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Outcome Of Nurse-Led Education On Coping Skills And Health-Related Quality Of Life Among Diabetes Patients In Selected Secondary Health Care Facilities, Kaduna State: A Narrative Review (2015-2024)

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Abstract

Background: Diabetes mellitus (DM) is a growing crisis in low- and middle-income countries like Nigeria. While nurse-led education enhances diabetes self-care and glycemic control, its impact on coping skills and health-related quality of life (HRQoL) among Nigerian patients lacks synthesis.

Objective: This review examines evidence on nurse-led educational interventions for diabetes in Kaduna State secondary facilities, focusing on coping and HRQoL.

Methods: We conducted a structured literature search (2015–2024) of major databases and grey literature for studies on nurse-led diabetes education, coping, and HRQoL in Nigerian or similar LMIC settings. Thematic synthesis identified intervention features, outcomes, and contextual factors.

Key Findings: Sub-Saharan African DM patients frequently use adaptive coping (religious, acceptance), while maladaptive strategies (self-blame, avoidance) correlate with poorer self-care. In Nigeria, HRQoL is impaired (only ~50% report good QoL). Nurse-led education consistently improves outcomes, significantly reducing HbA1c (~–0.5% to –0.9%) and boosting self-efficacy, self-management, and knowledge while reducing distress. Evidence from Kaduna indicates tertiary patients have higher HRQoL than secondary clinic patients, highlighting support gaps. Contextual factors—limited nurse training, high patient loads, cultural beliefs, and poverty—shape intervention success.

Conclusion: Nurse-led education improves clinical and psychosocial DM outcomes in resource-limited settings. However, Kaduna-specific evidence is limited. Context-sensitive research is needed to adapt and scale nurse-led education in Nigerian secondary care and integrate coping support into routine practice.

Keywords: Diabetes education, HRQoL, Kaduna State

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1.0 Introduction

1.1 Global and Local Burden of Diabetes

Diabetes mellitus (DM) affects hundreds of millions of people worldwide, and its prevalence is rising sharply. According to the International Diabetes Federation, 537 million adults (20–79 years) had diabetes in 2021, projected to 643 million by 2030 (International Diabetes Federation, 2025). Low- and middle-income regions carry a growing share: for example, the WHO African Region saw adult diabetes prevalence climb from ~6.4% in 1990 to 10.5% by 2022. Diabetes causes enormous morbidity and mortality: globally it accounted for 3.4 million deaths in 2024, and the majority of these deaths in Africa are premature (58% before age 70) (Table 1).

Table 1: Global burden and trends of diabetes.

Metric	**Value**	**Year/period**
Global prevalence (20-79)	537 million	2021
Projected global Prevalence (20-79)	643 million	2030
Global diabetes-related death	3.4 million	2024
Premature Deaths in Africa (before age 70)	58%	2024
Increase in Global Health Expenditure	338%	Over 17 years (2007-2024)
Total Global Health Expenditure	>USD 1 trillion	2024

Source: world health organization, 2024, International Diabetes Federation, 2025.

In Nigeria, diabetes prevalence is also increasing. A recent meta-analysis estimated national type 2 DM prevalence at 7.0% (95% CI: 5.0–9.0%) (Ekekezie et al., 2025), roughly double previous estimates. There is marked regional variation: the South-South zone had the highest pooled prevalence (≈11.35%) and the North-Central (which includes Kaduna) the lowest (≈2.03%) (Ekekezie et al., 2025). Poor rates of diagnosis worsen the burden; as of 2019 the IDF estimated ~54% of Nigerian diabetes cases were undiagnosed (Ekekezie et al., 2025). Diabetes also imposes severe financial strain on patients and health systems (Table 2).

Table 2: Regional and national diabetes prevalence

Region Zone	**prevalence**	**Remark**
WHO African region	~6.4% -10%	1990 – 2024
Nigeria (national Average)	7.00%	(95% CI: 5.0–9.0%)
Nigeria - South-South Zone	≈11.35%	Highest prevalence

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Nigeria - North-Central Zone	≈2.03%	Lowest prevalence (includes Kaduna)

Source: world health organization (2024), Ekekezie et al. (2025)

In 2024, global diabetes-related health expenditure exceeded USD 1 trillion, a 338% rise over 17 years (International Diabetes Federation, 2025). In Nigeria and other LMICs, out-of-pocket spending predominates, leading to catastrophic costs for many families. For example, studies in Kaduna have documented that even insured diabetic patients often incur high expenses for care (Table 3).

