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Awareness, Prevalence and Risks of Diabetic Neuropathy among Type – 2 Diabetic Mellitus (T2dm) Patients in a Tertiary Health Centre in Nigeria: A Systematic Review

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ABSTRACT

Background: *Diabetic peripheral neuropathy (DPN) is a prevalent and debilitating complication of Type 2 Diabetes Mellitus (T2DM) that significantly impacts patients' quality of life and imposes a considerable burden on healthcare systems. Despite the rising prevalence of diabetes in Nigeria, awareness, early detection, and management of DPN remain suboptimal. This study systematically reviews existing literature to evaluate the awareness, prevalence, and risk factors associated with DPN among T2DM patients in selected tertiary healthcare facilities in Africa. The review also identifies gaps in research and provides recommendations for improved management strategies.*

Methods: *A systematic review was conducted following the PRISMA guidelines. Literature from 2014 to 2024 was sourced from PubMed, Scopus, and Google Scholar using keywords related to DPN, T2DM, prevalence, awareness, and risk factors. Studies were screened using defined inclusion and exclusion criteria, and quality assessment was performed using the Newcastle-Ottawa Scale (NOS). Data extraction focused on study characteristics, findings, and key outcomes.*

Results: *Fourteen studies met the inclusion criteria, with reported DPN prevalence ranging from 29.4% to 93.3%. Key risk factors included advanced age, poor glycemic control, hypertension, obesity, and long disease duration. Awareness of DPN was notably low, with limited routine screening practices in healthcare facilities. Diagnostic variability among screening tools, such as the Michigan Neuropathy Screening Instrument (MNSI) and biothesiometers, highlighted a need for standardization. The review identified significant gaps in patient education, standardized protocols, and long-term evaluations of interventions.*

Conclusion: *DPN remains a critical complication of T2DM, with significant implications for patient quality of life and healthcare systems. Addressing gaps in awareness, routine screening, and diagnostic practices is essential. Future research should prioritize longitudinal studies, patient-centered education, and cost-effective diagnostic tools to mitigate the burden of DPN in resource-constrained settings.*

Keywords: Peripheral neuropathy, Diabetes mellitus, Prevalence, Awareness, Risk factors

INTRODUCTION

Diabetes mellitus (DM) is a metabolic condition characterized by persistent hyperglycemia, which causes disorder of glucose, protein, and lipid metabolism as a result of absolute or relative insulin deficiency or resistance in conjunction with organ system

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dysfunction.[1] In people with diabetes mellitus, up to 50% develop diabetic neuropathy.[2] The most prevalent of these neuropathic disorders is distal symmetrical polyneuropathy, sometimes known as "diabetic peripheral neuropathy" (DPN). Poor glycemic management and contributing factors to microvascular disease, such as obesity and hypertension, are risk factors for DPN. There is compelling evidence that nerve ischemia is the cause of DPN in both humans and animals.[3] DPN is among the most prevalent consequences of diabetes, and the longer a person has the disease, the more common it becomes. DPN affects 10–15% of those with newly diagnosed type 2 diabetes, and it can reach 50% of people who have had the disease for more than ten years.[4] The most typical clinical signs of DPN are paresthesia, numbness, and discomfort in both limbs. In extreme situations, foot ulcers may develop, which may potentially result in amputation.

In a multicenter study conducted in Nigeria by researchers to examine the burden of Diabetic foot ulcers, they found out that the burden is high and this was closely linked with inadequate knowledge about their conditions, visiting quack doctors or chemists as well as presenting late to the hospital for adequate and proper monitoring and care and this has led to high amputation rate in Nigeria.[5] After foot ulcer, the next common complication which they found among patients with T2DM was DPN (See Figure 1).

