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(REVIEW ARTICLE)

Diabetic Foot Ulcer Management and Amputation Outcomes in Nigeria: A Scoping Review of Current Evidence

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Abstract

Background: Nigeria carries the highest burden of diabetes mellitus in sub-Saharan Africa, and diabetic foot ulcer (DFU) is among its most disabling and life-threatening complications. Although primary studies on DFU have accumulated across Nigerian centers, the literature on management practices and amputation outcomes remains fragmented and has not been comprehensively mapped.

Objective: To systematically map the current evidence on the clinical presentation, management practices, amputation rates, and mortality outcomes of DFU in Nigeria and identify gaps to guide future research and policy.

Methods: This scoping review was conducted following the Arksey and O'Malley framework as refined by Levac and colleagues, and reported in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR). Four databases (PubMed, Scopus, African Journals Online, and Google Scholar) were searched from January 2005 to October 2025. A total of 1,184 records were identified; after the removal of 287 duplicates, 897 records were screened by title and abstract, of which 786 were excluded. One hundred and eleven full-text articles were assessed for eligibility, and 31 studies met the inclusion criteria for the final synthesis.

Results: The included studies were predominantly cross-sectional and retrospective hospital-based designs conducted in tertiary centers, concentrated in the South-West and North-West geopolitical zones. Late presentation was near-universal, with most patients presenting with advanced (Wagner grade 3 or higher) and pre-existing infected ulcers. Reported lower-extremity amputation rates ranged widely, with pooled regional estimates of approximately 33%, and in-hospital mortality clustered between 14% and 21%. Peripheral arterial disease, osteomyelitis, prolonged ulcer duration before presentation, advanced ulcer grade, and bacteremia were the most consistent determinants of amputation and death. Care was delivered through multidisciplinary teams in only a minority of centers, and low footcare knowledge, financial constraints, and resorting to traditional or unorthodox treatment recurred as barriers.

Conclusion: DFU in Nigeria are characterized by late presentation, high amputation and mortality rates, and uneven access to multidisciplinary care. The evidence base is geographically skewed and methodologically heterogeneous, with a near absence of prospective, longitudinal, and health-economic data. Standardized reporting, structured foot care services, and community-level prevention are priorities for reducing the preventable burden of limb loss.

Keywords: Diabetic Foot Ulcer; Lower-Extremity Amputation; Nigeria; Scoping Review; Diabetes Complications; Multidisciplinary Care

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1. Introduction

Diabetes mellitus represents a significant non-communicable disease challenge in sub-Saharan Africa, with Nigeria, the continent's most populous nation, bearing the largest absolute burden of the disease in the region [1]. The increasing prevalence of diabetes is paralleled by a rise in its chronic complications, notably foot disease, which is among the most disabling complications. Diabetic foot ulcers (DFU) arise from the intersection of peripheral neuropathy, peripheral arterial disease, and minor unperceived trauma. Once established, DFU pose a considerable risk of infection, lower-extremity amputation, prolonged hospitalization, and mortality [2,3].

Globally, the lifetime risk of foot ulceration in individuals with diabetes is estimated to range from 19% to 34%, with a five-year mortality rate following ulceration comparable to that of several common cancers [2,3]. In high-income countries, the implementation and dissemination of structured multidisciplinary foot care services have been linked to significant reductions in major amputations, readmissions, and mortality [29,30]. However, the adaptation of these improvements to resource-limited settings has been inconsistent and incomplete [3].

In Nigeria, the clinical presentation of diabetic foot significantly differs from that observed in high-income countries. Patients often present with advanced ulceration stages, frequently after the ulcer has become infected, following initial self-medication or reliance on traditional and faith-based care [4,13]. Knowledge of foot care among individuals with diabetes is limited, structured foot care teams are present in only a minority of centers, and out-of-pocket expenses restrict access to timely surgical and vascular interventions [4,13,15]. Consequently, there is a pattern of high amputation and mortality rates that starkly contrasts with the outcomes in other regions [4,7].

Numerous single-center and multicenter studies have examined various aspects of the diabetic foot in Nigeria, including its prevalence, risk factors, microbial profile, treatment, and outcomes [4,8,9,10,16,17]. However, these studies are published in journals with differing levels of accessibility, utilize diverse case definitions and ulcer-grading systems, and present inconsistent outcomes. Although a recent systematic review and meta-analysis attempted to quantify the prevalence and amputation outcomes [7], a comprehensive mapping of management practices, care pathways, barriers to care, and the structure of the evidence remains lacking.

