



NURSES' KNOWLEDGE ABOUT THE PREVENTION OF THE DIABETIC FOOT: AN INTEGRATIVE LITERATURE REVIEW

Conhecimento do enfermeiro sobre a prevenção do pé diabético: revisão integrativa da literatura

Conocimiento del enfermero sobre la prevención del pie diabético: revisión integrativa de la literatura

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ABSTRACT

Objective: To systematize nurses' knowledge about the prevention of the diabetic foot. **Methods:** Integrative literature review carried out from April to June 2016 in SciELO, LILACS and PubMed databases using the following descriptors: Knowledge; Nursing; Primary prevention; Diabetic foot. **Results:** Seven articles were selected, and they showed that the nurse's knowledge is based on counseling and care actions aimed at the prevention of the diabetic foot with a special focus on nail, calluses and shoes hygiene and care. The most used instrument for examining the feet was the 10g Monofilament. **Conclusion:** The nurses have contact with diabetic patients every day, but their actions often include activities exclusively aimed at disease counseling; therefore, their knowledge about the guidelines for preventing the diabetic foot is poor.

Descriptors: Knowledge; Nursing; Primary Prevention; Diabetic foot.

RESUMO

Objetivo: Sistematizar o conhecimento do enfermeiro sobre a prevenção do pé diabético. **Métodos:** Trata-se de uma revisão integrativa da literatura, realizada no período de abril a junho de 2016, nas bases de dados: SciELO, LILACS e PubMed, com os seguintes descritores: Conhecimento; Enfermagem; Prevenção primária; Pé diabético (Knowledge; Nursing; Primary Prevention; Diabetic foot). **Resultados:** Foram selecionados sete artigos, sendo evidenciado que o conhecimento do enfermeiro está pautado em ações de orientação e cuidado na prevenção do pé diabético, com enfoque importante na higienização e cuidado com unhas, calos e calçados. O instrumento de avaliação dos pés mais utilizado foi o Monofilamento de 10g. **Conclusão:** Conclui-se que os enfermeiros estão em contato diário com os pacientes diabéticos, mas que as ações muitas vezes estão direcionadas para atividades exclusivas de orientação quanto à doença em si, e, como consequência, o conhecimento acerca das orientações determinadas pelas diretrizes para prevenir o pé diabético torna-se insuficiente.

Descritores: Conhecimento; Enfermagem; Prevenção primária; Pé diabético.



RESUMEN

Objetivo: Sistematizar el conocimiento del enfermero sobre la prevención del pie diabético. **Métodos:** Se trata de una revisión integrativa de la literatura realizada entre abril y junio de 2016 en las bases de datos SciELO, LILACS y PubMed con los siguientes descriptores: Conocimiento; Enfermería; Prevención Primaria; Pie Diabético (Knowledge; Nursing; Primary Prevention; Diabetic foot). **Resultados:** Siete artículos fueron elegidos y ha sido evidenciado que el conocimiento del enfermero está fundamentado en acciones de orientación y cuidado para la prevención del pie diabético con importancia para la higiene y cuidado de las uñas, callos y calzados. El instrumento más utilizado para la evaluación de los pies ha sido el Monofilamento de 10g. **Conclusión:** Se concluye que los enfermeros tienen contacto a diario con pacientes diabéticos pero las acciones se concentran muchas veces en actividades exclusivas de orientación sobre la enfermedad y, en consecuencia, el conocimiento sobre las orientaciones que son determinadas por las directrices para la prevención del pie diabético es insuficiente.

Descriptor: Conocimiento; Enfermería; Prevención Primaria; Pie Diabético.

INTRODUCTION

Diabetes mellitus (DM) is one of the most prevalent chronic diseases worldwide and has a strong impact on morbidity in individuals, which results from acute and chronic complications and high rates of hospitalization and mortality, leading to significant economic and social losses^(1,2).

Diabetic foot is one of the most frequent complications of DM and its consequences can traumatize one's life as they include chronic wounds and even amputations of lower limbs. Periodic examination of the feet facilitates the early identification and treatment of the alterations found, allowing the prevention of an expressive number of diabetic foot complications⁽³⁾.

Nurses have an indispensable role in the systematic assessment of feet and in the early identification of risk factors, which contribute to reducing the number of ulcers and amputations. Such assessment should take into consideration patient's clinical history, i.e., occurrence of previous lesions or amputations and patient's inability to perform foot self-care should be investigated⁽⁴⁾.