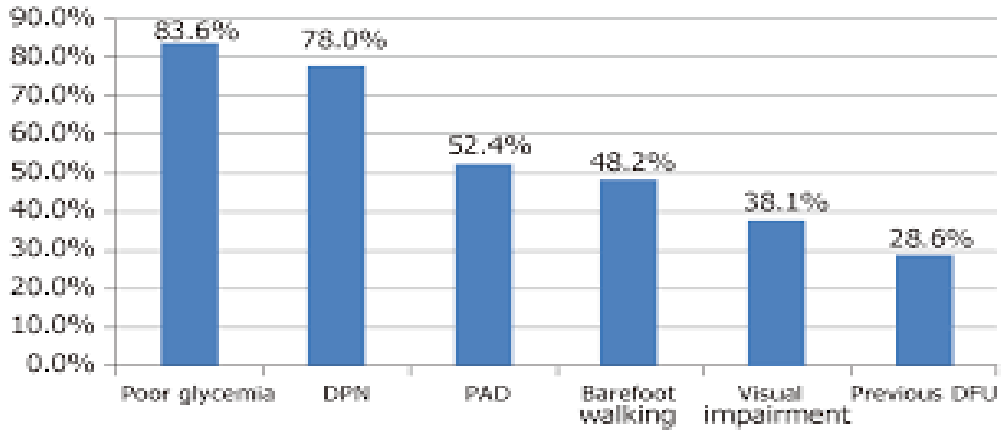

Figure 1: Common complications amongst T2DM patient (Source: Ugwu et al., 2019).[5]

Diabetic peripheral neuropathy (DPN) is a common disorder and is defined as signs and symptoms of peripheral nerve dysfunction in a patient with diabetes mellitus (DM) in whom other causes of peripheral nerve dysfunction have been excluded. Diabetic peripheral neuropathy (DPN) is a common microvascular complication of DM that increases the potential for morbidity and disability due to ulceration and amputation.[6] Despite the increasing burden of diabetes in Nigeria, the awareness, early detection, and management of DPN remain inadequate. Studies suggest that a significant proportion of T2DM patients develop DPN-related complications due to late diagnosis, poor glycemic control, and limited access to proper screening and treatment. Additionally, the variability in diagnostic approaches across different healthcare facilities poses a challenge to

standardizing care. Understanding the level of awareness, prevalence rates, and associated risk factors is crucial for developing targeted interventions that improve patient outcomes.

Rationale of Study

There is a significant amount of variation in the primary studies on DM regarding the prevalence of DPN in Africa.[7] The prevalence of Diabetic Neuropathy varies in literature however in a previous study it was said to be 71.1% as at 2022 [8] and the number keeps increasing. Another study also reported that the most common complication of diabetes mellitus is diabetic polyneuropathy (DPN) and it affects more than 50% of people with type 1 or type 2 diabetes (T2DM). [8, - 11]

To date, the majority of studies on the prevalence, awareness and risk factors have been carried out in Western countries but very little have examined associated determinants of DPN amongst these patients [12,13]. Patients may not have adequate knowledge about diabetes and its complications, leading to suboptimal self-management and increased risks. Despite the high prevalence of Type 2 Diabetes Mellitus (T2DM) in Nigeria, the routine assessment for diabetic peripheral neuropathy; a leading cause of diabetic foot, amputation, and mortality among these patients is not commonly practiced in many Nigerian hospitals and even Africa generally. Some studies have investigated DPN in Africa including Nigeria, yet there remains a lack of systematic synthesis of findings that can inform policy and clinical practice. Given that DPN is often underdiagnosed, this review seeks to bridge the gap by analyzing studies conducted in tertiary healthcare facilities to assess the current state of awareness, prevalence trends, and key risk factors associated with DPN. By synthesizing existing evidence, this study aims to highlight research gaps and propose strategies to enhance early detection, diagnosis, and management of DPN.

Objectives of the Study

The main objective of this study is to systematically evaluate and synthesize existing literature on the awareness, prevalence, and risk factors of diabetic peripheral neuropathy (DPN) among Type 2 Diabetes Mellitus (T2DM) patients. The specific objectives are to:

1. determine the level of awareness and understanding of diabetic neuropathy among T2DM patients.
2. determine the prevalence of diabetic peripheral neuropathy among T2DM patients.
3. identify key risk factors associated with diabetic peripheral neuropathy in T2DM patients.
4. explore the impact of diagnostic and screening practices for DPN in selected health facilities
5. evaluate the implications of diabetic peripheral neuropathy on patients' quality of life and functionality.

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6. identify gaps in current research on DPN and provide recommendations for future studies.

METHODS

Study Design

This study follows a systematic review methodology based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (See Figure 2). The review focuses on studies published between 2014 and 2024 that examine awareness, prevalence, and risk factors associated with diabetic peripheral neuropathy (DPN) among Type 2 Diabetes Mellitus (T2DM) patients.

Search Strategy

A comprehensive literature search was conducted across three major databases: PubMed, Scopus, and Google Scholar. The search terms included: "Diabetic Neuropathy", "Diabetic Peripheral Neuropathy", "Type 2 Diabetes Mellitus", "Prevalence", "Awareness", "Risk Factors", "Nigeria"

Both Medical Subject Headings (MeSH) terms and free-text keywords were used to ensure an extensive search. Boolean operators (AND, OR) were applied to refine search results and the search was limited to studies published in English between 2014 and 2024.

