

HEALTH EDUCATION FOR PREVENTION OF FOOT ULCERS IN PEOPLE WITH DIABETES: A NARRATIVE REVIEW

EDUCAÇÃO EM SAÚDE PARA PREVENÇÃO DE ÚLCERAS NOS PÉS DE PESSOAS COM DIABETES: REVISÃO NARRATIVA

EDUCACIÓN EN SALUD PARA LA PREVENCIÓN DE ÚLCERAS EN LOS PIES EN PERSONAS CON DIABETES: UNA REVISIÓN NARRATIVA

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ABSTRACT

Introduction: Diabetes mellitus is a chronic disease that can cause organ complications such as nephropathy, retinopathy and diabetic foot. **Objective:** Identify the role of nursing in health education to prevent foot ulcers in people with diabetes. **Methodology:** Narrative review of the literature with a qualitative approach carried out between November 2021 and March 2022, using the databases of the Latin American Literature in Health Sciences, Virtual Health Library and Nursing Database, with the descriptors “diabetic foot”, “nursing” and “health education”. The inclusion criteria are the availability of full-text articles related to the topic under study, being in the Brazilian context and having a nurse among the authors, published between 2016 and 2021. Dissertations, monographs, theses, books, studies unavailable for free, repeated, duplicated were excluded, and ten articles were analyzed. **Results:** They present individual and group health education practices on diabetes and its complications, such as foot ulcers, in order to promote self-care actions, focusing on recognizing risk factors and empowering people about the problem so that they are co-responsible in their health and illness process. **Final considerations:** The studies contributed pertinent reflections on strengthening health education in the care of people with diabetes and foot ulcers. However, nurses need more investment in training and health education, in a continuous and participatory manner, in order to avoid the fragmentation of health care and assistance.

Keywords: Health Education; Nursing; Diabetes Mellitus; Diabetic Foot.

RESUMEN

Introducción: La diabetes mellitus es una enfermedad crónica que puede causar complicaciones orgánicas como nefropatía, retinopatía y pie diabético. **Objetivo:** Identificar el papel de la enfermería en la educación sanitaria para prevenir las úlceras del pie en personas con diabetes. **Metodología:** Revisión narrativa de la literatura con abordaje cualitativo realizada entre noviembre de 2021 y marzo de 2022, utilizando las bases de datos de Literatura Latinoamericana en Ciencias de la Salud, Biblioteca Virtual en Salud y Base de Datos de Enfermería, con los descriptores “pie diabético”, “enfermería” y “educación en salud”. Los criterios de inclusión son la disponibilidad de artículos en texto completo relacionados con el tema en estudio, estar en el contexto brasileño y tener un enfermero entre los autores, publicados entre 2016 y 2021. Se excluyeron disertaciones, monografías, tesis, libros, estudios no disponibles de forma gratuita, repetidos, duplicados y se analizaron diez artículos. **Resultados:** Presentan prácticas individuales y grupales de educación en salud sobre la diabetes y sus complicaciones, como las úlceras del pie, con el fin de promover acciones de autocuidado, centrándose en reconocer los factores de riesgo y empoderar a las personas sobre el problema para que sean corresponsables del mismo. su proceso de salud y enfermedad. **Consideraciones finales:** Los estudios contribuyeron con reflexiones pertinentes sobre el fortalecimiento de la educación en salud en la atención a personas con diabetes y úlceras del pie. Sin embargo, las enfermeras necesitan más inversión en formación y educación sanitaria, de forma continua y participativa, para evitar la fragmentación de la atención y la asistencia sanitaria.

Palabras clave: Educación en Salud; Enfermería; Diabetes Mellitus; Pie Diabético.

