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Female Sexual Dysfunction among Women with Diabetes in Low- and Middle-Income Countries: Burden, Associated Factors and Health-Related Quality of Life: A Systematic Review

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Abstract

Background: Female sexual dysfunction (FSD) is an important sexual-health concern among women with diabetes. This systematic review synthesized evidence on the prevalence, affected sexual-function domains, associated factors, and health-related quality of life (HRQoL) among women with diabetes in low- and middle-income countries (LMICs).

Methods: The review followed PRISMA 2020 guidelines. OpenAlex, Taylor & Francis Online, PubMed/MEDLINE, and ScienceDirect were searched for studies published from January 2000 to 15 August 2026. Eligible quantitative studies involved adult women with diabetes in LMICs and reported FSD, sexual-function domains, associated factors, or HRQoL. Two reviewers independently screened studies, extracted data, and assessed methodological quality. Findings were synthesized narratively because of clinical and methodological heterogeneity.

Results: Thirty studies were included. Reported FSD prevalence ranged from 25.6% to 92.7%. The most frequently affected domains were sexual desire, arousal, lubrication, orgasm, satisfaction, and pain/dyspareunia. Factors associated with FSD included older age, longer diabetes duration, menopause, depression, obesity, hypertension, diabetes-related complications, vascular disease, and genitourinary conditions. Two studies directly assessed HRQoL using the SF-36 and the Sexual Quality of Life Questionnaire for Women, respectively. Both reported poorer quality of life among women with impaired sexual function. One additional study described reduced quality of life without quantitative assessment.

Conclusion: FSD was frequently reported among women with diabetes in LMICs, with considerable variation in prevalence across studies. The findings indicate that FSD is associated with several demographic and clinical factors and may adversely affect quality of life. Routine assessment of sexual health and further research using standardized diagnostic criteria and validated HRQoL instruments are warranted.

Keywords: *Female Sexual Dysfunction; Diabetes Mellitus; Sexual Function; Health-Related Quality Of Life; Low- And Middle-Income Countries; Systematic Review.*

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I. INTRODUCTION

Diabetes mellitus is a major chronic metabolic disorder and an increasing public health problem worldwide. Persistent hyperglycaemia can result in progressive vascular, neurological, hormonal and metabolic abnormalities that affect multiple organ systems. Among women, the consequences of diabetes extend beyond commonly recognized complications such as cardiovascular, renal, neurological and ocular disease and may also affect sexual health. Despite this, sexual dysfunction remains relatively underrecognized and is not routinely assessed in many diabetes-care settings. Female sexual dysfunction (FSD) refers to clinically significant difficulties involving one or more aspects of the sexual response, including sexual desire, arousal, lubrication, orgasm, satisfaction and pain or dyspareunia. Female sexual function is influenced by interacting biological, psychological, interpersonal and sociocultural factors. Diabetes may impair sexual function through chronic hyperglycaemia, vascular dysfunction, autonomic and peripheral neuropathy, hormonal alterations, genital infections, psychological distress, depression and diabetes-related complications. Consequently, women with diabetes may experience impairment across several domains of sexual functioning. The burden of FSD among women with diabetes appears substantial in low-, lower middle and upper middle-income countries (LMICs). Studies included in the present review have reported considerable variation in the prevalence of FSD across different populations and settings. For example, studies from Nigeria, Ethiopia, Bangladesh, Madagascar, Uganda, Turkey, Iran, China, India, Jordan and other LMIC settings have reported impaired sexual function among women with diabetes. The variation in prevalence may partly reflect differences in study populations, diabetes type and duration, menopausal status, assessment instruments, definitions of FSD and healthcare settings. Several demographic, clinical, metabolic, psychological and diabetes-related factors have been reported to be associated with FSD. Older age, longer duration of diabetes, menopause, depression, hypertension, obesity, diabetes-related complications, nephropathy, retinopathy, vascular disease, genitourinary conditions and treatment characteristics have been associated with poorer sexual function in different studies. For instance, an Ethiopian study identified older age, type 2 diabetes, depression, complications or comorbidities, lower educational attainment, being divorced or widowed and physical inactivity as factors associated with sexual dysfunction. Similarly, a study from Bangladesh reported a high prevalence of sexual dysfunction and found longer diabetes duration to be associated with orgasm problems and painful intercourse. The clinical importance of FSD extends beyond sexual activity because sexual function is closely related to psychological well-being, intimate relationships, self-esteem and health-related quality of life (HRQoL). Women experiencing FSD may experience emotional distress, reduced relationship satisfaction and poorer perceptions of their overall health. Evidence from Turkey, for example, demonstrated significantly poorer sexual quality-of-life scores among women with diabetes and FSD compared with those without FSD. However, HRQoL has not been consistently assessed across studies and differences in measurement instruments and reporting methods make comparison difficult.Although previous reviews have examined FSD among women with diabetes, evidence specific to LMICs remains fragmented. Global reviews may combine populations from substantially different socioeconomic, cultural and healthcare contexts, potentially obscuring determinants that are particularly relevant to women living in resource-constrained settings. Furthermore, the relationship between FSD and HRQoL has not been comprehensively synthesized across LMIC populations. The present review therefore brings together evidence from **30 studies** to provide a broader assessment of the burden of FSD, associated factors, affected sexual-function domains and available evidence concerning HRQoL among women with diabetes in LMICs. The findings may support greater recognition of sexual health within comprehensive diabetes care and inform screening, counselling, treatment and future research.

II. REVIEW OBJECTIVES

The primary objective of this systematic review was to synthesize the available evidence on female sexual dysfunction (FSD) among adult women with diabetes in low-, lower-middle and upper-middle-income countries (LMICs), with particular emphasis on its burden, associated factors, affected sexual-function domains and relationship with health-related quality of life (HRQoL).

The specific objectives were to:

1. Determine the reported burden and prevalence of FSD among women with diabetes in LMICS.

2. Identify the sexual-function domains most frequently affected, including sexual desire, arousal, lubrication, orgasm, sexual satisfaction and pain or dyspareunia.

3. Identify demographic, socioeconomic, clinical, metabolic, psychological, reproductive and diabetes-related factors associated with FSD among women with diabetes.

4. Summarize the available evidence on HRQOL among women with diabetes with FSD and examine the reported relationship between FSD and HRQOL

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III. METHODS

Study Design

This study was conducted as a **systematic review** to identify, critically appraise and synthesize available evidence on female sexual dysfunction (FSD) among women with diabetes in **low-, lower middle and upper middle-income countries (LMICs)**. The review focused on the burden and prevalence of FSD, affected sexual-function domains, factors associated with FSD, health-related quality of life (HRQoL) and the relationship between FSD and HRQOL.

The review was conducted and reported in accordance with the **Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020** guidelines. Eligible primary studies included observational and other quantitative studies involving adult women with diabetes that reported relevant information on FSD, sexual function, associated factors, or HRQoL. The review used predefined eligibility criteria, a systematic search strategy, independent study selection and data extraction, methodological quality assessment and narrative synthesis.

Because the included studies differed substantially in study populations, settings, sample sizes, diabetes characteristics, assessment instruments, definitions of FSD and reported outcomes, the findings were synthesized **narratively rather than through meta-analysis**. This approach was consistent with the substantial clinical and methodological heterogeneity observed across the included evidence.