PubMed search strategy: ("Diabetic Neuropathy"[MeSH Terms] OR "diabetic peripheral neuropathy") AND ("Type 2 Diabetes Mellitus"[MeSH Terms] OR "T2DM") AND ("awareness" OR "knowledge" OR "prevalence" OR "risk factors") AND ("Nigeria" OR "West Africa" OR "Sub-Saharan Africa")

Google Scholar search strategy: ("Diabetic Neuropathy" OR "Diabetic Peripheral Neuropathy") AND ("Type 2 Diabetes Mellitus" OR "T2DM") AND ("prevalence" OR "awareness" OR "knowledge" OR "understanding" OR "severity" OR "quality of life" OR "QoL" OR "research gaps" OR "unmet needs" OR "risks") AND ("patients") AND ("Nigeria" OR "Africa")

Scopus search strategy: (TITLE-ABS-KEY ("Diabetic Neuropathy" OR "Diabetic Peripheral Neuropathy") AND TITLE-ABS-KEY ("Type 2 Diabetes Mellitus" OR "T2DM") AND TITLE-ABS-KEY ("prevalence" OR "awareness" OR "knowledge" OR "understanding" OR "severity" OR "quality of life" OR "QoL" OR "research gaps" OR "unmet needs" OR "risks") AND TITLE-ABS-KEY ("Nigeria" OR "Africa"))

Eligibility Criteria

Studies included in this review were those conducted in Africa and focused on T2DM patients. Only peer-reviewed articles published in English that reported data on awareness, prevalence, or risk factors associated with DPN were considered. The review encompassed various study designs, including observational, cross-sectional, cohort, and case-control studies.
Conversely, studies that exclusively examined Type 1 Diabetes Mellitus were excluded, as were those lacking full-text availability. Additionally, conference abstracts, reviews, editorials, and opinion pieces were not considered.
Data Screening and Selection Process

The selection of studies followed a two-stage process. In the first phase, duplicate studies were removed, and the remaining articles were screened based on their titles and abstracts to determine their relevance to the research question. In the second phase, full-text articles that met the inclusion criteria were thoroughly reviewed to ensure methodological rigor and relevance. Any discrepancies in the selection process were resolved through discussion among the reviewers.

Quality Assessment

The quality of the included studies was evaluated using the Newcastle-Ottawa Scale (NOS), which assesses clarity of research objectives, appropriateness of study design, ethical considerations, sampling strategies, data collection methods, rigor in data analysis, and the generalizability of findings.

Data Extraction

In total, 298 articles were retrieved in total from the 3 databases with 102 from PubMed, 115 from Google Scholar and 81 from Scopus. 54 of the manuscripts were removed due to them being duplicates. Furthermore, based on the title and the abstract, 96 articles were excluded; and 47 more articles were removed because they focused more on biochemical parameters in relation to diabetic neuropathy; 38 articles were removed because they did not address the focus of this systematic review; and another 49 articles were removed because they were not primarily focused on diabetic neuropathy. Finally, a total of 14 studies were included in the systematic literature review.

Framework

The patient/population, intervention, comparison and outcomes (PICO) framework for systematic review was used for inclusion criteria (See Figure 2).

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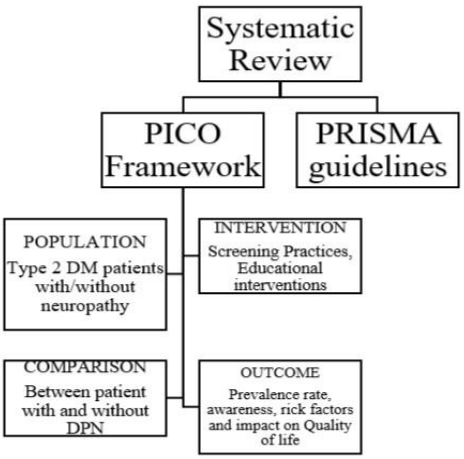

