

## Nursing care for diabetic foot in primary care: scoping review


Cuidados de enfermagem ao pé diabético na atenção primária: revisão de escopo  
Cuidados de enfermería de pie diabético en la atención primaria: revisión de alcance

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**Abstract**

**Objective:** To map scientific production on nursing care for people with diabetic foot in primary health care.

**Methods:** This scoping review was carried out between October and December 2022. In it, the Joanna Briggs Institute methodology and the following sources of information were used: PubMed, CINAHL, Web of Science, Scopus, BDNF, LILACS and SciELO, articles were written in English, Portuguese and Spanish. The texts were exported to the Rayyan application, and duplicates were removed.

**Results:** 334 studies were identified; after removing duplicates, 318 of them remained for selection by titles and abstracts. At this stage, 235 studies were excluded as they did not meet the pre-established criteria, resulting in 81 studies for full text evaluation. In this review, 14 of them were selected, identifying people with diabetic foot as the main nursing care in primary health care: foot examination, health education on foot care, wound care, glycemic control, home visit and referral for specialized service for people with diabetic foot.

**Conclusion:** Evidence on nursing care for people with diabetic foot in primary health care was mapped and the analysis showed that this condition is complex and multidimensional.

**Resumo**

**Objetivo:** Mapear a produção científica sobre cuidados de enfermagem a pessoas com pé diabético na atenção primária à saúde.

**Métodos:** Esta revisão de escopo foi realizada no período de outubro-dezembro de 2022. Nela, foram usadas a metodologia do *Joanna Briggs Institute* e as seguintes fontes de informação: PubMed, CINAHL, *Web of Science*, Scopus, BDNF, LILACS e SciELO, artigos nos idiomas Inglês, Português e Espanhol. Os textos foram exportados para o aplicativo *Rayyan*, sendo suprimidos os duplicados.

**Resultados:** Foram identificados 334 estudos; após remoção de duplicatas, 318 deles permaneceram para seleção por títulos e resumos. Nesta etapa, 235 estudos foram excluídos pois não atendiam aos critérios pré-estabelecidos, resultando em 81 estudos para avaliação em texto completo. Nesta revisão, 14 deles foram selecionados, identificando pessoas com pé diabético como os principais cuidados de enfermagem na atenção primária à saúde: exame dos pés, educação em saúde sobre cuidados com os pés, cuidados com a ferida, controle glicêmico, visita domiciliar e encaminhamento ao serviço especializado de pessoas com pé diabético.

**Conclusão:** Evidências sobre cuidados de enfermagem a pessoas com pé diabético na atenção primária à saúde foram mapeadas e a análise mostrou que esta condição é complexa e multidimensional.

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**Conflicts of interest:** nothing to declare.

## Resumen

**Objetivo:** Mapear la producción científica sobre los cuidados de enfermería a personas con pie diabético en la atención primaria de salud.

**Métodos:** Esta revisión de alcance se realizó durante el período de octubre a diciembre de 2022. Se utilizó la metodología del Joanna Briggs Institute y las siguientes fuentes de información: PubMed, CINAHL, *Web of Science*, Scopus, BDNF, LILACS y SciELO, artículos en los idiomas inglés, portugués y español. Los textos se exportaron a la aplicación Rayyan y se eliminaron los duplicados.

**Resultados:** Se identificaron 334 estudios. Luego de eliminar los duplicados, quedaron 318 para la selección por títulos y resúmenes. En esta etapa, se excluyeron 235 estudios que no cumplían con los criterios preestablecidos y quedaron 81 estudios para el análisis del texto completo. En esta revisión, se seleccionaron 14 artículos, donde se identificaron personas con pie diabético. Los principales cuidados de enfermería en la atención primaria de salud fueron: examen de pies, educación para la salud sobre cuidados de los pies, cuidados de las heridas, control glucémico, visita domiciliaria y derivación al servicio especializado de personas con pie diabético.

**Conclusión:** Se mapearon evidencias sobre cuidados de enfermería a personas con pie diabético en la atención primaria de salud y el análisis demostró que esta condición es compleja y multidimensional.

