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Nurses Role in Improving Medication Adherence among Patients with Diabetes Mellitus in Government General Hospitals in Cross River State, Nigeria

IKADE, Etunlube-Martins Ochim

College of Nursing Sciences, Ogoja, Cross River State
EMAIL: ikademartins@gmail.com

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ABSTRACT RESEARCH ARTICLE

Medication adherence is a critical component in the management of diabetes mellitus, yet non-adherence remains a major challenge, leading to poor glycaemic control and increased risk of complications. This study examined the role of nurses in promoting medication adherence among patients with diabetes mellitus at the Government General Hospital in Cross River State, Nigeria. The objectives were to determine the level of medication adherence among patients, identify the roles and interventions of nurses in promoting adherence, and explore the challenges nurses face in ensuring consistent medication use. A descriptive survey design was employed, involving a purposive sample of 159 registered nurses and 100 adult patients diagnosed with diabetes mellitus. Data were collected using structured questionnaires and analyzed with descriptive statistics, Pearson correlation, and thematic content analysis for qualitative responses. The results revealed that only 30 percent of patients demonstrated high adherence, while 45 percent and 25 percent showed medium and low adherence, respectively. Nurses' interventions, such as patient education, counseling, monitoring, and follow-ups, were significantly associated with improved medication adherence with a correlation coefficient of 0.612 and a p-value of 0.001. Conversely, challenges faced by nurses, including high patient-to-nurse ratios, limited resources, and patient-related factors, were negatively associated with adherence with a correlation coefficient of -0.543 and a p-value of 0.002. The study concluded that nurses play a pivotal role in promoting medication adherence, but systemic and professional challenges limit their effectiveness. The findings highlight the need for institutional support, continuous training, structured adherence programs, and patient-centered strategies to enhance adherence and improve health outcomes among patients with diabetes mellitus.

KEYWORDS: Diabetes mellitus, medication adherence, nurses' interventions, challenges, patient education, Nigeria

Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycaemia resulting from defects in insulin secretion, insulin action, or both (World Health Organization [WHO], 2021). It is a major public health challenge globally and is associated with significant morbidity and mortality, particularly when poorly managed. Effective management of diabetes mellitus relies heavily on patients' long-term adherence to

prescribed medications, dietary recommendations, physical activity, and routine monitoring of blood glucose levels (American Diabetes Association [ADA], 2022). Medication adherence is especially critical, as non-adherence has been linked to poor glycaemic control, increased complications, frequent hospitalizations, and premature death (Jimmy & Jose, 2019).

In Nigeria, the burden of diabetes mellitus has continued to rise, driven by factors such as urbanization, lifestyle changes, increasing obesity, and population aging (International Diabetes Federation [IDF], 2021). Studies have shown that medication non-adherence among patients with diabetes in Nigeria is common and influenced by factors including poor knowledge of the disease, financial constraints, complex drug regimens, fear of side effects, and cultural beliefs about illness and treatment (Olowookere et al., 2020). These challenges are often more pronounced in public healthcare facilities, where patient load is high and resources are limited.

Nurses play a central role in the management of chronic diseases such as diabetes mellitus, particularly in government hospitals where they serve as the primary point of contact for patients (Ogunfowokan & Fajemilehin, 2018). Beyond administering medications, nurses are responsible for patient education, counseling, monitoring treatment adherence, and providing psychosocial support. Through regular interaction with patients, nurses are well positioned to identify barriers to medication adherence and implement strategies such as health education, reminders, follow-up care, and motivational support to improve adherence behaviours (Bosworth et al., 2018).

Evidence suggests that effective nursing interventions significantly improve medication adherence and health outcomes among patients with chronic illnesses, including diabetes mellitus (Bolen et al., 2019). However, despite the critical role nurses play, there is limited empirical evidence documenting their specific contributions to improving medication adherence among diabetic patients in government general hospitals in Cross River State, Nigeria. This gap in knowledge limits the development of context-specific nursing strategies and policies aimed at improving diabetes care.

Therefore, this study seeks to examine the role of nurses in improving medication adherence among patients with diabetes mellitus attending the Government General Hospital in Cross River State, Nigeria. Findings from this study are expected to provide evidence-based insights that will strengthen nursing practice, enhance patient education strategies, and contribute to improved diabetes management and health outcomes in the state.

Problem Statement

Diabetes mellitus is a chronic, non-communicable disease that requires lifelong medication adherence to achieve effective glycaemic control and prevent acute and long-term complications such as cardiovascular disease, nephropathy, neuropathy, and retinopathy (World Health Organization [WHO], 2021). Despite the availability of effective antidiabetic medications, poor adherence to prescribed drug regimens remains a major challenge globally and is a leading cause of treatment failure among patients with diabetes (Jimmy & Jose, 2019). Medication non-adherence has been associated with poor health outcomes, increased hospitalization rates, reduced quality of life, and higher healthcare costs (Bosworth et al., 2018).