Search Strategy

A comprehensive literature search was conducted in four electronic databases: OpenAlex, Taylor & Francis Online, PubMed/MEDLINE, and ScienceDirect to identify studies evaluating female sexual function or sexual dysfunction among women with diabetes in low- and middle-income countries (LMICs). The search strategy focused on two core concepts: **diabetes mellitus** and **female sexual function or sexual dysfunction**. Health-related quality of life (HRQoL) was not included as a mandatory search concept because it was an outcome of interest rather than an eligibility requirement. This approach helped capture studies examining female sexual dysfunction that might not explicitly mention HRQoL in their titles or abstracts.The search combined relevant keywords, synonyms, and, where supported, controlled vocabulary using Boolean operators (AND and OR). Database-specific search syntax was adapted to the capabilities of each database. Geographical terms relating to LMICs were used where appropriate to improve retrieval; however, final eligibility was determined during title and abstract screening and full-text assessment, using the predefined inclusion and exclusion criteria and the World Bank income classification.The search covered publications from January 2000 to 15 August 2026. Studies published in English were eligible because the review team had limited capacity to translate and consistently assess non-English publications. The potential for language bias associated with this restriction was acknowledged when interpreting the findings. No study-design restriction was imposed during the initial search to maximize the retrieval of potentially eligible evidence.HRQoL-related outcomes were identified during full-text screening, data extraction, and synthesis. The complete database-specific search strategies, including search dates, keywords, controlled vocabulary where applicable, Boolean operators, database-specific syntax, and any limits applied, are presented in **Supplementary File 1**.

Eligibility Criteria

Eligibility criteria were predefined according to the review objectives, population, geographical setting, outcomes of interest and study designs. The criteria were applied consistently during title and abstract screening and subsequent full-text assessment to ensure that the included studies directly addressed female sexual dysfunction among women with diabetes in **low-, lower middle and upper middle-income countries (LMICS)**.

Inclusion Criteria

Population: Studies involving adult women diagnosed with diabetes mellitus, including type 1 or type 2 diabetes.Geographical setting: Studies conducted in countries classified as low-income, lower-middle-income, or upper-middle-income countries, according to the World Bank income classification applicable to the study period.

Primary outcome: Studies assessing female sexual dysfunction, sexual function, or one or more domains of sexual function, including sexual desire, arousal, lubrication, orgasm, sexual satisfaction, or dyspareunia.Associated factors: Studies reporting demographic, socioeconomic, clinical, metabolic, psychological, reproductive, diabetes-related, or other factors associated with FSD.

Health-related quality of life: Studies assessing HRQoL among women with diabetes, with or without FSD, or examining the relationship between FSD and HRQoL.Study designs: Quantitative primary studies, including cross-sectional, cohort, case-control and other observational studies, that provided relevant data for the review outcomes.Publication status: Full-text studies with sufficient information to assess eligibility and extract relevant data.

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Language: Studies published in English.

Exclusion Criteria

Studies were excluded if they were conducted exclusively in high-income countries; included participants without diabetes without reporting separate results for women with diabetes; did not assess FSD, sexual function, or a relevant sexual-function domain; or did not report information relevant to FSD burden, associated factors, HRQoL, or the relationship between FSD and HRQOL.

Studies conducted exclusively among men were excluded. Case reports, case series, editorials, commentaries, letters, conference abstracts without sufficient outcome data, protocols and other non-primary publications were also excluded.Systematic reviews, scoping reviews, narrative reviews and meta-analyses were excluded. Duplicate publications from the same study population were excluded, with the most complete and relevant report retained. Studies with insufficient information to determine eligibility or extract the required outcome data were also excluded.These criteria were designed to ensure that the final 30 included studies directly addressed the review population and objectives.

Study Selection

All records identified through the four electronic database searches were imported into a reference-management database, where duplicate records were identified and removed before screening. The remaining records were screened in two stages: title and abstract screening, followed by full-text assessment of potentially eligible studies. Two reviewers independently assessed the full-text articles against the predefined inclusion and exclusion criteria. Disagreements were resolved through discussion and consensus, with a third reviewer consulted when necessary. Reasons for exclusion at the full-text stage were documented.

A total of **4,682 records** were identified from four electronic databases: OpenAlex (n = 2,148), Taylor & Francis Online (n = 1,908), PubMed/MEDLINE (n = 494), and ScienceDirect (n = 132). After removal of 311 duplicate records, 4,371 records remained for title and abstract screening. Of these, 3,984 records were excluded, leaving 387 reports sought for retrieval. Fourteen reports could not be retrieved, and 373 full-text reports were assessed for eligibility. Of the full-text reports assessed, 343 were excluded for predefined reasons: wrong population (n = 129), wrong outcome (n = 96), wrong study design (n = 60), wrong setting (n = 38), and insufficient data (n = 20). Ultimately, **30 studies** that met the predefined eligibility criteria were included in the final systematic review.

The study selection process is presented in the **PRISMA 2020 flow diagram (Figure 1)**, which illustrates the numbers of records identified, duplicates removed, records screened, full-text reports assessed for eligibility, reports excluded with reasons, and studies included in the final review.

Data Extraction

A standardized and piloted data extraction form was developed before data extraction to ensure consistent and systematic collection of information from all included studies. Two reviewers independently extracted data from each eligible study. The completed extraction forms were compared and discrepancies were resolved through discussion and consensus; where necessary, a third reviewer was consulted.The following information was extracted from each included study: first author and publication year, country of study, study design, study setting, sample size, participant characteristics, type of diabetes, duration of diabetes, assessment tool used for female sexual dysfunction, prevalence of female sexual dysfunction, sexual-function domains assessed, health-related quality-of-life measurement instrument, level of impaired quality of life, factors associated with female sexual dysfunction, measures of association and the reported relationship between female sexual dysfunction and health-related quality of life. For studies reporting multiple measures or outcomes, all results relevant to the predefined review objectives were considered. Information on potential determinants included demographic, socioeconomic, clinical, metabolic, psychological, reproductive and diabetes-related characteristics where reported. The specific definitions and measurement instruments used by individual studies were also recorded to facilitate interpretation of differences across studies. The extracted data were checked for completeness and consistency before synthesis. Differences in study populations, outcome definitions, assessment instruments and reporting methods were considered when interpreting and comparing findings across the 30 included studies.

Risk of Bias Assessment

The methodological risk of bias of the included studies was independently assessed by two reviewers using critical appraisal tools appropriate to each study design. Cross-sectional studies were assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies. Case-control studies were assessed using the Newcastle–Ottawa Scale (NOS), while the quasi-experimental study was assessed using an appropriate JBI critical appraisal checklist. Disagreements between reviewers were resolved through discussion and consensus, with consultation of a third reviewer when necessary. The assessment considered study selection, measurement of exposures and outcomes, identification and management of confounding factors, completeness of data and appropriateness of statistical analyses. Domain-level judgments were recorded and used to determine an overall methodological risk-of-bias judgment. Detailed assessments for all included studies are provided in Supplementary Table 3.

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For cross-sectional studies, the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies was used. Cohort studies were assessed using the Newcastle–Ottawa Scale (NOS). The assessment considered study selection, comparability, measurement of outcomes, sample size, confounding factors and statistical analysis. Risk-of-bias judgments were recorded for individual methodological domains rather than relying solely on an overall numerical score. Studies were categorized as having low, moderate/some concerns, or high risk of bias. The assessments were considered when interpreting the findings, particularly the reported burden of FSD, associated factors and the relationship between FSD and HRQOL.

Certainty of Evidence

The certainty of evidence for the main outcomes was assessed using the GRADE approach. The assessment covered the burden of female sexual dysfunction (FSD), factors associated with FSD, health-related quality of life (HRQoL) and the relationship between FSD and HRQoL.Two reviewers independently assessed the certainty of evidence, with disagreements resolved through discussion and consensus. Evidence was categorized as high, moderate, low, or very low certainty. The assessment considered risk of bias, inconsistency, indirectness, imprecision and publication bias. Since most of the evidence was from observational studies, the initial certainty was considered low and could be downgraded when important limitations were identified.

Publication Bias Assessment

Publication bias was assessed qualitatively because the substantial clinical and methodological heterogeneity of the included studies and the absence of quantitative meta-analysis precluded formal statistical assessment using funnel plots or tests such as Egger's test. The reviewers considered the comprehensiveness of the literature search, the number and distribution of available studies, consistency of findings across studies and potential selective reporting of outcomes when judging the likelihood of publication bias. Because the review was based predominantly on observational studies and several outcomes, particularly HRQoL, were reported by relatively few studies, publication bias was considered undetected but uncertain rather than assumed to be absent. This uncertainty was incorporated into the GRADE assessment of certainty of evidence.

