







# Diabetic Foot Ulcer and Social Determinants of Health: A Scoping Review

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## ABSTRACT

**Objective:** To map the social determinants of health related to diabetic foot ulcers. **Method:** Scoping review, as established by the Joanna Briggs Institute, registered on the Open Science Framework platform. Data were gathered from fourteen databases without time or language restrictions. Selection criteria included studies that met the search strategy: adults of both genders, social determinants of health related to diabetic foot ulcers, as defined by the World Health Organization, in hospital, outpatient, and home care settings. The World Health Organization model of social determinants of health model was used. **Results:** A total of 1,371 studies were identified, of which 80 were included in the final sample. The primary determinants identified were structural factors such as culture and social values (3); gender (12); and intermediary factors, including biological factors (18) and behavioral factors (13); social capital and social cohesion (3) were also highlighted, with most studies published in English in 2021. **Conclusion:** Among the structural determinants, culture, social values, and gender were predominant, while biological factors were the leading intermediary determinants. Social capital shows an emerging area to identify the role of family, community, and health institutions in the care of diabetic foot ulcer.

**DESCRIPTORS:** Diabetic foot. Social determinants of health. Social capital. Review. Enterostomal therapy.


## Úlcera de pé diabético e determinantes sociais da saúde: revisão de escopo

## RESUMO

**Objetivo:** Mapear os determinantes sociais em saúde relacionados com a úlcera de pé diabético. **Método:** Revisão de escopo, conforme estabelecida pelo *Joanna Briggs Institute*, registrada na plataforma *Open Science Framework*. A busca de dados ocorreu em quatorze bases de dados, sem limitação de tempo ou idioma. Como critério de seleção, foram incluídos estudos que atenderam a estratégia de busca, sendo esta: adultos, de ambos os sexos, determinantes sociais em saúde relacionados com a úlcera de pé diabético, por terminologia padronizada da Organização Mundial de Saúde, em ambiente hospitalar, ambulatorial e domiciliar. Foi utilizado o modelo de determinantes sociais em saúde da OMS. **Resultados:** Foram identificados 1.371 estudos, dos quais 80 foram incluídos na amostra final. Os principais determinantes identificados: dentre os estruturais, cultura e valores sociais (3); gênero (12); dentre os intermediários, fatores biológicos (18) e fatores comportamentais (13); Capital Social e coesão social (3), em sua maioria publicado em 2021, idioma inglês.

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Section Editor: Manuela de Mendonça F. Coelho

Received: Mar. 20, 2024 | Accepted: Jul. 30, 2024

How to cite: Ferreira CRS, Tosin MHS, Pena FPS, Silva ALB, Barata KM, Oliveira BGRB. Diabetic Foot Ulcer and Social Determinants of Health: A Scoping Review. ESTIMA, Braz J Enterostomal Ther. 2024;22:e1552. [https://doi.org/10.30886/estima.v22.1552\\_IN](https://doi.org/10.30886/estima.v22.1552_IN)

**Conclusão:** Dentre os determinantes estruturais houve predomínio de cultura e valores sociais e gênero, e em determinante intermediário, os fatores biológicos. O Capital Social evidencia o cenário incipiente para identificar o papel da família, da comunidade e da instituição de saúde no cuidado da úlcera de pé diabético.

**DESCRITORES:** Pé diabético. Determinantes sociais da saúde. Capital Social. Revisão. Estomaterapia.

## Úlcera del pie diabético y determinantes sociales de la salud: una revisión de alcance

### RESUMEN

**Objetivo:** Mapear los determinantes sociales de la salud relacionados con las úlceras del pie diabético. **Método:** Revisión de alcance, conforme lo establecido por el Instituto Joanna Briggs, registrada en la plataforma *Open Science Framework*. La búsqueda de datos se realizó en catorce bases de datos, sin limitaciones de tiempo o idioma. Como criterio de selección, se incluyeron estudios que cumplieron con la estrategia de búsqueda, siendo: adultos, de ambos sexos, determinantes sociales de la salud relacionados con las úlceras del pie diabético, utilizando terminología estandarizada de la Organización Mundial de la Salud, en el ambiente hospitalario, ambulatorio y de atención domiciliaria. Se utilizó el modelo de determinantes sociales de la salud de la Organización Mundial de la Salud. **Resultados:** Se identificaron 1.371 estudios, de los cuales 80 fueron incluidos en la muestra final. Los principales determinantes identificados fueron: entre los estructurales, la cultura y los valores sociales (3); género (12); entre los intermediarios, factores biológicos (18) y factores comportamentales (13); Capital social y cohesión social (3), en su mayoría publicados en 2021, en idioma inglés. **Conclusión:** Entre los determinantes estructurales predominaron la cultura y los valores sociales y el género, y entre los determinantes intermedios, los factores biológicos. El Capital Social destaca un escenario incipiente para identificar el papel de la familia, la comunidad y la institución de salud en la atención de las úlceras del pie diabético.