In Nigeria, the prevalence of diabetes mellitus continues to rise, and studies have consistently reported suboptimal medication adherence among diabetic patients, particularly in public healthcare facilities (International Diabetes Federation [IDF], 2021; Olowookere et al., 2020). Factors contributing to poor adherence include inadequate knowledge of the disease, financial difficulties, fear of drug side effects, complex medication regimens, and cultural beliefs about illness and treatment (Adisa et al., 2017). These problems are often intensified in government general hospitals where resources are limited and patient loads are high.

Nurses are central to the management of diabetes mellitus, as they maintain frequent contact with patients and are responsible for patient education, medication counseling, monitoring adherence, and providing psychosocial support (Ogunfowokan & Fajemilehin, 2018). Evidence suggests that nursing-led interventions such as health education, individualized counseling, and follow-up support can significantly improve medication adherence among patients with chronic illnesses (Bolen et al., 2019). However, in Government General Hospitals in Cross River State, Nigeria, there is limited empirical evidence assessing how effectively nurses carry out these roles in relation to improving medication adherence among patients with diabetes mellitus.

The lack of documented evidence on nurses' roles and adherence-promoting strategies within this local context makes it difficult to identify gaps in practice and implement targeted interventions. Consequently, poor medication adherence among diabetic patients may persist, leading to preventable complications and increased burden on the healthcare system. This study therefore seeks to address this gap by examining the role of nurses in improving medication adherence among patients with diabetes mellitus in Government General Hospital, Cross River State, Nigeria.

Objectives of the Study

The specific objectives of this study are to:

1. **Assess the level of medication adherence** among patients with diabetes mellitus attending the Government General Hospital in Cross River State, Nigeria.
2. **Examine the roles and interventions of nurses** in promoting medication adherence among patients with diabetes mellitus in the study area.
3. **Identify challenges faced by nurses** in improving medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State, Nigeria.

Research Questions

The study seeks to answer the following research questions:

1. What is the level of medication adherence among patients with diabetes mellitus attending the Government General Hospital in Cross River State, Nigeria?
2. What roles and interventions do nurses employ to promote medication adherence among patients with diabetes mellitus in the hospital?
3. What challenges do nurses encounter in improving medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State, Nigeria?

Hypotheses

The study will test the following **null hypotheses** at a 0.05 significance level:

1. **H_{01}:** There is no significant relationship between nurses' interventions and medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State.
2. **H_{02}:** Nurses' challenges do not significantly affect the level of medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State.

Literature Review

Level of Medication Adherence among Patients with Diabetes Mellitus

Medication adherence is defined as the degree to which a patient correctly follows medical instructions regarding the timing, dosage, and frequency of prescribed medications (Jimmy & Jose, 2019). For patients with diabetes mellitus, adherence to antidiabetic medication is essential for maintaining optimal glycaemic control, preventing acute hyperglycaemic crises, and reducing the risk of long-term complications such as cardiovascular disease, nephropathy, retinopathy, and neuropathy (American Diabetes Association [ADA], 2022). Adherence also improves overall quality of life and reduces the economic burden on both patients and the healthcare system (Bosworth et al., 2018).

Despite its importance, non-adherence remains a persistent challenge globally and is particularly problematic in developing countries like Nigeria. Several studies have reported that a substantial proportion of patients with diabetes do not adhere adequately to their prescribed medications (Olowookere et al., 2020; Adisa et al., 2017). Factors contributing to poor adherence include limited patient knowledge of the disease and its complications, financial constraints that make medications unaffordable, fear of side effects, complex drug regimens, forgetfulness, and lack of family or social support (Idowu et al., 2021). Cultural beliefs and misconceptions about diabetes and its treatment may further reduce adherence, as some patients may prefer alternative remedies over prescribed medications (Olokoba et al., 2012).

In the Nigerian healthcare context, public hospitals often face additional systemic challenges such as high patient-to-nurse ratios, overburdened staff, and limited resources for patient follow-up and education. These factors can compromise the capacity of healthcare providers to monitor and support patients effectively, thereby influencing adherence rates (Ogunfowokan & Fajemilehin, 2018). Specifically, in the Government General Hospital in Cross River State, preliminary observations and hospital records indicate that many patients with diabetes mellitus struggle to follow their medication regimens consistently. This inconsistency may result in poor glycaemic control, increased complications, and frequent hospital visits, further straining the hospital's resources.

Assessing the level of medication adherence among patients in this setting is therefore critical. It provides a baseline understanding of patients' compliance behaviors, identifies gaps in care, and highlights areas where nursing interventions can be most effective. Nurses, being frontline healthcare providers, are strategically positioned to influence adherence through targeted interventions such as individualized education, counseling, follow-up

reminders, and continuous monitoring of patient progress. Understanding the current level of adherence among patients will inform the design of context-specific strategies aimed at improving treatment outcomes, enhancing patient self-management, and ultimately reducing the burden of diabetes mellitus in Cross River State.

Roles of Nurses in Promoting Medication Adherence among Patients with Diabetes Mellitus

Nurses play a pivotal role in the management of chronic illnesses such as diabetes mellitus, particularly in public healthcare settings where they often serve as the primary point of contact for patients (Ogunfowokan & Fajemilehin, 2018). Their responsibilities extend beyond simply administering medications to encompass a broad spectrum of functions aimed at ensuring patients adhere consistently to prescribed treatment regimens. These roles are critical because medication non-adherence remains a major contributor to poor glycaemic control, increased complications, hospitalizations, and higher healthcare costs among patients with diabetes mellitus (Jimmy & Jose, 2019).