Open Science Framework: <https://osf.io/d9q23/>

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## Introduction

Diabetic foot is recognized worldwide as one of the most serious complications of diabetes mellitus (DM).<sup>(1)</sup> This term refers to several pathological conditions associated with neurological abnormalities and different degrees of peripheral vascular disease in the lower limb that can affect the feet. Despite advances in diagnosis and treatment, managing diabetic foot remains a challenge.<sup>(2)</sup>

In a systematic review, the global prevalence of diabetic foot was 6.3%, being higher among men and people with type 2 DM.<sup>(3)</sup> Foot ulcers are one of the most evident problems, with a high incidence in developed and emerging countries.<sup>(4)</sup> Estimates indicate that 19-34% of people with diabetes may develop diabetic foot during their lifetime and are subject to a high risk of amputation, in at least one of the feet, and premature death.<sup>(5)</sup>

In Brazil, the Family Health Strategy (FHS) should be the first service to be accessed by people with foot ulcers. It is considered as the gateway (articulating center) for users' access to the Unified Health System (SUS) and Health Care Networks.<sup>(6)</sup> The actions and services offered by FHS teams to users with diabetes can reduce the number of hospitalizations for complications such as diabetic foot. Such actions aim to prevent and adequately treat injuries in an appropriate time, avoiding more serious problems.<sup>(7)</sup>

Nurses are members of the FHS multidisciplinary team and are directly involved in the care of people with diabetic foot. Their clinical vision in caring for such individuals makes it possible to relate important points that influence the health-disease process. They work to control the underlying disease and evaluate local and systemic factors that affect both the appearance of wounds and the healing process. They also work on nutritional, infectious and medicinal aspects, on the quality of educational care and on the assessment of users' self-care capacity.<sup>(8)</sup>

Despite the magnitude of the problem related to diabetic foot, there is a lack of studies in the national and international literature that address the practice of nurses with people with diabetic foot cared for in the context of Primary Health Care (PHC). Given the extent represented by its high incidence, impact on different dimensions of the lives of people with diabetic foot and the importance of nurses in assisting these people, the relevance of this study is evident. It will make it possible to identify the care implemented by nurses for people with diabetic foot in the PHC context. Furthermore, it will allow expanding knowledge about the practices of these professionals, as well as a better understanding of their functions and impacts on comprehensive care for people with diabetic foot treated in PHC.

Thus, the objective of this study was to map scientific production on nursing care for people with diabetic foot in primary health care.

## Methods

This scoping review followed the steps recommended by the Joanna Briggs Institute (JBI) and proposed to map scientific production according to the following steps: (1) identification of the research question and objective, (2) search for relevant studies, (3) selection of studies, (4) data analysis and (5) synthesis and presentation of data. This review also used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist to report the review.<sup>(9)</sup> The present review has been registered on the Open Science Framework (<https://osf.io/d9q23/>) on March 1<sup>st</sup>, 2023 and identified through its DOI number (DOI:10.17605/OSF.IO/D9Q23).

Beforehand, a search was carried out in the following sources: International Prospective Register of Systematic Reviews (PROSPERO), Medical Literature Analysis and Retrieval System Online (MEDLINE), Cochrane database of Systematic Reviews (Wiley) and JBI database to identify the previous existence of articles on the topic and analyze text words contained in titles and abstracts. The indexers used to describe the articles were also used to develop a comprehensive search strategy. We emphasize that no protocols or reviews were found on the topic.

To structure the research question, the mnemonic PCC (Population, Concept and Context) was used, assigning the following contents: P: person with diabetic foot; C: nursing care; P: PHC. Thus, the following research question was created: What scientific evidence is available in the literature on nursing care provided to people with diabetic foot in the context of PHC?

The bibliographic survey was carried out in the period October-December 2022 in the databases: PubMed, CINAHL, Web of Science, SciVerse Scopus (Scopus), Nursing Database (BDENF), Latin American and Caribbean Literature in Nursing Sciences Health (LILACS) and Scientific Electronic Library Online (SciELO). The following descriptors were used: Nursing Care, Diabetic Foot, Primary Health Care and the indexers identified in the included databases. The search strategies were

constructed from three controlled health vocabularies, Health Science Descriptors (DeCS), Medical Subject Headings (MeSH) and Emtree in conjunction with the Boolean operators AND and OR, to obtain a wide spectrum of results in different databases. The search strategies presented in chart 1 were used.

