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Illness Related Factors Which Predict the Quality of Life Among Nurses with Diabetes Mellitus in Public Tertiary Health Institutions in Rivers State

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Abstract

Diabetes mellitus among nurses warrants urgent attention due to the significant health risks associated with the condition, which may adversely affect their quality of life and professional functioning within healthcare settings. This study adopted a correlational research design and targeted a population of 106 nurses diagnosed with diabetes mellitus at the University of Port Harcourt Teaching Hospital and the Rivers State University Teaching Hospital. A census sampling technique was employed, whereby all 106 diabetic nurses were included in the study. Data were collected using a structured questionnaire, which demonstrated a reliability coefficient of 0.81. The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27, with regression analysis applied at a 0.05 level of significance. The result indicated that the highest predictor of quality of life among diabetic nurses was duration of illness and quality of life ($r = 0.82$, $p<0.05$), and 68.1% of quality of life of diabetic nurses was predicted by the duration of illness ($R^2 = 0.681$). There was a high prediction between presence of complication and quality of life ($r = 0.89$, $p<0.05$), and 89.0% of quality of life of diabetic nurses was predicted by the presence of complication ($R^2 = 0.890$). The result indicated that there was a high prediction between blood sugar control and quality of life ($r = 0.87$, $p<0.05$), and 79.5% of quality of life of diabetic nurses was predicted by the blood sugar control ($R^2 = 0.795$). It was concluded that the predictors of quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State were basically disease-specific factors such as presence of complications, blood sugar control, and duration of illness. It was recommended among others that, nurses with diabetes mellitus should prioritize self-care and engage in regular self-care activities such as maintaining a healthy weight, regularly track blood glucose level, and stay connected by regularly communicating with healthcare providers and support group to improve overall quality of life.

Keywords: *Factors, Illness, Quality of Life, Predictors, Public Tertiary Health Institution.*

Introduction

In both rich and developing countries, the prevalence of chronic non-communicable diseases is on the rise, and it already accounts for a disproportionate share of the world's disease burden. Demographic shifts and the resulting changes in lifestyle brought about by urbanisation are major causes of this trend. Nurses are healthcare professionals who provide direct care to individuals, families, and communities across diverse clinical and community settings, thereby forming a critical component of the global healthcare workforce. Despite their essential role, nurses are among the most vulnerable groups within the healthcare system due to lifestyle demands and occupational stressors inherent in their profession. This vulnerability increases their susceptibility to various metabolic disorders, including diabetes mellitus (DM). Furthermore, pre-existing health conditions among some nurses may exacerbate their risk of developing such diseases. The prevalence of DM among nurses therefore warrants urgent attention, given the serious health risks associated with the condition, which may lead to diminished quality of life and psychological complications within healthcare settings (Aryangat & Gerish, 2020).

According to the American Diabetes Association (2014), diabetes mellitus is a collection of metabolic disorders that can have different causes. It is marked by long-term high blood sugar levels caused by problems with insulin production, insulin action, or both, and it is also accompanied by problems with the metabolism of carbohydrates, lipids, and proteins. Diabetes mellitus is a debilitating condition with far-reaching physical, social, emotional, and economic consequences. The disease adversely affects individuals' quality of life and overall health status, while also imposing substantial direct healthcare costs and indirect societal costs associated with reduced productivity (Andayani et al., 2020). Furthermore, diabetes mellitus has been identified as a leading cause of non-traumatic limb amputations and blindness among working-age adults (Al-Shehri et al., 2018). Consequently, a comprehensive understanding of diabetes mellitus and its associated complications is essential for effective disease management and control.

What constitutes a high quality of life, according to the World Health Organization's Quality of Life (WHOQOL) Group, is an individual's sense of self-worth in light of their aspirations, expectations, worries, and the cultural and ethical frameworks in which they reside. As a result, there are many facets to the idea of quality of life, including one's bodily and mental health, their degree of autonomy, their social networks, and their interactions with important aspects of their immediate environment (Jahanlou & Karam, 2021). Furthermore, Odili et al. (2020) noted that the quality of life of individuals living with diabetes mellitus includes functional abilities that are directly influenced by the disease itself and/or its medical management. Nurses with diabetes may experience a unique set of challenges that impact their QoL, such as managing diabetes-related symptoms, balancing work demands with diabetes self-management, coping with emotional toll of living with a chronic condition, stigma and disclosure of diabetes status.