Data Synthesis

The findings from the 30 included studies were synthesized according to the review objectives, focusing on the burden and prevalence of female sexual dysfunction (FSD), affected sexual-function domains, factors associated with FSD, health-related quality of life (HRQoL) and the reported relationship between FSD and HRQoL.A quantitative meta-analysis of FSD prevalence was not considered appropriate despite the inclusion of 30 studies because of substantial clinical and methodological heterogeneity across the evidence base. In particular, studies differed considerably in participant characteristics and populations, including age distribution, diabetes type and duration, menopausal status and healthcare setting. There was also substantial variation in the instruments used to assess sexual dysfunction, including the Female Sexual Function Index (FSFI), Changes in Sexual Functioning Questionnaire (CSFQ-14), Brief Index of Sexual Functioning for Women (BISF-W) and other study-specific or validated questionnaires. Furthermore, studies used different diagnostic definitions and cut-off values for defining FSD and some reported domain-specific dysfunction rather than an overall FSD prevalence. Differences in study design, sample size, comparison groups, outcome reporting and measurement methods further limited the comparability of prevalence estimates. Pooling these estimates into a single summary prevalence could therefore produce a clinically difficult-to-interpret estimate and potentially obscure important differences between study populations and measurement approaches.Accordingly, prevalence estimates were summarized descriptively and presented as reported by individual studies rather than statistically pooled. The same narrative approach was used for affected sexual-function domains, associated factors, HRQoL outcomes and the relationship between FSD and HRQoL. Findings were compared according to study characteristics, measurement instruments, geographical setting and reported outcomes, with differences in outcome definitions and measurement approaches taken into account when interpreting the evidence

IV. RESULTS

A total of 4,682 records were identified from four electronic databases: OpenAlex (n = 2,148), Taylor & Francis Online (n = 1,908), PubMed/MEDLINE (n = 494), and ScienceDirect (n = 132). After removal of 311 duplicate records, 4,371 records remained for title and abstract screening. Of these, 3,984 records were excluded, leaving 387 reports sought for retrieval. Fourteen reports could not be retrieved, and 373 full-text reports were assessed for eligibility. Of these, 343 full-text reports were excluded for predefined reasons, including wrong population (n = 129), wrong outcome (n = 96), wrong study design (n = 60), wrong setting (n = 38), and insufficient data (n = 20). Ultimately, 30 studies were included in the final systematic review. The study selection process is presented in the PRISMA 2020 flow diagram (Figure 1), illustrating the numbers of records identified, duplicates removed, records screened, full-text reports assessed for eligibility, studies excluded with reasons, and the final number of studies included in the review.

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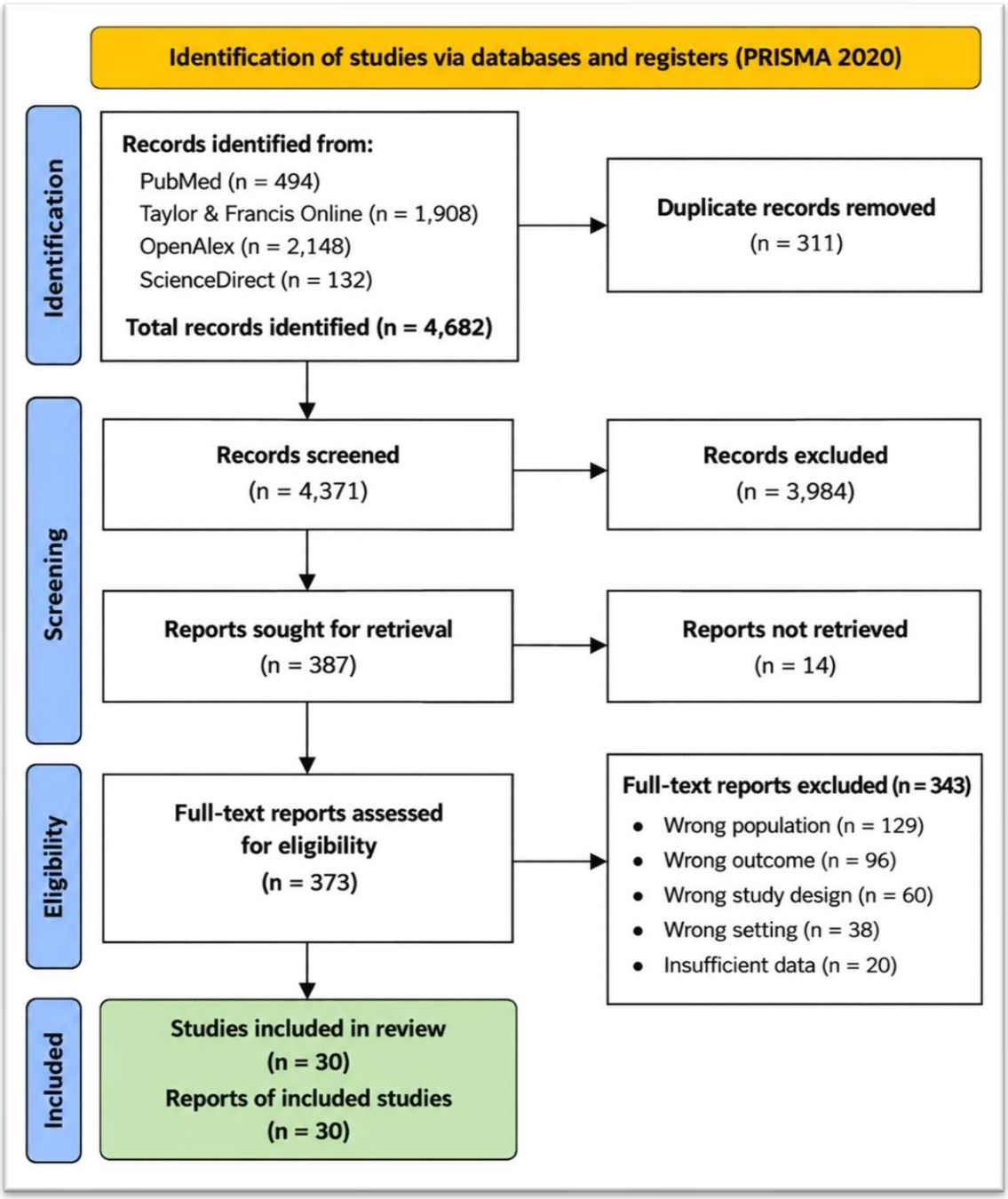


Figure 1. PRISMA 2020 flow diagram showing the identification, screening, eligibility assessment, and inclusion of studies in the systematic review.

Table 1. Characteristics of the studies included in the systematic review (n = 30).