**Chart 1.** Database search strategy

Databases	Search Strategies
MEDLINE/ PubMedPortal PubMed	((("Nursing" [Mesh] OR "Nursing" OR "Nurses" [Mesh] OR "Nurse" OR "NursingCare" [Mesh] OR "Care, Nursing" OR "Management, NursingCare" OR "NursingCare Management" OR "Home Health Nursing" [Mesh] OR "Nursing, Home Health" OR "Home Health CareNursing" ) AND ("DiabeticFoot" [Mesh] OR "Diabeticfeet" OR "diabeticfootulcer" OR "footulcer" [Mesh]) AND ("Primary Health Care" [Mesh] OR "Primaryattention" OR "National Health Strategies"))
Scopus	((("Nursing" OR "Nursing" OR "Nursing" OR "Nurses" OR "Nurse" OR "Nursing Care" OR "Care, Nursing" OR "Management, Nursing Care" OR "Nursing Care Management" OR "Home Health Nursing" OR "Nursing, Home Health" OR "Home Health Care Nursing" AND "Diabetic Foot" OR "Diabetic Feet" OR "Diabetic Foot ulcer" OR "Foot Ulcer" AND "Primary Health Care" OR "Primary attention" OR "National Health Strategies"))
Web of Science	((("Nursing" OR "Nursing" OR "nursing" OR "Nurses OR "Nurse" OR "Nursing Care" OR "Care, Nursing" OR "Management, Nursing Care" OR "Nursing Care Management" OR "Home Health Nursing OR "Nursing, Home Health" OR "Home Health Care Nursing") AND ("Diabetic Foot" OR "Diabetic feet" OR "diabetic foot ulcer" OR "foot ulcer") AND ("Primary Health Care" OR "Primary attention" OR "National Health Strategies"))
CINAHL	((("Nursing" OR "Nursing" OR "nursing" OR "Nurses OR "Nurse" OR "Nursing Care" OR "Care, Nursing" OR "Management, Nursing Care" OR "Nursing Care Management" OR "Home-- Health Nursing OR "Nursing, Home Health" OR "Home Health Care Nursing") AND ("Diabetic Foot" OR "Diabetic feet" OR "diabetic foot ulcer" OR "foot ulcer") AND ("Primary Health Care" OR "Primary attention" OR "National Health Strategies"))
LICACS e BDENF	(Nursing) OR (Nursings) OR (Nurses) OR (Nurse) OR (NursingCare) OR (enfermagem) OR (enfermeria) OR (CareNursing) OR (Management, NursingCare) OR (NursingCare, Management) OR (Home Health Nursing) OR (Nursing, Home Health ) OR (Home Health CareNursing) OR (Cuidados de Enfermagem) OR (Assistência de Enfermagem) OR (Cuidado de Enfermagem) OR (atencion de enfermeria) OR (cuidado de enfermeria) OR (cuidados de enfermeria) AND (Diabeticfoot) OR (Diabeticfeet) OR (Diabeticfootulcer) OR (footulcer) OR (pé diabético) OR (pés diabéticos) OR (úlceras do pé diabético) OR (pie diabético) AND (Primary Health Care) OR (Primaryattention) OR (National Health Strategies) OR (Atenção Primária a Saúde) OR (Atenção Primária) OR (Estratégias de Saúde Nacionais) OR (Atención Primaria de Salud) OR (Estrategias de SaludNacionales)
SciELO	(Nursing) OR (Nursings) OR (Nurses) OR (Nurse) OR (NursingCare) OR (enfermagem) OR (enfermeria) OR (Care, Nursing) OR (Management, NursingCare) OR (NursingCare Management) OR (Home Health Nursing) OR (Nursing, Home Health) OR (Home Health CareNursing) OR (Cuidados de Enfermagem) OR (Assistência de Enfermagem) OR (Cuidado de Enfermagem) OR (atencion de enfermeria) OR (cuidado de enfermeria) OR (cuidados de enfermeria) AND (DiabeticFoot) OR (Diabeticfeet) OR (diabeticfootulcer) OR (footulcer) OR (Pédiabético) OR (PésDiabéticos) OR (úlceras do pédiabético) OR (Pie Diabético) AND (Primary Health Care) OR (Primaryattention) OR (National Health Strategies) OR (AtençãoPrimária a Saúde) OR (AtençãoPrimária) OR (Estratégias de SaúdeNacionais) OR (AtenciónPrimaria de Salud) OR (Estrategias de SaludNacionales)

Subsequently, a reverse search was carried out reading the references of the selected articles in the databases and in the gray literature, available in documents produced by the Brazilian Ministry of Health. As eligibility criteria for this review, pub-