Figure 2: Systematic Review Framework

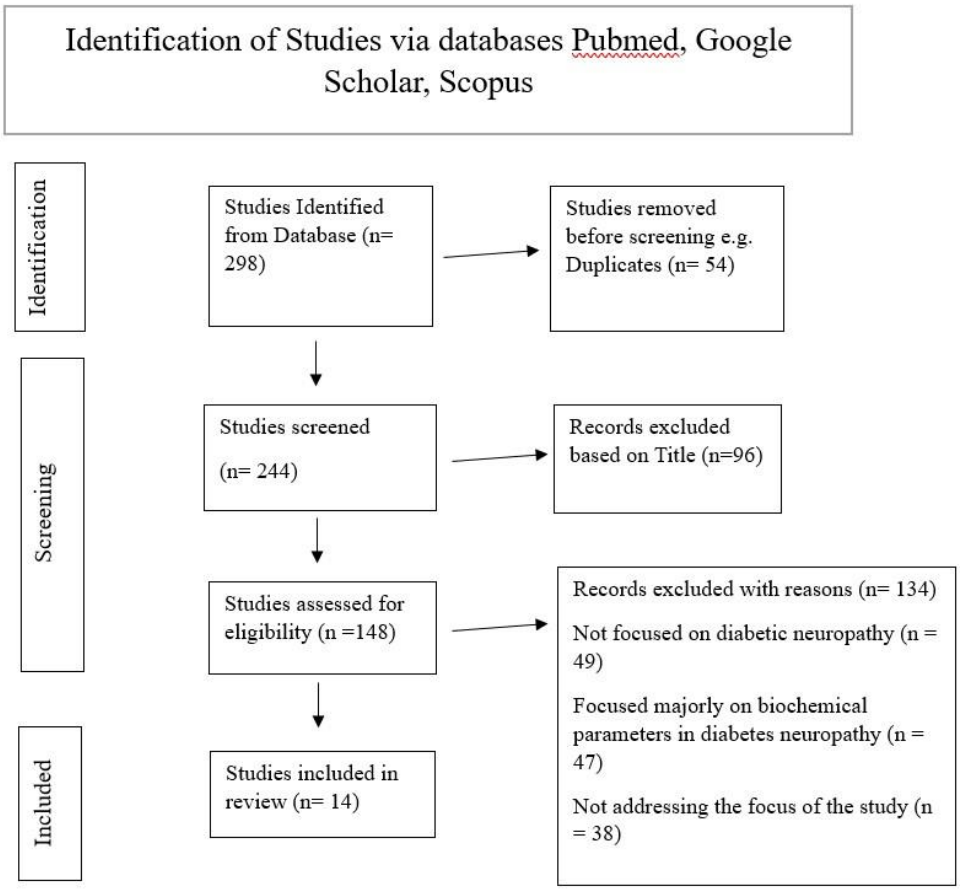

Figure 3: PRISMA Framework

RESULTS

Summary of the Systematic Review

S/N	Author	Study Country, Continent	Study Overview	Study Characteristics	Findings
1	Abbas et al., 2024[14]	Tanzania, East Africa	This study aimed to characterize the epidemiology and clinical burden of Charcot Neuroarthropathy (CN) among a large population of diabetes patients	Conducted between January 2013 and December 2015, the prospective analytic cohort study explored the prevalence of CN, its relationship with diabetic peripheral neuropathy (DPN), and its implications for patient outcomes	The prevalence of CN among the diabetes population increased significantly over the three years, from 1.6% in 2013 to 20% in 2014, and 34% in 2015, with the rise being statistically significant ($P < 0.001$). CN was strongly associated with neuropathy and posed serious risks, including severe deformity, disability, and limb amputation.
2	Adeniyi et al., 2015[15]	Nigeria, West Africa	This study explores the prevalence of foot problems among patients with Type 2 Diabetes Mellitus (T2DM) and their relationship with habitual physical activity.	Using the Baecke Physical Activity Questionnaire, Michigan Neuropathy Screening Instrument, Lower Limb Function Scale, and a custom foot deformity audit, the study assessed 246 patients.	The findings revealed that work-related physical activity was highest, while participation in sports and leisure activities was reduced. Peripheral neuropathy affected 26.1% of patients, and 19.7% had the lowest limb function. Pes planus was the most common foot deformity (20.1%), with significant differences in physical activity indices across deformity groups. Reduced physical activity was associated with higher neuropathic scores, forefoot deformities, and lower limb dysfunction, highlighting the need for tailored physical activity interventions for these patients.
3	Amour et al., 2019[16]	Tanzania, East Africa	This study investigated the burden, severity, and associated risk factors of diabetic peripheral	The study included 327 diabetic patients (65.7% females and 34.3% males) with a mean age of 57.2 years. Most participants had Type 2 DM	The prevalence of DPN was 72.2%, with severe neuropathy observed in 55% of affected patients, moderate in 19%, and mild in 26%. The severity increased with age (>40 years), higher BMI, and