	Author/Year	Country	Study Design	Sample Size	FSD Tool	FSD Prevalence (%)	Factors Associated with FSD	HRQoL Tool/ Findings	Relationship Between FSD and HRQoL	Main Findings
01	Olarinoye et al., 2008	Nigeria	Comparative cross-sectional study	51 diabetic women	Female Sexual Function Index	NR	Older age, longer duration of diabetes and menopause; no significant	NR	NR	Women with type 2 diabetes had significantly lower overall sexual-

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					(FSFI)		association with BMI, blood pressure, glycemic control, or diabetic complications			function scores than non-diabetic controls (20.5 ± 8.3 vs. 31.2 ± 8.8; P < 0.001). Arousal, pain, orgasm and satisfaction domains were significantly lower, while desire did not differ significantly. Diabetes significantly impaired sexual performance.
02	Ogbera et al., 2009	Nigeria	Cross-sectional study	58 women with type 2 diabetes	Female Sexual Function Index (FSFI)	88%	Psychological morbidity/poor mental health status was associated with sexual dysfunction	GHQ-12 was used to assess psychological status; HRQoL was not assessed	NR	Sexual dysfunction was highly prevalent among women with diabetes (88%). The mean FSFI score was significantly lower among women with diabetes than controls (16.2 ± 9.5 vs. 21 ± 8.5; P = 0.02). Women with diabetes attempted sex less frequently and poor mental health was associated with sexual dysfunction.
03	Ezeani et al., 2020	Nigeria	Cross-sectional case-control study	75 women with T2DM	Female Sexual Function Index	NR	Age, marital status, BMI, fasting blood sugar and hypertension	NR	NR	The mean total FSFI score was 22.10 ± 6.66 among women with T2DM

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					(FSFI)					versus 22.43 ± 5.29 among controls. Desire, lubrication and orgasm scores were significantly lower among diabetic women. The proportions reporting problems with arousal (40.0%), lubrication (36.4%), orgasm (32.7%) and pain (29.1%) were higher among diabetic women. Age, marital status, BMI, fasting blood sugar and hypertension were predictive of sexual dysfunction.
04	Asefa et al., 2019	Ethiopia	Facility-based cross-sectional study	398 diabetic patients; 142 women	Changes in Sexual Functioning Questionnaire-14 (CSFQ-14)	56.6% among women	Age >41 years (AOR 3.98); no formal education (AOR 3.20); divorced/widowed (AOR 5.28); T2DM (AOR 4.52); complications/comorbidity (AOR 2.05); depression (AOR 4.05); lack of physical activity (AOR 1.62)	NR	NR	Overall sexual dysfunction was 53.3%; among women it was 56.6%. Frequency of sexual desire dysfunction was the most common female domain (46.5%), followed by desire/interest dysfunction (36.6%). Older age, T2DM, depression, complications/comorbidit

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										y, lower education, being divorced/widowed and lack of physical activity were significantly associated with sexual dysfunction.
05	Kamrul-Hasan et al., 2023	Bangladesh	Cross-sectional comparative study	150 women with T2DM	19-item Female Sexual Function Index (FSFI)	79%	Longer duration of diabetes was associated with orgasm problems (aOR 1.3, 95% CI 1.1–1.7) and painful intercourse (aOR 1.2, 95% CI 1.1–1.5)	NR	NR	Sexual dysfunction was reported by 79% of women with diabetes compared with 72% of controls. Women with T2DM had significantly lower global FSFI scores (20.8 ± 7.2 vs. 23.7 ± 4.8; $p < 0.001$), with significantly poorer desire, lubrication, orgasm and satisfaction domains.
06	Raharinavalona et al., 2024	Madagascar	Cross-sectional analytical study	122 women with T2DM	19-item Female Sexual Function Index (FSFI)	47.5%	Age 50–59 years (OR 2.03, 95% CI 1.03–4.51); nephropathy (OR 2.18, 95% CI 1.09–3.98); ischemic stroke; ischemic heart disease; carotid atherosclerosis (OR 2.64, 95% CI 1.09–7.85); obesity (OR 3.64, 95% CI 1.22–12.3); calcium-channel blocker use	NR	NR	FSD was present in 58/122 women with T2DM (47.5%). Older age, vascular complications, nephropathy, obesity, calcium-channel blocker use and genitourinary infections were significantly associated with FSD.

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							(OR 4.71, 95% CI 1.35–21.0); genitourinary infection (OR 2.06, 95% CI 1.07–4.28)			
07	Ishak et al., 2010	Malaysia	Cross-sectional study	163 married women	Validated Malay version of FSFI (MVFSFI)	25.8%	Age, husband's age, duration of marriage, medical problems, menopausal status, frequency of sexual intercourse; medical problems and frequency of intercourse remained significant in multivariable analysis	NR	NR	42/163 women had FSD. Desire problems were most common (39.3%), followed by arousal (25.8%), lubrication (21.5%), satisfaction (21.5%), orgasm (16.6%) and pain (16.6%).
08	Ahmed et al., 2018	Egypt	Cross-sectional study	146 diabetic women	19-item Female Sexual Function Index (FSFI)	44% in T1DM; 25% in T2DM	Diabetes type; T1DM women were more affected than T2DM women	NR	NR	FSD was significantly more prevalent among women with T1DM (44%) and T2DM (25%) than healthy controls (9%). Mean FSFI scores were lower in T1DM (21.1 ± 3.9) and T2DM (26.4 ± 4.2) than controls (31.5 ± 5.8). All six FSFI domains—desire, arousal, lubrication, orgasm, satisfaction and pain—were significantly impaired in both diabetic

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										groups.
09	Gaju et al., 2019	Morocco	Cross-sectional study	60 diabetic women	Brief Index of Sexual Functioning for Women (BISF-W)	48.3%	Duration of diabetes, age and menopause; no correlation with type of diabetes	NR	NR	Sexual dysfunction was reported in 48.3% of diabetic women. Vaginal lubrication problems occurred in 38.4%, inability to orgasm and lack of sexual arousal were reported and decreased desire and dyspareunia were also identified. Sexual dysfunction was correlated with duration of diabetes, while age and menopause were additional factors.
10	Ohenhen & Adam, 2026	Nigeria	Cross-sectional descriptive study	252 women with T2DM	Female Sexual Function Index (FSFI)	80.6%	Specific associated factors were not reported in the provided article extract	NR	NR	Among 420 participants with T2DM, 252 were women and 203 (80.6%) had sexual dysfunction. Among the female domains, arousal (mean 2.1), desire (mean 2.3) and orgasm (mean 2.4) were the most affected, while satisfaction had the highest mean score

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										(3.4).
11	Abdelkhaliek et al., 2024	Egypt	Quasi-experimental pre–post study	178	Female Sexual Function Index (FSFI), 19 items covering desire, arousal, lubrication, orgasm, satisfaction and pain	92.7% pre-intervention; 44.9% remained with dysfunction post-intervention	No statistically significant relationship between sexual function and diabetes duration, diabetes type, regularity, treatment type, diabetes complications, chronic diseases, or other medications	No specific HRQoL tool reported. The study discussed sexual quality of life but primarily measured sexual function using FSFI	Not statistically assessed	PLISSIT-model counseling significantly improved sexual function. Mean total FSFI increased from 19.5 ± 3.7 to 23.3 ± 4.1 ($p < 0.001$). All six FSFI domains significantly improved after counseling.
12	Obaid et al., 2022	Egypt	Cross-sectional case-control	400 women: 300 diabetic (134 T1DM, 166 T2DM) and 100 controls	FSFI	50.7% T1DM; 28.9% T2DM; 10.0% controls	Long duration of diabetes was the main risk factor for FSD	HRQoL tool not reported in the provided study information	Not assessed	FSD was significantly more common among women with T1DM than T2DM and controls. Women with diabetes also experienced higher rates of sexual dysfunction and inadequate lubrication.
13	Owiti et al., 2012	Kenya	Descriptive cross-sectional	350 total; 164 females	FSFI	36.6%	Socio-demographic correlates were assessed; specific female-associated factors are not reported in the provided abstract	Not reported	Not assessed	FSD was present in 36.6% of diabetic women, categorized as mild (17.1%), moderate (18.3%) and severe (1.2%). The study found a high