A scoping review is the appropriate methodology when the objective is to map a heterogeneous and multidimensional body of evidence, clarify the definitions and measurements of concepts, and identify gaps rather than synthesizing a single effect estimate [34,35]. Therefore, the objectives of this scoping review were to (i) describe the characteristics and clinical presentation of patients with diabetic foot ulcers (DFU) as reported in the Nigerian literature; (ii) map the management practices and care structures described; (iii) summarize reported amputation and mortality outcomes and their determinants; (iv) identify the barriers to optimal care; and (v) characterize the gaps and limitations of the existing evidence base to inform future research and health policy.

2. Materials and Methods

2.1. Study design and protocol

This study was conducted using a scoping review methodology based on the framework established by Arksey and O'Malley, which was later refined by Levac et al. This framework encompasses five stages: formulating the research question, identifying relevant studies, selecting studies, charting data, and collating, summarizing, and reporting the findings [34,35]. The reporting adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) [33]. As this review utilized only previously published data, ethical approval was not necessary.

2.2. Research question and eligibility criteria

The primary research question addressed was: What is the existing evidence regarding the clinical presentation, management, and outcomes related to the amputation and mortality of diabetic foot ulcers in Nigeria? The eligibility criteria were structured using the population – concept – context framework, as recommended for scoping reviews [33].

- Population: Adults (aged ⩾ 18 years) with diabetes mellitus and a diagnosed diabetic foot ulcer.
- Concept: Clinical characteristics, management practices, care structures, and outcomes, including ulcer healing, lower-extremity amputation, length of hospitalization, and mortality, together with their determinants.

- Context: Any healthcare setting in Nigeria.

The inclusion criteria for the studies comprised primary research designs, such as cross-sectional, case – control, cohort, or interventional studies, as well as reviews that reported data specific to Nigeria. These studies were required to be published in English and within the period from January 2005 to October 2025. The exclusion criteria encompassed studies conducted outside Nigeria or those that did not provide disaggregated Nigerian data, studies not centered on diabetic foot disease, those lacking relevant outcomes, and publications in the form of conference abstracts, editorials, commentaries, or case reports involving fewer than five patients.

2.3. Information sources and search strategy

Four electronic databases were searched: PubMed, Scopus, African Journals Online (AJOL), and Google Scholar for relevant studies. The search combined terms for the population and concept using Boolean operators in the general form: (“diabetes” OR “diabetic”) AND (“foot” OR “lower extremity” OR “limb” OR “leg”) AND (“ulcer” OR “wound” OR “infection” OR “gangrene” OR “amputation”) AND (“Nigeria” OR the names of Nigerian states and geopolitical zones). The reference lists of all the included articles and relevant reviews were hand-searched to identify additional eligible studies. The last search was conducted on March 2026.

2.4. Study selection

All retrieved records were exported to a reference manager, and duplicates were removed. Two reviewers independently screened the titles and abstracts based on the eligibility criteria. Subsequently, the full texts of potentially eligible records were retrieved and independently assessed for eligibility. Disagreements were resolved through discussion and, if necessary, adjudication by a third reviewer. The selection process and number of records at each stage are detailed in the PRISMA-ScR flow diagram (Figure 1).

The search yielded a total of 1,184 records (PubMed, n = 312; Scopus, n = 268; AJOL, n = 196; Google Scholar, n = 384; hand-searching of reference lists, n = 24). After removing 287 duplicate records, 897 records were screened based on their titles and abstracts. Of these, 786 records were excluded as being irrelevant. A total of 111 full-text articles were sought and assessed for eligibility, of which 80 were excluded for the following reasons: data not disaggregated for Nigeria or conducted outside Nigeria (n = 31), no relevant DFU outcome reported (n = 21), incorrect publication type, such as abstract, commentary, or small case report (n = 16), and full text unavailable or duplicate cohort (n = 12). Ultimately, 31 studies met the inclusion criteria and were included in the synthesis.