RESUMO

Introdução: Diabetes mellitus é uma doença crônica que pode causar complicações nos órgãos, como nefropatia, retinopatia e pé diabético. **Objetivo:** Identificar o papel da enfermagem na educação em saúde para prevenção de úlceras nos pés de pessoas com diabetes. **Metodologia:** Revisão narrativa da literatura com abordagem qualitativa realizada entre novembro de 2021 a março de 2022, utilizando-se das bases de dados da Literatura Latino-Americana em Ciências da Saúde, Biblioteca Virtual em Saúde e Base de Dados de Enfermagem, com os descritores “pé diabético”, “enfermagem” e “educação em saúde”. Como critérios de inclusão estão disponibilidade de artigos com texto completo referentes à temática em estudo, ser no contexto brasileiro e ter um enfermeiro entre os autores, publicados entre os anos de 2016 a 2021. E de exclusão, dissertações, monografias, teses, livros, estudos indisponíveis gratuitamente, repetidos, duplicados, sendo analisados dez artigos. **Resultados:** Apresentam práticas de educação em saúde, individuais e grupais, sobre diabetes e suas complicações, como úlceras nos pés, a fim de promover ações de autocuidado, com foco no reconhecimento dos fatores de risco e empoderamento das pessoas acerca do problema para que sejam corresponsáveis no seu processo de saúde e adoecimento. **Considerações finais:** Os estudos contribuíram com reflexões pertinentes acerca do fortalecimento da educação em saúde no cuidado às pessoas com diabetes e úlceras nos pés. No entanto, os enfermeiros necessitam de mais investimentos em capacitação e educação em saúde, de forma continuada e participativa, a fim de evitar a fragmentação do cuidado e da assistência à saúde.

Palavras-chave: Educação em Saúde; Enfermagem; Diabetes Mellitus; Pé Diabético.



INTRODUCTION

Diabetes mellitus (DM) is one of the biggest public health problems of the 21st century. It is estimated that the number of people with DM in the world was 537 million in 2021, with a projection of 643 million in 2030 and 783 million in 2045. Approximately 50% of DM cases do not receive a timely diagnosis, and around 90% of cases of this disease are type 2^(1,2). It affects around 3% of the world population and, by 2045, 783 million individuals between the ages of 20 and 79 are expected to suffer from this disease. Thus, while the global population is expected to increase by 20% during this period, the number of individuals with this problem tends to increase by 46%⁽¹⁾. The Surveillance Report on Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel) showed that, in 2019, the frequency of DM diagnosis was 10.2%. It was higher among women (11.1%) than men (9.1%), increasing with age, in the range of 65 years or older, which corresponded to (29.3%) for men and (31%) for women⁽³⁾. It is estimated that the number of people living with diabetes in the world exceeds 530 million, presenting alarming projections for the coming years, especially in developing countries, such as Brazil. The increase in the prevalence of DM is directly related to factors such as population aging, nutritional transition, sedentary lifestyle and urbanization, which contribute to increased insulin resistance and pancreatic beta cell dysfunction^(4,5). During DM treatment, complications such as diabetic

neuropathy, kidney disease, retinopathy, sensitized skin, arterial problems, amputations and foot disease may occur⁽⁶⁾. Therefore, neuropathy occurs due to a change in nerve function, impairing autonomic, motor and sensory functions. Furthermore, peripheral neuropathy is the most common type of diabetic neuropathy, causing damage to the external nerves of the lower limbs, modifying sensory action, leading to perceptions of numbness and favoring the development of ulcers on the feet of people with DM⁽⁷⁾.

Amidst the difficulties, foot ulcers, one of the most worrying consequences of DM, cause deterioration of physical and mental well-being, as well as costly expenses for the patient, and may lead to irreversible complications such as amputations, which cause physical consequences, with limitations that affect the individual's autonomy and Independence⁽⁷⁾. Not only physical but also psychological consequences can have repercussions on recovery, since feelings such as fear and depression hinder the recovery process. In view of this, it is essential to know the complications of DM and how to avoid them, in addition to taking care of diet, physical exercise and correctly administering medication at the scheduled times to adequately control blood glucose levels.

In this context, health professionals, especially nurses, play a fundamental role, encouraging and assisting the individual in developing a care plan, identifying the risk



factors observed during care. Health education regarding foot precautions is an essential tool for preventing possible complications⁽⁸⁾. Thus, working on health education provides a great difference in the quality of life and in the attention of users when they see images of foot ulcers, being guided on the importance of self-assessment and alerted on the self-care that is necessary for the feet to avoid the development of complications⁽⁹⁾.