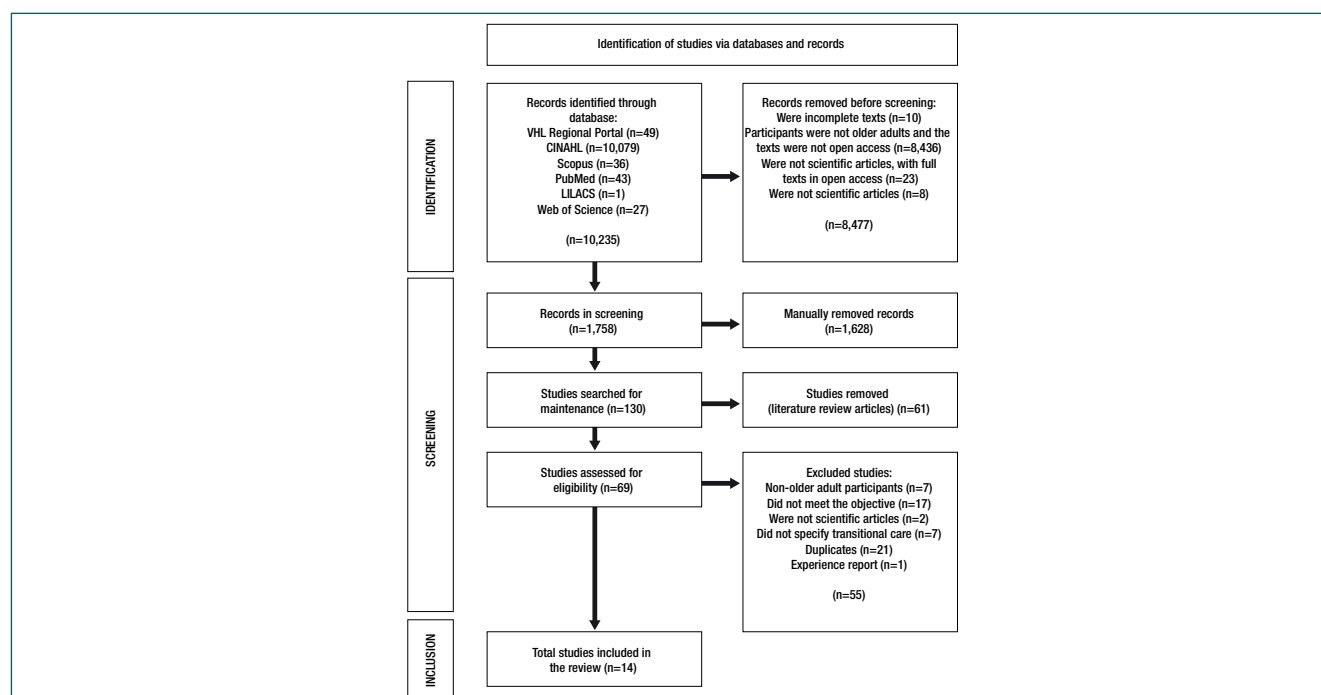
lications on nursing care aimed at people with diabetic foot in PHC were established. Quantitative and qualitative primary studies and mixed and secondary methods were researched, such as systematic, scoping, integrative, narrative reviews, etc. This review considered studies exploring care performed specifically by nurses. Articles in English, Spanish and Portuguese were included, without limiting the publication time. Duplicate studies, opinion articles, letters to the editor, summaries of event annals, studies with unavailable full text and those without information on the population, concept and context of interest to this study were excluded. After the search, two independent reviewers exported the identified documents to the Qatar Computing Research Institute (QCRI) Rayyan application to manage references and remove duplicates.<sup>(10)</sup> Titles and abstracts were screened for evaluation against the inclusion criteria. The full text of the selected studies was retrieved and evaluated.

Discrepancies were resolved with the participation of a third examiner. Data were analyzed using a data extraction instrument developed by the authors for this review. The extracted data included specific information such as: year, country of publication,

type of study, number of participants and/or studies, objective, nursing care, nursing activities and main results. This mapping allowed the data to be synthesized and interpreted, generating a numerical description of the texts included in the review. Following JBI's recommendations for analysis, separation, summarization and reporting of results were carried out to present an overview of all material through thematic categories. The results were presented in tables and figures, accompanied by a narrative synthesis.