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			neuropathy (DPN), a common microvascular complication of diabetes mellitus (DM) that can lead to severe outcomes like amputation or death	(72%), while the rest had Type 1 DM (27.2%). Neuropathy prevalence was assessed alongside factors like age, BMI, and diabetes duration. The severity of DPN was categorized into mild, moderate, and severe forms, and associations with risk factors were analyzed	longer diabetes duration (>7 years). Key risk factors included age >40 years (OR 2.8), age >60 years (OR 6.4), obesity (OR 6.7), and hypertension (OR 4.3). The study highlighted that DPN is underdiagnosed in northern Tanzania, where routine neuropathy screening is lacking. Nearly half of the patients with neuropathy presented with severe cases, emphasizing the need for improved screening and management strategies.
4	Awadalla et al., 2017[17]	Sudan, North Africa	This study investigated the prevalence of complications associated with Type 2 Diabetes Mellitus (T2DM) across different cities in Sudan.	The study included 424 individuals with T2DM, with a near-equal gender distribution (50.7% males, 49.3% females). Data were collected through standardized interviews that recorded medical history, socio-demographic factors, lifestyle characteristics, and diabetes-related complications. Glycemic control was assessed using HbA1c levels, with good control defined as HbA1c <7%.	The prevalence of diabetic complications was alarmingly high. Peripheral neuropathy affected 68.2% of participants, retinopathy was present in 72.6%, and diabetic foot was observed in 12.7%. Other notable complications included hypertension (39.9%), myocardial infarction (5.9%), high cholesterol (59.9%), high triglycerides (32.5%), and low HDL (52.6%). Only 15.7% of participants achieved good glycemic control (HbA1c <7%). Factors significantly associated with complications included longer diabetes duration ($p<0.001$) and living in urban areas ($p<0.004$). The study highlighted the critical need for improved management strategies to address the high burden of T2DM complications in Sudan.
5	Bello et al., 2019[6]	Nigeria, West Africa	This study aimed to assess the prevalence and predictors of distal	A cross-sectional study design was employed, recruiting 175 diabetic patients consecutively. DSP was	The prevalence of DSP and CAN was 41.7% and 26.9%, respectively, with 19.4% of patients having both conditions. Hypertension (OR:

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S/N	Author	Study Country, Continent	Study Overview	Study Characteristics	Findings
			symmetrical polyneuropathy (DSP) and cardiovascular autonomic neuropathy (CAN) in diabetic patients in Ilorin, North-central Nigeria.	assessed using the Michigan Neuropathy Screening Instrument (MNSI), with DSP defined by an MNSI symptom score ≥7 or a physical examination score ≥2. CAN was evaluated using five cardiovascular autonomic function tests, with abnormalities in ≥2 tests defining CAN	2.401; 95% CI: 1.169–4.930, $P = 0.017$) and poor glycaemic control (OR: 2.957; 95% CI: 1.488–5.878, $P = 0.002$) were independent predictors of DSP. Similarly, hypertension (OR: 2.215; 95% CI: 1.023–4.414, $P = 0.043$) and serum creatinine (OR: 1.035; 95% CI: 1.014–1.056, $P \leq 0.001$) independently predicted CAN. The study highlights the need for intensified efforts to control blood pressure and glucose levels and to regularly monitor renal function to prevent these complications
6	Ede et al., 2018[18]	Nigeria, West Africa	This study aimed to evaluate the incidence and risk factors for peripheral neuropathy (PN) in diabetic adults, with and without foot ulcers, in an indigenous African population	The cross-sectional study included 90 diabetic adults, evenly divided into two groups: 45 with foot ulcers and 45 without. Peripheral neuropathy was assessed using the Michigan Neuropathy Screening Instrument (MNSI), the 10 g Semmes-Weinstein monofilament (SWM), and the 128-Hz vibrating tuning fork (VTF). Demographic data and risk factor associations (age, alcohol consumption, duration of diabetes, cigarette smoking, BMI, height, and sex) were investigated.	Peripheral neuropathy was prevalent in 93.33% of participants with foot ulcers and 73.33% of those without, as assessed by MNSI. The SWM and VTF showed a strong positive correlation with each other and with the MNSI. Significant risk factors for PN included advancing age, longer duration of diabetes, alcohol consumption, hyperglycemia, and cigarette smoking, while BMI, height, and sex were not significant. The findings highlight the high incidence of PN in diabetic adults in Africa and emphasize the need for early screening and aggressive management of modifiable risk factors to prevent diabetic foot ulceration
7	Jember et al., 2017[19]	Ethiopia, East Africa	This study assessed the prevalence and associated factors of diabetic peripheral sensory	An institution-based cross-sectional study was conducted in 2016 on 408 diabetic patients, with 368 completing the study. The Michigan Neuropathy	The overall prevalence of PSN was 52.2%. Key factors associated with PSN included: • **Age >50 years**: AOR: 3.0 (CI [1.11, 7.89])

