes, reducing the influence of factors such as distance from health centres, lack of time in the registration process and carrying out the programmes in person, in addition to the fact that technology makes the programmes more attractive to people and influences their personal motivation, making them more committed to completing the programmes.

The results obtained from the people who completed the programmes obtained a considerable weight loss, considering that the considerable weight loss, considering that overweight/obesity is a risk factor that directly influences the development of Type 2 Diabetes Mellitus; this pathology influences as a risk factor for the development of other pathologies, without considering the consequences that it causes in the organism in the long term, such as the development of microvascular and macrovascular complications.

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