Table 3: Health system and economic impact

Scale	**Value/ Context**
Undiagnosed Cases in Nigeria	~54%
Primary Funding in LMICs/Nigeria	Out-of-pocket spending
Consequence of Funding Model	Catastrophic costs for families
Local Example (Kaduna, Nigeria)	High out-of-pocket expenses even for insured patients

Sources: *International Diabetes Federation, (2025). Ekekezie et al. (2025)*

Kaduna State faces these challenges with limited resources. Kaduna's secondary health facilities – which often serve as the primary sites for diabetes care in the region – shoulder heavy patient loads. Local data indicate that diabetes patients in Kaduna experience substantially impaired quality of life: in one study, patients at tertiary centers reported significantly better HRQoL than those treated at secondary clinics (Oyefabi et al., 2023). This suggests that patients at secondary level (the focus of this review) may lack the same support and education resources as those at higher-level centers. In summary, the growing prevalence of diabetes and its complications in Nigeria (particularly in under-resourced regions like Kaduna) underscores the need for effective self-management support models.

1.2 Importance of Self-Management and Education

Effective diabetes care depends largely on patients' day-to-day self-management behaviors (diet, exercise, medication adherence, glucose monitoring, etc.). Because of the chronic and complex nature of diabetes, patients face continuous demands that can be overwhelming without proper support. High patient knowledge and self-efficacy are associated with better glycemic control and fewer complications (Ekekezie et al., 2025). Conversely, low engagement in self-care is common;

one study found over 50% of adults with T2DM show poor adherence to recommended behaviors (Sun et al., 2025). Thus, Diabetes Self-Management Education (DSME) is considered a cornerstone of care. DSME programs aim to equip patients with the knowledge, skills, and confidence for effective self-care and problem-solving. When well-designed and culturally adapted, DSME has been shown to improve glycemic outcomes and reduce complications. For example, systematic reviews report that structured diabetes education (often nurse-led) significantly improves glycosylated hemoglobin (HbA_1c), blood pressure, and other metabolic markers (Dailah, 2024; Ekekezie et al., 2025).

Beyond clinical measures, education and self-management support can reduce diabetes-related distress and improve psychological adaptation. Patients who understand their disease and how to manage it tend to feel more in control, reducing anxiety and depression. The self-efficacy theory posits that empowering patients (through education and skills training) increases confidence to handle diabetes, which is linked to better coping and behavior change (Sun et al., 2025). A recent RCT in China demonstrated that a 6-week nurse-led self-management program greatly enhanced patients' diabetes self-efficacy and self-care behaviors, while significantly reducing diabetes-specific distress immediately post-intervention (Liang, 2025). These psychosocial benefits of education are key for long-term disease adaptation and quality of life.

1.3 Rationale for Nurse-Led Models

Nurses are uniquely positioned to deliver DSME and ongoing support. As the largest cadre of healthcare workers and often the most accessible providers in LMIC settings, nurses can bridge gaps in specialist care (Dailah, 2024). Over the past decade, nurse-led interventions (including specialized diabetes nursing clinics and education programs) have gained prominence. Studies indicate that nurses can effectively teach patients about diet, medication, and lifestyle, and can provide counseling on coping and behavior change (Dailah, 2024). A recent narrative review found that nurse-led diabetes education consistently produces significant improvements in patients' knowledge, self-care behaviors, glycemic control, and psychological outcomes (e.g. quality of life) (Dailah, 2024). For example, it is well-documented that patients in nurse-led education groups

achieve larger reductions in HbA_{1c} and better self-management scores than those receiving routine care (Dailah, 2024; Sun et al., 2025).

In Nigeria, nurse-led models are particularly promising given physician shortages. Nurse-run clinics and education sessions can reach more patients in secondary facilities. However, much of the published evidence on nurse-led DSME comes from other regions. There is a need to synthesize what is known globally and regionally, then consider how it applies to Kaduna. Understanding the key components of effective nurse-led programs (e.g. individualized assessments, goal-setting, group education, follow-up calls) can guide local implementation. Importantly, nurse-led models can integrate psychosocial support – for example, training patients in adaptive coping strategies and addressing emotional barriers – which is critical for long-term management (Dailah, 2024; Liang, 2025).

1.4 Definitions of Coping and HRQoL

Coping skills in the context of chronic illness refer to the cognitive and behavioral strategies people use to manage stressors and challenges of their condition (Hapunda, 2022). In diabetes, effective coping might include active problem-solving (planning diet, monitoring glucose), seeking emotional or social support, and maintaining a positive mindset (acceptance). In contrast, maladaptive coping includes denial, self-blame, or avoidance (e.g. neglecting care when feeling overwhelmed). Effective coping is linked to better adherence and psychological well-being. For instance, a Zambian study found that diabetes patients who used emotional support coping had better self-care behaviors, whereas those who used self-blame had worse outcomes (Hapunda, 2022).

Health-Related Quality of Life (HRQoL) is a multi-dimensional concept that includes physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of the environment. In diabetes, HRQoL is influenced by symptom burden, treatment complexity, and psychosocial factors (e.g. depression, stigma). Impairments in HRQoL (lower physical functioning, social engagement, etc.) are common among diabetics due to chronic complications and the stress of self-management (Ekekezie et al., 2025). Measuring

HRQoL (e.g. via WHOQOL or disease-specific instruments) provides insight into how diabetes and its management affect overall well-being.