**DESCRIPTORES:** Pie diabético. Determinantes sociales de la salud. Capital social. Revisión. Estomaterapia.

## INTRODUCTION

The Diabetic Foot Ulcer (DFU), one of the multifactorial complications of Diabetes Mellitus (DM), affects individuals on a biopsychosocial level, with significant financial costs for families, individuals, and health services. The global incidence of DFU ranges from 19% to 34%, with an annual rate of 2%, a 40% recurrence rate within one year, and 65% within three years<sup>(1,2)</sup>. Biological factors indicate a higher risk in cases of glycemic decompensation, Diabetic Peripheral Neuropathy (DPN) and its associated deformities, Peripheral Arterial Disease (PAD), previous ulceration or amputation, smoking, retinopathy, and nephropathy, particularly in those undergoing dialysis or post-transplant<sup>(1,3)</sup>. DFUs generally occur in people with diabetes who present with two or more risk factors, with DPN and PAD being the most frequent and playing a central role in the development of lesions<sup>(1)</sup>. These factors and their complications are gradually being linked to social and economic issues.

The Social Determinants of Health (SDH) are conditions in which people live and work and how they relate to the health-disease process. To explain these, the World Health Organization (WHO) proposed a framework divided into three structures: structural determinants, which include sociopolitical and economic factors; intermediary determinants, which include biological, behavioral, psychosocial, and healthcare system factors; and Social Capital (SC), a transversal determinant involving family, community, and institutional factors, to support the investigation of the impact of social structures on Health Inequities (HI)<sup>(4)</sup>.

As no review studies were identified on the involvement of SDH with DFU outcomes, and recognizing that addressing socioeconomic and political conditions is essential to expanding strategies to tackle HI—factors that exacerbate the risks for this condition, the primary issue of this study—a critical review of the literature conducted with American adults with

diabetes, using the WHO SDH model, highlights the need for more research on this topic and its complications. One example is DFU, which aims to meet the demand for interventions targeted at a population or community<sup>(5)</sup>.

## OBJECTIVES

The objective of this scoping review was to map the social determinants of health related to DFU.

## METHODS

This study is a Scoping Review (SR), which followed the stages established by the Joanna Briggs Institute (JBI). The initial protocol was registered on the Open Science Framework (OSF) platform, accessible via the link <https://osf.io/xn79h/>, where the mentioned protocol was published<sup>(6)</sup>.

To formulate the research question, the PCC (participants, concept, and context) strategy was used, where P = adults, of both sexes, with DFU; C = SDH, which were mapped using standardized WHO terminology; and C = hospital, outpatient, and home care settings, based on the guiding question: What are the SDH associated with individuals with DFU in hospital, outpatient, and home care settings? As selection criteria, studies that met the PCC strategy were included, while newspaper articles, blogs, and editorials were excluded.

Eligible sources included studies with quantitative, qualitative, mixed-methods approaches, systematic reviews, and expert opinions. Primary studies, guidelines, policies, published conference proceedings, book chapters, unpublished theses and dissertations, and “grey literature,” as well as reference lists from selected studies, were also considered for further investigation.

The databases used via the Virtual Health Library (VHL) Portal included the Latin American and Caribbean Health Sciences Literature (LILACS), Nursing Databases (BDENF), the National Collection of Information Sources of the Unified Health System – SUS (ColecionaSUS), PubMed (MEDLINE), EMBASE, Scopus, Web of Science, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). Unpublished studies and grey literature were searched through the Science.gov portal and the collaborative, multilingual database Epistemonikos. Through the Capes Portal: Academic Search Premier, Academic Source, Open Dissertations, and SocINDEX with full text/ODI (EBSCO), in addition to the Scientific Electronic Library Online (SciELO) journal portal. After study selection, the reference lists were also analyzed. There were no time or language limitations due to the theoretical framework linked to SDH.