S/N	Author	Study Country, Continent	Study Overview	Study Characteristics	Findings
			neuropathy (PSN) among patients attending the chronic illness clinic at Felege Hiwot Regional Referral Hospital, Bahir Dar, Northwest Ethiopia	Screening Instrument (MNSI) was used to assess PSN. Data were gathered through interviews, patient record reviews, physical examinations, and anthropometric measurements. Both bivariate and multivariate binary logistic regression analyses were performed to identify significant factors associated with PSN	• **Overweight and obesity**: AOR: 7.3 (CI [3.57, 14.99]) • **Duration of diabetes**: AOR: 3.4 (CI [1.75, 6.60]) • **Lack of physical exercise**: AOR: 4.8 (CI [1.90, 7.89]) • **Male gender**: AOR: 2.4 (CI [1.18, 5.05])
8	Khalil et al., 2019[20]	Egypt, North Africa	This cross-sectional study investigated the prevalence of chronic diabetic complications, including neuropathy, diabetic kidney disease (DKD), retinopathy, and peripheral arterial disease (PAD), in newly diagnosed and known Type 2 Diabetes Mellitus (T2DM) patients	The study analyzed 506 T2DM patients, comprising 323 with previously known diabetes and 183 newly diagnosed during a household survey. Data collection involved detailed medical histories, clinical examinations (e.g., fundus and foot exams, ankle-brachial index assessments), and laboratory tests, including HbA1c, lipid profiles, serum creatinine, and urinary albumin-creatinine ratios. Statistical analysis compared complication rates between the two groups and examined associations between different complications	The prevalence of complications was significantly higher in patients with known T2DM compared to those newly diagnosed: • **Peripheral neuropathy**: 29.4% in known vs. 3.3% in newly diagnosed ($p<0.001$) • **Diabetic kidney disease**: 46.1% in known vs. 10.4% in newly diagnosed ($p<0.001$) • **Retinopathy**: 48.3% in known vs. 10.4% in newly diagnosed ($p<0.001$) • **Peripheral arterial disease (PAD)**: 45.5% in known vs. 9.8% in newly diagnosed ($p<0.001$)
9	Oguejiofor et al., 2019[21]	Nigeria, West Africa	This cross-sectional study assessed the prevalence and clinical correlates of	The study involved 524 T2DM subjects (46.6% males, 53.4% females) attending the NAUTH	Among the 223 subjects without neuropathic symptoms, PN prevalence varied based on the diagnostic method:

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			peripheral neuropathy (PN) in Type 2 Diabetes Mellitus (T2DM) patients without neuropathic symptoms.	Diabetes Clinic. Data collection included clinical histories, physical examinations, fasting plasma glucose measurements, glycated hemoglobin (HbA1c), and fasting lipid profiles. Subjects without neuropathic symptoms were identified using the Diabetic Neuropathy Symptom Score (DNSS), and PN was evaluated using a tuning fork and two types of biothesiometers (analog and digital).	• **Tuning fork**: 71.5% • **Analog biothesiometer**: 14.8% • **Digital biothesiometer**: 14.8% The tuning fork detected a significantly higher prevalence of PN, reflecting its subjectivity compared to biothesiometers. None of the evaluated clinical variables were significant predictors of PN ($P > 0.05$).
10	Yeboah et al., 2018[22]	Ghana, West Africa	This case-control study explored the association between peripheral sensory neuropathy (PSN) and arterial stiffness in diabetes patients	The study involved 240 diabetic patients and 110 non-diabetic controls. Large-fiber nerve function was evaluated using a neurothesiometer, with PSN defined as VPT values above the 97.5th percentile from age- and gender-adjusted models in non-diabetic controls.	This study demonstrates that PSN is associated with arterial stiffness in diabetic patients in Ghana. PSN patients showed increased odds of higher CAVI, independent of conventional cardiovascular risk factors.
11	Maiga et al., 2020[23]	Mali, West Africa	This cross-sectional, descriptive study assessed the prevalence, epidemiological characteristics, and therapeutic pathways of diabetic polyneuropathy (DPN) in Mali	Conducted over six months at two major diabetes follow-up centers, the study utilized the Michigan Neuropathy Screening Instrument (MNSI) for DPN diagnosis, the DN4 questionnaire to evaluate neuropathic pain, and the ED-5D scale to assess patients' quality of life.	The study revealed that diabetic polyneuropathy (DPN) was prevalent in 69.8% of the study population, with the majority of patients reporting moderate to intense neuropathic pain, predominantly described as a burning sensation. Associated factors included obesity, dyslipidemia, and type 2 diabetes.