1.5 Aim and Scope of the review

This review aims to synthesize current evidence on nurse-led diabetes education and its impact on patients' coping skills and HRQoL, with a focus on Kaduna State secondary healthcare settings. Specifically, we seek to: (1) describe the typical structure and components of nurse-led DSME programs relevant to Kaduna; (2) examine how such interventions affect patients' coping (knowledge, self-efficacy, psychological adaptation); (3) assess impacts on HRQoL across physical, social, and emotional domains; and (4) identify contextual facilitators and barriers to success in Kaduna (e.g. cultural factors, resource constraints). By integrating quantitative and qualitative findings, this review will clarify how nurse-led education can improve diabetes outcomes and identify gaps for future research and policy in the Kaduna context.

1.6 Significance of the Review

This narrative review makes several important contributions to public health knowledge, practice, and policy. First, by synthesizing evidence on nurse-led education interventions and their impact on coping skills and HRQoL among diabetes patients in Kaduna State's secondary healthcare facilities, the review addresses a significant gap in context-specific evidence for Northern Nigeria. While substantial evidence exists on nurse-led diabetes interventions in high-income countries and some evidence from LMICs generally (Chowdhury et al., 2024; Sun et al., 2025), limited research has specifically examined these issues in the Kaduna State context or in secondary healthcare facilities in Northern Nigeria. This review provides a foundation for understanding the current state of evidence, identifying gaps, and informing context-appropriate intervention development.

Second, the review contributes to understanding of the psychosocial dimensions of diabetes management in Sub-Saharan Africa. While clinical outcomes such as glycemic control have received substantial attention, the psychosocial aspects including coping skills and HRQoL have been less studied in African contexts (Hapunda et al., 2022). By synthesizing evidence on these outcomes and their relationships with nurse-led education, the review advances understanding of

how psychosocial factors influence diabetes outcomes in African settings and how interventions can be designed to address these dimensions effectively. This psychosocial focus is particularly important given the substantial cultural, economic, and healthcare system differences between African contexts and high-income countries where most research on diabetes psychosocial outcomes has been conducted.

Third, the review has important implications for public health practice and healthcare delivery in Kaduna State and similar contexts. By identifying effective components of nurse-led education interventions, understanding how these interventions influence coping skills and HRQoL, and documenting implementation considerations and challenges, the review provides practical guidance for healthcare providers, facility managers, and program coordinators seeking to implement or improve diabetes education services. The emphasis on secondary healthcare facilities, which serve as the primary point of ongoing diabetes care for many patients in Nigeria, makes the review particularly relevant for frontline healthcare providers and administrators working in these settings.

Fourth, the review contributes to healthcare policy development in Nigeria and other LMICs. By documenting the evidence on effectiveness, cost considerations, implementation requirements, and contextual factors influencing success, the review provides policymakers with information needed to make evidence-based decisions about resource allocation, program development, and scale-up of nurse-led diabetes education services. The consideration of economic implications, including the substantial burden of catastrophic health expenditures for diabetic patients in Kaduna State (Babandi, et al 2025), is particularly relevant for policymakers considering investments in preventive and management approaches.

Fifth, the review identifies critical gaps in the evidence base and provides direction for future research. By synthesizing existing evidence and highlighting limitations, gaps, and methodological challenges, the review informs researchers about priority areas for future investigation. This includes the need for more research specifically in Kaduna State, studies examining the long-term sustainability of intervention effects, implementation science research to understand how to effectively scale effective interventions, and economic evaluations to assess cost-effectiveness in

the local context. The review's identification of measurement considerations and methodological issues provides guidance for researchers designing future studies.

The novelty of this review lies in its specific focus on nurse-led education interventions and their impact on coping skills and HRQoL in the context of secondary healthcare facilities in Kaduna State, Nigeria. While other reviews have examined nurse-led diabetes interventions generally (Dailah, 2024), diabetes self-management education in LMICs, HRQoL in diabetes populations, no previous review has specifically integrated these elements in the Kaduna State context. The review's attention to both clinical and psychosocial outcomes, its integration of evidence from multiple disciplines and methodological approaches, and its specific contextual focus provide a unique perspective that advances understanding beyond what previous reviews have offered.

2.0 Methods of the review

2.1 Literature Search Strategy

A comprehensive search of multiple electronic databases was conducted to identify relevant literature published between 2015 and 2024. The following databases were searched: PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, Cochrane Library, African Journals Online (AJOL), Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PsycINFO. Additionally, websites of international and national organizations were searched, including the World Health Organization (WHO), International Diabetes Federation (IDF), Centers for Disease Control and Prevention (CDC), and Nigerian Federal Ministry of Health. These sources were selected to ensure comprehensive coverage of both peer-reviewed research and grey literature relevant to the review topic.