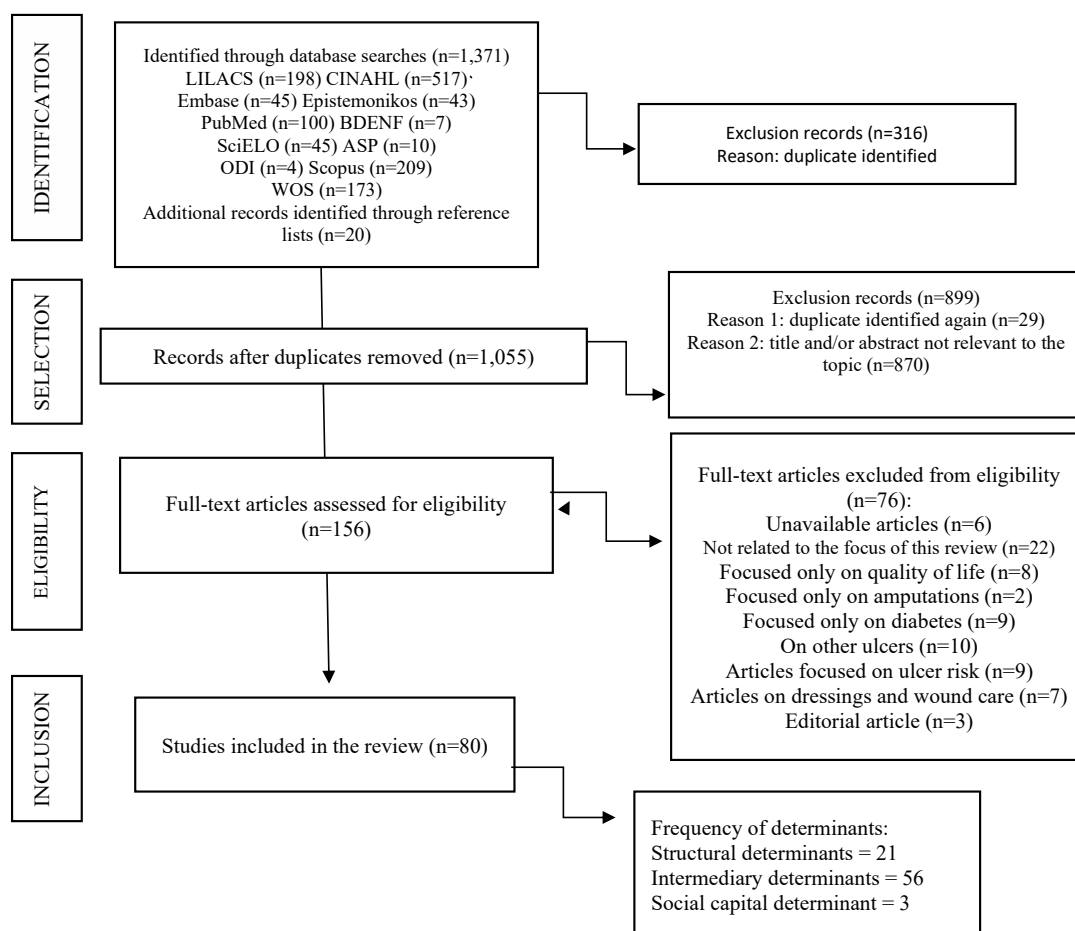
Data selection occurred in three phases. Phase 1 consisted of the initial search, limited to March 26, 2022, in the databases MEDLINE (PubMed), EMBASE (Elsevier), and LILACS (VHL Portal) to confirm the terms. In phase 2, the words found in the titles and abstracts of relevant articles and the index terms used to describe the articles were employed to develop the search strategy in Portuguese, English, and Spanish: “Leg Ulcer” OR “Foot Ulcer” OR “Plantar Ulcer” OR “Diabetic Foot” OR “Diabetic Foot Ulcer” AND (“social determinants of health” OR “health determinant” OR “Social Indicators” OR “Socioeconomic Factors” OR “Socioeconomic Aspects” OR “inequality” OR “inequalities” OR “inequity” OR “inequities” OR “Standard of Living” OR “Living Standard” OR “Standards of Living” OR “Gini Coefficient” OR “Gini Index” OR “Development Indicators” OR “HDI” OR “Human Development Index” OR “Environmental Monitoring” OR “Pollution Control” OR “Environmental Control” OR “Pollution Prevention” OR “Pollution Reduction” OR “Social Conditions” OR “Social Condition” OR “Living Conditions” OR “Sexual Factors” OR “Employment” OR “Labor Occupation” OR “Active Population” OR “Labor Status” OR “Occupational Status” OR “Employment Status” OR “underemployment” OR “subemployment” OR “Social Environment” OR “Political Environment” OR “Social Environment” OR “Social Environments” OR “Working Conditions” OR “Social Class” OR “Socioeconomic Environment” OR “Socioeconomic Conditions” OR “Social Stratification” OR “Social Stratum” OR “Socioeconomic Structure” OR “Socioeconomic Level” OR “Socioeconomic Position” OR “Socioeconomic Situation” OR “Nutritional Status” OR “Nutrition Status” OR “Cultural Factors” OR “Social Vulnerability” OR “High Social Risk”). Phase 3: Search strategy, including all identified keywords and indexing terms, adapting each source of information included, with the final search conducted on January 5, 2023.