S/N	Author	Study Country, Continent	Study Overview	Study Characteristics	Findings
12	Simo et al., 2020[24]	Cameroon, Central Africa	This study aimed to evaluate the hospital-based prevalence of diabetic polyneuropathy (DPN) and identify its correlates among older adults with diabetes in Sub-Saharan Africa.	A cross-sectional survey was conducted over five months, including 159 older adults with type 2 diabetes, irrespective of the reason for their hospital visit. DPN was diagnosed using a Diabetic Neuropathy Examination (DNE) score greater than 3/16	The prevalence of DPN among the study population was 31.4%, with 78% of cases being symptomatic. Significant correlates of DPN included glycated hemoglobin ($p = 0.049$), HIV infection ($p = 0.031$), and albuminuria ($p < 0.001$), even after adjusting for age, gender, and diabetes duration.
13	Petropoulos et al., 2016[25]	MENA Region	This study highlights the prevalence and management challenges of diabetic peripheral neuropathy (DPN) and painful diabetic peripheral neuropathy (PDPN)	The analysis focuses on populations across primary and secondary care settings in the Middle East. It examines diagnostic variability and treatment outcomes, particularly in relation to glucose, blood pressure, and lipid control. The reliance on evidence and recommendations from Western trials, as well as the widespread use of B vitamins for nerve repair and symptom relief, is also discussed.	The study finds that inadequate control of risk factors like hyperglycemia, hypertension, and dyslipidemia has contributed to high rates of foot ulceration and amputations in the region. Current symptomatic treatment strategies often rely on recommendations from Western trials, which may not account for regional demographic and patient response differences.
14	Kisozi et al., 2017[26]	Uganda, East Africa	This study investigates the prevalence and risk factors of diabetic peripheral neuropathy (DPN) among newly diagnosed diabetes mellitus patients.	A cross-sectional study design was employed, involving 248 newly diagnosed adult diabetic patients. Neuropathy was screened using the Neuropathy Symptom Score (NSS) and Neuropathy Disability Score (NDS) criteria.	The prevalence of DPN among newly diagnosed diabetic patients was 29.4%. Moderate neuropathy affected 16% of the patients, while 5% experienced severe neuropathy. Older age (above 60 years) significantly increased the risk of DPN (OR 3.72; $p=0.018$), as did a history of foot ulcers (OR 2.59; $p=0.042$)

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DISCUSSION

This systematic literature review reveals the awareness, prevalence, risk factors of diabetic peripheral neuropathy in T2DM patient. In terms of prevalence, there were different findings from different regions of Africa. In Nigeria, the prevalence reported in the studies were 41.7% as reported by a similar study conducted in Ilorin; 26.1% as reported by another study in southwest Nigeria; 16.6% from a similar study conducted in Ghana. [6, 15,22] In contrast to these three previous studies, two other studies from Nigeria showed higher prevalence of DPN among T2DM patient reporting 83.4% and 57.40% respectively.[18, 21] This contrast might be due to the large study population used and also the inclusion of T1DM patients as part of the sample population.

Awareness and Understanding of Diabetic Neuropathy Among T2DM Patients

Awareness and understanding of DPN among Nigerian T2DM patients remain low, as evidenced by limited patient engagement with neuropathy-specific care. Studies have highlighted a lack of routine counseling and educational interventions in healthcare settings, which hinders patients' ability to recognize early symptoms of DPN. This gap in awareness not only delays diagnosis but also exacerbates the progression of complications such as diabetic foot ulcers.

Prevalence of Diabetic Peripheral Neuropathy Among T2DM

The prevalence of diabetic peripheral neuropathy (DPN) among patients with type 2 diabetes mellitus (T2DM) in Nigeria demonstrates significant variability across studies, reflecting differences in population characteristics and diagnostic criteria. Reported prevalence rates range from 29.4% in newly diagnosed patients at Mulago Hospital to 41.7% in a study conducted at Ilorin, and as high as 72.2% in a study at Kilimanjaro Christian Medical Center. These findings indicate that DPN is a common complication of diabetes, underscoring the urgent need for enhanced screening and early intervention programs in Nigeria's healthcare system.