The search strategy was designed to capture literature addressing the four specific objectives of the review: coping strategies among diabetes patients, HRQoL among diabetes patients, relationships between coping strategies and HRQoL, and outcomes of nurse-led education interventions. Given the narrative nature of the review, the search was designed to be broad and inclusive rather than highly restrictive, recognizing that relevant evidence might be found across diverse study designs, disciplines, and publication types.

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2.2 Search Terms

Search terms were developed to capture the key concepts of the review: nurse-led education/nurse-led interventions, diabetes mellitus/diabetes self-management, coping skills/coping strategies, health-related quality of life/HRQoL, and geographic context (Kaduna State, Nigeria, Sub-Saharan Africa). Boolean operators (AND, OR) were used to combine terms appropriately, and search strings were adapted to account for differences in indexing and search functionality across databases.

Key search terms and concepts included:

- **Nurse-led interventions: "**nurse-led education," "nurse-led intervention," "nurse-led program," "diabetes education nurse," "nurse educator," "nurse-led diabetes self-management education," "nurse-led DSME," "nurse practitioner," "diabetes specialist nurse"
- **Diabetes and self-management:** "diabetes mellitus," "type 1 diabetes," "type 2 diabetes," "T2DM," "diabetes self-management," "diabetes self-care," "diabetes education," "diabetes management," "chronic disease management"
- **Coping skills and strategies:** "coping skills," "coping strategies," "coping mechanisms," "adaptation," "psychological adaptation," "problem-solving," "adaptive coping," "maladaptive coping," "Brief COPE," "COPE inventory," "coping orientation"
- **Health-related quality of life:** "health-related quality of life," "HRQoL," "quality of life," "QoL," "well-being," "SF-36," "Short Form-36," "WHOQOL-BREF," "WHOQOL," "Diabetes Quality of Life," "DQoL," "health status," "patient-reported outcomes"
- **Geographic context:** "Kaduna State," "Kaduna," "Nigeria," "Northern Nigeria," "North-western Nigeria," "Sub-Saharan Africa," "Africa," "low- and middle-income countries," "LMICs," "developing countries," "resource-limited settings"
- **Healthcare setting:** "secondary healthcare facilities," "secondary care," "secondary hospitals," "primary healthcare," "outpatient clinics," "diabetes clinics"

A typical search string for PubMed might be: ("nurse-led education" OR "nurse-led intervention" OR "diabetes education nurse") AND ("diabetes mellitus" OR "type 2 diabetes" OR

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"diabetes self-management") AND ("coping skills" OR "coping strategies" OR "Brief COPE") AND ("health-related quality of life" OR "quality of life" OR "HRQoL") AND ("Nigeria" OR "Africa" OR "Sub-Saharan Africa").

2.3 Search Filters/Limiters

The search was restricted to publications from 2015 to 2024 to ensure relevance and currency of evidence, given rapidly evolving knowledge and practices in diabetes management and education. No language restrictions were applied in principle, though the practical focus was on English-language publications given the predominance of English-language research in the databases searched. Study type filters were not applied during the initial search, given the narrative review's aim to include diverse evidence types. However, during the selection process, different types of evidence were considered and appropriate weighting given to studies based on methodological rigor and relevance to review objectives.

2.4 Other Sources

In addition to database searches, several supplementary methods were employed to identify relevant literature. Reference lists of key articles and review papers were hand-searched to identify additional relevant studies not captured through database searches. Citation searching was conducted for highly relevant articles to identify more recent work that had cited them. Grey literature repositories including OpenGrey, ProQuest Dissertations and Theses, and institutional repositories were searched for theses, dissertations, technical reports, and other grey literature. Experts in the field, including diabetes researchers, nursing educators, and public health specialists working in Northern Nigeria, were contacted where possible to identify unpublished or in-press work relevant to the review topic.

2.5 Selection Criteria

The screening and selection of literature were based on criteria (Table 4)

2.6 Selection Process

The study selection process followed a multi-stage screening approach typical of systematic and narrative reviews. First, titles and abstracts of all identified records were screened by the primary

reviewer to identify potentially relevant studies based on the inclusion/exclusion criteria. Studies that were clearly irrelevant based on title or abstract were excluded at this stage. For studies where relevance was unclear from title and abstract alone, full-text articles were retrieved for further assessment.

Table 4: Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Geographic focus	Settings similar to Kaduna (Nigeria or other sub-Saharan African/LMIC contexts) or systematic reviews including such settings	High-income countries without LMIC representation
Intervention	Nurse-led education or interventions for diabetes patients	Non-nurse-led interventions
Measured outcomes	Coping (knowledge, self-efficacy, coping strategy use, psychological distress) or health-related quality of life	Studies without coping or HRQoL outcomes
Population	Adults with type 2 diabetes (or mixed diabetes types)	Type 1 diabetes only (without mixed types)
Setting	Outpatient or community settings	Inpatient settings
Study design	Qualitative and quantitative studies, randomized trials, observational studies	Studies without measured outcomes
Study type	Peer-reviewed studies and credible reports	Non-peer-reviewed or non-credible sources

Second, full-text articles of potentially relevant studies were assessed against the inclusion/exclusion criteria in greater detail. The primary reviewer conducted this assessment, with consultation with the research team for ambiguous cases. Studies meeting all inclusion criteria and no exclusion criteria were included in the full review. Studies excluded at this stage were documented with reasons for exclusion.

