Patient Education and Awareness of Sexual Dysfunction as a Cardiovascular Warning Sign in Diabetes: A Scoping Review of the Sub-Saharan African Evidence

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Abstract

Background: Sexual dysfunction, and erectile dysfunction in particular, is a common complication of diabetes and a recognised early marker of endothelial dysfunction and cardiovascular disease. In sub-Saharan Africa, where the diabetes burden is rising rapidly and cardiovascular awareness is low, the extent to which patients and clinicians recognise sexual dysfunction as a cardiovascular warning sign, and the role of patient education in that recognition, has not been systematically mapped.

Objective: To map the current evidence on patient education, awareness, and clinical communication regarding sexual dysfunction as a cardiovascular warning sign in people with diabetes in sub-Saharan Africa, and to identify gaps to guide future research, education, and policy.

Methods: This scoping review followed the Arksey and O'Malley framework as refined by Levac and colleagues, and was 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 1,042 records were identified; after removal of 268 duplicates, 774 records were screened by title and abstract, of which 681 were excluded. Ninety-three full-text articles were assessed for eligibility, and 25 studies met the inclusion criteria for the final synthesis.

Results: Included studies were predominantly cross-sectional surveys, with a smaller body of qualitative and intervention studies, concentrated in Ethiopia, Nigeria, and South Africa. Sexual dysfunction was highly prevalent and consistently under-disclosed and under-screened. Across studies, most affected men did not know that sexual dysfunction was a complication of diabetes or a possible signal of vascular disease, and the great majority had never been screened or asked about sexual health during routine diabetes care. Patient embarrassment and stigma, provider discomfort and time pressure, lack of privacy, and recourse to traditional and herbal remedies recurred as barriers. The cardiovascular-warning-sign framing was almost entirely absent from patient education materials and from documented clinical encounters, and structured educational interventions addressing it were very few.

Conclusion: In sub-Saharan Africa, sexual dysfunction in diabetes is common but rarely discussed, and its value as a cardiovascular warning sign is largely unrecognised by patients and

under-used by clinicians. The evidence base is dominated by prevalence studies, with few educational or communication interventions and a near-absence of work explicitly linking sexual-health awareness to cardiovascular risk. Integrating sexual-health education into diabetes care, training providers in proactive and culturally sensitive communication, and testing awareness interventions are priorities for translating a missed clinical signal into earlier cardiovascular prevention.

Keywords: Sexual dysfunction; erectile dysfunction; diabetes mellitus; cardiovascular risk; patient education; sub-Saharan Africa; scoping review.

1. Introduction

Diabetes mellitus has emerged as a significant non-communicable disease challenge in sub-Saharan Africa, characterized by a rapidly increasing number of individuals affected by the condition, with a substantial proportion remaining undiagnosed or untreated [1,2]. As the regional burden intensifies, so does the prevalence of its chronic complications, notably cardiovascular complications, which have become the leading causes of mortality in the region [3,4]. In sub-Saharan Africa, cardiovascular diseases frequently present at an earlier age than in high-income countries. This phenomenon is compounded by limited public awareness of cardiovascular risk factors and insufficient screening [4,5].

Sexual dysfunction, particularly erectile dysfunction in men, is a prevalent and frequently neglected complication of diabetes [6,7]. Among African populations with diabetes, the pooled prevalence of erectile dysfunction is notably high, estimated at over 70% in one regional meta-analysis and approximately 63% in a global umbrella review focusing on the African subset [6,8,9]. Beyond its significant impact on quality of life, interpersonal relationships, and psychological well-being, erectile dysfunction is now recognized as an early clinical indicator of endothelial dysfunction and a precursor to cardiovascular disease, typically preceding symptomatic cardiovascular events by several years [10,11,12]. The smaller calibre of the penile arteries results in the manifestation of erectile symptoms before cardiac symptoms, thereby providing sexual dysfunction with genuine value as an early, cost-effective warning sign that should prompt cardiovascular risk assessment [11,12].