Health education aimed at promoting self-care actions, focusing on recognizing risk factors, as well as empowering the population regarding the problem, making it essential for them to be co-responsible for their health and illness process. It is important to highlight that the nurse's commitment to the patient's health directly reflects on their quality of life, and the care process is the responsibility of both, the nurse with scientific knowledge, working with educational care measures and the patient following the guidelines given by the professional⁽¹⁰⁾.

Therefore, considering the importance of systematic monitoring of people with DM in health care networks (RAS), primary health care (PHC), through basic health units (UBS), is configured as a gateway serving the perspective of prevention, early diagnosis, continued treatment, management of risk factors and prevention of complications, acts of health promotion. However, people with advanced stages of the disease need to be assisted at other levels of the network and then continue

monitoring at their UBS for analysis and development of a care plan⁽¹¹⁾. Based on this premise, it is important that the health team has a holistic view of the person with DM, identifying components that expose the person to risks and complications.

Given this problem, foot care for people living with DM involves several measures that require close collaboration and responsibility from both the patient and health professionals⁽¹²⁾. Therefore, it is necessary to adopt health education practices for patients and families of people with diabetes regarding the prevention of foot ulcers. For this reason, the nurse, in addition to providing care to the patient, plays the role of educator, thus encouraging self-care and strategies for coping with the disease. Thus, this study aims to identify the role of nursing in health education in the prevention of foot ulcers in people with diabetes.

METHOD

This is a narrative review of the literature, with a qualitative approach, and is a study that does not require the use of statistical methods and techniques, since the natural environment is the direct source for data collection and the researcher is the key instrument⁽¹³⁾.

To define the guiding question, the PVO strategy was used: Population, Variable, Outcomes, from which the question of this narrative review emerged: "What is the role of nursing in health education for people with diabetic foot?" With "P" referring to "people



with diabetic foot”, “V” equivalent to “nursing” and “O” to “health education”.

The bibliographic survey was carried out between November 2021 and March 2022. To search for studies, the databases of the Latin American Literature in Health Sciences (LILACS), Virtual Health Library (BVS), and Nursing Database (BDENF) were selected, using terms linked to the descriptors in Health Sciences (DECs): “diabetic foot”, “nursing” and “health education”, using the Boolean operator AND, applying the advanced search for the terms. Other reference searches were conducted on the websites of the Brazilian Diabetes Society (SBD), the International Diabetes Federation (IDF), and the Ministry of Health.

The inclusion criteria were the availability of full-text articles that reported on the study theme, were in the Brazilian context, and had a nurse among the authors, with a time frame from 2016 to 2021. Dissertations, monographs, theses, books, studies that were unavailable for free, repeated, duplicated, that were not in the Brazilian context, and that did not fit the proposed theme were excluded.

To extract data, a spreadsheet was created in Excel 2021 containing variables such as year/author(s)/journal, title, objective, type of

study, and main results. A preliminary 169 articles were identified through searches in the selected databases, applying the established criteria. After reading their titles and abstracts, as the first filter of the research, in order to identify studies that answered the guiding question, 159 articles were excluded.

The remaining ten articles were then read in full, cautiously to support the studies that were related to the objective presented, and were evaluated by two independent reviewers, blindly, who composed the final sample of the review. The findings were structured in a table and the articles were organized in descending order according to the year of publication, for better identification. They were analyzed in an interpretative manner, compared and discussed according to the pertinent literature, as well as duly cited and referenced, respecting the copyright of the research.

RESULTS

By applying the eligibility criteria, the ten publications included in this review are presented in Table 1, organized by year/author/journal, title, objective, type of study and main results, allowing an overview of the articles selected for the study.