Certain factors can predict the quality of life of diabetic nurses. Highlighting the predictors can help health organizations and health care providers identify areas for intervention and diabetic management (Gbolami et al., 2018). Blood glucose control has a significant impact on QoL for individuals with diabetes including nurses. The primary objective of diabetes mellitus management is to maintain blood glucose levels as close to normal as possible in order to achieve optimal metabolic outcomes and prevent the development of complications (Marra, 2014). Evidence suggests that improved glycemic control is associated with enhanced quality of life among individuals living with diabetes mellitus, as better metabolic regulation reduces disease-related symptoms and long-term health risks (Buresara & Valeminsley, 2018).

The duration of diabetes mellitus has been shown to significantly influence nurses' quality of life. While the risk of diabetes-related complications is generally lower during the early stages of the disease, prolonged duration is often associated with poorer quality of life outcomes among individuals living with diabetes. Gorien et al. (2017) reported that nurses who had lived with diabetes for more than five years exhibited lower quality of life scores, particularly within the physical health domain. This decline is likely attributable to increased disease severity and the cumulative burden of complications, both of which are known to negatively affect the quality of life of diabetic patients. Conversely, some studies have reported no significant association between disease duration and quality of life. For instance, Brown et al. (2014), in a study of individuals with type 1 diabetes in the United Kingdom, found that treatment satisfaction and quality of life scores were higher among patients with a longer duration of the disease.

The presence of diabetes-related complications has a significant influence on the quality of life of individuals living with diabetes mellitus. Complications such as diabetic foot ulcers and limb amputations are known to exert a substantial negative effect on patients' overall well-being. Beyond physical impairment, diabetes mellitus can profoundly affect psychological and social functioning, with some patients experiencing depression and, in severe cases, suicidal ideation (Koopmanschap, 2013). Despite efforts aimed at preventing diabetes-related complications, the impact of the disease on quality of life is often overlooked. Nevertheless, diabetes complications are almost universally associated with reduced quality of life, as affected individuals require continuous blood glucose monitoring and frequently experience anxiety related to dietary restrictions, the risk of hypoglycemic episodes, and the potential development of further complications (Singh & Bradley, 2016). Funnell (2016) opined that in the domain characteristics of diabetes mellitus, complications such as visual loss, kidney damage, erectile problems, heart disease, peripheral neuropathy, chronic pain, amputation, difficulty in walking and autonomic neuropathy problems affect physical health; mood disorders (short and long term), frustration, discouragement, body image disturbance and negative feelings affect psychological health; while financial burden, fatigue in work place, impaired relationship in quality and quantity, hypoglycaemic attacks in workplace, visual disturbance and impairment in sexual relationship affect social health.

The management of diabetes mellitus—through nutritional regulation, pharmacological therapy, physical activity,

diabetes education, and regular blood glucose monitoring—places substantial demands on patients and their significant others, which may adversely affect health-related quality of life. Empirical studies conducted in Nigeria at the University of Benin Teaching Hospital and the University of Ilorin Teaching Hospital by Odili et al. (2020) and Issa and Baiyewu (2016), respectively, demonstrated that diabetes mellitus significantly influences the lives of affected individuals. These studies further identified lower income levels, limited educational attainment, lower employment status, and the presence of diabetes-related complications as key factors associated with poorer quality of life among patients living with diabetes mellitus.

Nurses with diabetes experience a unique set of challenges that impact their quality of life, such as balancing work demands with diabetes self-management, coping with the emotional toll of living with a chronic condition, managing diabetes-related symptoms like fatigue, concerns about experiencing low blood sugar episodes while working, and disclosure of diabetes status to colleagues. Non-communicable diseases, including diabetes mellitus, constitute some of the most significant public health challenges globally. Diabetes mellitus is ranked among the four leading chronic non-communicable diseases and is associated with debilitating complications and serious end-organ damage affecting vital body systems, resulting in substantial deterioration in overall quality of life. The disease profoundly influences individuals' quality of life, not only through its direct health consequences but also by contributing to familial, financial, and social challenges. Nurses play a critical role in promoting the health and well-being of populations; therefore, their own health status is of paramount importance. Maintaining optimal health among nurses is essential, as they must be physically and mentally fit to perform their professional duties effectively within demanding and often stressful healthcare environments.

Research Questions

The following research questions were stated to guide the study:

1. What is the relationship between the length of time a nurse has had diabetes and their quality of life at public tertiary health facilities in Rivers State?
2. Are nurses with diabetes mellitus at public tertiary health institutions in Rivers State more likely to have a high quality of life if they have complications from the disease?
3. How well does the ability to control blood sugar levels relate to the quality of life of nurses in Rivers State who have diabetes mellitus and work in public tertiary healthcare facilities?