Scientific research on nurses' knowledge about the prevention of diabetic foot is of great importance because it allows the identification of the quality of care provided as well as the reformulation of strategies to avoid DM complications. Therefore, the present study aimed to systematize nurses' knowledge about the prevention of diabetic foot.

METHODS

This is an integrative review of the literature, which is characterized by allowing the search, critical assessment and synthesis of available evidence on the subject investigated and the identification of gaps that lead to the development of future research, its final product being the current state of knowledge on the topic of interest⁽⁵⁾.

The review involved the following steps: identification of the theme and selection of the hypothesis – or the research question – to prepare the review; establishment of criteria for inclusion and exclusion of studies/sampling and for search in the literature; definition of the information that should be extracted from the selected studies/categorization of the studies; assessment of the studies included in the review; interpretation of results; presentation of the review/synthesis of the knowledge⁽⁶⁾.

The study was carried out from April to June 2016 and searches were made in the following electronic databases: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS) and United States National Library of Medicine/Medical Literature Analysis and Retrieval System online (PubMed/Medline). These databases are available in the Virtual Health Library (VHL). DeCS (Health Sciences Descriptors) and MeSH (Medical Subject Headings) were used to verify the descriptors, which consisted of the following: Knowledge; Nursing; Primary Prevention; Diabetic foot. The search was made using descriptors in English and associating them with the Boolean connective “and”.

The findings were organized and synthesized after a pre-selection of the articles, which consisted in reading the titles and abstracts to check whether they met the inclusion and exclusion criteria. Inclusion criteria were: full online texts in Portuguese and English on the subject analyzed published between 2011 and 2016. Exclusion criteria were: duplicates, theses and institutional documents. The selection of articles to be included in the study was performed by two people and independently to ensure the eligibility for the research.

The selected articles were described and characterized according to title, authors' names, journal in which it was published, year of publication, database, objectives, methodology used and main outcomes. The results were synthesized according to the similarity of the content.

The interpretation of the results followed a critical analysis of the reviewed studies, which allowed an assessment of nurses' theoretical/practical knowledge about the prevention of diabetic foot. The analysis focused on the actions (counseling and care) carried out by nurses, which constitute the implications resulting from this integrative review. Additionally, the study sought to identify the main strategies and difficulties faced in developing preventive practices.

RESULTS

The search yielded 465 potential studies, 07 of which met the preestablished inclusion and exclusion criteria. The data described in figure 1 demonstrate the selection of the sample in the three databases chosen for the study.

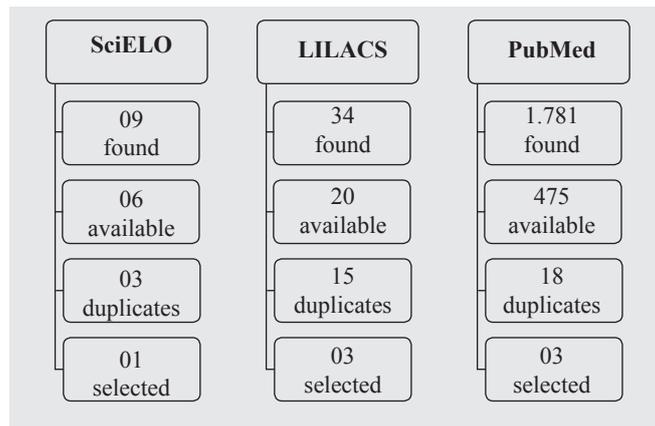


Figure 1 - Flow chart of article identification and selection process according to database.

Most of the studies were found in LILACS and PubMed databases; there was a predominance of quantitative studies and cross-sectional studies. The main assessment tools used in the studies were structured and semi-structured questionnaires and interviews. Additionally, most of the studies were published in nursing and public health journals and sought to know nurses' attitude, knowledge and practice in the prevention of diabetic foot, investigating the identification of foot injuries, the care, and the guidelines for the prevention of diabetic foot (Chart I).

Chart I - Characterization of the articles according to author, year, place, knowledge, strategies and difficulties.