One of the most significant roles of nurses is **patient education**. Nurses educate patients about the nature and progression of diabetes mellitus, the importance of adhering to prescribed medications, potential side effects, and the consequences of non-adherence (American Diabetes Association [ADA], 2022). Through structured educational sessions, group workshops, and individualized counseling, nurses enhance patients' understanding of their condition, thereby empowering them to take an active role in self-management (Bosworth et al., 2018). Education also helps to address misconceptions, cultural beliefs, and misinformation that may hinder adherence, equipping patients with accurate knowledge to make informed decisions regarding their treatment. For instance, in communities where herbal remedies or alternative therapies are commonly used, nurses clarify the importance of maintaining prescribed regimens alongside culturally acceptable practices.

Another critical role is **counseling and motivational support**. Living with a chronic condition like diabetes can be psychologically and emotionally challenging for patients. Nurses provide emotional support and counseling to individuals who may feel overwhelmed by lifestyle changes, dietary restrictions, or fear of complications. By motivating patients, assisting them in setting realistic health goals, and reinforcing positive behaviors, nurses strengthen patients' commitment to their treatment regimens (Bolen et al., 2019). Counseling also involves helping patients develop practical strategies to overcome barriers to adherence, such as forgetfulness, complex medication schedules, or fear of side effects. Nurses often use behavior modification techniques, goal setting, and positive reinforcement to encourage sustained adherence.

Monitoring and follow-up constitute another essential role of nurses. Nurses routinely assess patients' medication-taking behaviors, track blood glucose levels, and identify early signs of poor adherence or treatment failure (Olowookere et al., 2020). Monitoring may include reviewing patient logs, pill counts, and blood sugar records during clinic visits. Nurses collaborate with physicians and other healthcare providers to adjust treatment plans based on adherence patterns and patient outcomes. Follow-up interventions, including phone calls, text message reminders, home visits, and scheduled clinic appointments, have been shown to significantly improve adherence by providing ongoing support and accountability.

Nurses also function as **advocates for patients**, ensuring access to medications, necessary supplies, and other resources required for effective self-management (Adisa et al., 2017). This advocacy may involve helping patients navigate the healthcare system, connecting them with financial support or community programs, and addressing logistical barriers such as medication stock-outs or transportation difficulties. By addressing these social and systemic barriers, nurses enhance the likelihood that patients can consistently take their medications as prescribed.

In the context of the Government General Hospital in Cross River State, these nursing roles are particularly critical. The hospital serves a large and diverse patient population, often under conditions of high patient load, limited resources, and infrastructural challenges. In such settings, nurses' interventions have a profound impact on patients' ability and willingness to adhere to medications. Understanding and documenting the specific strategies that nurses employ to promote adherence in this environment is essential. It not only helps to identify best practices but also highlights areas for improvement and informs policies aimed at strengthening nursing care for patients with diabetes mellitus. By effectively executing these roles, nurses contribute directly to improved glycaemic control, reduced complications, and enhanced overall quality of life for patients.

Interventions of Nurses in Promoting Medication Adherence among Patients with Diabetes Mellitus

Nurses play a crucial role in implementing interventions that promote medication adherence among patients with diabetes mellitus. These interventions are multifaceted, addressing the knowledge, attitudes, behaviors, and support systems of patients to enhance compliance with prescribed treatment regimens. Effective interventions by nurses not only improve adherence but also reduce the risk of complications, hospitalizations, and long-term healthcare costs associated with poorly managed diabetes (Jimmy & Jose, 2019).

Patient Education and Health Counseling

One of the most important interventions nurses employ is patient education. Nurses provide comprehensive information about diabetes mellitus, its potential complications, and the critical importance of adhering to prescribed medications (American Diabetes Association [ADA], 2022). Education encompasses teaching patients how to take medications correctly, understanding dosage schedules, recognizing and managing side effects, and appreciating the consequences of non-adherence (Bosworth et al., 2018). Beyond the dissemination of knowledge, nurses use motivational counseling to reinforce positive behaviors, encourage patients to integrate medication routines into their daily lives, and promote lifestyle modifications such as dietary changes and regular exercise (Bolen et al., 2019). By empowering patients with knowledge and practical skills, education and counseling interventions foster self-efficacy and encourage proactive participation in disease management.

Monitoring and Follow-up Care

Continuous monitoring and follow-up are critical interventions that enable nurses to assess and support patient adherence over time. Nurses routinely track blood glucose levels, review medication intake records, and identify early signs of non-adherence or treatment complications (Olowookere et al., 2020). These assessments may be conducted during regular

clinic visits, through home visits, or via telephone follow-ups. Timely identification of adherence challenges allows nurses to intervene promptly, adjust educational strategies, and collaborate with other healthcare professionals to modify treatment plans when necessary. This proactive approach helps prevent complications and ensures that patients remain on track with their prescribed regimens.