Key Risk Factors Associated with Diabetic Peripheral Neuropathy

Key risk factors for DPN in Nigeria include advanced age, poor glycemic control, hypertension, obesity, and long disease duration. For instance, poor glycemic control was a significant predictor of DPN in Ilorin (OR 2.957, p=0.002), while hypertension was strongly associated with both DPN (OR 2.401, p=0.017) and cardiovascular autonomic neuropathy (CAN) [6]. Additionally, advancing age and increased body mass index were identified as critical predictors in other studies conducted in Ethiopia and Douala. [19]

Diagnostic and Screening Practices for DPN

Diagnostic and screening practices for DPN in tertiary healthcare centers in Nigeria often rely on tools such as the Michigan Neuropathy Screening Instrument (MNSI), vibration perception thresholds which is sometimes subjective, and monofilament testing. While these methods are inexpensive and easy to use, studies reveal significant variability in their sensitivity. Tuning forks, for example, diagnosed DPN more frequently than biothesiometers in southeastern Nigeria, reflecting the need for standardized diagnostic

protocols. The lack of routine screening in some centers also contributes to the underdiagnosis of DPN.

Impact on Quality of Life

DPN significantly impairs patients' quality of life and physical functionality. Patients with DPN experience pain, reduced mobility, and higher risks of complications such as foot ulcers and amputations. In Ghana, patients with peripheral sensory neuropathy exhibited lower cardio-ankle vascular indices and pulse wave velocities, further highlighting their reduced physical capacity. Additionally, in Mali, neuropathic pain and autonomic dysfunction contributed to moderate-to-severe pain and sensory impairments, significantly affecting patients' daily lives.

Gaps in Current Research and Recommendations for Future Studies

Despite the growing body of research, several gaps remain. Few studies focus on the level of awareness and understanding of DPN among T2DM patients in Nigeria. Additionally, there is limited data on the effectiveness of different screening tools in tertiary healthcare centers. Furthermore, there is a lack of longitudinal studies that evaluate the long-term impact of DPN interventions on quality of life. Future research should prioritize educational interventions to improve patient awareness and early diagnosis, standardized diagnostic protocols across healthcare facilities, the development of locally relevant clinical guidelines.

Recommendations

Addressing the burden of diabetic peripheral neuropathy (DPN) requires several targeted interventions. First, educational interventions should be implemented to integrate focused training on DPN into nursing curricula and continuing education programs. This will enhance nurses' competency in screening and managing DPN, leading to improved patient outcomes. Additionally, routine screening should be promoted by advocating for the use of standardized screening tools, such as the Michigan Neuropathy Screening Instrument (MNSI), in healthcare facilities. This would facilitate early detection and timely management of DPN, ultimately reducing complications associated with the condition.

Furthermore, patient education programs must be developed and tailored to cultural contexts, ensuring that T2DM patients understand the risks and symptoms of DPN. Increasing awareness through structured educational initiatives will encourage self-care and adherence to preventive measures. Policy advocacy is also essential; engaging policymakers to recognize DPN as a critical public health concern and allocate resources toward research, education, and clinical practice improvements can significantly enhance disease management strategies.

Research prioritization is crucial to support further investigations on the efficacy of interventions, barriers to care, and the long-term impact of DPN in resource-limited

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settings like Nigeria. Expanding research efforts will provide evidence-based solutions to mitigate the disease burden. Lastly, interdisciplinary collaboration should be strengthened among healthcare providers to develop integrated care pathways that address the physical, psychological, and social aspects of DPN management. By fostering collaboration between medical professionals, nurses, and policymakers, a more holistic approach to managing DPN can be achieved, ensuring better health outcomes for affected individuals.

These recommendations, when effectively implemented, have the potential to improve nursing education, clinical practice, and research while significantly reducing the impact of DPN among T2DM patients in Nigeria.

CONCLUSION

DPN is a prevalent and debilitating complication among T2DM patients in Nigeria, with significant implications for quality of life and functionality. Risk factors such as poor glycemic control, hypertension, and long disease duration underscore the importance of comprehensive diabetes management programs. While diagnostic and screening practices are evolving, there is a need for standardized protocols and greater patient education. Addressing these gaps will require targeted interventions, enhanced research efforts, and policy reforms to mitigate the burden of DPN in Nigeria and West Africa. Future studies should focus on longitudinal outcomes, patient-centered education, and cost-effective diagnostic tools to improve care delivery and patient outcomes.

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