Table 1 - Distribution of articles by year/author(s)/journal, title, objective, type of study and main results. Crato, CE, 2022. N=10

Nº	Year/ Author(s)/ Periodic	Title	Aim	Type of Study	Main Results
1	2020 Moreira et al ⁽¹⁴⁾ . Rev Esc Enferm USP	Effect of the operative group in teaching self-care for diabetic feet: a randomized clinical trial	To evaluate the effect of the operative group in teaching foot self-care to prevent diabetic foot.	Controlled and blinded clinical trial	One hundred and nine volunteers participated in the study. The majority of the volunteers who constituted the study sample were female, and both genders had low levels of education. Homogeneity was also observed between the groups in terms of lifestyle variables: being a smoker, drinking alcohol, and practicing physical activity.
2	2019 Arruda et al ⁽¹⁵⁾ . Revista de Enfermagem UFPE Online	Nurses' knowledge about diabetic foot care	To understand nurses' knowledge about diabetic foot care in Primary Care.	Quantitative, descriptive, cross-sectional study	Ninety nurses participated in the study, 82 (91.1%) of whom were female and eight (8.9%) were male. Regarding the highest qualification, 69 (76.7%) nurses had a specialization course and 56 (62.2%) reported not having participated in courses and/or training on diabetic foot; regarding the use of a protocol for the evaluation of diabetic foot, 71 (78.9%) did not use a protocol and 15 (16.7%) reported using the MS manuals.
3	2018 Scain, Franzen, Hirakata ⁽¹⁶⁾ . Revista Gaúcha de Enfermagem	Risks associated with mortality in patients treated in a diabetic foot prevention program	To identify in patients with type 2 diabetes which changes in the feet would be associated with demographic, clinical, biochemical and treatment characteristics and which of these would increase the risk of mortality.	Retrospective longitudinal study	The 918 patients had an average glycemic control outside the target. Regarding diabetes treatment, 9.0% were only on diet and exercise; 514 patients had foot alterations, 46.6% had NSP and 39.5% had PAD. During the 12 years of the study, 158 deaths recorded in the hospital records and their primary cause were identified.
4	2017 Pereira et al ⁽¹⁷⁾ . Revista de Pesquisa Cuidado é Fundamental	Nurses' actions in preventing diabetic foot: the perspective of people with diabetes	To investigate the actions performed by nurses in preventing diabetic foot from the perspective of people with diabetes mellitus (DM).	Research with a qualitative, exploratory and descriptive approach	Effective actions related to foot prevention are largely limited to health education actions, and not to foot examinations. The omissions in the performance of nurses in the prevention of diabetic



	Online	mellitus			foot reflect the fact that, to a large extent, nurses have not assumed responsibility and fulfilled their duty of care, by suppressing the assessment of the feet of people with DM from their actions, perhaps because they do not appropriate preventive actions.
5	2017 Dias, Santos, Oliveira ⁽¹⁸⁾ . Revista de Enfermagem UFPE Online	Home visit as a tool to promote health in amputated diabetic feet	To report the experience of daily home visits to change dressings in amputations of four toes due to diabetic foot complications, indicating successes and limitations.	Qualitative, descriptive study, experience report type	An elderly woman diagnosed with type 2 DM 15 years ago lived alone in her home in a city in the interior of Sergipe. She reported suffering from interdigital mycosis on the toes of her right foot, undergoing treatment with herbs, without evaluation or guidance from a qualified professional. After two weeks, she noticed an unpleasant odor and sought care at the city's USF. After being diagnosed with necrosis, she was referred to a referral hospital in the capital of the state of Sergipe. Daily home visits contributed to the reduction of the traumatic wound with the use of 5% papain.
6	2017 Vargas et al ⁽¹⁹⁾ . Revista de Enfermagem UFPE Online	Primary care nurses' conduct in caring for People with diabetic foot	To understand the actions of primary care nurses in caring for people with Diabetes Mellitus (DM) regarding diabetic foot.	Qualitative, exploratory, descriptive study	They showed that nurses' knowledge about caring for people with DM is partial, superficial and fragmented, not allowing for appropriate care actions, especially in detecting risks for the development of diabetic foot and performing foot examination assessments. The other group, who reported not feeling confident in the care, related the high demand for care in other areas and the lack of training as the reason.
7	2017 Menezes et al ⁽²⁰⁾ . Revista de Enfermagem UFPE Online	Action research: self-care practices of people with diabetic foot	Understand the self-care practices of people with diabetic foot.	Qualitative study, action research	Self-care is not performed correctly. The difficulties were based on lack of knowledge about appropriate footwear, correct nail cutting and the importance of foot examination. Marital status was shown to be a contributing factor to self-