For data extraction, the selection was exported to the Endnote reference manager for duplicate removal and subsequently to the Rayyan application from the Qatar Computing Research Institute (QCRI) for the selection of eligible studies. Titles and abstracts were reviewed by two independent reviewers, who evaluated them according to the inclusion criteria. Any discrepancies between the reviewers at each stage of the selection process were discussed with a third reviewer and, if still unresolved, with a fourth reviewer. The reasons for exclusions were reported. The extracted data were transferred to tables in Microsoft Excel, where qualitative data were mapped, and the determinants identified in the conclusions were quantified by number and frequency, as described in the studies.

The eligible studies were organized into a table and mapped by country distribution, created using the Marpchart program. The studies were classified according to the conceptual framework of SDH by the WHO, Solar, and Irwin<sup>4</sup>, which includes: structural determinants related to the socioeconomic and political context (governance, macroeconomic policy, social and public policy, cultures, and epidemiological conditions); structural determinants related to socioeconomic position (social class, gender, race/ethnicity, education, and income); intermediary determinants (material circumstances, working conditions, behavioral and biological factors, psychosocial or socio-environmental factors, and the healthcare system); and the transversal determinant of SC and cohesion<sup>(4,6)</sup>.

## RESULTS

The initial selection resulted in 1,351 studies, with an additional 20 articles identified through reference list reviews, reaching a total of 1,371 potentially eligible studies. After the selection and eligibility phases, 80 studies were included, as shown in the Prisma Scr (Figure 1).



Source: Authors.

**Figure 1.** Eligible studies in a Scoping Review on health determinants and diabetic foot ulcers according to the Prisma Scr flowchart.

Most of the studies were published in 2021, with an increasing number of publications over the years (Figure 2). The languages of publication were English (76), Portuguese (3), and Spanish (1), with a predominance of quantitative studies (67), followed by qualitative studies (13).

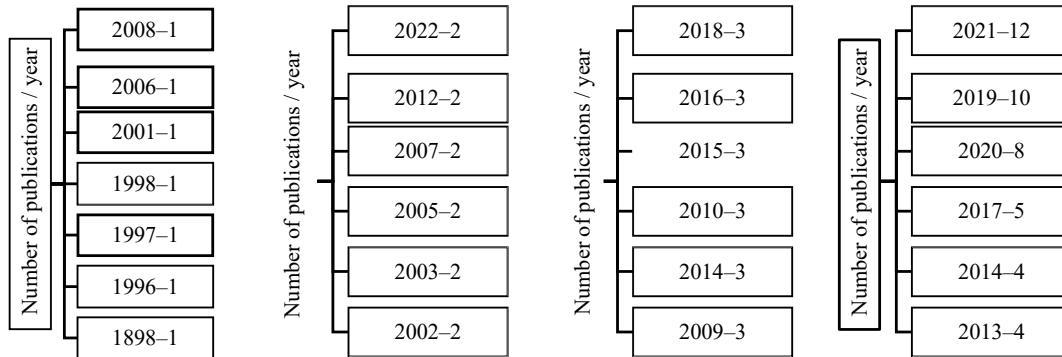


Figure 2. Distribution of articles in ascending order by the number of publications in a scoping review on determinants and diabetic foot ulcers.

The distribution of studies by country (Figure 3) shows a predominance of publications from North America, with the United States leading (20), followed by Australia (9), the United Kingdom (5), Canada (4), Brazil (4), Indonesia (4), Germany (3), China (2), Denmark (2), France (2), India (2), England (2), Sweden (2), Thailand (2), Tanzania (2), Turkey (2), Saudi Arabia (1), Bangladesh (1), South Korea (1), the Czech Republic (1), Spain (1), Greece (1), Israel (1), Kenya (1), Nigeria (1), Nicaragua (1), Portugal (1), Sri Lanka (1), and Uganda (1).