Throughout the selection process, efforts were made to minimize bias and ensure transparency. Screening decisions were documented in a systematic manner, and when uncertainty existed, the principle of inclusion was generally followed to avoid potentially excluding relevant evidence. The narrative nature of the review allowed for inclusion of studies with varying methodological rigor, with critical appraisal conducted during data synthesis rather than as a strict inclusion/exclusion criterion.

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2.7 Data Extraction and Thematic Synthesis Approach

From each included source, we extracted data on: study design, location, sample characteristics (age, diabetes type), description of nurse-led intervention (structure, duration, content), and reported outcomes on coping skills and/or HRQoL. We also noted any mentions of implementation context (barriers, enablers). Extracted findings were coded inductively to identify recurring themes: coping strategy types, changes in knowledge/self-efficacy, dimensions of HRQoL affected, etc. We then organized these codes into thematic categories aligned with our objectives (see Thematic Synthesis below). Where available, quantitative effect sizes (e.g. mean differences in HbA_1c, self-efficacy scales, QoL scores) were noted to gauge the magnitude of intervention effects. Given the varied study designs, we did not perform a meta-analysis. Instead, we qualitatively synthesized the evidence, giving attention to consistency of findings and study quality. Where systematic reviews or meta-analyses existed (e.g. on nurse-led DSME), we used their pooled results to inform our synthesis. Throughout, we focused on summarizing what is known about nurse-led education effects in contexts relevant to Kaduna, highlighting both empirical findings and contextual insights.

2.8 Thematic Synthesis of Evidence

2.8.1 Common Structures of Nurse-Led Interventions in Kaduna

Nurse-led diabetes education programs vary in structure but share key elements. Typically, they consist of multiple structured sessions (often ≥3) focusing on disease education and self-management skills. For example, one RCT described a 6-week program with one individual counseling session, three group training sessions, and two follow-up telephone calls, all delivered by trained nurses (Liang, 2025). In meta-analytic reviews, interventions were characterized by regular face-to-face education (covering diet, medication adherence, exercise, blood glucose monitoring) and by strategies to boost motivation (goal-setting, problem-solving techniques) (Dailah, 2024; Sun et al., 2025). Some programs incorporate family members or peer support to strengthen social backing. Importantly, many nurse-led models are underpinned by behavioral theory (e.g. self-efficacy theory) to explicitly build patient confidence (Liang, 2025; Sun et al., 2025).

In Kaduna and similar LMIC contexts, nurse-led programs often occur in routine clinic settings. Common features include: use of visual aids or simple handouts to overcome literacy barriers; emphasis on culturally relevant diet/exercise advice; group sessions to leverage shared learning; and continuity of care via regular follow-ups. Training of nurses in counseling skills (motivational interviewing, empathetic communication) is frequently part of the intervention design, recognizing that nurses must also coach patients through the psychological burden of diabetes (Dailah, 2024). While direct evidence from Kaduna-specific trials is limited, these general structures – regular, interactive education sessions supplemented by follow-up – appear feasible and effective in similar sub-Saharan settings (Dailah, 2024; Liang, 2025).

2.8.2 Effects on Coping Skills: Knowledge, Self-Efficacy, Psychological Adaptation

Diabetes Knowledge: Nurse-led education consistently raises patients' diabetes-related knowledge. Patients report better understanding of the disease, its treatment, and lifestyle adjustments after structured programs. Improved knowledge is a proximal outcome of education. For instance, meta-analyses note "significant improvements in diabetes knowledge" in nurse-led groups versus usual care (Dailah, 2024). In practice, higher knowledge enables more effective self-management (e.g. knowing how to adjust meals to control blood glucose). Although none of the retrieved studies in Kaduna explicitly measured knowledge gains, analogous programs in Nigeria and other countries show this trend as a usual first step towards better coping.

Self-Efficacy: A robust finding is that nurse-led education greatly enhances self-efficacy, i.e. patients' confidence in managing their diabetes. In a meta-analysis of RCTs, Sun et al. found a large standardized effect (SMD ≈ +1.48) in self-efficacy scores for nurse-led DSME compared to control (Sun et al., 2025). Likewise, a Chinese trial reported significantly higher self-efficacy immediately after the intervention ($p<0.001$) (Liang, 2025). Greater self-efficacy reflects better psychological adaptation: patients feel more capable of problem-solving daily challenges. This translates into sustained behavior changes. For example, those with increased self-efficacy were more likely to adhere to medication schedules and exercise regimens. Improved self-efficacy is also linked to reduced anxiety about hypoglycemia or complications. Given that self-efficacy is a

key mediator of coping, these results suggest nurse-led programs effectively build psychological resilience in patients.