Author	Year	Place	Knowledge (prevention/ care guidelines)	Strategies	Difficulties
Cubas et al ⁽⁷⁾	2013	Curitiba (PR)	Guidelines on the use of footwear and nail cutting; Types of socks; Assessment of protective and tactile sensitivity using a esthesiometer (Semmes-Wertein monofilament).	Multidisciplinary action to enhance guidelines and improve adherence to them; Educational activities.	Lack of important information;

Aalaa et al ⁽⁸⁾	2012	Tehran (Iran)	Guidelines on foot cleaning and skin and nail care; Guidelines on moisture and use of appropriate socks and shoes; Sensitivity test was carried out (Semmes-Wertein monofilament)	Nurses attended special training in foot care to provide effective services to facilitate promote diabetic patients' health; Public health education.	Academic training of nurses is poor; Lack of a nurse specialist in the field.
Policarpo et al ⁽⁹⁾	2014	Picos (PI)	Guidelines on foot hygiene; Nail and callus care; Sensitivity test was carried out.	Educational measures (brochures, meetings and home visits) aimed at improving patients' knowledge.	Lack of knowledge.
Varaei et al ⁽¹⁰⁾	2013	Iran	Nursing evidence-based guidelines.	Education that can improve nurses' knowledge and attitude.	Health practices are passed on incorrectly.
Pereira et al ⁽¹⁶⁾	2013	Fortaleza (CE)	Guidelines on hygiene, moisture (of the skin daily) and nail filing rather than cutting; Static inspection of physical examination; Guidelines on not walking barefoot.	Promotion of health education for people with diabetes mellitus.	Anamnesis and physical examination of the feet occurred incompletely. Failure to follow important steps in preventing the development of diabetic foot or the associated complications; Lack of important information.
Silva et al ⁽¹⁸⁾	2012	Ponta Grossa (PR)	Skin and foot care.	Educational activities aimed at the personal and social well-being of the patient.	Lack of knowledge.
Couto et al ⁽²⁴⁾	2014	Itabuna (BA)	Guidelines on the use of appropriate medication, diet, regular physical activity, glycemic control and need for self-care (foot hygiene); Use of the Semmes-Wertein monofilament test.	Implementation of measures (strategy or programs) to improve care and prevention of complications arising from diabetic neuropathy.	Lack of material resources; Social issues hinder the implementation of some actions (lack of basic sanitation and irregular water supply in the neighborhoods, which hinder personal and household hygiene, especially among patients with extensive ulcers).

The patients were provided with information about foot hygiene, nail care (cutting and filing) and calluses (removal), skin hydration, use of appropriate footwear, importance of diet (restricted) and physical activity, and glycemic control with the purpose of educating them about self-care to avoid diabetic foot complications.

The most used instruments for foot examination were: 10g (5.07U) Semmes-Weinstein monofilament for tactile and protective sensitivity tests; 128 Hz tuning fork for vibration tests; and neurological hammer for Achilles Reflex test. Of these, the Semmes-Weinstein Monofilament was the most used by professionals for the physical examination.

Strategies for the prevention of diabetic foot included health education activities and home visits in addition to self-care and treatment of the diabetic patient. Thus, the need to implement strategies and programs to minimize diseases and complications due to DM should be highlighted.

Ways of updating the knowledge and of planning and strengthening the activities carried out by nurses included training and meetings with the multidisciplinary team.

Some of the barriers to carrying out prevention activities were: poor academic training; lack of a nurse specialized in the area; nurses' poor knowledge about diabetic foot prevention; incomplete anamnesis and physical examination; lack of material resources; and social factors (such as lack of basic sanitation and irregular water supply, which hinders personal and household hygiene, especially in patients with extensive ulcers).

DISCUSSION

Diabetic foot prevention is an important public health issue and has been discussed in different parts of the world by several professionals. In this context, nursing stands out for promoting educational actions to raise awareness and sensitize the population to prevent DM complications. The nurse practitioner keeps a direct contact with the community through consultations and home visits in which they are responsible for the early identification of health problems, health promotion, disease prevention and health recovery through the continuity of care⁽⁴⁾. Because of that, it is believed that the care process requires the participation of the diabetic patient in his/her own health-disease process.

According to the studies analyzed, the care provided by nurses includes the provision of information on foot hygiene (washing, nail cutting, removal of calluses and skin hydration) and use of appropriate footwear. However, important information on the daily physical examination of the feet was not provided. In this regard, it should be noted that routine feet examination is essential in the early identification of risk factors for diabetic foot. Additionally, feet self-care is an indispensable factor in primary prevention, for it can prevent the appearance of ulcers and improve patient's life expectancy.

The most common instrument used by nurses for foot examination was the 10g (5.07U) Semmes-Weinstein Monofilament. This tests consists in pressing (touching) some areas of the foot surface with the tip of a special nylon wire (monofilament) to test its sensitivity to such pressure. Failure in feeling the pressure required to bend the 10g monofilament is consistent with impairment of local sensitivity to pressure or protective sensitivity⁽¹¹⁾.