The realization of this value is contingent on recognition. Patients must acknowledge that sexual difficulties may have medical significance and warrant disclosure, while clinicians must perceive them as opportunities to assess cardiovascular risk rather than private matters to be avoided. Both forms of recognition are influenced by knowledge, communication and education. In sub-Saharan Africa, several factors render this recognition particularly fragile: sexual health is heavily stigmatized, many patients are unaware that sexual dysfunction is a complication of diabetes, healthcare providers receive minimal training in sexual history taking, consultations are brief and lack privacy, and many men initially seek assistance from traditional healers or use adulterated herbal remedies that pose additional cardiovascular risks [13,14,15,16].

An increasing volume of African research has documented the prevalence and risk factors

associated with sexual dysfunction in diabetes, while a separate body of literature has explored cardiovascular awareness and diabetes self-management in the region. However, the intersection of these areas—specifically, whether and how patients and clinicians in sub-Saharan Africa recognize sexual dysfunction as a cardiovascular warning sign, the extent of patient education on this issue, and the interventions that have been implemented—remains unexplored. A scoping review is the appropriate methodology for mapping a diverse, multidisciplinary, and emerging body of evidence that includes quantitative, qualitative, and interventional studies, with the aim of identifying gaps, rather than synthesizing a single effect estimate [17,18].

The objectives of this scoping review were as follows: (i) to describe existing knowledge regarding patient awareness and understanding of sexual dysfunction as a complication of diabetes and as a cardiovascular warning sign in sub-Saharan Africa; (ii) to map practices related to disclosure, screening, and clinical communication concerning sexual dysfunction in diabetes care; (iii) to characterize the barriers at the patient, provider, and system levels that hinder recognition and discussion; (iv) to identify educational or awareness interventions that have been attempted; and (v) to delineate the gaps in the evidence base to guide future research, education, and health policy.

2. Materials and Methods

2.1 Study design and protocol

This study employed a scoping review methodology based on the framework established by Arksey and O'Malley, which was later refined by Levac et al. The process involved five stages: formulating the research question, identifying pertinent studies, selecting studies, charting the data, and collating, summarizing, and reporting the findings [17,18]. This report adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) [19]. The review protocol was registered with the Open Science Framework prior to data collection. As this review used only previously published data, ethical approval was not required for this study.

2.2 Research question and eligibility criteria

The guiding question was, What is the current evidence on patient education, awareness, and clinical communication regarding sexual dysfunction as a cardiovascular warning sign in people

with diabetes in sub-Saharan Africa? Eligibility was framed using the population–concept–context structure recommended for scoping reviews.

Population: Adults with diabetes mellitus in sub-Saharan Africa, their partners, and healthcare providers who care for them.

Concept: Awareness, knowledge, education, disclosure, screening, and clinical communication related to sexual dysfunction, including its recognition as a marker of cardiovascular or vascular disease.

Context: Any healthcare or community setting in sub-Saharan Africa.

Studies were included if they were primary research (cross-sectional, cohort, case–control, qualitative, mixed-method, or interventional) or reviews reporting sub-Saharan African data, published in English between January 2005 and October 2025, and reported data relevant to awareness, knowledge, education, disclosure, screening, or communication around sexual dysfunction in diabetes. Studies were excluded if they were conducted outside sub-Saharan Africa or did not disaggregate regional data, addressed sexual dysfunction outside the context of diabetes, reported only laboratory or mechanistic outcomes with no awareness, education, or communication dimension, or were conference abstracts, editorials, or commentaries.