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										prevalence of sexual dysfunction among diabetic patients.
14	Asonye et al., 2025	Nigeria	Cross-sectional study	90 women with T2DM	Female Sexual Function Index (FSFI); FSDS-R for sexual distress	86.7%	Older age, higher educational level, longer duration of diabetes, hypertension and treatment type were significantly associated with greater sexual distress/severity of SD	No specific HRQoL tool was used. The study assessed sexual distress using FSDS-R	Not directly assessed. The authors state that poor sexual functioning can be distressing and may affect quality of life, but no quantitative FSD–HRQoL relationship was reported	Very high burden of SD among women with T2DM; 86.7% had SD and 81.1% had high sexual distress. Arousal and orgasm were among the most affected domains. Older age, longer diabetes duration, hypertension, higher education and more complex treatment were associated with greater sexual distress.
15	Nakidde, 2019	Uganda	Cross-sectional	209 diabetic females	Female Sexual Function Index (FSFI)	67.9%	Longer duration of diabetes (AOR=1.95, 95% CI: 1.06–3.56, p=0.030); having menses (AOR=0.492, 95% CI: 0.25–0.97, p=0.040). No significant association with age, menopause, BMI, HbA1c, contraceptive use, or alcohol.	Not assessed/reported	Not assessed	FSD was highly prevalent among diabetic women attending Mulago National Referral Hospital. Longer duration of diabetes and having menses were significantly associated with FSD.
16	Doruk et al., 2005	Turkey	Case-control	127 wome	Sexu al-	T1DM: 71%;	No significant	Not asses	Not assessed/repor	FSD was significantly

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			study	n (21 T1DM, 50 T2DM, 56 controls)	function questionnaire assessing desire, arousal, lubrication, orgasm, satisfaction and pain	T2DM: 42%; Controls: 37%	predictors among diabetic women; in controls, age, poor education, absence of occupation and menopause were associated	sed/reported	ted	more common in women with T1DM than T2DM and controls; desire, arousal and lubrication were particularly affected in T1DM.
17	Erol et al., 2002	Turkey	Comparative study	132 women (72 T2DM, 60 controls)	Index of Female Sexual Function (IFSF)	Not explicitly reported as an overall percentage; libido loss 77%, diminished clitoral sensation 62.5%, vaginal dryness 37.5%, vaginal discomfort 41.6%, orgasmic dysfunction 49%	No specific associated factors were reported in the abstract	Not specified; authors stated sexual dysfunction diminished quality of life	Not quantitatively assessed; authors reported that sexual dysfunction diminished quality of life	Type 2 diabetic women had significantly lower sexual-function scores than controls (29.3 ± 6.4 vs 37.7 ± 3.5). Sexual symptoms were substantially more common among diabetic women.
18	Abu Ali et al., 2008	Jordan	Cross-sectional comparative study	1,137 married women	Arabic version of FSFI	59.6% among diabetic women ≥50 years, compared with 45.6% among non-	Older age, higher BMI, longer diabetes duration, coronary artery disease, nephropathy and retinopathy were	Not reported	Not assessed/reported	FSD was significantly more prevalent among diabetic Jordanian women than non-diabetic women, particularly among

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						diabetic women	negatively associated with sexual function. Glycemic control, smoking, dyslipidemia, hypertension, autonomic neuropathy and peripheral neuropathy were not significant			women aged ≥50 years.
19	Mezones-Holguin et al., 2008	Peru	Comparative cross-sectional study	72 postmenopausal women (36 diabetic, 36 controls)	Female Sexual Function Index (FSFI)	75.0% among diabetic women vs 30.6% among controls	Diabetes mellitus remained independently associated with FSD after adjustment for depression, education, hysterectomy, marital relationship and age (OR 6.2, 95% CI 2.0–19.6)	No dedicated HRQoL instrument reported. Diabetic women had worse depression scores and more deteriorated marital relationships	Not directly assessed with a validated HRQoL tool	Diabetes was associated with poorer sexual function across all FSFI domains: desire, arousal, lubrication, orgasm, satisfaction and pain. The effect remained significant after adjustment for depression and other factors.
20	Shi et al., 2012	China	Comparative cross-sectional study	222 total: 115 T2DM women + 107 controls	Female Sexual Function Index (FSFI)	79.2% in T2DM women vs 55.0% in controls	Age and diabetes were independent risk factors; BMI also influenced FSD among diabetic women	Not reported	Not assessed/reported	T2DM women had significantly lower total FSFI scores and lower scores in all domains (desire, arousal, lubrication, orgasm, satisfaction and pain) than

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										controls. FSD was particularly prominent among premenopausal women.
21	Sharifiaghdas et al., 2012	Iran	Case-control study	136 total: 45 T2DM women + 91 controls	Sexual Function Questionnaire	Domain-specific high probability: desire 71.1%, arousal sensation 84.4%, arousal lubrication 55.6%, orgasm 71.1%, pain 8.9%, enjoyment 66.7%	Significant differences between diabetic and control women were observed for desire, arousal sensation and pain. 12.5% of diabetic women had diabetic retinopathy.	Not reported	Not assessed/reported	Sexual dysfunction was common in both groups. Diabetic women had significantly greater problems in desire, arousal sensation and pain than controls.
22	Elyasi et al. (2015)	Iran	Cross-sectional	150	Female Sexual Function Index (FSFI)	78.7% (95% CI: 71.4–84.4)	Depression/stress was strongly related to FSD; sexual dysfunction was particularly common among women with depression	HADS used to assess anxiety/depression; HRQoL not assessed	Not assessed	FSD was highly prevalent among women with type 2 diabetes. Lubrication problems (58%), reduced desire (50%), arousal problems (50%), dyspareunia (47.3%), orgasmic dysfunction (32.7%) and reduced satisfaction (42.7%) were reported. Depression was common and associated with sexual

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										dysfunction.
23.	Sebtain (2022)	Pakistan	Descriptive cross-sectional study	150	Female Sexual Function Index (FSFI)	66.9%	NR in the provided abstract	Not assessed/reported	Not assessed	FSD was highly prevalent among women with type 2 diabetes. Lubrication problems occurred in 76.7%, decreased libido in 68.6%, arousal complaints in 78%, dyspareunia in 47.3%, abnormal orgasm in 60.6%, and decreased satisfaction in 61.6%.
24.	Tafazoli et al., 2017	Iran	Correlational cross-sectional study	90	Rosen Female Sexual Function Index (FSFI)	25.6%	Not specifically reported as predictors of FSD; sexual function was associated with age, stress/depression and diabetes-related factors	SF-36; mean QoL score 58.75	Significant association between overall sexual function and overall QoL, including physical and psychological/mental health dimensions ($P < 0.005$)	Sexual function was significantly associated with QoL among women with type 2 diabetes. Lower sexual function was associated with poorer QoL.
25	Tuncel et al., 2017	Turkey	Cross-sectional, single-centre study	93	Female Sexual Function Index (FSFI)	55.9%	Older age, longer duration of diabetes, insulin therapy, antidepressant therapy, hypertension, neuropathy and coronary artery disease	Not assessed/reported	Not assessed	FSD affected 55.9% of women with T2DM, involving all domains of the sexual response cycle. FSFI scores were negatively correlated with age and diabetes duration.
26	Sachdeva et al., 2023	India (LMIC)	Cross-sectional questionnaire-	50 women with diabet	Female Sexual	44% among women with	Higher age, higher BMI, longer duration of	Not assessed; HAD	Not assessed/reported	FSD was significantly more common in

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			based study	es (plus 50 controls)	Function Index (FSFI)	diabetes	diabetes, insulin treatment and diabetes complications	S was used to assess anxiety and depression, not HRQoL		women with diabetes than controls (44% vs 20%, p<0.01). Dysfunction affected desire, arousal, lubrication and orgasm.
27	Idung AU, Effiong JH, Edet IV, et al. (2019)	Nigeria	Prospective cross-sectional study	162	Female Sexual Function Index (FSFI), 19-item questionnaire	66.7% (108/162)	Older age at diabetes onset; longer duration of diabetes; diabetes complications, particularly neuropathy; higher BMI/morbid obesity; treatment with injectables/oral medications	No specific HRQoL tool was used. The authors discussed sexual dysfunction as a quality-of-life issue and reported a potential negative impact on psychological well-being, marriage, family and quality of life.	Not directly measured statistically. The study states that sexual dysfunction can have a negative impact on quality of life, but no HRQoL instrument or quantitative FSD–HRQoL association was assessed.	Sexual dysfunction was common among women with diabetes. Sexual pain was the most affected domain (95.4%), followed by lubrication (93.5%), orgasm (91.7%), satisfaction (84.3%), arousal (90.7%) and desire (72.2%).
28	Omidvar et al., 2013	Iran	Cross-sectional	500 women with diabet	Questionnaire; self-	32.3%	Diabetic complications were significantly	Not assessed/report	Not assessed	FSD was common among women with