Adaptive Coping Strategies: Nurse-led programs help patients shift towards more adaptive coping. Adaptive strategies observed include active problem-solving, goal-oriented planning, and importantly, using social and religious support. In the Zambian study, adaptive coping (esp. religious coping and acceptance) was most common among patients (Hapunda, 2022). Nurse educators often acknowledge and leverage such culturally salient strategies. For example, a program might discuss how spiritual faith or community prayer groups can support stress management. Educational sessions can normalize use of positive coping (seeking emotional support from family or support groups) and teach skills like relaxation or cognitive reframing. By contrast, maladaptive coping (e.g. self-blame or withdrawal) tends to decline: patients learn problem-focused techniques instead of blaming themselves or ignoring treatment. The same Zambian study noted that self-blame was associated with poorer self-care (Hapunda, 2022); by countering self-blame through education and emotional support, nurse-led interventions improve psychological outcomes.

In summary, nurse-led education strengthens coping skills by increasing knowledge and self-efficacy and promoting adaptive strategies. Patients leave with better understanding of diabetes, feel more capable of managing it, and adopt healthier coping patterns (e.g. seeking support rather than avoiding problems). These gains reduce diabetes-specific distress and depression: the Zambian study explicitly found that patients with maladaptive coping had higher distress and depression (Hapunda, 2022). Thus, by fostering adaptive coping, nurse-led programs address the psychological adaptation aspect of diabetes.

2.8.3 Impacts on Health-Related Quality of Life: Physical, Social, Emotional Domains

Improving HRQoL is a central goal of patient education. Several studies demonstrate that nurse-led DSME can yield gains in various QoL domains. On the physical health domain, improved self-care (medication adherence, diet, exercise) leads to better glycemic control, which in turn reduces symptoms (fatigue, neuropathy pain) and complications. Meta-analytic evidence shows that nurse-led interventions significantly lower HbA_{1c} (e.g. MD ≈ –0.92 at 4–6 months) (Sun et al., 2025).

Such biomedical improvements are known to correlate with physical QoL improvements. For example, patients in nurse-led programs often report greater energy and mobility after their blood sugar is better controlled.

In the emotional/psychological domain, education and coping support have clear benefits. By addressing fears and frustrations, education reduces diabetes-related distress. This has been observed empirically: the Chinese RCT reported significant reductions in diabetes-related distress in the nurse-led group (Liang, 2025). As patients feel more in control and supported, depression and anxiety symptoms tend to lessen. Importantly, improving psychological coping itself is part of QoL enhancement: for instance, patients who learned stress management techniques reported better mood and life satisfaction at follow-up.

On the social functioning domain, nurse-led education often engages family or peers, which strengthens social support networks – a known protector of QoL. Group education sessions allow patients to share experiences, reducing isolation. Qualitative feedback from interventions (noted in some studies) suggests participants feel encouraged by family involvement encouraged by nurses. However, social/QoL data are less frequently quantified in the literature. One relevant finding from Kaduna is that patients managed in tertiary vs. secondary care reported significantly higher social and emotional QoL scores (Oyefabi et al., 2023), implying that effective support structures (more common in tertiary centers) benefit those domains. By extension, nurse-led programs at the secondary level – if well-implemented – could help close that gap, for example by linking patients to community resources or support groups.

In summary, evidence indicates nurse-led education improves overall HRQoL. Meta-analyses of DSME (though not always nurse-specific) show modest but significant QoL gains. Dailah's review explicitly notes that nurse-led groups achieve better psychosocial outcomes and quality of life (Dailah, 2024). In practice, patients report improvements in energy levels, mood, and social participation following such interventions. It should be noted that baseline HRQoL among Nigerian diabetics is often low: for example, only ~7% of patients had "good" overall QoL in Port Harcourt, and many Enugu patients fared worse on WHOQOL scales than healthy peers (Ekekezie

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et al., 2025). Nurse-led education offers a way to ameliorate these deficits by addressing both medical and emotional needs.

2.9 Contextual facilitators and barriers in Kaduna

Facilitators: In Kaduna State, several contextual factors influence the success of nurse-led education. In terms of coping specifically, poverty and social stress can push patients towards maladaptive coping (e.g. hopelessness or reliance solely on divine healing). Therefore, a facilitator can be strong informal support networks: involving family members in education can turn community gatherings into educational opportunities (Table 5). Overall, understanding these Kaduna-specific contexts – scarce resources, socioeconomic challenges, cultural preferences – is crucial. Programs must be adapted accordingly (e.g. using simple visuals, providing low-cost self-care tips, scheduling sessions at accessible times) to be effective (Dailah, 2024).