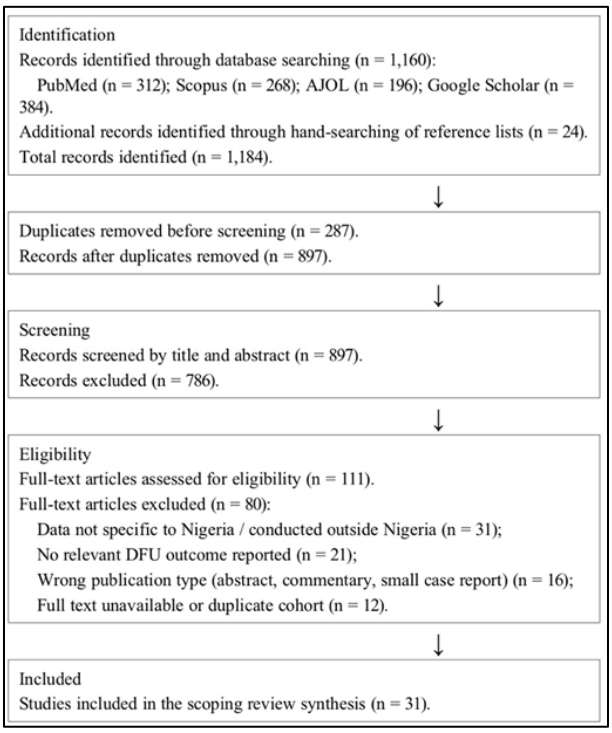

Figure 1 PRISMA-ScR Flow Diagram

2.5. Data charting and synthesis

A standardized data-charting form was created in a spreadsheet and initially tested on five studies before comprehensive data extraction. The charted items included the first author and year, geopolitical zone and study site, study design, sample size, participant characteristics (age, sex, diabetes type, and duration), ulcer characteristics and grading system employed, management approach and care structure, amputation rate and level, mortality, length of stay, reported determinants of adverse outcomes, and reported barriers to care. Owing to the descriptive objective and heterogeneity of the study designs and outcome definitions, the data were synthesized narratively and summarized using descriptive statistics, frequency counts, and tabulation. In alignment with the scoping review methodology, no statistical pooling or meta-analysis was conducted. A formal risk of bias assessment was not undertaken, as the evaluation of methodological quality is not a requisite component of a scoping review.

3. Results and Discussion

3.1. Characteristics of Included Studies

The 31 studies included in this analysis were primarily observational in nature. Most were cross-sectional hospital-based surveys and retrospective record reviews, with fewer studies employing prospective observational and case–control designs. The most substantial body of prospective data originated from the Multicentre Evaluation of Diabetic Foot Ulcer in Nigeria (MEDFUN), a one-year observational study involving 336 patients hospitalized for diabetic foot ulcers (DFU) across six tertiary institutions located in the six geopolitical zones [4–6]. The studies were predominantly conducted in tertiary teaching and federal hospitals, with the South-West and North-West zones being the most represented, while the North-East and parts of the South-South were relatively under-represented [8–12]. Sample sizes varied, ranging from fewer than 100 to several hundred patients. A summary of the distribution of study characteristics is provided in Table 1.

Table 1 Summary of the characteristics of included studies (n = 31)

Characteristic	Category	Number of studies
Study design	Cross-sectional	13
	Retrospective review	9
	Prospective observational	6
	Case–control	3
Geopolitical zone	South-West	11
	North-West	6
	South-East	4
	North-Central	4
	South-South	3
	North-East / multizone	3
Care setting	Tertiary / teaching hospital	24
	Secondary / general hospital	5
	Multicentre	2

3.2. Clinical presentation and patient characteristics

Across the included studies, patients with diabetic foot ulcers (DFU) were predominantly middle-aged to elderly, with mean ages ranging from the mid-fifties to early sixties, and the vast majority had type 2 diabetes [4,8,10]. The mean duration of diabetes at presentation was typically around ten years, and glycemic control was frequently suboptimal [8,10]. The prevalence estimates reported in the Nigerian series align broadly with the pooled estimates for diabetic foot disease across sub-Saharan Africa [19]. A consistent and clinically significant finding was the delayed presentation: the median duration of ulceration before hospital presentation in the multicenter data was approximately 39 days, with

most patients presenting with advanced ulcers [4]. In the MEDFUN cohort, 79.2% of patients had ulcers at Wagner grade 3 or higher, and 76.8% were infected at the time of admission [4]. Recurrent risk factors identified in cross-sectional studies include peripheral neuropathy, peripheral arterial disease, longer diabetes duration, previous ulceration, foot deformity, visual impairment, and poor glycemic control [8,9,10,12,14].