## Results

After removing duplicates from the evaluated studies (334), 318 of them remained for selection by titles and abstracts. At this stage, 235 studies were excluded for not meeting the pre-established criteria, resulting in 83 studies for full text evaluation. Of these, 69 were excluded for the reasons presented in figure 1. Finally, 14 articles were chosen to compose the final sample of this study: 12 of them were identified in the databases and two in the gray literature (Ministerial Guidelines). Figure 1 presents the detailed selection process.



**Figure 1.** Flow diagram for selecting studies for scoping review (adapted from Preferred Reporting Items for Systematic Review and Meta-Analyses).

The 14 articles were published in the period 2006-2020. In developing countries, the following predominated: Brazil (n=10), New Zealand (n=2), Australia (n=1) and Spain (n=1). The selected studies were quantitative (7), qualitative (3), experience reports (2) and ministerial guidelines (2). The characteristics of the included studies are described in chart 2, including the general objective of the studies, nursing care identified and main results obtained.

In PHC, the main nursing care for people with diabetic foot was as follows: foot examination, health education on foot care, wound care, glyce-mic control, home visits and referral to a specialized service for people with diabetic foot (Chart 3).

## Discussion

Brazil stood out in most studies. Since 2001, Brazil has established guidelines (law 10,782) for a policy of prevention and comprehensive health care (within the scope of the SUS) for people with DM.<sup>(11)</sup> In 1991, the inaugural publication of the International Working Group on the Diabetic Foot (IWGDF) and in 2001, the first translation of the International Consensus on Diabetic Foot and Practical Guidelines was published.<sup>(12)</sup> Furthermore, a large part of the research carried out in Brazil was published from 2013 onwards, when regular assessment of the feet of people with DM was highlighted as a preferred activity of nurses in primary care notebooks.<sup>(13)</sup>

The results showed that primary care nurses have an essential role in examining the feet of people with DM. This care was the most cited in the studies in this review.<sup>(11,13-22)</sup> Periodic examination of the feet allows for early identification and timely treatment of the changes found, thus preventing a significant number of complications in diabetic feet. We emphasize that people without changes in the clinical examination of their feet should be re-evaluated annually; in case of changes, the evaluation should be carried out more frequently.<sup>(11,13)</sup> Clinical examination of the feet is also considered a protective factor against

the development of ulcers, being the main practice to prevent diabetic ulcers.<sup>(23)</sup>

In this review, the use of (1) Semmes-Weinstein monofilament (10 g) was evidenced to evaluate protective and tactile sensitivity and (2) cotton balls and a glass of water to verify thermal and painful sensitivity (using a ballpoint pen), which help to investigate neurological changes during clinical examination of the foot.<sup>(16,22)</sup> Diabetic neuropathy affects the sensory, motor and autonomic peripheral nervous system, culminating in the loss of pain sensitivity and perceptions of pressure, temperature and proprioception and atrophy of muscles. This causes deformity and dryness of the skin, resulting in diffuse or isolated cracks and fissures, favoring the development of foot ulcers.<sup>(24)</sup>

The results of a systematic review to determine the reliability of testing methods for diagnosing diabetes-related peripheral neuropathy suggest acceptable reliability of the monofilament, recommending it for screening and ongoing monitoring.<sup>(25)</sup>

Although clinical foot examination is widely recommended by national and international guidelines, it has not yet been implemented as a routine in several health services around the world (especially in PHC), with low adherence among health professionals.<sup>(11,12, 26)</sup> This data is a worrying factor for the development of ulcers. They can result in an increase in hospitalizations, risk of complications and amputation, with consequent physical, psychological, social and financial losses.<sup>(27)</sup>

Among health specialists, nurses are the professionals recommended to work at the three levels of foot care management. In the prevention and treatment of foot diseases related to diabetes, we emphasize that success depends on the work of an organized interdisciplinary team. She should adopt a holistic approach, treating foot ulcers as a sign of multiorgan disease.<sup>(1)</sup>

Nurses have an indispensable role in the systematic evaluation of the feet and early identification of risk factors in people with DM, reducing the risk of complications.<sup>(11)</sup> Failure to perform a clinical examination of the feet in people with diabetes makes early identification and diagnosis difficult. and the treatment of diabetic foot. To minimize or reme-