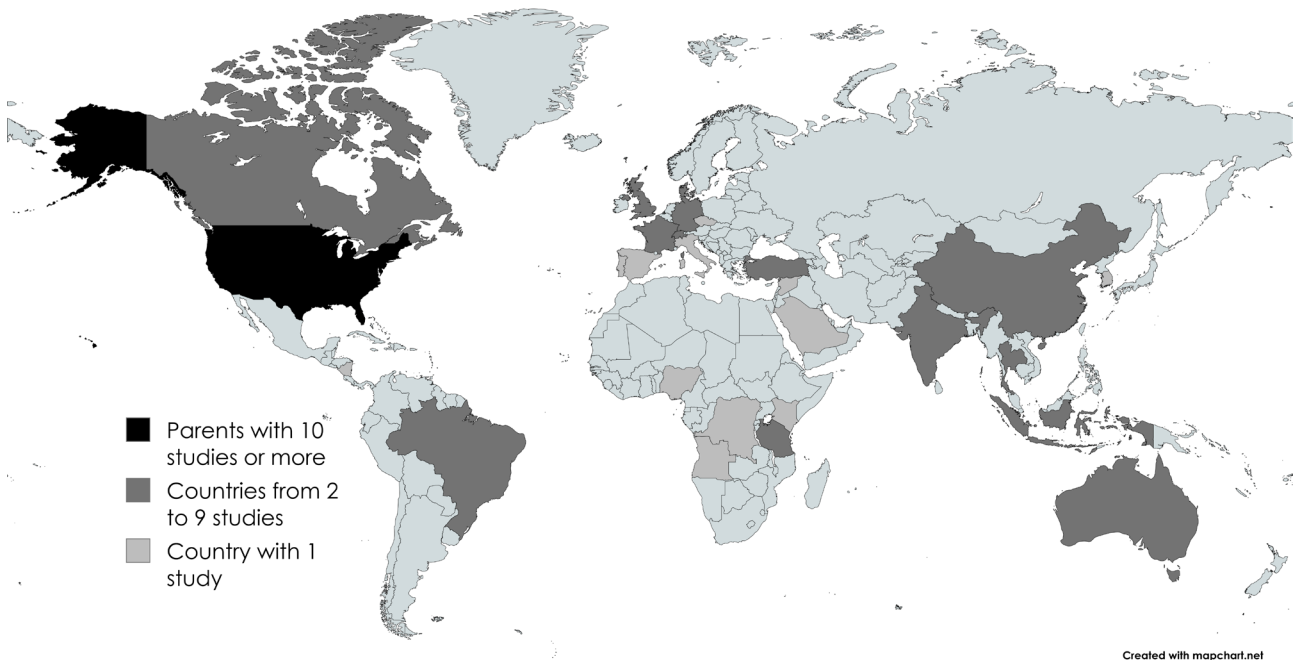


Figure 3. Map of article distribution by country of publication.

The synthesis of the mapped studies was organized according to the determinant addressed by each study’s focus (Table 1) (7-87). The most discussed structural determinant in the socioeconomic and political context was related to cultures and social values (3), while gender was the most discussed in terms of socioeconomic position (13). Regarding intermediary determinants, biological and behavioral factors were the focus of the greatest number of studies. SC was present in three of the selected studies.

**Table 1.** Studies included by social determinants in diabetic foot ulcer, Brazil, 2023.

<b>Social Determinants of Health</b>		
<b>Structural - socioeconomic/political context</b>		
Determinants	n – studies	Authors
Governance	0	-
Macroeconomic policies	2	(7,8)
Social policies	0	-
Public policies	1	(9)
Culture and social values	3	(10-12)
Epidemiological conditions	0	-
<b>Structural – socioeconomic position</b>		
Social class	1	(13)
Gender	12	(14-24)
Race/ethnicity	1	(25)
Education	0	-
Income	1	(26)
<b>Intermediary</b>		
Material circumstances	8	(27-34)
Working conditions	1	(35)
Behavioral factors	13	(36-48)
Biological factors	18	(49-67)
Psychosocial factors	6	(68-72)
Health system	10	(73-83)
<b>Transversal – capital</b>		
Social capital and social cohesion	3	(84-86)

Source: Authors.

## DISCUSSION

With the aim of mapping the SDH in individuals with DFU, and considering the impact these factors have on the health conditions of such individuals, it was found that, according to the WHO's interpretation, SDH prioritize the sociopolitical context and socioeconomic position as structural determinants and causal factors of HI<sup>(5)</sup>. This review revealed a scarcity of scientific production, with few studies addressing the political and economic issues associated with DFU.