3.3. Management Practices and Care Structures

The literature describes management as combining glycemic control, wound debridement and dressing, empirical and culture-directed antibiotic therapy, surgical intervention including amputation, and, in a minority of centers, structured multidisciplinary foot care [4,26,27,28,31]. Given that the predominant isolates from Nigerian and broader African diabetic foot ulcers are Staphylococcus aureus and gram-negative organisms with high rates of multidrug resistance, empirical antibiotic choices often do not align with local susceptibility patterns [16,17,18]. Multicenter evidence has demonstrated that multidisciplinary care can be delivered in Nigerian tertiary settings [4], yet most single-center reports have described care without a dedicated foot-care team, and a survey of orthotic practice found that most practitioners worked in centers lacking a diabetic foot management team [15]. In contrast, evidence from high-income settings consistently demonstrates that the establishment of multidisciplinary diabetic foot clinics is linked to decreases in major amputations, readmissions, and mortality [29,30]. The underdevelopment of structured, team-based footcare pathways in Nigeria is both a recurring observation in the literature and a plausible contributor to the poor outcomes reported [15,32].

3.4. Amputation and Mortality Outcomes

Amputation and mortality were the most consistently reported outcomes, although the denominators and definitions varied significantly. High rates of lower-extremity amputations have been reported. In a multicenter cohort, 35.4% of hospitalized patients underwent amputation [4,5]. Additionally, a regional synthesis estimated a pooled amputation prevalence of approximately 33%, with below-knee amputation being the most common [7]. In-hospital mortality was similarly high, clustering between approximately 14% and 21% across studies, with a multicenter case-fatality rate of approximately 20% [4,6,7]. A notable additional finding was the proportion of patients who left against medical advice, reported at approximately 10% to 12%, reflecting financial and sociocultural pressures that shape outcomes [4,7]. The selected outcomes from key Nigerian studies are summarized in Table 2.

Table 2 Reported amputation and mortality outcomes from selected Nigerian studies

Study (design)	Sample size	Amputation rate	Mortality	Setting
MEDFUN multicentre cohort (prospective)	336	35.4%	20.5%	Six tertiary centres
MEDFUN amputation analysis (prospective)	336	35.4%	—	Six tertiary centres
MEDFUN mortality analysis (prospective)	323	—	21.4%	Six tertiary centres
Regional meta-analysis (pooled, 18 studies)	2,616	33.3%	17.8%	Multiple zones
Tertiary-centre series (retrospective)	<200	Variable	14–21%	Single tertiary centre

3.5. Determinants of adverse outcomes

The most consistently reported determinants of amputation and mortality include prolonged ulcer duration prior to presentation, peripheral arterial disease, advanced ulcer grade (Wagner grade $\geqslant 4$), osteomyelitis, and wound infection [5,7]. Multivariable analyses of multicenter data identified ulcer duration exceeding one month, peripheral arterial disease, and osteomyelitis as independent predictors of amputation, whereas bacteremia and renal impairment were independent predictors of mortality [5,6]. These determinants largely align with the international literature on risk factors for amputations in diabetic foot disease [20,21,22,23,24,25]. However, several factors, particularly late presentation and advanced infection at initial contact, are influenced by health-system and care-seeking factors that are especially significant in the Nigerian context [4,13].

3.6. Barriers to optimal care

Numerous barriers identified in the literature impede effective foot care among individuals with diabetes. Notably, only approximately 25% of patients in a multicenter cohort possessed prior knowledge of foot care, although education in this area has been shown to enhance health-seeking behavior and outcomes [4,13]. The issue of late presentation is exacerbated by patients initially resorting to self-medication, traditional healers, and faith-based care before seeking

hospital treatment [4,13]. Financial limitations and the necessity for out-of-pocket payments further contribute to delayed presentation, treatment abandonment, and discharge against medical advice [4,7]. At the health system level, the lack of dedicated multidisciplinary foot care teams, restricted orthotic and offloading services, and inconsistent diagnostic capabilities further hinder care provision [15]. These barriers are interrelated and elucidate why amputation and mortality rates remain elevated despite the proven feasibility of multidisciplinary care in certain centers [4,29,30].