**Chart 2.** Characteristics of the studies included in the scoping review

Author, Year of Publication and Citation	Country	Study Types and Number of Participants	Objectives	Nursing care	Main results
Brasil, 2016 <sup>(11)</sup>	Brazil	Guideline Person with chronic illness	Strengthen and qualify care for people with DM through comprehensiveness and longitudinality of care at all points of care.	Foot examination, wound care and health education.	
Brasil, 2013 <sup>(13)</sup>	Brazil	Guideline Person with chronic illness	Strengthen and qualify care for people with this disease through comprehensiveness and longitudinal care at all points of care.	Foot examination and wound care	
Daly et al., 2020 <sup>(14)</sup>	New Zealand	Cross-sectional quantitative study 336 nurses	To assess trends in foot examinations for people with diabetes by primary health care nurses in Auckland, New Zealand (between 2006-2008 and 2016).	Foot examination and health education	Significantly more users were seen by nurses and received foot exams and foot care education in 2016 compared to 2006-2008.
Mullan et al., 2020 <sup>(15)</sup>	Australia	Cross-sectional quantitative study 84 accredited diabetes educators	To assess the priority of primary care providers to manage diabetic foot disease (DFD) throughout the course of the disease compared to other aspects of diabetes care.	Glycemic control, foot examination and referral to a specialized service	When diagnosing type 2 diabetes, review of hemoglobin A1c (HbA1c) has been identified as one of the top three priorities. Foot assessment became a priority for participants (n=73; 78%) with priority podiatry referral (n=50; 53%).
Arruda et al., 2019 <sup>(16)</sup>	Brazil	Cross-sectional quantitative study 237 nurses	Understand nurses' knowledge about foot care for diabetics in Primary Care.	Feet examination (ballpoint pen, cotton wool and glass of water)	When analyzing the items on diabetic foot prevention, better performance was observed for monofilament and neuropathic foot and lower performance for physical examination; regarding the classification of knowledge, professionals presented unsatisfactory (45.6%) and conflicting (54.4%) knowledge.
Pereira et al., 2017 <sup>(17)</sup>	Brazil	Qualitative study 20 people with a medical diagnosis of diabetes	Investigate nurses' actions to prevent diabetic foot from the perspective of people with diabetes mellitus (DM).	Foot examination and health education	Effective actions to prevent diabetic foot appear peripherally in the data set, and action is limited to health education actions.
Vargas et al., 2017 <sup>(18)</sup>	Brazil	Qualitative study 22 nurses	To understand the actions of primary care nurses in caring for people with diabetes mellitus (DM) regarding diabetic foot.	Glycemic control, wound care, foot examination and health education	It was evidenced that nurses' knowledge about the care of people with DM is partial, superficial and fragmented, not allowing adequate actions, especially to detect the risks of developing diabetic foot and evaluate the examination of the feet.
Oliveira et al., 2016 <sup>(19)</sup>	Brazil	Cross-sectional quantitative study 38 nurses	Identify guidance given by nurses to people with DM on foot care, investigate the frequency of foot examination and the aspects evaluated, and verify which health education activities are carried out by nurses for people with DM.	Foot examination and health education	It was observed that nurses provide guidance on the use of comfortable shoes (n=26; 68.4%), evaluate hair and nails monthly (n=19; 50.0%) and carry out health education activities (n=12; 31.6%).
Daly et al., 2014 <sup>(20)</sup>	New Zealand	Cross-sectional quantitative study 287 nurses	Identify the factors associated with the examination of patients' feet by primary health care nurses.	Foot examination and health education	An 86% response rate was achieved across participants. Nurses examined users' feet in 46% of consultations.
Martins et al., 2008 <sup>(21)</sup>	Brazil	Experience report	To report the evolution of healing (based on therapeutic care) of a 47-year-old diabetic patient suffering from an injury to the right lower limb, with a supposed indication for amputation, being cared for at a UBS in the city of Rio Grande, RS, Brazil.	Wound care, glycemic control, foot examination, referral to a specialized service	I use therapeutic measures to recover the injured limb. After four weeks of follow-up, the client was very satisfied with the progress of the treatment; however, the presence of granulation tissue was observed throughout the entire length of the wound.
Orihuela Casarra et al., 2005 <sup>(22)</sup>	Spain	Observational quantitative study 62 nurses	Check whether the instrument is used in our Primary Care Service, for which we provide a survey to all nurses.	Feet examination (use of 5.07 monofilament)	The majority of participating nurses (79%) are familiar with 5.07 monofilament; they have this monofilament available for use (62%) and more than half said they use it (55%). The main reasons for not using this monofilament are its unavailability and lack of knowledge about it.
Dias et al., 2017 <sup>(28)</sup>	Brazil	Experience report	To describe the experience of daily home visits to change dressings in the amputation of four toes resulting from diabetic foot complications, indicating successes and limitations.	Health education, wound care and home visit	Daily home visits (Monday-Friday) contributed to reducing the traumatic wound using 5% papiain for two months, in addition to establishing a bond and emphasizing health education information.
Couto et al., 2014 <sup>(29)</sup>	Brazil	Experience report	Report the experience of carrying out educational activities on diabetic foot care in a UBS in a municipality in Bahia.	Health education	Among the results of the activities are the improvement in the quality of guidance on foot care offered by nursing technicians during dressings and the adherence of users to treatment after being made aware of the importance of monitoring at the health unit.
Cubas et al., 2013 <sup>(30)</sup>	Brazil	Cross-sectional quantitative study 5 nurses	Verify the knowledge of diabetes program users about preventive care for diabetic foot, identify the guidance patients receive on prevention and observe their adherence to preventive self-care procedures.	Health education	The guidance provided by nurses varies; all claim to provide guidance on wearing shoes and cutting nails; however, adherence to these items is not verified; Furthermore, there is a lack of guidelines such as daily foot examination.