Therefore, it is an easy-to-handle and accurate technology that detects alterations of tactile sensation and perception. Noteworthy, the monofilament is the test chosen by non-specialists for the determination of an increased risk of ulceration due to its high sensitivity, good specificity, simplicity and low cost⁽¹²⁾.

However, the literature on foot examination recommends the use of at least the 10g monofilament test in combination with another test, and, whenever possible, a reflex test should be included in the examination⁽¹³⁾.

The 10g monofilament is not suitable for an earlier diagnosis of polyneuropathy because it does not detect alterations of small fibers responsible for superficial and thermal pain sensitivity; the test only assesses the perception of pressure (touch)⁽¹¹⁾. Therefore, the use of only one instrument to perform physical examination of the feet is considered insufficient for the early detection of risk factors for diabetic foot, since each instrument has its specificity in the identification of alterations.

Thus, the nursing consultation, one of nurses' duties in primary care, and the physical examination of the feet prove to be important tools for the prevention of future complications. However, nurses have failed to perform feet examination for several reasons, including lack of infrastructure, ignorance, and excessive demand⁽¹⁴⁾.

As noted above, examining the feet of diabetic patients is essential for the quality of nursing care and the prevention of ulcer complications. In addition, nurses should encourage self-care practices and provide the necessary guidelines⁽¹⁵⁾. Failure to perform such prevention measures may increase the risk of injuries.

Thus, it is important to emphasize the risk conditions for the development of foot ulcers, which consist of the following alterations: onychomycosis, ingrown nails, inadequate nail cutting, edema, varicose veins, altered tibial pulse, dry feet, fissures, claw toe, accentuation of the arch of the foot, elevation of the dorsum of the foot, metatarsal prominence, calluses, tingling, numbness and cramps⁽¹⁶⁾. Given that, local dermatological alterations are thought to reflect social and economic barriers faced by diabetic people to acquire footwear, insoles, creams, and other items for the prevention of foot problems⁽¹⁷⁾.

Preventive measures for diabetic foot include foot and nail care, which consists in avoiding mycosis, drying the moisture between the toes, inspecting shoes and not using corn plasters, scrapers or blades on calluses. These measure are equally

important actions in the primary prevention of ulcers and lower limb amputation⁽¹⁷⁾. One of the interventions recommended for patients with diabetes is the constant use of appropriate shoes that meet the needs of each person⁽¹⁸⁾. Because of that, the shoes must have: extra depth, which allows adaptation of removable insoles; inner padding; absence of inner seam; adjustable closure system (velcro or lacing); square tip; and heels of up to three centimeters. Shoes should also cover toes and heels completely and be made of soft leather or canvas⁽¹⁹⁾.

However, previous experiences regarding diabetic patients' knowledge of and behavior towards foot care is part of such preventive effort. Successful diabetes education depends on whether the patient is encouraged to develop a proactive attitude towards self-care⁽²⁰⁾.

Self-care corresponds to the form of protection indispensable to avoid chronic complications⁽²¹⁾. In a complementary way, nurse practitioners are challenged to foster diabetic patients' autonomy in care through complete and updated guidelines on diabetic foot.

Thus, health professionals' performance in the provision of guidelines on disease self-care involves understanding and examining the individual, providing him/her with emotional and clinical support, knowledge and skills to achieve goals, and helping them discover and develop autonomy to be responsible for controlling their disease. However, primary health care professionals often develop educational actions on their own and resent the lack of training in Diabetes education^(22,23).

Therefore, in addition to technical and scientific knowledge of each area, the professional needs to be equipped with tools to respond to the population's health needs through an interdisciplinary, multidisciplinary and networked performance in order to guarantee comprehensive care. Training of health professionals needs to be enhanced so that they become capable of directing their learning process throughout life and adapting to changes in addition to reasoning critically and making decisions based on their own assessment⁽²⁴⁾.

In this regard, health professionals need to rethink their practices and academic training regarding nursing practices and actions aiming at the early identification of the risks and complications that affect the person with diabetic foot⁽²⁵⁾. The search for professional training should be a routine among multidisciplinary health teams so that they get to know the pathology, treatment and forms of health education prior to the planning of preventive care.

The nurse practitioner, as a fundamental part of the team, should focus on health education in pedagogical actions, emphasizing the control and prevention of complications of diabetes through educational programs and training of health professionals to assist in the educational process⁽²⁶⁾.