Among the structural socioeconomic/political context determinants, most studies focused on culture and social values, particularly in investigating risk factors or treatment methods for DFU, considering the empirical aspects of specific cultures. In the context of structural determinants, social values related to health are seen as varying in importance depending on nationality and are often overlooked by health policies<sup>(4)</sup>. For example, in Thailand, walking barefoot during cultural practices is identified as a cause of DFU<sup>(12)</sup>, while the use of medicinal plants for wound treatment in Brazil and Africa has been identified as an ancient practice passed down through generations<sup>(10,11)</sup>.

Since ancient times, medicinal plants and herbal extracts have been used in the wound healing process due to their attributed therapeutic properties. This has, over time, influenced different self-care behaviors related to the body<sup>(10)</sup>. In underdeveloped countries, this practice is associated with economic factors, as empirical practices often precede professional care. In contrast, in developed countries, Western society tends to seek popular care first, which can delay or worsen the clinical diagnosis of DFU<sup>(11)</sup>.

In Brazil, this cultural care practice has been historically influenced by Indigenous, enslaved, and immigrant populations during the colonial era. Due to the country's diverse flora and its use by traditional populations, knowledge of therapeutic

applications is sometimes the only available resource for health care, including wound treatment, particularly in rural areas where economic conditions and distance from urban centers make access to professional care difficult<sup>88</sup>. This practice of popular care, determined by familial and community interactions, is a cultural characteristic that should not be ignored in professional monitoring<sup>(11)</sup>.

However, the diversity of potential uses of medicinal plants in DFU requires further studies on their effects and toxicity to ensure safe use, whether in their natural form or in phytotherapy<sup>(10)</sup>. The unaccompanied use of medicinal plants in the treatment of DM can result in inadequate control and, consequently, the development of DFU.

The culture and values associated with the occurrence of DFU as a chronic condition influence other social determinants, such as gender. In the review in question, gender predominated in socioeconomic position, where its role as a cultural factor relates to beliefs about health and illness in DFU. Historically, different lifestyles have been observed between genders, influencing how chronic conditions are managed. Traditionally, women have been involved in caregiving activities, whether at home or in professions such as nursing and primary school teaching, while men have engaged in activities like hunting or professions such as law<sup>(19)</sup>.

In a comparative context, most of the mapped studies show a predominance of DFU in males, with the difference between gender and the development of lesions being a common focus of research. Male gender is identified as a risk factor for DFU. In a cohort study conducted in Saudi Arabia with 62,681 people with DM, foot complications were prevalent in 4% of the sample due to DFU, with the majority being men. This prevalence was also observed in a study with 890 people with DM, 11% of whom had DFU, conducted in Australia<sup>(20)</sup>. In Brazil, an investigation into the severity of diabetic foot in the city of Salvador over a 10-year period also indicated a predominance of males<sup>(24)</sup>.

The case studies from these investigations highlight common characteristics between males and DFU, suggesting that age is a progressive risk factor across all age groups, and a diagnosis at a younger age may indicate a worse prognosis. Additionally, these studies analyze the affected anatomical regions of the foot, where limited joint mobility and the presence of pressure points, as well as DPN resulting from inadequate glycemic control, are prevalent. Furthermore, lifestyle and behavior, characterized by lower engagement in self-care and physical activity, and higher exposure to activities with trauma risks, are described as historical and evolutionary factors<sup>(15,19,21,24)</sup> contributing to the occurrence of DFU.

Based on the findings described above, it was observed that, in a comparative context, no reliable database was found among the studies included in this review to link gender differences with the presence or absence of DFU. However, one study identified the presence of a DPN diagnosis as the main factor influencing which gender is more affected<sup>89</sup>. This finding could significantly contribute to DFU prevention policies and care for individuals with DM, potentially leading to a care plan based on SDH, where gender is considered when defining a care model to be offered within the health network.

This SR does not aim to analyze gender disparities in depth. However, it is important to note that most studies on gender and DFU were cross-sectional, with representative samples, providing an international overview of various realities. Given the findings, it is important to highlight the need for studies using different methods and other levels of evidence to address the identified gap on this topic.

The impact of these structural determinants as root causes of HI and social stratification highlights how they affect individual health issues. However, the WHO points out that sociopolitical and economic determinants receive little attention from health researchers, despite their hierarchical influence<sup>(4)</sup>. Factors such as education, income, and occupation, identified as structural SDH of DM5, were not deeply explored in the studies included in this review.

Regarding intermediary determinants, biological factors predominated, followed by behavioral factors. The care of individuals with DFU as a chronic condition still involves curative demands, with a focus centered on the wound. Studies on DFU have historically focused on its clinical management, and only in the last two decades has there been a focus on investigating biological and behavioral risk factors<sup>(19)</sup>. This is evident from the growing number of publications identified in this SR that focus on these factors.