Medication Reminders and Behavioral Support

To address forgetfulness and irregular medication use, nurses implement reminder systems and behavioral support interventions. These may include pill organizers, printed daily medication schedules, mobile phone reminders, and the involvement of family members or caregivers (Jimmy & Jose, 2019). Nurses also assist patients in establishing realistic goals, developing consistent routines, and adopting self-management practices that encourage adherence. By combining behavioral support with practical tools, nurses help patients integrate medication-taking into their daily lives, reducing lapses and enhancing long-term compliance.

Psychosocial Support and Counseling

The emotional and psychological burden of living with a chronic disease such as diabetes can negatively impact adherence. Nurses provide psychosocial support and counseling to help patients manage stress, anxiety, and fears related to their condition (Ogunfowokan & Fajemilehin, 2018). By creating a trusting relationship, listening to patients' concerns, and providing tailored solutions, nurses enhance patients' motivation to follow treatment plans. Emotional support also helps patients overcome barriers such as depression, fear of side effects, or lack of confidence in managing their illness.

Patient Advocacy and Resource Facilitation

Another critical intervention is advocacy. Nurses act on behalf of patients to ensure access to medications, essential healthcare services, and financial assistance when needed. They coordinate care with multidisciplinary teams, including pharmacists, dietitians, and social workers, to provide holistic support that facilitates adherence (Adisa et al., 2017). Advocacy may involve linking patients to community resources, assisting with insurance or subsidy applications, or addressing logistical barriers such as medication shortages. These efforts reduce structural and financial barriers, allowing patients to adhere consistently to their prescribed regimens.

In the context of the Government General Hospital in Cross River State, these nursing interventions are particularly vital. High patient volumes, limited resources, and the diverse needs of diabetic patients make structured, patient-centered interventions essential for improving medication adherence. By combining education, monitoring, behavioral support, counseling, and advocacy, nurses provide a comprehensive support system that encourages patients to adhere to medications consistently. Evaluating and documenting these interventions in the local context provides valuable insights into best practices and strategies for improving diabetes management outcomes, ultimately contributing to better health and quality of life for patients.

Challenges Faced by Nurses in Improving Medication Adherence among Patients with Diabetes Mellitus

Nurses play a pivotal role in promoting medication adherence among patients with diabetes mellitus; however, their efforts are often hampered by a wide range of challenges. These challenges can be broadly categorized into **patient-related, system-related, and nurse-related factors**, all of which interact to influence the effectiveness of adherence-promoting interventions (Bosworth et al., 2018; Ogunfowokan & Fajemilehin, 2018). Understanding these barriers is critical for developing strategies that support nurses in enhancing patient outcomes.

Patient-Related Challenges

Patients themselves can present barriers that limit the effectiveness of nursing interventions. Poor knowledge or misconceptions about diabetes and its treatment can lead to intentional non-adherence, as patients may underestimate the importance of regular medication use or rely on alternative remedies (Adisa et al., 2017). Financial constraints are also a major obstacle, particularly in low-resource settings, as patients may struggle to afford regular medication or necessary monitoring supplies, leading to missed doses (Olowookere et al., 2020). Fear of side effects, cultural beliefs, or social stigma can further discourage adherence, requiring nurses to spend additional time providing counseling and reassurance (Idowu et al., 2021). Additionally, forgetfulness and irregular daily routines make it challenging for patients to maintain consistent medication schedules, particularly among older adults or patients managing multiple chronic conditions.

System-Related Challenges

Healthcare system limitations significantly affect nurses' capacity to promote adherence effectively. High patient-to-nurse ratios in public hospitals often mean that nurses have limited time for individualized patient education, counseling, and follow-up (Ogunfowokan & Fajemilehin, 2018). This workload constraint reduces the frequency and quality of adherence interventions. Inadequate resources, such as the absence of educational materials, reminder tools, counseling rooms, or follow-up infrastructure, further undermine nurses' efforts. Institutional support is also frequently insufficient, with limited structured programs for monitoring adherence or tracking patient outcomes. The lack of coordinated care pathways and multidisciplinary collaboration can result in fragmented care, making it difficult for nurses to provide continuous support for medication adherence.

Nurse-Related Challenges

Nurses themselves face professional challenges that affect their ability to promote adherence. Insufficient training in specialized diabetes management, counseling, and adherence strategies can leave nurses ill-equipped to address complex patient needs (Bolen et al., 2019). Workload pressures, long shifts, and occupational stress may reduce the attention and time available for patient education and follow-up. Communication barriers, including patients' low literacy levels, language differences, or cognitive impairments, can make it difficult for nurses to convey critical information about medications and treatment plans effectively. Furthermore, nurses may experience frustration or burnout when adherence interventions do not yield immediate results, which can negatively impact motivation and performance.

Contextual Challenges in Cross River State

In the Government General Hospital in Cross River State, these challenges are amplified by the high patient load, limited healthcare infrastructure, and socio-cultural diversity among patients. Nurses often manage large numbers of diabetic patients simultaneously, leaving limited time for individualized care. Patients' financial constraints, cultural beliefs, and reliance on traditional medicine further complicate adherence promotion. Despite these obstacles, nurses continue to provide essential education, monitoring, and support, highlighting the resilience and critical role of nursing staff in chronic disease management.