3.7. Gaps in the evidence base

Three significant gaps were identified in the literature. First, the evidence is predominantly concentrated in the South-West and North-West zones and within tertiary centers, resulting in an underrepresentation of primary, secondary, and community settings, as well as several other zones [8 – 12]. Second, the literature is primarily composed of cross-sectional and retrospective studies; there is a paucity of prospective longitudinal data on healing trajectories, recurrence, amputation-free survival, and post-amputation outcomes. Additionally, there is an almost complete lack of health economic evaluations, despite the data suggesting catastrophic out-of-pocket expenses [7,30]. Third, the variability in ulcer grading systems, case definitions, and outcome reporting hinders comparability across studies and prevents meaningful quantitative synthesis in this review [7,16,17]. To address these gaps, it is necessary to implement standardized reporting frameworks, conduct prospective multicenter cohort studies with sufficient follow-up, and incorporate cost data into outcome studies.

3.8. Strengths and limitations of this review

This review systematically mapped the Nigerian DFU literature over two decades across four databases, following a pre-registered protocol and adhering to the PRISMA-ScR guidelines [33]. This study has several limitations must be considered. The focus on English-language publications and the selection of only four databases may have excluded the grey literature and locally indexed reports. In alignment with the scoping review methodology, a formal risk-of-bias assessment was not conducted; thus, the findings reflect the literature's content without evaluating its quality [34,35]. Additionally, owing to the heterogeneity of the underlying studies, the summary figures should be interpreted as indicative ranges rather than precise estimates.

4. Conclusion

Current evidence suggests that diabetic foot ulcers in Nigeria are characterized by late presentation, with advanced and infected ulcers, leading to high rates of lower-extremity amputation, affecting approximately one-third of hospitalized patients, and in-hospital mortality rates ranging from 14% to 21% [4,7]. The most consistently reported determinants of adverse outcomes include peripheral arterial disease, osteomyelitis, advanced ulcer grade, prolonged ulcer duration and bacteremia. These factors are exacerbated by limited foot care knowledge, financial constraints, reliance on unorthodox care, and the scarcity of multidisciplinary foot care services [5,6,13,15]. The feasibility of implementing multidisciplinary care in Nigerian tertiary settings, as demonstrated in multicenter studies, along with the established international benefits of such care, clearly indicates the interventions that are most likely to reduce preventable limb loss [4,29,30]. Priorities for mitigating the substantial and largely preventable burden of diabetic foot disease in Nigeria include strengthening structured foot care services, expanding patient and community foot care education, enhancing early referral pathways, and generating prospective, standardized, and health-economic evidence

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that they have no financial or non-financial conflicts of interest relevant to this work.

Statement of ethical approval

This study is a scoping review of previously published literature and did not involve human participants, human data, or animals directly. Ethical approval and informed consent were therefore not required.

Authors' Contributions

O.G.A. conceived and designed the review, developed the search strategy, performed study selection and data charting, and drafted the manuscript. A.B.A. contributed to study selection, data charting, and interpretation. M.E.O. contributed to data charting, tabulation, and critical revision. D.T.I. contributed to screening, interpretation, and critical revision. All authors read and approved the final manuscript.

References

[1] International Diabetes Federation. IDF Diabetes Atlas. 11th ed. Brussels: International Diabetes Federation; 2025.

[2] Armstrong DG, Tan TW, Boulton AJM, Bus SA. Diabetic foot ulcers: a review. JAMA. 2023;330(1):62–75. doi:10.1001/jama.2023.10578.

[3] McDermott K, Fang M, Boulton AJM, Selvin E, Hicks CW. Etiology, epidemiology, and disparities in the burden of diabetic foot ulcers. Diabetes Care. 2023;46(1):209–221. doi:10.2337/dci22-0043.

[4] Ugwu E, Adeleye O, Gezawa I, Okpe I, Enamino M, Ezeani I. Burden of diabetic foot ulcer in Nigeria: current evidence from the multicenter evaluation of diabetic foot ulcer in Nigeria. World J Diabetes. 2019;10(3):200–211. doi:10.4239/wjd.v10.i3.200.