					care, where participants were married and reported receiving encouragement for self-care from their partners. The sample consisted of retired/pensioner participants. Changing habits was seen as a difficulty for some members of the group.
8	2016 Oliveira et al ⁽²¹⁾ . Revista de Pesquisa Cuidado é Fundamental Online	Role of family health strategy nurses in preventing diabetic foot	Identify guidelines provided by nurses to people with DM on foot care; investigate the frequency of foot examinations and the aspects evaluated; verify which health education activities are carried out by nurses for people with DM.	Descriptive study with a quantitative approach	It was found that nurses provide specific guidance, which includes care aimed directly at the feet; and general guidance, which includes care for adequate control of DM.
9	2016 Menezes et al ⁽²²⁾ . Rev. Eletr. Enf.	Educational Strategies for Diabetic People with Foot Neuropathy Risk: Synthesis of Good Evidence	Identify the best evidence on health education strategies used for teaching and learning people with DM and foot at risk of neuropathy.	Integrative review, with a qualitative approach	Regarding the types of strategies or techniques implemented to approach people with DM and foot at risk of neuropathy, it was possible to observe the existence of two most expressive ones: group guidance and individual guidance, whether associated with each other or not, and linked to educational programs or not.
10	2016 Silva et al ⁽²³⁾ . Rev. Cienc. enferm.	Health promotion for people with diabetes mellitus in preventive educational care of diabetic foot	To understand the results of interventionist health education actions to prevent diabetic foot.	Mixed method study, evaluative-interpretative in the action research approach	The participants diagnosed with DM (92.31%) reported using oral hypoglycemic agents for glycemic control and only one (7.76%) uses insulin therapy, as well as presenting macrovascular complications. It stands out as a complementary treatment for health deviations (84.62%) reported using herbal medicines, exclusively for DM (36.36%). Regarding specific foot care (76.9%).

The titles showed that most of the articles contained the selected descriptors, always finding: diabetic foot, diabetes mellitus, nursing, nursing care and health education, Portuguese language, with three publications from 2016, four from 2017 and one article each in 2018, 2019 and 2020, with nurses acting in all of them and, in a minority, doctors and other specialties.

Regarding the objectives, six referred to activities carried out, such as individual/group guidance, by nurses for people with diabetes mellitus and four addressed technologies for people with diabetic foot. In the publications, group guidance predominated.

Regarding the method adopted in the studies, the following stood out: randomized clinical trial, qualitative, retrospective longitudinal, quantitative, action research and mixed study. Of these, qualitative studies stood out, with five publications.

Regarding the main results, there are people with DM and foot ulcers, evidencing the role of nurses in providing guidance and individual and group care, with approaches for adequate control of DM and encouragement for self-care, despite some difficulties in providing care and care for the feet, the main reason being the lack of continuing education on the subject.

Thus, the studies analyzed indicate that there are guidelines on general care such as the importance of practicing physical activity, correct use of medication, blood glucose control, in addition to more specific guidelines aimed at diabetic feet such as hygiene, hydration, more

appropriate footwear, correct nail cutting, daily inspection of the feet to check for cuts or blisters, as well as monitoring with the nursing team in the daily life of the person with diabetes.

DISCUSSION

DM stands out among chronic diseases due to its high prevalence and increased morbidity and mortality, presenting as chronic complications, diabetic foot, with ulceration and infections in the lower limbs as one of the main pathophysiological factors, including diabetic neuropathy, plantar pressure and trauma^(15,16). Knowledge of the causes of foot ulcers in people with DM by health professionals, patients and family members prevents possible amputations, which can be avoided with health education activities, in addition to encouraging self-care and interdisciplinary care⁽¹¹⁾.

In addition, individuals with DM who do not have preventive practices in relation to their feet are assessed as having a greater chance of developing foot ulcers. Therefore, it is essential for prevention that health professionals correctly guide patients with DM together with their family⁽²⁴⁾. Thus, the ongoing health education process conducted by nurses favors the care of people with foot ulcers, as well as reduces the risk of death, and is essential for those suffering from chronic diseases, especially those living with DM, with a view to effective self-care, changing habits and improving quality of life.