2.3 Information sources and search strategy

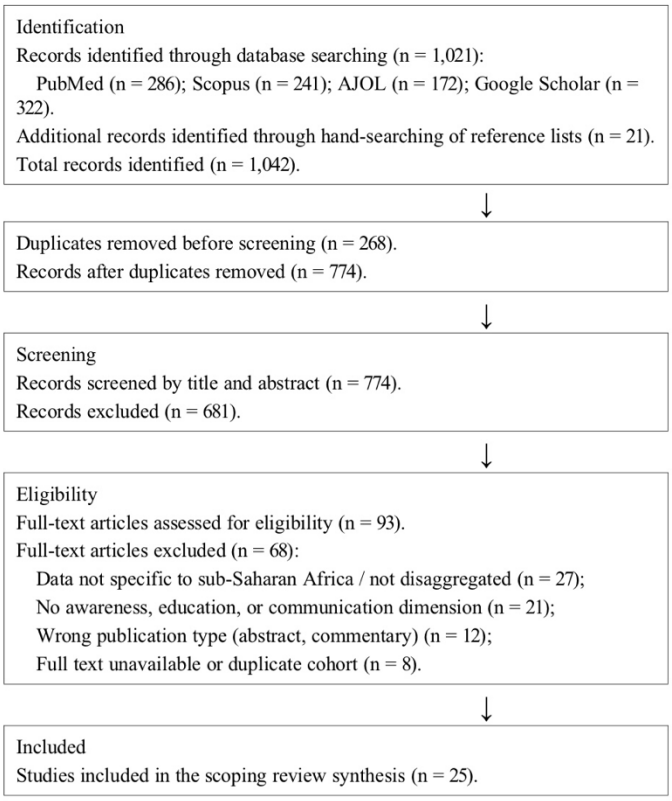
Four electronic databases were searched: PubMed, Scopus, African Journals Online (AJOL), and Google Scholar. The search combined terms for the population and the concept using Boolean operators, in the general form: (“diabetes” OR “diabetic”) AND (“sexual dysfunction” OR “erectile dysfunction” OR “sexual health”) AND (“awareness” OR “knowledge” OR “education” OR “screening” OR “communication” OR “disclosure” OR “cardiovascular”) AND (“Africa” OR the names of sub-Saharan African countries). The reference lists of all included articles and relevant reviews were hand-searched to identify additional eligible studies. The last search was run on 15 October 2025.

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 against the eligibility criteria, after which

the full texts of potentially eligible records were retrieved and assessed independently. Disagreements were resolved through discussion and, where necessary, adjudication by a third reviewer. The selection process and number of records at each stage are summarized in the PRISMA-ScR flow diagram (Figure 1).

Figure 1. PRISMA-ScR Flow Diagram



The search process initially identified 1,042 records, distributed as follows: PubMed (286), Scopus (241), AJOL (172), Google Scholar (322), and hand-searching of reference lists (21). After removing 268 duplicate records, 774 records were screened based on their titles and abstracts. Of these, 681 records were deemed irrelevant and excluded from the study. Subsequently, 93 full-text articles were retrieved and evaluated for their eligibility. Among these, 68 articles were excluded for the following reasons: data not specific to sub-Saharan Africa or not disaggregated (27); absence of awareness, education, or communication dimensions (21); inappropriate publication type, such as abstract or commentary (12); and unavailability of full text or duplicate cohorts (8).

Ultimately, 25 studies satisfied all the inclusion criteria and were incorporated into the synthesis.

2.5 Data charting and synthesis

A standardized data-charting form was developed in a spreadsheet and piloted on five studies before full extraction. The following items were charted: first author and year; country and setting; study design; sample size and population; the construct examined (awareness, knowledge, disclosure, screening, communication, or intervention); key findings relating to recognition of sexual dysfunction and its cardiovascular significance; reported barriers; and, where applicable, intervention type and outcome. Given the descriptive aim and heterogeneity of the designs, the data were synthesized narratively and summarized using descriptive statistics, frequency counts, and tabulation. No statistical pooling or meta-analysis was performed, consistent with the scoping review methodology. A formal risk of bias assessment was not performed, as appraisal of methodological quality is not a required component of a scoping review.