Among the main biological factors, DPN and its physical alterations were identified as significant causes of DFU and delayed healing. An explanatory study, using logistic regression, compared a sample of 2,770 individuals with DFU and 1,993 without DFU and identified loss of sensation and reduced ankle joint mobility as predictive factors for ulceration<sup>58</sup>,

which are indicative of DPN. Another comparative study, conducted in the UK using a 12-year primary care database with more than 15,000 people with DM, of whom 1,122 had DFU, also identified the absence of monofilament sensitivity as a causal factor<sup>(53)</sup>. For both studies, as well as in studies conducted in China<sup>(55)</sup> and the United States<sup>(64)</sup>, consistently elevated hemoglobin A1c levels were identified as the biological cause of DPN.

Age and sex also emerged as biological factors. Increasing age and male sex, in their genotypic characteristics (not considering behavioral factors), were identified as determinants that influence the occurrence of changes in normal blood flow and predisposition to PAD<sup>(49,53,54,56)</sup>. Studies with larger samples focusing on circulatory changes related to these factors are needed and encouraged.

Additionally, regarding biological factors, nutrition has gained attention in recent publications, with studies from 2020<sup>(2)</sup> and 2021<sup>(1)</sup>. It was found that nutritional status is one of the most neglected factors in wound healing<sup>50</sup>. Most studies investigated nutrient absorption or deficiencies. In this context, when related to SDH, food insecurity, access, and food quality are fundamental social aspects in understanding inadequate glycemic control, resulting from high-calorie and low-nutrient diets. The studies highlighted a deficit in macronutrient intake, particularly protein, and micronutrient deficiencies, such as vitamins C, D, A, and zinc, which are crucial for DFU healing<sup>(52,60)</sup>.

However, the identified relationship is still not well-defined<sup>(52,60)</sup>. A review study, when evaluating the association between nutrients, nutritional status, and the presence or healing of DFU, as well as the studies on this topic in this review, describes that the correlation between poor nutritional status and the presence or delay in healing does not establish a causal relationship. Therefore, there is a need for, and a suggestion to conduct, new studies that propose better methods of supplementation and their relationship to DFU, as well as studies with methodologies that support the correlation associated with causal relationships.

Behavioral factors highlight the predominance of studies on the use of appropriate footwear as an important factor in preventing DFU and promoting positive healing or preventing ulcer recurrence, provided that the footwear offloads pressure correctly, in accordance with international diabetic foot guidelines<sup>1,67</sup>. Footwear type is described in studies as a self-care practice that is still neglected, as pointed out in the Foot Disease in Inpatients Study in Australia, where the sample (n=733) indicated that the use of protective footwear inside the home was not a frequent habit, even in the presence of DPN or amputations<sup>(44)</sup>.

Another multivariate analysis, resulting from the aforementioned study, examined the use of footwear in outdoor environments and found that inappropriate footwear, lacking foot protection, was associated with female sex, the presence of PAD, and amputations ( $p < 0.05$ )<sup>(45)</sup>. A common characteristic among studies on footwear was the association of social and economic structural factors, such as low income and education, with the consequent choice of inadequate footwear, walking barefoot, and greater exposure to foot trauma and injury due to the high cost of quality footwear technologies for appropriate footwear adaptation<sup>(67)</sup>.

Studies mapped in this review described sleep patterns as a behavioral factor that can either facilitate or hinder healing, highlighting the multifactorial complexity involved in DFU. The five studies unanimously used the Pittsburgh Sleep Quality Index (PSQI) to evaluate sleep quality and classified individuals with DFU as poor sleepers with worse sleep quality. Three studies were conducted in Brazil, one in Turkey, and one in Indonesia<sup>(38,40,46-48)</sup>.

The main causes suggested as being associated with poor sleep quality included age, gender, income, marital status, occupation, physical activity<sup>(38,40)</sup>, painful physical symptoms, poor glycemic control, and nocturia<sup>46</sup>, as well as stress levels, medication, and diet<sup>(47)</sup>. Scientific attention to this relationship has only emerged in the last ten years, and studies are still too limited to determine a causal relationship. However, the importance of future studies is noted, as poor sleep quality can lead to oxidative stress, delaying healing<sup>(40)</sup>.

The interrelationship and predominance of intermediary biological and behavioral determinants were observed in the mapped studies and corroborate the findings of a study investigating social determinants and vulnerability in DFU. In that study, 20 conditions were identified, most of which were related to individual biological aspects, and it was emphasized that diabetic foot is routinely associated with this approach. However, it was cautioned that these and other factors should not be analyzed separately, as doing so risks disconnected interventions from social realities<sup>(51)</sup>.