[5] Ugwu E, Adeleye O, Gezawa I, Okpe I, Enamino M, Ezeani I. Predictors of lower extremity amputation in patients with diabetic foot ulcer: findings from MEDFUN, a multi-center observational study. J Foot Ankle Res. 2019;12:34. doi:10.1186/s13047-019-0345-y.

[6] Adeleye OO, Ugwu ET, Gezawa ID, Okpe I, Ezeani I, Enamino M. Predictors of intra-hospital mortality in patients with diabetic foot ulcers in Nigeria: data from the MEDFUN study. BMC Endocr Disord. 2020;20(1):134. doi:10.1186/s12902-020-00614-4.

[7] Olamoyegun MA, Alare K, Afolabi SA, et al. Epidemiology and outcome of diabetic foot ulcers in Nigeria: a systematic review and meta-analysis of 2 decades: 2005–2024. J Epidemiol Glob Health. 2026;16:7. doi:10.1007/s44197-025-00509-4.

[8] Aliyu R, Gezawa ID, Uloko AE, Ramalan MA. Prevalence and risk factors of diabetes foot ulcers in Kano, northwestern Nigeria. Clin Diabetes Endocrinol. 2023;9(1):6. doi:10.1186/s40842-023-00155-4.

[9] Olopade OB, Odeniyi IA, Olusanya AW, Sowemimo OE, Akinsola CM, Fasanmade OA. Determinants of diabetic foot ulcer among persons with diabetes mellitus attending an outpatient clinic in a Nigerian tertiary hospital: a cross-sectional study. J Clin Sci. 2025;22(4):203–209. doi:10.4103/jcls.jcls_88_25.

[10] Salawu AI, Ajani GO, Soje MO, Ojo OD, Olabinri EO, Obajolowo OO, et al. Diabetes mellitus foot ulcer and associated factors among type 2 diabetes patients in a tertiary institution in southwest Nigeria. Ann Afr Med. 2022;21(4):339–347. doi:10.4103/aam.aam_57_21.

[11] Idowu AE, Amole IO, Durodola AO, Adesina SA, Idowu OA, Adegoke AO, et al. Foot-at-risk among adult outpatients with diabetes mellitus in Bowen University Teaching Hospital, Ogbomoso, Nigeria. Pan Afr Med J. 2023;46:106. doi:10.11604/pamj.2023.46.106.39397.

[12] Odusan O, Familoni OB, Raimi TH. Diabetic foot ulcer: risk factors among patients of a secondary healthcare facility in south west Nigeria. Ghana Med J. 2018;52(4):200–205.

[13] Okpe I, Ugwu E, Adeleye O, Gezawa I, Enamino M, Ezeani I. Foot care education, health-seeking behaviour and disease outcome in patients with diabetic foot ulcer: results from the Multi-Centre Evaluation of Diabetic Foot Ulcer in Nigeria study. Int J Foot Ankle. 2019;3:038. doi:10.23937/2643-3885/1710038.

[14] Agboghoroma OF, Akemokwe FM, Puepet FH. Peripheral arterial disease and its correlates in patients with type 2 diabetes mellitus in a teaching hospital in northern Nigeria: a cross-sectional study. BMC Cardiovasc Disord. 2020;20(1):102. doi:10.1186/s12872-020-01395-3.

[15] Onwukamuche CK, Eze JC. Level of knowledge and practice of orthotics in the diabetic foot management in Nigeria. Eng Technol J. 2023;8(6):2389–2397.

[16] Makeri D, Odoki M, Eilu E, Agwu E. Update on prevalence and antimicrobial resistance of Staphylococcus aureus and Pseudomonas aeruginosa isolated from diabetic foot ulcers in Africa: a systematic review and meta-analysis. Bull Natl Res Cent. 2023;47(1):145. doi:10.1186/s42269-023-01119-5.

[17] Wada FW, Mekonnen MF, Sawiso DD, et al. Bacterial profile and antimicrobial resistance patterns of infected diabetic foot ulcers in sub-Saharan Africa: a systematic review and meta-analysis. Sci Rep. 2023;13:14655. doi:10.1038/s41598-023-41882-z.