Hypotheses

The following null hypotheses were formulated to guide the study and were tested at the 0.05 level of significance:

1. Duration of diabetes mellitus does not significantly predict the quality of life of nurses with diabetes mellitus in public tertiary health institutions in Rivers State.
2. The presence of diabetes mellitus–related complications does not significantly predict the quality of life of nurses with diabetes mellitus in public tertiary health institutions in Rivers State.
3. Level of blood glucose control does not significantly predict the quality of life of nurses with diabetes mellitus in public tertiary health institutions in Rivers State.

Methodology

Based on data collected from the NHIA clinics and staff clinics at both institutions, this study utilised a correlational research design to enrol 106 nurses with diabetes mellitus who were employed by two public tertiary health institutions in Rivers State. Of these, 74 nurses were from the University of Port Harcourt Teaching Hospital and 32 from the Rivers State University Teaching Hospital (2024). All nurses who satisfied the inclusion criteria and had diabetes mellitus were included in the study, using a census sampling technique. Information was gathered by means of the World Health Organisation Quality of Life instrument (WHOQOL-BREF), a standardised 26-item questionnaire that was created in 1996 to serve as a cross-cultural measure of quality of life that is both multilingual and multidimensional. A Cronbach's alpha coefficient of 0.81 indicates that the instrument has acceptable internal consistency reliability; it consists of four categories and uses a five-point Likert scale ranging from extremely unreliable to very reliable.

With the ethical approval from the ethical committee and the letter of introduction from the Head of department, Human Kinetics, Health and Safety Studies; the researcher approached the Head of Nursing services of the two hospitals, and obtained an administrative permit to collect data from respondents. The researcher and the assistants administered the questionnaires to the respondents, the questionnaires were retrieved on the spot immediately after completion. Data collection lasted for eight weeks. Data collected were computed using Statistical Product and Service Solutions (SPSS) version 27.0, for editing, coding and analysis. Linear regression statistical model was used to analyze the data at 0.05 level of significance.

The ethical approval was granted on 4th September, 2024 and 27th September, 2024 with the registration numbers: NHREC/UPTHREC/03/2023 and RSUTH/REC/2024/563 respectively; before data collection and informed consent was obtained from the participants. Confidentiality and anonymity, was maintained during the process of data collection and the participants were not exposed to any form of hazard.

Results

The result of the study are shown below:

Table 1: Regression analysis on the extent to which duration of illness predict quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Decision
1	0.82	0.68	0.68	1.83	**High extent**

Guide: 0.00-0.19 = very low, 0.20-0.39 = low, 0.40-0.59 = moderate, 0.60-0.79 = high and 0.80 above is very high

Table 1 illustrated the extent to which duration of illness predict quality of life among nurses. The result indicated that there was a high prediction between duration of illness and quality of life (r = 0.82). The result further showed that 68.1% of quality of life of diabetic nurses was predicted by the duration of illness (R^2 = 0.681). Thus, the extent to which duration of illness predicted quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State was high

Table 2: Regression analysis on the extent to which presence of complication predict quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Decision
1	0.89	0.89	0.89	2.08	**Very High extent**

Guide: 0.00-0.19 = very low, 0.20-0.39 = low, 0.40-0.59 = moderate, 0.60-0.79 = high and 0.80 above is very high

Table 2 illustrated the extent to which presence of complication predict quality of life among nurses. The result indicated that there was a high prediction between presence of complication and quality of life (r = 0.89). The result further showed that 89.0% of quality of life of diabetic nurses was predicted by the presence of complication (R^2 = 0.890). Thus, the extent to which presence of complication predicted quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State was very high.

Table 3: Regression analysis on the extent to which blood sugar control predict quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Decision
1	0.87	0.79	0.78	2.73	**Very high extent**

Guide: 0.00-0.19 = very low, 0.20-0.39 = low, 0.40-0.59 = moderate, 0.60-0.79 = high and 0.80 above is very high

Table 3 illustrated the extent to which blood sugar control predict quality of life among nurses. The result indicated that there was a high prediction between blood sugar control and quality of life (r = 0.87). The result further showed that 79.5% of quality of life of diabetic nurses was predicted by the blood sugar control (R^2 = 0.795). Thus, the extent to which blood sugar control predicted quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State was very high.

Test of Hypotheses

Table 4: Regression analysis on duration of illness and quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	662.615	1	662.615	196.24	0.00*	**Rejected**
	Residual	310.643	92	3.377			
	Total	973.258[d]	93				

***Significant, p<0.05**

Table 4 presents the regression analysis examining the relationship between duration of illness and quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State. The findings indicate that duration of illness significantly predicted quality of life [f(1,92) = 196.24, p<0.05]. Consequently, the null hypothesis stating that duration of illness does not significantly predict quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State was rejected.