Table 5: Facilitators

Facilitator	Description & Impact
Nurse-Patient Trust & Accessibility	Nurses are widely trusted and serve as the primary point of contact for healthcare. This established relationship allows them to significantly increase patient engagement and participation in education programs.
Cultural & Religious Affinity	The local population in Kaduna relies heavily on religious coping and strong community bonds. Educational programs that acknowledge and incorporate these local beliefs—such as framing diabetes management within the context of faith and daily practices—are more likely to resonate and be accepted by patients.
Policy Support for Primary Care	There is a growing emphasis on strengthening primary healthcare, with nurses increasingly placed in leading roles. This policy environment provides a supportive framework for establishing and expanding nurse-led clinics.

Source: Hapunda, (2022).

Barriers: Resource constraints are significant. Secondary facilities in Kaduna often have high patient-to-nurse ratios and limited diabetes-specific training for nurses. This can strain the delivery of multi-session education. Economic barriers also affect outcomes: patients may be unable to afford healthy foods or medications, undermining education efforts. As noted in Kaduna research, even patients with insurance face catastrophic expenses (Babangida et al., 2025). Low literacy

rates can hinder the effectiveness of written educational materials. Finally, cultural attitudes such as stigma or fatalism about chronic illness may discourage active coping (Table 6).

Table 6: Barriers

Barriers	Description & Impact
Resource Constraints	Secondary facilities often have high patient-to-nurse ratios and limited diabetes-specific training. This strains the capacity to deliver multi-session education programs effectively.
Economic Hardship	Patients frequently struggle to afford healthy foods and medications. Research indicates that even insured patients face catastrophic out-of-pocket expenses, undermining efforts to adhere to education recommendations (Babandi et al., 2025).
Low Literacy Rates	Limited literacy within the population hinders the effectiveness of standard written educational materials.
Cultural Attitudes & Poverty	Stigma or fatalism regarding chronic illness can discourage active coping. Furthermore, poverty and social stress may drive patients toward maladaptive strategies, such as hopelessness or relying solely on divine healing rather than medical management.

Sources: Babandi et al., (2025).

3.0 Discussion of findings

3.1 Summary of Main Findings of the review

This review synthesizes evidence that nurse-led diabetes education positively influences coping skills and HRQoL for patients, while highlighting gaps in the Kaduna context. Key findings include: (1) Coping improvements: Patients receiving nurse-led DSME demonstrate higher self-efficacy and more adaptive coping strategies. They shift towards problem-focused and support-seeking behaviors, reducing self-blame and emotional distress (Hapunda, 2022) (Liang, 2025). (2) Knowledge gains: Such interventions consistently increase diabetes knowledge, empowering patients to manage daily care tasks (though specific knowledge scores were not quantified here). (3) Clinical and psychosocial outcomes: Nurse-led programs significantly improve glycemic control (reducing HbA_1c by ~0.5–0.9%) (Sun et al., 2025) and psychosocial well-being (elevated self-efficacy, reduced distress). (4) HRQoL enhancement: Participants often report better physical and emotional health after interventions, though baseline QoL in Kaduna patients remain low. The

only Kaduna-specific study found that patients at well-resourced tertiary centers had better HRQoL than those at secondary centers (Oyefabi et al., 2023), implying that strengthening secondary-level education could lift patient QoL.

However, evidence directly from Kaduna State is scarce. Most included studies are from other African countries or systematic reviews of LMIC settings. Nevertheless, the consistency of findings across settings supports the inference that Kaduna patients could benefit similarly from nurse-led education. In summary, nurse-led education appears to bolster the psychological resources (knowledge, confidence, coping) that patients need, leading to tangible improvements in life quality and clinical indicators.

3.2 Comparison with National/Global Literature

Our findings align closely with international research on nurse-led diabetes care. Global meta-analyses consistently show that structured DSME under nurse leadership produces better glycemic and psychosocial outcomes than usual care (Sun et al., 2025) (Dailah, 2024). The magnitude of HbA_1c reduction in nurse-led groups (~0.5–1.0%) matches or exceeds typical results of medication changes (Sun et al., 2025). Improvements in self-efficacy and self-care behaviors are also widely reported, as seen in the Chinese RCT (Liang, 2025) and other trials. The prominence of religious coping in African patients (Hapunda, 2022) echoes findings from similar contexts (e.g. Ghana, Malawi), suggesting a cultural pattern of faith-based coping that local programs should respect.

Similarly, the depressed HRQoL observed in Nigerian studies mirrors global observations that diabetes significantly impairs quality of life. In Nigeria specifically, prior surveys have noted low overall QoL in diabetics, with critical gaps in therapy adherence translating to poor outcomes (Ekekezie et al., 2025). The relatively better QoL in Kaduna tertiary versus secondary facilities (Oyefabi et al., 2023) is a novel insight, highlighting local health system disparities. Internationally, this aligns with the idea that more intensive support (often present in tertiary centers) yields better patient well-being.

Notably, the literature emphasizes that multicomponent education (including psychological support) is more effective than purely didactic teaching. The evidence we reviewed supports this:

nurse-led programs that integrated coping training and follow-up (not just information giving) had the strongest effects. This is consistent with WHO recommendations for DSME to include psychosocial as well as clinical education.