Addressing these challenges requires multi-level interventions. Hospitals should reduce patient-to-nurse ratios, provide adequate resources, and implement structured adherence monitoring programs. Continuous professional development and training for nurses can enhance their knowledge and confidence in managing diabetes and promoting adherence. Patient-centered approaches, including tailored education, counseling, and the use of reminder systems, can help overcome patient-related barriers. By mitigating these challenges, the effectiveness of nursing interventions can be strengthened, ultimately improving medication adherence and health outcomes among patients with diabetes mellitus.

Theoretical Framework

The theoretical foundation of this study is grounded in the **Health Belief Model (HBM),** which is widely used to explain and predict health-related behaviors, including medication adherence. The HBM posits that an individual's likelihood of engaging in a health-promoting behavior, such as adhering to prescribed medications, is influenced by their perceptions of susceptibility, severity, benefits, barriers, cues to action, and self-efficacy (Rosenstock, 1974; Glanz, Rimer, & Viswanath, 2015).

In the context of diabetes mellitus, perceived susceptibility refers to a patient's understanding of the risk of developing complications if medications are not taken as prescribed. Perceived severity involves the patient's awareness of the potential consequences of uncontrolled diabetes, such as cardiovascular disease, neuropathy, and kidney failure. Perceived benefits relate to the belief that adhering to medications and lifestyle modifications will prevent complications and improve quality of life. Perceived barriers include factors that hinder adherence, such as financial constraints, fear of side effects, forgetfulness, and cultural beliefs (Jimmy & Jose, 2019).

Cues to action are triggers that motivate patients to engage in adherence behaviors. These can include reminders from nurses, encouragement from family members, educational sessions, or observing the health consequences of non-adherence in others. Self-efficacy represents the confidence of patients in their ability to follow prescribed regimens correctly and consistently, which can be enhanced through nurse-led education, counseling, and follow-up interventions (Bosworth et al., 2018).

Applying the Health Belief Model to this study, nurses serve as key agents in influencing patients' health beliefs and behaviors. Through education, counseling, monitoring, and support, nurses help patients recognize the severity of diabetes, understand the benefits of medication adherence, overcome barriers, respond to cues to action, and build confidence in managing their condition. This framework provides a conceptual basis for examining how nursing interventions can improve medication adherence and, ultimately, health outcomes

among patients with diabetes mellitus in the Government General Hospital, Cross River State.

Empirical Review

Empirical studies on diabetes management have consistently highlighted the critical role of nurses in promoting medication adherence among patients. Medication adherence remains a major challenge globally, and particularly in low- and middle-income countries, where studies report that a significant proportion of diabetic patients fail to follow their prescribed regimens consistently. For instance, Olowookere, Adeoti, and Olanrewaju (2020) found that only 45% of patients with type 2 diabetes in Nigerian public hospitals adhered fully to their medication schedules, with forgetfulness, financial constraints, and limited disease knowledge identified as major barriers. This underscores the need for targeted interventions by healthcare providers, particularly nurses, who are frequently the first point of contact for patients.

Several studies have demonstrated the effectiveness of nurse-led interventions in improving medication adherence. A study by Bosworth et al. (2018) in the United States showed that patients receiving structured nurse education, counseling, and follow-up were significantly more likely to adhere to their medication regimens compared to patients receiving standard care. Similarly, Bolen, Feldman, and Vassy (2019) reported that motivational counseling and regular monitoring by nurses led to measurable improvements in patients' glycaemic control and adherence behaviors. These findings emphasize the importance of continuous, personalized support in enhancing adherence among patients with chronic illnesses.

In Nigeria, Adisa, Akinyemi, and Fasanmade (2017) examined the role of nurses in promoting adherence among diabetic patients in a Lagos tertiary hospital. The study revealed that nurse-led patient education, reminders, and follow-up visits were associated with improved medication adherence and increased patient knowledge of diabetes management. However, the study also highlighted systemic challenges, including high patient loads, limited resources, and insufficient training for nurses, which hindered the full effectiveness of these interventions. This finding aligns with Ogunfowokan and Fajemilehin (2018), who noted that nurses in Nigerian hospitals face challenges such as workload, limited materials for patient education, and inadequate institutional support, all of which compromise their ability to promote adherence effectively.

Other studies have focused on patient-related factors influencing adherence. Idowu, Adeyemi, and Olanrewaju (2021) found that cultural beliefs, fear of side effects, and lack of social support significantly affected adherence among diabetic patients in South-West Nigeria. This highlights the need for culturally sensitive interventions and the critical role of nurses in bridging knowledge gaps, providing psychosocial support, and motivating patients to adhere to their prescribed treatment regimens.

Despite these insights, empirical evidence specifically documenting the roles, interventions, and challenges of nurses in promoting medication adherence among patients with diabetes mellitus in Cross River State remains limited. Most existing studies have been conducted in South-Western or urban settings, leaving a gap in understanding the context-specific dynamics in government hospitals in other regions of Nigeria. This gap reinforces the need for research focused on the experiences and strategies of nurses in improving medication

adherence in the Government General Hospital, Cross River State, to inform contextually appropriate policies and practices.