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				es	administered sexual-function questionnaire		associated with FSD. Age, diabetes duration and BMI were not significantly associated with FSD.	ed		diabetes. Low desire (81.8%) and arousal disorders (78.3%) were the most frequent problems; orgasm disorder occurred in 47.5% and resolution disorder in 35.1%.
29	Celik et al., 2015	Turkey	Cross-sectional	423	Women with diabetes	Type 1 & Type 2	Female Sexual Function Index (FSFI); Sexual Quality of Life Questionnaire-Women (SQLQ)	80.4 % overall; 85.6 % in type 2 diabetes; 55.6 % in type 1 diabetes	Diabetes type; longer diabetes duration; decreased sexual desire and intercourse frequency	Sexual QoL was significantly lower among women with FSD (62.7 ± 21.2) than women without FSD (89.6 ± 9.9), $p < 0.001$
30	Vafaeimanesh et al., 2014	Iran	Descriptive-analytic cross-sectional study	110 women with diabetes	Female Sexual Function Index (FSFI), cutoff <26	53.6% (59/110)	Albuminuria/ nephropathy (p=0.001) and retinopathy (p=0.007) were significantly associated with sexual dysfunction. Age, diabetes duration, HbA1c, BMI, hypertension, CAD, exercise and neuropathy were not significantly associated.	Not assessed/reported	Not assessed; the study did not measure HRQoL or examine its relationship with FSD	FSD was common among women with type 2 diabetes, affecting 53.6%. Diabetic nephropathy/ albuminuria and retinopathy were significantly associated with FSD.

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Characteristics of Individual Studies

A total of **30 studies** were included in the systematic review. The studies were published between **2002 and 2026** and were conducted across several LMICs, including Nigeria, Ethiopia, Bangladesh, Madagascar, Uganda, Malaysia, Egypt, Morocco, Turkey, Jordan, Peru, China, Iran, Pakistan and India. Most studies used **cross-sectional designs**, while a smaller number used case-control, comparative, or quasi-experimental designs. Sample sizes varied considerably, ranging from **51 to 1,137 participants**. The majority of studies assessed FSD using the **Female Sexual Function Index (FSFI)**, although some used the Changes in Sexual Functioning Questionnaire, Brief Index of Sexual Functioning for Women, validated Malay version of the FSFI, Index of Female Sexual Function, Sexual Function Questionnaire and other validated or study-specific instruments. Reported FSD prevalence varied substantially, ranging from **25.6% to 92.7%**, reflecting differences in populations, diabetes type, study settings and assessment instruments. The studies included women with **type 1 diabetes, type 2 diabetes, or diabetes mellitus without further specification**. Several studies also included non-diabetic control groups, allowing comparisons of sexual function between women with and without diabetes. Commonly assessed sexual-function domains were **desire, arousal, lubrication, orgasm, satisfaction and pain/dyspareunia**. Frequently reported factors associated with FSD included **older age, longer diabetes duration, menopause, depression or psychological distress, obesity, hypertension, diabetes-related complications, nephropathy, retinopathy, vascular disease, genitourinary infections and treatment-related factors**. Assessment of **HRQoL was limited and inconsistent**. Where assessed, instruments included the **SF-36 and Sexual Quality of Life Questionnaire for Women (SQLQ-W)**. Some studies reported poorer quality of life among women with FSD, while many did not directly assess HRQoL or its relationship with FSD

Results

Study Characteristics

A total of 30 studies met the predefined eligibility criteria and were included in the systematic review. The studies examined female sexual dysfunction (FSD), associated factors, sexual-function domains and, where available, health-related quality of life (HRQoL) among women with diabetes in LMICs. The included studies were predominantly cross-sectional studies, with some comparative cross-sectional, case-control, descriptive, correlational and quasi-experimental designs. Study sample sizes varied substantially, from 51 to 1,137 participants.The 30 included studies were conducted across 16 countries in Africa, Asia and Latin America. African countries contributed studies from Nigeria, Ethiopia, Uganda, Madagascar, Egypt, Kenya and Morocco, while studies from Asia were conducted in Bangladesh, Turkey, Iran, Jordan, China, Pakistan, India and Malaysia. One study was conducted in Peru, representing Latin America. Nigeria contributed the largest number of included studies, followed by Iran and Turkey, while several countries were represented by a single study. The geographical distribution demonstrates that evidence on female sexual dysfunction among women with diabetes in LMICs remains unevenly distributed, with greater representation from selected countries and limited evidence from many other LMIC settings.The characteristics and main findings of the 30 included studies are summarized in Table 1.

Risk of Bias of Included Studies

Risk of bias was assessed independently for all 30 included studies using study-design-appropriate critical appraisal tools. Cross-sectional studies were assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies. Where applicable, studies with other designs were assessed using the critical appraisal tool appropriate to their methodological design. The assessment considered participant selection, measurement of exposures and outcomes, identification and management of confounding factors, completeness of data and appropriateness of statistical analyses. Overall risk-of-bias judgments were categorized as low, moderate/some concerns, or high. Detailed study-level risk-of-bias judgments for all 30 included studies are presented in Supplementary Table 3. The risk-of-bias assessments were considered when interpreting the findings, particularly the reported burden of FSD, associated factors and the relationship between FSD and HRQOL.

Certainty of Evidence

The certainty of evidence was assessed using the GRADE approach across the main review outcomes. Because most included studies were observational and substantial clinical and methodological heterogeneity was present, the certainty of evidence was generally low or very low. The certainty of evidence for the burden of FSD was considered low, reflecting predominantly observational study designs, variation in assessment instruments and definitions and substantial variability in reported prevalence. Evidence concerning factors associated with FSD was also considered low certainty because of differences in study populations, adjustment strategies, outcome definitions and potential residual confounding. Evidence concerning HRQoL and the relationship between FSD and HRQoL was judged to be very low certainty because relatively few studies assessed these outcomes directly, measurement instruments varied and quantitative synthesis was not possible.The GRADE assessment of the certainty of evidence for the main review outcomes is presented in Table 2.

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Outcome	Evidence base	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall certainty
Burden/prevalence of FSD	30 observational studies	Serious	Serious	Not serious	Serious	Undetected/uncertain	Low ⊕⊕◯◯
Factors associated with FSD	Multiple observational studies	Serious	Serious	Serious	Serious	Undetected/uncertain	Low ⊕⊕◯◯
Sexual-function domains	Multiple observational/comparative studies	Serious	Serious	Not serious	Serious	Undetected/uncertain	Low ⊕⊕◯◯
HRQoL among women with FSD	Few studies	Very serious	Serious	Serious	Serious	Undetected/uncertain	Very low ⊕◯◯◯
Relationship between FSD and HRQoL	Few observational studies	Serious	Serious	Serious	Serious	Undetected/uncertain	Very low ⊕◯◯◯

Table 2. GRADE assessment of certainty of evidence for the main review outcomes

GRADE certainty ratings: High = ⊕⊕⊕⊕; Moderate = ⊕⊕⊕◯; Low = ⊕⊕◯◯; Very low = ⊕◯◯◯. Evidence from observational studies was initially considered low certainty and was downgraded where important concerns related to risk of bias, inconsistency, indirectness, imprecision.
HRQoL among women with FSD: 2 studies directly assessed quality-of-life outcomes; 1 additional study reported a narrative quality-of-life statement without quantitative assessment; 27 studies did not directly assess HRQoL or its relationship with FSD.

Overall certainty: Very low.
Publication bias was assessed qualitatively and remained uncertain because formal statistical assessment was not possibleBurden of Female Sexual Dysfunction.