To avoid an increase in the number of complications in the lower limb, prevention and educational programs must be implemented. These programs should also be monitored by the health team, especially by the nurse, one of the professionals responsible for patient adherence to treatment and educational actions aimed at the prevention of conditions caused by DM⁽²⁷⁾.

Despite the countless strategies and policies developed by health services, preventive actions have not been effective, since hospitalizations for DM complications continue to increase⁽²⁸⁾. Thus, it is necessary to foster health professionals' critical and emancipatory thinking so they can establish an open and interactive communication with patients, leading them to acquire knowledge and skills to improve their education about self-management of disease care⁽²⁹⁾.

Self-management of diabetes is a goal universally considered fundamental in educational strategies for disease control⁽³⁰⁾. Health education about diabetes has been defined as a process of problematization of health conditions and quality of life that provides individual, collective and institutional changes aimed at transforming reality. It is one of the most important long-term investments, since people's health costs with diabetes and the social costs of complications are enormous⁽³¹⁾.

In this regard, the literature shows that 99% of the daily care needed to treat diabetes is carried out by the person with DM or their relatives, and the biggest challenge for health professionals is to establish an effective health education process to promote self-care⁽³²⁾.

Likewise, the findings of the present study showed that the educational measures most used by nurses to prevent diabetic foot were health education activities, which focused on sensitizing and encouraging diabetic patients to change lifestyle and leading them to the autonomy of care and ways of coping with treatment.

Despite the prevention programs and adherence to prophylactic measures, there are still many barriers to satisfactorily reducing the risk factors associated with diabetic foot and its complications. Lack of diagnosis or its delay, non-monitoring of risk situations and failure to implement prophylactic measures are often associated with the occurrence of serious injuries⁽³³⁾.

The findings of the present study showed that the difficulties faced by nurses to carry out prevention activities negatively influenced the planning of actions, health education and adherence to treatment. Also, the problems in adherence to treatment consist of several factors, such as: low levels of education, socioeconomic status, lack of knowledge about the disease and obstacles to access health services⁽³⁴⁾.

Thus, given the reality experienced by the health team in the face of the demand for services and the scarce material resources, there is a need to implement measures that improve the care and prevention of complications of diabetic neuropathy, which can reduce public expenses and other surgical procedures (debridement and amputations)⁽³⁵⁾.

Teamwork in diabetes mellitus care enhances professionals' ability to understand patients' real needs for achieving good health and adopting healthy lifestyle, allowing greater efficiency and lower costs in educational programs. However, it is necessary to invest in the continuing education of the multidisciplinary teams and their training in self-management of noncommunicable diseases⁽³⁶⁾.

To this end, nurses and other health care professionals should be willing to develop preventive strategies for diabetic foot that involve lifestyle change and the promotion of feet self-care. Family members should also be involved in the care that the disease requires^(37,38).

Health professionals, especially nurses, should work within an educational context, since educational practices also include care, regardless of the level of health care. Thus, providing appropriate guidelines in the health services may lead the diabetic patient to increase their knowledge and, consequently, improve their quality of life⁽³⁹⁾.

The guidelines aimed at the prevention of diabetic foot complications reported by the studies are effective in foot care. Added to this is the promotion of self-care, interdisciplinary care, adherence to treatment and health education. Thus, the study emphasizes that nurses play a fundamental role in assisting in the care and education of patients⁽⁴⁰⁾.

Given the above, the present review is thought to contribute to the knowledge about the theme and highlights the importance of the nurse's role in primary prevention and the expansion of primary actions directed to diabetes care, particularly the prevention of foot injuries. The guidelines and care reported by the studies can contribute to the prevention of injuries in the lower limbs, reducing the risks of amputations. However, there is a need for the mobilization of care, with the diversification of prevention activities, which must consider the diabetic patient in its complexity. Health services must provide adequate infrastructure and the nurse must be able to carry out quality preventive actions.

CONCLUSION

The nurses of the articles analyzed are in daily contact with diabetic patients and their actions are often directed towards exclusive counseling activities regarding the disease itself. Therefore, knowledge about the guidelines for preventing diabetic foot is insufficient. Nevertheless, primary health care nurses need to improve their knowledge about the pathophysiology of the disease, its comorbidities and complications to establish goals that lead to satisfactory and complete prevention of diabetic foot. They should work in partnership with the multidisciplinary team to optimize the continuity of the disease care.

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