The nursing professional, as a member of the health team, is a member of the



dissemination of information through health education and analysis of the stage of risk, collaborating in the development of healthy practices that will enable greater protection and better acceptance of diabetes ^(16,20,22). In this sense, they have an essential position of care linked to these clients, assigning the commitment to seek and monitor risk factors, informing individuals with diabetes. In addition, they seek to include the health team in the care plan, providing instructive practices for treatment and monitoring of metabolic control, thus avoiding complications of the disease ⁽²⁵⁾.

Nursing care for people with DM is essential in the treatment of this chronic disease, as it influences the quality of life of the patient and their family, and failure to do so causes harm⁽²¹⁾. This, combined with educational practices, leads to the strengthening of health promotion actions, impacting the reduction of possible complications, such as amputations, as well as triggering reflections among the people involved in the process, making it possible to raise awareness of changes in lifestyle and self-care.

In view of this, family inclusion is essential for cooperation during the execution of practices that the unaccompanied individual may not be able to perform in some way. As studies show, care related to proper hygiene, nail clipping, among others, are essential for the prevention and early diagnosis of injuries. It is therefore considered that nursing guidance constitutes one of the strategies capable of

encouraging and developing the potential of patients and family members, as well as equipping them to take on, as subjects, actions aimed at addressing these problems. However, meeting this need is a basic requirement of nurse-patient interaction, in addition to the family, which plays a fundamental role in the face of the chronicity of DM^(17,20).

It is worth noting that some nurses report superficial and fragmented knowledge regarding appropriate care procedures, especially in detecting the risks for the development of foot ulcers in people with DM and in performing foot examinations, due to weaknesses found during the undergraduate period; the lack of in-service training, due to the deficit in continuing education for professionals, reflecting on the performance of nurses in the service and interfering in the care provided to people with DM and foot ulcers; and the organization of the service, due to the high demand and, often, with a privileged focus on other care groups⁽¹⁹⁾.

To strengthen the health education process, the studies in the review reveal both individual and group guidance, generally in conversation circles, where topics chosen by the patients themselves are addressed, such as foot care, diet, physical activity, use of medications, coordinated by nurses, nutritionists, pharmacists, among others ^(19,21,23), seeking to empower the patient and family regarding care for diabetes and its complications.

Educating patients and their families about self-care involves educational processes on



healthy eating, carbohydrate counting, physical exercise, identification and treatment of hypoglycemia, administration of insulin, intensive insulin therapy and detection of complications ⁽¹¹⁾. Thus, nurses stand out as one of the basic professionals in preventive care, through nursing consultations in PHC, which should involve assessing the feet and injuries, classifying the individual's risk and needs, as well as providing assistance based on guidance to people and their families about the importance of foot care, adopting a healthy diet and lifestyle and maintaining adequate blood glucose levels ⁽¹⁷⁾.

Therefore, nurses, especially in PHC, can use different health education strategies in a clear, effective and accessible way, as they are spaces that promote educational practices capable of preventing or delaying the onset of DM complications, and it is important for them to be trained to properly assess and guide people with foot injuries resulting from diabetes. To this end, the role of nurses ⁽⁹⁾ in preventing foot ulcers requires solid scientific knowledge that encompasses aspects of assessment, education and therapeutic interventions, which is essential to promote the health of diabetic patients and prevent complications.

FINAL CONSIDERATIONS

The findings show promising results in relation to DM care with both individual and group health education strategies, with discussions on topics proposed by patients, such

as foot care, diet, physical activity, correct use of medication, among others, led by nurses and other health professionals, bringing reflections on the importance of expanding knowledge about the disease and the care needed to prevent foot ulcers in people with diabetes.

However, they demonstrate the need for in-service training, family involvement and strengthening the health education process, in a continuous and participatory manner, in order to avoid the fragmentation of health care and assistance. Thus, investing in health training and education strategies, organizing the work process, dialoguing and getting closer to patients and family members, positively impacts health practices aimed at implementing continuous care for people with DM and its complications.

The importance of further research in this area is therefore highlighted, with the aim of investing increasingly in technologies for better care for patients with DM and foot ulcers. The costs to the health sector in worsening this situation are also emphasized, such as amputation, which causes, in addition to physical consequences, emotional consequences that can affect quality of life and continuity of treatment.

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