3.3 Methodological Strengths and Gaps in Reviewed Studies

The evidence base has strengths: many studies were randomized controlled trials or systematic reviews (Sun et al., 2025). The consistency of findings across these methods strengthens confidence. Inclusion of grey literature helped capture context-specific information (e.g. local HRQoL studies). Moreover, narrative synthesis allowed integration of quantitative outcomes with qualitative themes (patients reported coping strategies).

However, significant gaps remain. Few studies specifically target Kaduna State or northern Nigeria. Most research is cross-sectional or small-scale; very few Nigerian studies measured coping or QoL as outcomes of interventions. The quality of some studies varies: some relied on self-reported measures without control groups, limiting causal inferences. Publication bias is a concern, as negative or null findings may be underreported, especially in program evaluations. Also, heterogeneity in outcome measures (different coping scales, QoL instruments) makes quantitative comparison difficult. For example, while WHOQOL-BREF is used in some Nigerian studies, many interventions reported only generic measures of distress or satisfaction.

Crucially, there is a lack of long-term follow-up data. Many reported benefits (e.g. self-efficacy gains) were measured immediately post-intervention (Liang, 2025); whether these persist is unclear (the Chinese trial found effects diminished by 3 months post-intervention). Sustainability of improved coping and QoL is an open question. Finally, most studies focus on type 2 diabetes; evidence for type 1 diabetes patients in Nigeria is even scarcer.

3.4 Implications for Nursing Practice and Policy

The findings have clear implications. For practice, secondary healthcare facilities in Kaduna should consider implementing or expanding nurse-led DSME programs. Training nurses in diabetes education and counseling is critical. Programs should incorporate psychosocial support: for example, assessing patients' coping styles (perhaps using Brief COPE) and addressing

maladaptive strategies. Nurses should be empowered to provide ongoing follow-up (e.g. phone check-ins) and to involve family, when possible, as social support is linked to better outcomes (Hapunda, 2022). Given resource limits, education content must be concise, culturally sensitive (e.g. leveraging religious themes), and easy to repeat.

For policy, health administrators should recognize nurse-led education as a cost-effective strategy to improve outcomes. Policies could mandate that secondary clinics allocate time and space for structured education sessions. Government and NGOs might fund nurse training workshops in motivational interviewing and diabetes counseling. Ensuring nurses have educational materials (flipcharts, posters in local languages) is another low-cost support. Importantly, integrating nurse-led education into routine care (e.g. scheduling group classes on clinic days) would help institutionalize it. Finally, addressing broader barriers (e.g. financial subsidies for diabetic supplies, promoting health insurance coverage) will amplify the benefits of education.

3.5 Conclusion and Future Directions

3.5.1 Overall Conclusions

In summary, the evidence indicates that nurse-led education can significantly enhance coping skills and HRQoL among diabetes patients, by improving knowledge, building self-efficacy, and addressing psychological stress. These interventions yield better clinical outcomes (notably glycemic control) and likely improve patients' physical and mental well-being. Such models are well-suited to resource-constrained settings like Kaduna, where nurses are often the primary educators available. However, the specific impact in Kaduna's secondary facilities remains under-studied. Existing local research shows that without targeted support, patients' quality of life at this level lags behind that in better-resourced centers. Thus, implementing nurse-led DSME in Kaduna has strong theoretical and indirect evidence of benefit, but requires formal evaluation.

3.5.2 Identified Research Gaps

Major gaps highlighted by this review include: (1) Kaduna-specific trials: There is a need for well-designed interventional studies in Kaduna State that evaluate nurse-led programs' effects on coping and HRQoL, preferably with control groups and standardized measures. (2) Long-term

outcomes: Future research should examine whether improvements in coping and QoL are sustained over time, and how often "refresher" education is needed. (3) Economic evaluation: Cost-effectiveness analyses of nurse-led education in Nigeria would inform policy decisions. (4) Barriers/facilitators: Qualitative studies in Kaduna could explore patients' and nurses' perceptions to tailor interventions (e.g. addressing cultural beliefs, language differences, or stigma). (5) Diverse populations: Research should include women, older adults, and rural patients who may face unique challenges.

3.5.3 Policy/Practice Call to Action

Given the promising evidence, health authorities and facility managers in Kaduna should prioritize integration of nurse-led diabetes education into routine care. This may involve developing standardized training curricula for diabetes nurses, allocating time for group education sessions, and monitoring patient outcomes (e.g. via periodic coping/QoL surveys). Collaboration with community leaders (including religious organizations) could enhance program reach and cultural relevance.

At the national level, policymakers should recognize nurse-led education as an essential component of diabetes care guidelines. Resources (e.g. funding, educational materials) should be directed to strengthen nursing capacity in chronic disease management. Finally, stakeholders (governments, donors, NGOs) should support further research on nurse-led models in Nigeria. By closing the evidence gaps and translating existing knowledge into action, Nigeria can improve the lives of millions of diabetic patients.

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