The healthcare system, an intermediary determinant present in ten studies, can be protective when it expands and facilitates access; otherwise, it has a direct impact on the increase in DFU cases. A review on DFU management in primary care highlights that the primary assistance provided is health education through lectures on foot self-care, with infrequent evaluation of these limbs. It reaffirms the essential role of nursing in risk assessment and classification, as well as the involvement of the entire healthcare team in foot health management, according to their professional responsibilities <sup>(90)</sup>.

In this context, the importance of nursing in global health is recognized, as well as its relevance to achieving health goals. Moreover, the study by Mendes et al. <sup>(91)</sup> highlights the agreement among participants that social and environmental determinants should be included in nursing curricula due to the strong connections between social determinants and people's physical and mental health. Strengthening the curriculum could help meet global health objectives and achieve the Sustainable Development Goals (SDGs).

SC aims to characterize the interaction of trust and support among individuals, communities, and institutions. Although SC was minimally addressed in this SR, studies that investigated any form of support, whether from family, institutions, or government, for DFU were eligible. In Greece, the presence of good social support in 50% (n=140) of people with DFU in a diabetes clinic indicated that better self-care behaviors and health status were observed when social support was perceived from significant others, family, and friends<sup>85</sup>. In Turkey, a cohort study showed faster healing, with a reduction of up to 50% in the affected area when family social support was present <sup>(86)</sup>.

In Australia, social support and assistance have been shown to impact the psychosocial health of individuals with DFU. Through categories identified in a qualitative study, it was observed that individuals tended to internalize their thoughts instead of sharing them with their support network. Additionally, the need for assistance with transportation to medical appointments may limit social capacity, and there was little recognition of daily institutional support <sup>(87)</sup>. However, no studies in this review directly linked SC with DFU, and a similar gap was found in another scoping review focused on social support and DFU, a gap that needs to be addressed <sup>(92)</sup>.

It is reiterated that people with DM may experience reduced SC and isolate themselves by not sharing their experiences or disease-related needs, which can worsen their health condition and increase the risk of developing ulcers. Furthermore, this review highlights the ongoing discussion about SC as a direct cause of HI. Given its cross-cutting nature, there is a need for studies that address behavior in DFU <sup>(4)</sup>.

As for limitations, it should be noted that this scoping review was limited to a general discussion of the mapped studies. Only studies available electronically in full were analyzed, which may have restricted access to other relevant data. Additionally, no assessment tools were applied to evaluate the quality of the studies. Nonetheless, this review provides a broad overview of the scientific framework, encouraging further investigation and more in-depth analysis of the SDH affecting the health of people with DFU.

## CONCLUSION

This review mapped eighty studies that demonstrated the relationship between SDH and DFU. Among the structural determinants, there was a predominance of studies investigating culture and social values (3) and gender (12) in DFU. However, there is a scarcity of research in the political and economic context, highlighting the challenge of recognizing the role of political action in social stratification and access to resources in health research. Among the intermediary determinants, biological factors (18), particularly neuropathy and PAD, were identified as predictive determinants of ulceration. Behavioral factors also emerged, focusing on footwear, nutrition, and sleep quality as important determinants associated with DFU. SC (3) remains in an early stage of study, with challenges in identifying the role of family, community, and healthcare institutions in providing the necessary social support for DFU care.

Thus, it is suggested that more studies focus on structural determinants related to the political and economic context, aiming to gather evidence on the needs required for better care of people with DM to prevent DFU and, when it occurs, to avoid negative outcomes like amputation. Likewise, it was noted that there is less research related to SC in meeting the

needs of people with DFU, highlighting the need for more studies and publications addressing this topic in association with the determinants.

The mapping also prompted reflection on the importance of careful evaluation during nursing consultations to assess the relationship between SDH and DFU. Therefore, studies that map SDH and integrate them into nursing care are recommended.

**Acknowledgments:** Not applicable.

**Author contributions:** CRSF: project administration, writing – original draft, investigation, methodology. MHST: formal analysis, writing – review and editing, methodology. FPSP: writing – review and editing, methodology, validation. ALBS: writing – review and editing, methodology. KMB: writing – review and editing, methodology. BGRBO: project administration, writing – original draft, investigation, methodology.

**Data availability:** All data were generated or analyzed in the present study.

**Funding:** Not applicable.

**Conflict of interest:** None declared.

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