3. Results and Discussion

3.1 Characteristics of included studies

The 25 included studies had quantitative, qualitative, and interventional designs. The predominant category comprised cross-sectional surveys examining the prevalence, correlates, and awareness of sexual dysfunction in men with diabetes [20–25]. These were supplemented by qualitative studies exploring the lived experiences of sexual difficulties and clinical communication [13,26,27], as well as regional syntheses addressing the prevalence and risk factors [6,8,9]. Additionally, a smaller subset of studies focused on interventions or service-level analyses. [28]. Geographically, the evidence is concentrated in Ethiopia, Nigeria, and South Africa, with individual contributions from Ghana, Zimbabwe, and Malawi, and multi-country collaborations [1,13]. The sample sizes ranged from small qualitative samples to surveys with several hundred participants. The distribution of the study characteristics is summarized in Table 1.

Table 1. Summary of the characteristics of included studies (n = 25).

Characteristic	Category	Number of studies
Study design	Cross-sectional survey	13
	Qualitative	6
	Review / meta-analysis	4

Characteristic	Category	Number of studies
	Intervention / service-level	2
Country	Ethiopia	8
	Nigeria	6
	South Africa	6
	Ghana / Zimbabwe / Malawi	3
	Multi-country	2
Construct examined	Awareness / knowledge	10
	Disclosure / screening / communication	9
	Barriers / lived experience	6

3.2 Awareness and knowledge of sexual dysfunction as a complication and warning sign

In the studies reviewed, a consistent observation was the high prevalence of sexual dysfunction among individuals with diabetes, a condition that remains poorly understood by those affected by it. Regional analyses have indicated that the prevalence of erectile dysfunction among African men with diabetes ranges from approximately 63% to 71% [6,8,9]. In contrast, individual studies from sub-Saharan Africa reported prevalence rates ranging from approximately 70% to over 90% [20,21,22,23]. Despite these findings, awareness of sexual dysfunction as a complication of diabetes was notably low in this study. In a series conducted at a South African community health center, most affected men sought medical attention primarily for sexual difficulties, unaware of their association with diabetes [22]. Similarly, Ethiopian studies revealed that the vast majority of men had neither raised concerns about sexual problems nor been questioned about them, with one cohort reporting that nearly all participants had never been screened or treated [21,24]. Importantly, the recognition of sexual dysfunction as an indicator of vascular or cardiovascular disease was almost entirely absent from patient-oriented literature, despite the well-established global understanding of the vascular connection [10,11,12]. This gap is significant because cardiovascular awareness in the region is already low [5], resulting in missed opportunities to use

this early indicator for risk assessment.

3.3 Disclosure, screening, and clinical communication

The literature highlights widespread communication failures regarding sexual health in diabetes care. Patients often refrain from disclosing sexual difficulties, and clinicians seldom inquire about them. A South African study that video-recorded routine primary care consultations of patients primarily with diabetes and hypertension revealed that sexual histories were obtained in only a small fraction of encounters, leading to the frequent oversight of patients with sexual dysfunction [27]. Qualitative research conducted in South Africa and Malawi indicated that men experience significant distress in silence, lack information about the causes of their difficulties, and perceive minimal support from healthcare providers [13]. Regional primary care guidelines have recognized that sexual health is given low priority and that practitioners receive inadequate training in screening for and managing sexual dysfunction, despite the increased risk among patients with non-communicable diseases, such as diabetes [26]. Consequently, the clinical encounter, which should ideally transform a sexual symptom into a discussion of cardiovascular risk, often fails to achieve this conversion.

3.4 Barriers to recognition and discussion

Barriers exist at the patient, provider, and system levels, each reinforcing the other. At the patient level, factors such as embarrassment, stigma, fear of losing masculinity, and a sense of helplessness hinder disclosure of the disease. Additionally, limited knowledge leads many men to not recognize their symptoms as medically significant [13,20,22]. At the provider level, discomfort with sexual topics, inadequate training, paternalistic attitudes, and time constraints limit inquiry [26,27]. At the systemic level, the brevity of consultations, insufficient privacy, and lack of structured screening tools or sexual health pathways in diabetes clinics hinder discussions on this topic [26,27]. Furthermore, many men initially seek assistance outside the formal healthcare system, turning to traditional and faith-based healers or herbal remedies, some of which are adulterated with high-dose phosphodiesterase-5 inhibitors that present significant cardiovascular risks [15,16]. These barriers elucidate why a common and potentially informative symptom remains both under-disclosed and underutilized.