Prevalence According to Diabetes Type
The prevalence of FSD varied considerably between individual studies. Reported prevalence ranged from 25.6% to 92.7%, although differences in study populations, diabetes type, menopausal status, definitions of FSD and assessment instruments contributed to this variation.

High prevalence was reported in several studies. For example FSD was reported in 88% of women with diabetes in Nigeria, 86.7% in a Nigerian study of women with type 2 diabetes, 80.6% in another Nigerian study, 79% in Bangladesh and 67.9% among diabetic women in Uganda. Other studies reported lower prevalence, including 25.6% in Iran, 25.8% in Malaysia, 32.3% in Iran, 36.6% in Kenya, 44% among women with diabetes in India and 47.5% in Madagascar. Where studies reported female sexual dysfunction separately according to diabetes type, the findings demonstrated differences between women with type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM). In the Egyptian study by Ahmed et al., FSD was reported in 44% of women with T1DM and 25% of women with T2DM, compared with 9% among healthy controls. Mean FSFI scores were also lower among women with T1DM (21.1 ± 3.9) and T2DM (26.4 ± 4.2) than among controls. Other included studies also reported differences in sexual function according to diabetes type, although prevalence estimates were not consistently reported separately for T1DM and T2DM. For example, Doruk et al. reported FSD prevalence of 71% among women with T1DM and 42% among women with T2DM, while noting that sexual dysfunction was more common among women with T1DM than T2DM and controls. These findings suggest that diabetes type may be an important factor associated with female sexual dysfunction. However, direct comparison between T1DM and T2DM should be interpreted cautiously because the studies differed in sample characteristics, assessment instruments, definitions of FSD and clinical populations.The reported prevalence of FSD according to diabetes type, including comparisons with control groups where available, is summarized in Table 3.

Table 3. Prevalence of Female Sexual Dysfunction by Diabetes Type Where Reported

Study	Country	T1DM FSD prevalence	T2DM FSD prevalence	Control prevalence	Assessment tool
Ahmed et al 2018	Egypt	44%	25%	9 %	FSI
2005	Turkey	71%	42	37%	Sexual-function questionnaire
Other included studies	various	NR	NR	NR	Various

NR =Not reported

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sexual-Function Domains

FSD affected multiple domains of sexual functioning. The commonly affected domains included desire, arousal, lubrication, orgasm, satisfaction and pain/dyspareunia. In the Nigerian study by Ezeani et al., problems with arousal, lubrication, orgasm and pain were reported among diabetic women, while the Bangladeshi study found poorer desire, lubrication, orgasm and satisfaction scores among women with type 2 diabetes. In the Egyptian study, all six FSFI domains were significantly impaired among both type 1 and type 2 diabetic women compared with controls. Similarly, studies from China and Turkey reported significantly lower sexual-function scores among diabetic women across several or all sexual-function domains.

Factors Associated With FSD

Several demographic, clinical, metabolic, psychological and diabetes-related factors were associated with FSD. Older age and longer duration of diabetes were among the most consistently reported factors. Other frequently reported factors included menopause, depression, hypertension, obesity, diabetes-related complications, nephropathy, retinopathy, vascular disease, genitourinary infections and treatment characteristics. For example, the Ugandan study found that longer diabetes duration was significantly associated with FSD (AOR 1.95, 95% CI 1.06–3.56), while having menses was negatively associated with FSD. The Madagascar study found associations with older age, nephropathy, vascular complications, obesity, calcium-channel blocker use and genitourinary infection.

Psychological factors were also important. Depression or poor mental health was associated with sexual dysfunction in studies from Nigeria and Iran.

Health-Related Quality of Life

Evidence concerning health-related quality of life (HRQoL) was substantially more limited than evidence concerning female sexual dysfunction (FSD). Of the 30 studies included in the systematic review, only two directly assessed quality-of-life outcomes using a specified measurement instrument. Tafazoli et al. (2017) in Iran used the 36-Item Short Form Health Survey (SF-36) and reported a significant association between sexual function and overall quality of life, including physical and psychological/mental-health dimensions; lower sexual function was associated with poorer quality of life ($P < 0.005$). Celik et al. (2015) in Turkey used the Sexual Quality of Life Questionnaire for Women (SQLQ-W) together with the Female Sexual Function Index (FSFI) and found significantly poorer sexual quality-of-life scores among women with FSD compared with women without FSD (62.7 ± 21.2 vs. 89.6 ± 9.9; $P < 0.001$).Thus, both studies that directly assessed quality-of-life outcomes reported poorer quality of life among women with impaired sexual function and neither reported a statistically non-significant or null association between FSD and quality of life. However, the two studies used different approaches to measuring quality of life: Tafazoli et al. used a generic HRQOL instrument (SF-36), whereas Celik et al. assessed sexual-specific quality of life using the SQLQ-W. This distinction limits direct comparison between the findings.An additional study by Erol et al. (2002) stated that sexual dysfunction diminished quality of life, but quality of life was not quantitatively assessed using a validated HRQoL instrument. The remaining 27 studies did not directly assess HRQOL or quality of life using a dedicated instrument or did not examine the relationship between FSD and quality of life. Consequently, evidence concerning the relationship between FSD and HRQoL remains sparse and heterogeneous and the overall certainty of evidence was judged to be very low.

Overall Synthesis

Overall, the included evidence indicates that FSD is common among women with diabetes in LMICs, with substantial variation in reported prevalence between studies. Older age, longer duration of diabetes, psychological distress, menopause, obesity, hypertension and diabetes-related complications were frequently associated with FSD. Sexual dysfunction commonly affected several domains simultaneously, particularly desire, arousal, lubrication, orgasm, satisfaction and pain. Evidence also suggests that FSD is associated with poorer sexual quality of life and, in studies that assessed it, poorer HRQoL. Because the studies differed considerably in populations, settings, sample sizes, outcome definitions, assessment tools and reporting methods, the review used narrative synthesis rather than quantitative meta-analysis.

V. DISCUSSION

This systematic review synthesized evidence on female sexual dysfunction (FSD), associated factors, sexual-function domains and health-related quality of life (HRQOL) among women with diabetes in low- and middle-income countries (LMICs). Across the 30 included studies, FSD was common, although the reported prevalence varied substantially between populations and study settings. The variation in prevalence likely reflects differences in participant characteristics, diabetes type and duration, menopausal status, comorbidities, study design, sample size and the instruments and thresholds used to define sexual dysfunction. Most studies used the Female Sexual Function Index (FSFI), but differences in cut-off values and assessment approaches may also have contributed to the observed variability.The findings indicate that female sexual dysfunction should be considered an important component of diabetes-related health and well-being. Several studies identified longer duration of diabetes, older age, menopause, obesity, hypertension, diabetes-related complications, nephropathy, retinopathy, neuropathy and psychological distress as factors associated with poorer sexual function. These findings suggest that FSD is associated with multiple interacting biological, psychological, metabolic, vascular, hormonal, clinical, treatment-related and social factors rather than being consistently associated with a single factor. The consistency of several of these associations across different LMIC settings strengthens the

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argument for incorporating assessment of sexual health into comprehensive diabetes care.The review also demonstrates that different domains of female sexual function may be affected to different degrees. Desire, arousal, lubrication, orgasm, satisfaction and pain or dyspareunia were frequently reported as affected domains. This is clinically important because focusing only on an overall FSD score may fail to identify the specific sexual difficulties experienced by individual patients. Clinical assessment should therefore consider the individual domains of sexual function where appropriate and should provide women with an opportunity to discuss sexual concerns confidentially.