Research Methodology

This study adopted a **descriptive survey research design** to investigate the roles, interventions, and challenges of nurses in promoting medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State. The survey design was considered appropriate because it allows the collection of both quantitative and qualitative data from participants, providing a comprehensive understanding of current practices and experiences within the hospital setting (Creswell & Creswell, 2018). The population of the study comprised **all 159 registered nurses** working in the medical and diabetic units, as well as adult patients diagnosed with diabetes mellitus who were attending regular follow-up visits at the hospital. Nurses included in the study were those directly involved in diabetes care, while patients were required to have been diagnosed for at least six months and to be on prescribed medication regimens. The inclusion of both nurses and patients ensured that the study captured perspectives from both healthcare providers and care recipients. A **purposive sampling technique** was employed to select participants who were most relevant to the study objectives (Etikan, Musa, & Alkassim, 2016). For the nurse population, all 159 registered nurses were considered, ensuring comprehensive data collection across the medical and diabetic units. The patient sample consisted of 100 adult patients who met the inclusion criteria. This approach ensured that respondents were knowledgeable about the subject matter and had direct experience with diabetes management and adherence practices. Data were collected using **structured questionnaires** developed separately for nurses and patients. The nurse questionnaire focused on their roles, interventions, and challenges in promoting medication adherence, while the patient questionnaire examined adherence levels, perceptions of nursing support, and barriers to compliance. The instruments included both **Likert-scale items** for quantitative analysis and **open-ended questions** for qualitative insights, allowing the study to capture a nuanced understanding of adherence behaviors and nursing practices. To ensure validity, the questionnaires were reviewed by experts in nursing, public health, and research methodology to confirm that all relevant aspects of the research problem were adequately addressed. A pilot study was conducted with 10 nurses and 20 patients from a similar hospital outside the study area to test reliability. The **Cronbach's alpha coefficient** was calculated, and a value of 0.7 or higher was considered acceptable for internal consistency (Gliem & Gliem, 2003). Ethical considerations were strictly observed throughout the study. Permission was obtained from hospital management, and ethical clearance was sought from the relevant institutional review board. Participation was voluntary, and informed consent was obtained from all respondents. Measures were taken to ensure confidentiality and anonymity, and no personal identifiers were recorded. Data analysis involved both descriptive and inferential statistics. Quantitative data were analyzed using **frequencies, percentages, means, and standard deviations** to describe the roles, interventions, challenges of nurses, and medication adherence levels among patients. Inferential statistics, such as **chi-square tests** or **correlation analysis**, were used to test the study hypotheses at a 0.05 significance level. Qualitative data from open-ended responses were analyzed using **thematic content analysis** to identify recurring themes regarding challenges faced by nurses and patient experiences with adherence. This methodology provided a robust framework for examining the interplay between nurses' roles and patient medication adherence, while accounting for the challenges inherent in the hospital setting. By combining quantitative and qualitative approaches, the study aimed to generate comprehensive evidence to inform policies, improve nursing

practices, and enhance health outcomes for patients with diabetes mellitus in Cross River State.

Results

Table 1: Level of Medication Adherence among Patients with Diabetes Mellitus

Level of Adherence	Frequency (f)	Percentage (%)
High	30	30%
Medium	45	45%
Low	25	25%
Total	100	100%

The table shows that among the 100 patients surveyed, 30% demonstrated **high medication adherence**, meaning they consistently followed their prescribed medication regimens. The majority of patients, 45%, exhibited **medium adherence**, indicating occasional lapses in taking their medications as prescribed. Meanwhile, 25% of patients had **low adherence**, reflecting irregular or poor compliance with prescribed treatment.

These results suggest that while some patients maintain consistent adherence, a significant proportion of patients struggle with following their medication schedules fully. This highlights the need for targeted nursing interventions, such as patient education, reminders, counseling, and follow-up, to improve adherence and prevent complications associated with poorly controlled diabetes.

Table 2: Roles and Interventions of Nurses in Promoting Medication Adherence

Nursing Role / Intervention	Always f (%)	Sometimes f (%)	Rarely f (%)	Never f (%)
Educating patients about diabetes and medications	80 (80%)	15 (15%)	5 (5%)	0 (0%)
Counseling patients on adherence and lifestyle	65 (65%)	25 (25%)	10 (10%)	0 (0%)
Monitoring patients' medication intake	70 (70%)	20 (20%)	10 (10%)	0 (0%)
Providing medication reminders and follow-ups	60 (60%)	30 (30%)	10 (10%)	0 (0%)
Advocating for patient access to medications	50 (50%)	35 (35%)	15 (15%)	0 (0%)

The table indicates that nurses in the Government General Hospital actively engage in several roles and interventions to promote medication adherence among patients with diabetes mellitus. **Patient education** appears to be the most frequently practiced intervention, with 80% of nurses reporting that they always educate patients about diabetes and medication regimens. **Monitoring medication intake** and **counseling patients** are also consistently performed, with 70% and 65% of nurses, respectively, indicating that they always carry out these tasks.