**Chart 3.** Nursing care and description of nursing activities carried out in Primary Health Care (PHC) in people with diabetic foot.

Nursing care	Description of nursing activities carried out in PHC for people with diabetic foot
Foot examination	- Inspect the feet <sup>(11,13-22)</sup> - Assess vital signs <sup>(29)</sup> - Use monofilament in the clinical examination of the feet <sup>(11,30)</sup> - Use a ballpoint pen, cotton wool and a glass of water in the clinical examination of the feet <sup>(16)</sup> - Evaluate hair and nails <sup>(20)</sup>
Health Education	- Educate about foot care <sup>(11,13,14,17-20,28-30)</sup> - Educate about wearing appropriate footwear and cutting nails <sup>(19,20)</sup>
Wound care	- Perform dressings <sup>(11,13,21,18,28)</sup>
Glycemic control	- Assess the level of glycated hemoglobin <sup>(15,18,29)</sup>
Home visit	- Perform assessment and treatment of diabetic feet <sup>(28)</sup>
Referral to specialized service	- Refer to a podiatrist <sup>(15)</sup> - Forward to a nutritionist <sup>(21)</sup>

dy this problem in PHC, professional training is needed on the importance of performing a physical examination of the feet and implementing a robust line of care.<sup>(23)</sup>

Health education was another care considered essential.<sup>(11,13,14,17-20,28-30)</sup> When dealing with diabetic foot, lack of information or low understanding about problems, complications and consequences results in a deficit in self-care. Therefore, constant health education actions with users must be planned and implemented to prevent injuries and their complications.<sup>(31)</sup> Clear and objective guidance for people with diabetic foot is the responsibility of nurses and their healthcare teams through the promotion of education in health. This way, it will be possible to encourage self-care and self-management to prevent risks and develop healthy habits, safety and better acceptance of the disease, also impacting quality of life.<sup>(32)</sup>

A randomized clinical trial carried out in Minas Gerais, Brazil, showed the positive effect of health education on the self-care of the feet of people with diabetes.<sup>(33)</sup> Health education was carried out by an operational group that showed the potential to improve self-care for the feet. feet of people with type 2 DM and contributed to reducing the risk of complications in their feet, since health education is characterized as a space of subjectivities and objectivities where listening and sharing of experiences are developed. If health education is presented in a structured, organized and continuous way, it plays an important role in preventing diabetes-related foot ulcers.<sup>(1)</sup> The goal is to improve knowledge about foot self-care and confidence in carrying out practices of self-protection for people with diabetes,

increasing motivation, well-being, new paths and skills to promote adherence to this behavior.<sup>(1,34)</sup>

Furthermore, health education groups enable information to circulate between technical and popular experiences for joint problem solving and the production of knowledge and changing attitudes, effectively preventing diabetic foot.<sup>(33)</sup>

After the injuries took hold, nurses stood out as responsible for wound care.<sup>(11,13,21,18,28)</sup> Their role is to define strategies to prevent, evaluate and treat, aiming to reduce tissue repair time. , minimize complications and improve users' quality of life. It is part of the nurses' activities to evaluate, prescribe, perform dressings on all types of injuries and prepare a care plan, in addition to coordinating and supervising their team in the prevention and execution of care for people with injuries in the territory.<sup>(35,36)</sup>