Health-related quality of life

The evidence concerning HRQOL was substantially weaker than the evidence concerning the burden and associated factors of FSD. Of the 30 studies included in this review, only two directly assessed quality-of-life outcomes using specified instruments. Tafazoli et al. (2017) used the SF-36 and found that sexual function was significantly associated with overall quality of life, including physical and psychological/mental-health dimensions, with poorer sexual function associated with poorer quality of life. Celik et al. (2015) used the Sexual Quality of Life Questionnaire for Women (SQLQ-W) and found significantly poorer sexual quality-of-life scores among women with FSD than among women without FSD. Both studies therefore supported an association between impaired sexual function and poorer quality of life.However, these findings should be interpreted cautiously because the two studies assessed different dimensions of quality of life. The SF-36 is a generic HRQoL instrument, whereas the SQLQ-W specifically measures sexual quality of life. Therefore, the available evidence does not represent a consistent assessment of general HRQoL across studies. Erol et al. (2002) also reported that sexual dysfunction diminished quality of life, but this conclusion was not based on quantitative assessment with a validated HRQoL instrument.Importantly, no study that directly assessed quality of life reported a statistically non-significant association between sexual dysfunction and quality of life. Nevertheless, the absence of evidence of a null association should not be interpreted as proof of a consistent effect because only two studies directly measured quality-of-life outcomes. The remaining 27 studies did not directly assess HRQoL or the relationship between FSD and quality of life. The small number of direct assessments, differences in instruments, predominantly cross-sectional designs and lack of quantitative synthesis substantially limit the strength and generalizability of the evidence.Accordingly, the certainty of evidence for HRQoL and the relationship between FSD and HRQoL was judged to be very low. Future studies should routinely incorporate validated generic HRQoL instruments, such as the SF-36 or other appropriate validated measures, alongside standardized measures of sexual function. Where sexual-specific quality of life is examined, this should be clearly distinguished from generic HRQoL to facilitate meaningful interpretation and comparison across studies.

Implications for LMIC settings

The findings have particular relevance for LMIC health systems, where diabetes services frequently prioritize glycaemic control and prevention of major microvascular and macrovascular complications. Sexual health may receive less attention despite its potential effects on psychological well-being, intimate relationships and overall quality of life. The high burden of FSD reported across several LMIC settings suggests that sexual health should be considered as part of holistic diabetes care.Routine assessment does not necessarily require extensive additional investigations. Healthcare providers can incorporate brief, culturally sensitive questions about sexual function into diabetes consultations and provide further assessment when concerns are identified. Training healthcare workers in confidential and non-judgmental communication may be particularly important in settings where discussion of sexual health is culturally sensitive.

Comparison and interpretation of the evidence

Comparison With Previous Studies

A recent systematic review and meta-analysis by Wang et al. included 50 articles comprising 9,532 women with diabetes and reported a pooled prevalence of sexual dysfunction of 53% (95% CI 46%–61%) [32]. This finding is broadly consistent with the substantial burden observed in the present review. However, the present review was specifically restricted to women with diabetes in LMICs and used narrative synthesis because of substantial clinical and methodological heterogeneity. Therefore, the pooled estimate reported by Wang et al. should be interpreted as complementary evidence rather than as a directly comparable estimate for LMIC populations.

Strengths and limitations

A major strength of this review is its focus on women with diabetes in LMICs, a population that is comparatively underrepresented in the international literature on sexual health. The review incorporated evidence from multiple countries and considered not only the prevalence of FSD but also associated factors, specific sexual-function domains and HRQoL. The use of database-specific search strategies and study-design-appropriate critical appraisal tools also strengthened the methodological approach.

Several limitations should nevertheless be considered. First, most included studies were cross-sectional, limiting causal inference. Second, substantial methodological and clinical heterogeneity existed across studies, particularly in participant characteristics, definitions of FSD, measurement instruments and assessment of associated factors. Third, HRQoL was inconsistently assessed and relatively few studies examined the relationship between FSD and HRQoL directly. Consequently, the certainty of evidence for HRQoL outcomes was very low.Fourth, the review was restricted to English-language publications because the review team had limited resources and translation capacity to consistently assess non-English full-text studies. This restriction may have

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introduced language bias and could have resulted in the exclusion of relevant evidence published in other languages. The findings should therefore be interpreted with this limitation in mind.Fifth, LMIC classification may change over time as countries move between World Bank income categories. To improve consistency, country eligibility should be determined using the World Bank classification applicable to the study's recruitment or data-collection period, using the prespecified midpoint-year approach for studies spanning more than one classification period. Finally, some potentially relevant studies may have been missed despite the use of multiple electronic databases and reference-list screening.

VI. RECOMMENDATIONS FOR FUTURE RESEARCH

Future studies should use standardized and validated measures of female sexual function, preferably the FSFI or another internationally validated instrument, with clearly stated cut-off values. Researchers should also routinely measure HRQoL using validated instruments and report the relationship between sexual dysfunction and quality of life using appropriate statistical methods.

Longitudinal and multicentre studies are particularly needed to determine whether diabetes duration, glycaemic control, vascular and neurological complications, psychological distress and treatment factors independently predict the development or persistence of FSD. Studies should also investigate the effects of interventions such as improved glycaemic control, treatment of diabetes complications, psychological support, sexual counselling and multidisciplinary sexual-health services.Research in LMICs should additionally consider cultural, socioeconomic, relationship and healthcare-access factors that may influence the recognition and management of FSD. Inclusion of diverse populations and publication of studies in multiple languages would also help reduce language and geographical gaps in the evidence base.

VII. CONCLUSION

Female sexual dysfunction appears to be a common but under-recognized problem among women with diabetes in LMICs. Older age, longer diabetes duration, menopause, obesity, hypertension, diabetes-related complications and psychological distress were frequently associated with poorer sexual function. However, substantial heterogeneity and the predominance of cross-sectional studies limit causal interpretation. Evidence linking FSD with HRQoL is promising but remains limited and inconsistent. Integrating sexual-health assessment into comprehensive diabetes care, together with standardized measurement of sexual function and HRQoL, may improve recognition and management of an important but frequently overlooked aspect of women's health.

ABBREVIATIONS

AOR – Adjusted Odds Ratio

BMI – Body Mass Index

BISF-W – Brief Index of Sexual Functioning for Women

CI – Confidence Interval

CSFQ-14 – Changes in Sexual Functioning Questionnaire-14

FSD – Female Sexual Dysfunction

FSFI – Female Sexual Function Index

FSDS-R – Female Sexual Distress Scale-Revised

GHQ-12 – General Health Questionnaire-12

GRADE – Grading of Recommendations Assessment, Development and Evaluation

HbA1c – Glycated Hemoglobin

HADS – Hospital Anxiety and Depression Scale

HRQoL – Health-Related Quality of Life

IFSFI – Index of Female Sexual Function

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LMICs – Low- and Middle-Income Countries

MeSH – Medical Subject Headings

NOS – Newcastle–Ottawa Scale

OR – Odds Ratio

PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses

QoL – Quality of Life

RCT – Randomized Controlled Trial

SF-36 – 36-Item Short Form Health Survey

SQLQ-W – Sexual Quality of Life Questionnaire for Women

T1DM – Type 1 Diabetes Mellitus

T2DM – Type 2 Diabetes Mellitus

WHO – World Health Organization

REGISTRATION

This systematic review was prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO) under registration number [CRD420261488908]

DECLARATION

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AUTHOR CONTRIBUTIONS

Conceptualization: Lucas Gindu and Kesheni Lemi. Methodology: Lucas Gindu, Florent Ishimwe, Venance Mswelo, Mumbere Vahwere Bienfait, Kesheni Lemi, Theoneste Hakizimana, and Elias Xwatsal. Literature searching and study selection: Lucas Gindu, Florent Ishimwe, and Venance Mswelo. Data extraction and quality assessment: Mumbere Vahwere Bienfait, Kesheni Lemi, and Theoneste Hakizimana. Data synthesis and interpretation: Lucas Gindu, Mumbere Mayani David,Kesheni Lemi, and Elias Xwatsal. Writing—original draft preparation: Lucas Gindu,Said Odoma and Kesheni Lemi. Writing—review and editing: all authors. Supervision: Venance Mswelo and Mumbere Vahwere Bienfait. All authors reviewed and approved the final manuscript and agree to be accountable for their contributions.

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