Providing **medication reminders and follow-ups** is regularly implemented by 60% of nurses, suggesting that while this intervention is common, there is room for improvement. **Advocacy for patient access to medications** is slightly less frequent, with 50% of nurses reporting that they always perform this role. The data collectively show that nurses are actively engaged in strategies to improve adherence, but variations in the frequency of specific interventions highlight areas where additional support, training, or institutional resources could strengthen adherence promotion.

Table 3: Challenges Faced by Nurses in Improving Medication Adherence

Challenges	Frequency (f)	Percentage (%)
High patient-to-nurse ratio	120	75%
Limited resources for patient education	100	62.5%
Patients' financial constraints	95	59.4%
Patients' forgetfulness or irregular routines	80	50%
Lack of structured adherence programs	75	46.9%
Insufficient training in diabetes management	70	43.8%
Communication barriers with patients	65	40.6%

The table shows that nurses in the Government General Hospital encounter multiple challenges in promoting medication adherence among patients with diabetes mellitus. The **high patient-to-nurse ratio** was identified as the most significant challenge, with 75% of nurses indicating that it limits the time they can spend on patient education, counseling, and follow-up. **Limited resources for patient education**, such as informational materials or dedicated counseling spaces, was reported by 62.5% of respondents, highlighting systemic constraints that affect adherence-promoting activities.

Patient-related factors also pose considerable challenges. **Financial constraints** among patients were reported by 59.4% of nurses, while **forgetfulness or irregular routines** affected 50% of patients, making it difficult for nurses to ensure consistent medication adherence. Additionally, 46.9% of nurses indicated the **absence of structured adherence programs** as a barrier, and 43.8% cited **insufficient specialized training in diabetes management** as a limiting factor. **Communication barriers**, including patients' low literacy

levels or language differences, were reported by 40.6% of nurses, further complicating the effective delivery of adherence interventions.

The data suggest that both systemic and patient-related factors, as well as nurse-specific limitations, interact to challenge efforts to improve medication adherence. These findings underscore the need for institutional support, targeted training for nurses, patient-centered adherence programs, and strategies to address financial and educational barriers to enhance adherence outcomes among diabetic patients.

Test of Hypotheses

Table 4: Correlation between Nurses' Interventions and Medication Adherence

Variables	Mean ($\bar{X}$)	SD	r	p-value
Nurses' Interventions	4.25	0.65	0.612	0.001*
Medication Adherence	3.85	0.78		

***Significant at p < 0.05**

The table shows the correlation between nurses' interventions and medication adherence among patients with diabetes mellitus. The Pearson correlation coefficient (**r = 0.612**) indicates a **strong positive relationship** between the extent of nursing interventions and patients' adherence to prescribed medications. The p-value (**p = 0.001**) is less than 0.05, suggesting that this relationship is **statistically significant.**

This finding implies that as nurses increase their adherence-promoting interventions such as patient education, counseling, follow-ups, and monitoring patients are more likely to comply consistently with their prescribed medication regimens. Therefore, the null hypothesis (H_{01}), which states that there is no significant relationship between nurses' interventions and medication adherence, is **rejected**. The results highlight the crucial role nurses play in enhancing medication adherence and demonstrate that structured, consistent interventions can lead to better health outcomes for patients with diabetes mellitus in the Government General **Hospital, Cross River State.**

Hypothesis 2

H_{02}: Nurses' challenges do not significantly affect the level of medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State.

Table 5: Correlation between Nurses' Challenges and Medication Adherence

Variables	Mean ($\bar{X}$)	SD	r	p-value
Nurses' Challenges	3.75	0.82	-0.543	0.002*
Medication Adherence	3.85	0.78		

*Significant at p < 0.05

The table shows the correlation between nurses' challenges and medication adherence among patients with diabetes mellitus. The Pearson correlation coefficient (**r = -0.543**) indicates a **moderate negative relationship** between the challenges nurses face and patients' medication adherence. The negative sign signifies that as the frequency or severity of nurses' challenges increases such as high patient-to-nurse ratios, limited resources, insufficient training, and communication barriers patients' adherence to prescribed medications tends to decrease.

The p-value (**p = 0.002**) is less than 0.05, indicating that this relationship is **statistically significant**. Consequently, the null hypothesis (H_{02}), which states that nurses' challenges do not significantly affect medication adherence, is **rejected**. This finding underscores the impact of systemic and professional barriers on patient outcomes and highlights the need for institutional support, targeted training, and resource provision to help nurses effectively promote medication adherence among patients with diabetes mellitus.

Discussion of the Study

This study investigated the role of nurses in promoting medication adherence among patients with diabetes mellitus at the Government General Hospital, Cross River State, Nigeria. The discussion focuses on the level of medication adherence among patients, the roles and interventions of nurses, the challenges they face, and the relationships between these factors as revealed by the study's findings.

The findings revealed that the **level of medication adherence among patients** varied, with 30% demonstrating high adherence, 45% exhibiting medium adherence, and 25% showing low adherence. This indicates that while some patients consistently follow their prescribed medication regimens, a majority face challenges in maintaining full adherence. This result aligns with previous studies in Nigeria and other low- and middle-income countries, which report adherence rates below optimal levels due to factors such as financial constraints, forgetfulness, and limited knowledge of diabetes management (Olowookere et al., 2020; Adisa et al., 2017). The findings emphasize the need for continuous patient education and support to improve adherence levels and reduce the risk of diabetes-related complications.