[18] Nwosu PC, Egwuatu EC, Wright AKA, Ebiala FI, Yaro GO, Sone PE, et al. Diabetic foot ulcers in Africa: a systematic review of microbial profiles and clinical outcomes in the context of multidrug resistance. Epidemiol Health Data Insights. 2025;1(6):ehdi022. doi:10.63946/ehdi/17471.

[19] Haile KE, Asgedom YS, Azeze GA, Amsalu AA, Gebrekidan AY, Kassie GA. Diabetic foot: a systematic review and meta-analysis on its prevalence and associated factors among patients with diabetes mellitus in sub-Saharan Africa. Diabetes Res Clin Pract. 2025;220:111975. doi:10.1016/j.diabres.2024.111975.

[20] Lin C, Liu J, Sun H. Risk factors for lower extremity amputation in patients with diabetic foot ulcers: a meta-analysis. PLoS One. 2020;15(9):e0239236. doi:10.1371/journal.pone.0239236.

[21] Luo Y, et al. The incidence of lower extremity amputation and its associated risk factors in patients with diabetic foot ulcers: a meta-analysis. Int Wound J. 2024;21(2):e14391. doi:10.1111/iwj.14391.

[22] Rodrigues BT, Vangaveti VN, Malabu UH. Prevalence and risk factors of lower limb amputations in patients with diabetic foot ulcers: a systematic review and meta-analysis. Diabetes Metab Syndr. 2022;16(2):102397. doi:10.1016/j.dsx.2022.102397.

[23] Sen P, Demirdal T, Emir B. Meta-analysis of risk factors for amputation in diabetic foot infections. Diabetes Metab Res Rev. 2019;35(7):e3165. doi:10.1002/dmrr.3165.

[24] Lu Q, Wang J, Wei X, Wang G, Xu Y. Risk factors for major amputation in diabetic foot ulcer patients. Diabetes Metab Syndr Obes. 2021;14:2019–2027. doi:10.2147/DMSO.S307815.

[25] Gong H, Ren Y, Li Z, et al. Clinical characteristics and risk factors of lower extremity amputation in the diabetic inpatients with foot ulcers. Front Endocrinol. 2023;14:1144806. doi:10.3389/fendo.2023.1144806.

[26] Senneville E, Albalawi Z, van Asten SA, et al. IWGDF/IDSA guidelines on the diagnosis and treatment of diabetes-related foot infections (IWGDF/IDSA 2023). Diabetes Metab Res Rev. 2024;40(3):e3687. doi:10.1002/dmrr.3687.

[27] Chen P, Vilorio NC, Dhatariya K, et al. Guidelines on interventions to enhance healing of foot ulcers in people with diabetes (IWGDF 2023 update). Diabetes Metab Res Rev. 2024;40(3):e3644. doi:10.1002/dmrr.3644.

[28] Everett E, Mathioudakis N. Update on management of diabetic foot ulcers. Ann N Y Acad Sci. 2018;1411(1):153–165. doi:10.1111/nyas.13569.

[29] Buggy A, Moore Z. The impact of the multidisciplinary team in the management of individuals with diabetic foot ulcers: a systematic review. J Wound Care. 2017;26(6):324–339. doi:10.12968/jowc.2017.26.6.324.

[30] Joret MO, Osman K, Dean A, et al. Multidisciplinary clinics reduce treatment costs and improve patient outcomes in diabetic foot disease. J Vasc Surg. 2019;70(3):806–814. doi:10.1016/j.jvs.2018.11.032.

[31] Maity S, Leton N, Nayak N, et al. A systematic review of diabetic foot infections: pathogenesis, diagnosis, and management strategies. Front Clin Diabetes Healthc. 2024;5:1393309. doi:10.3389/fcdhc.2024.1393309.

[32] Hingorani A, LaMuraglia GM, Henke P, et al. The management of diabetic foot: a clinical practice guideline by the Society for Vascular Surgery in collaboration with the American Podiatric Medical Association and the Society for Vascular Medicine. J Vasc Surg. 2016;63(2 Suppl):3S–21S. doi:10.1016/j.jvs.2015.10.003.

[33] Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467–473. doi:10.7326/M18-0850.

[34] Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32. doi:10.1080/1364557032000119616.

[35] Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implement Sci. 2010; 5:69. doi:10.1186/1748-5908-5-69