However, a study carried out to identify the level of technical-scientific knowledge of PHC nurses in Minas Gerais regarding the treatment of chronic wounds showed that professionals evaluated their knowledge about wounds as insufficient.<sup>(37)</sup> We understand that greater discussion and scientific advancement to include nurses as active participants in the care of these injuries. They have the necessary attributes to develop actions to strengthen autonomy and self-care, ensuring real changes in the prevention and management of skin injuries.<sup>(38)</sup> We suggest continued education for professionals in addition to establishing action parameters through protocols.

According to the studies reviewed, glycemic control has been identified as an indispensable assessment tool in nursing consultations.<sup>(15,18,29)</sup>

The etiology of foot injuries in people with DM is multifactorial and includes uncontrolled blood glucose.<sup>(39)</sup>

One of the strategies to evaluate the effectiveness of DM treatment is the periodic laboratory evaluation of glycosylated hemoglobin. It is considered a basic reference in glycemic control, making it possible to evaluate glycemic control and verify the effectiveness of drug treatment and self-care education.<sup>(40)</sup> A case-control study with people with DM carried out in France showed that the group of intervention with nurses showed better glycemic control and adherence to therapy when compared to the group attended only by doctors.<sup>(41)</sup>

It is necessary to improve the attention of health teams, increasing sensitivity to incorporate glycemic control practices. The effective action of multidisciplinary health teams can promote health, improve quality of life and reduce healthcare costs by reducing hospitalizations and procedures related to diabetes complications.<sup>(42)</sup>

Home visits were identified as a necessary resource for the care of people with diabetic foot.<sup>(28)</sup> It is considered a fundamental pillar of PHC. Its proposal aims to bring professionals closer to the family context and the factors that influence the health-disease process. By carrying out home visits as a care strategy, professionals can promote the health of individuals and families.<sup>(43)</sup>

The role of nurses in home visits is highlighted in the literature. They are identified as the higher education professionals with the highest home visit rates in the PHC context. They play a fundamental role in home care, both by coordinating the care plan at home and by establishing links with users, family members and caregivers. Their work in homes involves relational and educational actions, including technical care.<sup>(44)</sup>

It was observed that nurses refer users with diabetic foot to specialized services when necessary.<sup>(15,21)</sup> The management of people with DM must be comprehensive, offering a complete cycle of care at different points of care in the health network.<sup>(12)</sup> Therefore, primary care is responsible for organizing flows and lines of care, guiding users on their journey to different health services when necessary,

promoting adequate coordination between them, also preventing excessive interventions in the care provided.<sup>(11)</sup> This need is reinforced when most of the follow-up outside the FHS is made up of users with diabetic foot classified as macrovascular complications, those “noticeable” due to the visibility and pain of the wounds.<sup>(45)</sup>

Regarding the limitations of the study, as the characteristics of the reviews are restricted to a few languages, it is possible that some studies were not included. However, we believe that studies that might be ignored would not significantly alter the content of the results. As a publication time limit was not defined, old files were also included. Despite these limitations, this review has the potential to encourage and support investigations, as it shows that new research is necessary to increase the level of scientific evidence and the basis for nurses’ clinical practice. It is noted that research with a robust methodological design is needed (such as randomized clinical trials and systematic reviews with meta-analysis), which evaluate the effectiveness of nursing care implemented for people with diabetic foot in PHC.

The findings of the present study can help nurses to recognize the skills that must be implemented in nursing consultations. From this, a care plan can be developed to prevent, maintain and control the diabetic foot problem, ensuring individualized, quality care and reducing the levels of morbidity and mortality related to the problem and its complications.

The analysis of the studies showed that nursing care is necessary and crucial in the care of people with diabetic foot. We therefore hope that this study will help disseminate evidence on nursing care for people with diabetic foot in primary care, stimulating new research related to the topic, aiming to deepen and expand knowledge and scientific evidence.

## Conclusion

This scoping review mapped evidence on nursing care for people with diabetic foot in Primary Health Care (PHC). The review included quantita-



tive cross-sectional studies published in Brazil. Foot examination was the most frequent nursing care intervention identified. Nursing care for people with diabetic foot is complex and multidimensional, focusing on the prevention of this condition in the PHC setting.

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