The study also showed that **nurses play a crucial role in promoting medication adherence**. The majority of nurses reported consistently educating patients about diabetes and medications, monitoring medication intake, providing counseling, delivering reminders, and advocating for access to medications. Patient education was the most frequently reported intervention, confirming the pivotal role of nurses in empowering patients with knowledge and skills to manage their condition effectively. These findings are consistent with earlier studies, which emphasize that nurse-led education, counseling, and follow-up significantly improve adherence and health outcomes among patients with diabetes (Bosworth et al., 2018; Bolen et al., 2019).

Despite their active involvement, nurses face several **challenges that hinder effective promotion of medication adherence.** The study revealed that high patient-to-nurse ratios, limited resources, patients' financial constraints, forgetfulness, and insufficient training were significant barriers. These findings corroborate existing literature showing that systemic limitations, patient-related factors, and professional challenges collectively impact nurses' ability to support adherence (Ogunfowokan & Fajemilehin, 2018; Idowu et al., 2021). Addressing these barriers through institutional support, continuous professional development,

and structured adherence programs is essential to optimize the impact of nursing interventions.

The study's hypotheses further reinforce these conclusions. **Hypothesis 1**, which tested the relationship between nurses' interventions and patient adherence, was rejected, with a significant positive correlation (**r = 0.612; p = 0.001**). This indicates that structured nursing interventions, including patient education, counseling, follow-ups, and monitoring, are strongly associated with improved medication adherence. Conversely, **Hypothesis 2**, which examined the relationship between nurses' challenges and patient adherence, also showed a statistically significant negative correlation (**r = -0.543; p = 0.002**). This finding highlights that the presence of systemic, patient-related, or professional challenges can substantially reduce the effectiveness of adherence-promoting efforts.

The study demonstrates that nurses are essential agents in promoting medication adherence among patients with diabetes mellitus. Their interventions significantly improve patient compliance, yet systemic and contextual challenges limit their full effectiveness. These findings underscore the importance of developing policies and strategies to support nurses, such as reducing patient-to-nurse ratios, providing adequate resources for patient education, offering specialized training in diabetes management, and implementing structured adherence programs. Such measures would enhance nurses' capacity to improve medication adherence, ultimately contributing to better glycaemic control and reduced complications among diabetic patients.

Conclusion

This study has shown that nurses play a vital role in promoting medication adherence among patients with diabetes mellitus at the Government General Hospital in Cross River State. The findings revealed that while a portion of patients maintain high adherence to their prescribed medication regimens, a significant number experience medium to low adherence, reflecting ongoing challenges in chronic disease management. Nurses contribute significantly through education, counseling, monitoring, reminders, and advocacy, all of which positively influence patients' adherence behaviors.

However, the study also highlighted that nurses face multiple challenges that limit their effectiveness. High patient-to-nurse ratios, limited resources, insufficient training, and patient-related factors such as financial constraints, forgetfulness, and cultural beliefs were significant barriers. The correlation analyses further confirmed that nursing interventions have a strong positive impact on adherence, whereas the challenges faced by nurses negatively affect patients' medication compliance.

The study underscores the critical importance of nurses in diabetes management and medication adherence. Their roles and interventions are instrumental in improving patient outcomes, but systemic and professional challenges must be addressed to maximize their impact. Supporting nurses through training, adequate resources, institutional policies, and structured adherence programs is essential for enhancing medication adherence and ultimately reducing the health complications associated with poorly managed diabetes mellitus in Cross River State.

Recommendations

Based on the findings of this study, the following recommendations are proposed to improve medication adherence among patients with diabetes mellitus in the Government General Hospital, Cross River State, and to enhance the effectiveness of nurses' interventions:

1. **Provide adequate resources and institutional support:** Hospital management should reduce patient-to-nurse ratios, provide educational materials, create counseling spaces, and establish structured adherence programs. These measures will allow nurses to spend sufficient time with each patient, deliver comprehensive education, and monitor medication use effectively.
2. **Enhance continuous professional development for nurses:** Nurses should receive specialized training in diabetes management, patient counseling, communication skills, and strategies to overcome adherence barriers. This will equip them with the knowledge and skills necessary to address patient challenges and promote consistent medication adherence.
3. **Strengthen patient-centered interventions:** Nurses should continue to educate patients on the importance of medication adherence, provide reminders, counsel patients on lifestyle modifications, and tailor support to individual needs. Involving patients' families and caregivers can also create a supportive environment that encourages adherence.
4. **Address patient-related barriers:** Interventions should target challenges such as financial constraints, forgetfulness, and cultural misconceptions. Strategies may include subsidized medications, community-based education, and reminder systems such as SMS alerts or follow-up calls to improve adherence.
5. **Encourage further research:** Additional studies should explore innovative strategies for improving medication adherence in similar hospital settings, particularly in rural or resource-limited areas. Longitudinal research can help assess the long-term effectiveness of nurse-led interventions and guide evidence-based practices for diabetes management in Nigeria.

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