3.5 Educational and awareness interventions

In sub-Saharan Africa, there is a notable scarcity of interventions specifically targeting the recognition of sexual dysfunction as an indicator of cardiovascular risk. Existing studies on interventions and service levels suggest the potential efficacy of integrated chronic disease care models that combine health education with the simultaneous management of multiple conditions, thereby enhancing detection and patient engagement [28]. Strategies directed at healthcare providers, such as audits, feedback, and brief training sessions, have been effective in increasing the screening rates for sexual dysfunction in patients with diabetes in other regions, indicating a potentially applicable approach. However, these interventions have rarely been tested in this region. Furthermore, educational materials aimed at patients that present sexual dysfunction as a prompt for cardiovascular risk assessment are largely absent. The qualitative literature consistently advocates increased awareness among patients, their partners, and healthcare providers, as well as the integration of sexual health into standard diabetes care. However, these recommendations have rarely been implemented or assessed in the region [13,26].

3.6 Gaps in the evidence base

Three significant gaps were identified. First, the framing of sexual dysfunction as a cardiovascular warning sign is largely absent in African studies. These studies predominantly address sexual dysfunction as a quality-of-life or prevalence issue rather than recognizing it as a vascular indicator warranting cardiovascular risk assessment. Consequently, the explicit connection that imparts preventive value to the symptom is seldom communicated to patients or clinicians. Second, current research primarily concentrates on male erectile dysfunction, and prevalence surveys are conducted cross-sectionally. There is a lack of emphasis on female sexual dysfunction, partner viewpoints, longitudinal or interventional study designs, and the effectiveness of educational interventions. Third, the research is geographically concentrated in a limited number of countries, which restricts the applicability of the findings across diverse regions of Africa. To address these gaps, studies that explicitly assess the awareness of patients and healthcare providers regarding the cardiovascular implications of sexual dysfunction are necessary. Furthermore, it is necessary to develop culturally tailored educational interventions. Additionally, the impact of incorporating sexual health communication into diabetes care on enhancing cardiovascular risk detection should be assessed.

3.7 Strengths and limitations of this review

This study has several limitations must be acknowledged. The focus on English-language publications and the use of only four databases may have resulted in the omission of grey literature and locally indexed reports, which is particularly concerning for this region of the world. In line with the scoping review methodology, a formal risk-of-bias assessment was not conducted; thus, the findings reflect the content of the literature rather than evaluating its quality [17,18]. Additionally, due to the infrequent explicit framing of cardiovascular warning signs in primary studies, the synthesis necessarily integrates adjacent literature rather than presenting a fully developed body of work, which constitutes one of the central findings of the review.

4. Conclusion

In sub-Saharan Africa, sexual dysfunction frequently accompanies diabetes; however, it is seldom disclosed by patients, infrequently inquired about by clinicians, and rarely recognized as a cardiovascular warning sign, despite global evidence indicating its significance. Patient awareness of the association between diabetes and sexual dysfunction is limited, and screening and communication are minimal. Factors such as stigma, provider discomfort, brief and non-private consultations, and reliance on unconventional remedies perpetuate this silence among patients. The existing literature is predominantly composed of prevalence studies, with a scarcity of educational or communication interventions and a notable lack of research explicitly linking sexual health awareness to cardiovascular risk. Priorities for transforming this often-overlooked clinical indicator into a preventive opportunity include integrating sexual health education into routine diabetes care, training providers in proactive and culturally sensitive communication, developing patient materials that present sexual dysfunction as a prompt for cardiovascular assessment, and evaluating whether such awareness interventions enhance early cardiovascular detection.

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6. 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.

7. Conflict of Interest

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

8. Ethical Statements

This study is a scoping review of previously published literature and did not involve human participants, human data, or animals directly.

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