Table 5: Regression analysis on presence of complications and quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	573.893	1	573.893	132.20	0.00*	**Rejected**
	Residual	399.365	92	4.341			
	Total	973.258[d]	93				

***Significant, p<0.05**

Table 5 presents the regression analysis examining the relationship between the presence of diabetes-related complications and quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State. The results show that the presence of complications significantly predicted quality of life [f(1,92) = 132.20, p<0.05]. Consequently, the null hypothesis stating that the presence of complications does not significantly predict quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State was rejected.

Table 6: Regression analysis on blood sugar control and quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	287.433	1	287.433	38.55	0.00*	Rejected
	Residual	685.825	92	7.455			
	Total	973.258	93				

***Significant, p<0.05**

Table 6 presents the regression analysis assessing the relationship between blood glucose control and quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State. The findings indicate that blood glucose control significantly predicted quality of life $F(1,92) = 38.55, p < 0.05]$. Consequently, the null hypothesis stating that blood glucose control does not significantly predict quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State was rejected.

Discussion of Findings

Longevity of sickness was found to have a strong predictive potential for quality of life, accounting for 68.1% of the variance in quality of life among diabetic nurses ($R^2 = 0.681$). Since a patient's quality of life can be negatively impacted by the progression of their

disease over time, this conclusion should come as no surprise. This study's results support those of Gupta et al. (2021), who investigated the relationship between the length of time a person has been sick and their quality of life while living with diabetes mellitus in India's Sub-Hamalayan region. Consistent with previous research, this study found that the longer a nurse has been sick with diabetes mellitus, the lower their quality of life is. This study was conducted at the General Hospital in the city of Leskovac and was conducted by Stojanovic et al. (2018). Consistent with previous research, this study found a strong correlation between the length of time a patient has been sick and their quality of life when it came to self-reported hypoglycemia in adults with diabetes in Northwest Ethiopia (Tiruneh et al., 2019). Consistent with previous research, this study found a strong correlation between the length of time a patient has been sick and their quality of life. Fiseha et al. (2018) investigated what factors contribute to poor glycaemic control in adult outpatients with diabetes who visited a hospital in Northwest Ethiopia. This study's results are consistent with those of Azzam et al. (2021), who investigated the variables impacting glycaemic control in Egyptians with diabetes who visited basic healthcare institutions in Mansoura, District. They found that there was a strong correlation between the length of time a person was sick and their quality of life. There was a strong correlation between the length of illness and quality of life, according to this study's findings, which are consistent with those of Almasri et al. (2020), who investigated the effects of diabetes mellitus on health-related quality of life among Saudi Arabian nurses caring for patients with type 2 diabetes. While Gebremedhin et al. (2018) found no statistically significant correlation between BMI and QoL in their research of type 2 diabetic patients in southwestern Ethiopia, our findings contradict that finding. One possible explanation for this discrepancy is because the two studies used different locations; the first one was in Ethiopia, while the second one was in Nigeria. Wang et al. (2023) found no statistically significant link between duration of disease and quality of life among inhabitants of Zhongshan city, China, who have type 2 diabetes mellitus. This study contradicts their findings.

The findings of the study revealed a strong predictive relationship between the presence of diabetes-related complications and quality of life, with complications accounting for 89.0% of the variance in the quality of life of nurses living with diabetes mellitus ($R^2 = 0.890$). This result aligns with the findings of Stojanovic et al. (2018), whose study on nurses with diabetes mellitus at the General Hospital in Leskovac reported a significant association between disease-related factors and quality of life outcomes. Similarly, Chung et al. (2013), in a study of Korean patients with type 2 diabetes mellitus, observed a significant relationship between the presence of complications and quality of life. Consistent findings were also reported by Tiruneh et al. (2019) in Northwest Ethiopia, where a strong association between diabetes-related complications and quality of life was identified among adult diabetic patients experiencing hypoglycemia. In addition, Fiseha et al. (2018) reported comparable results in a study conducted in Northeast Ethiopia, indicating that the presence of complications was significantly associated with poorer quality of life. These findings are further supported by previous studies, including those of Gbolami et al. (2018) and Singh and Bradley (2016). However, the present findings contrast with those of Koponen et al. (2016), who reported a non-significant association between diabetes-related complications and quality of life in Ethiopia. This discrepancy may be attributed to contextual differences such as study location, population characteristics, and healthcare systems, as the referenced study was conducted in Ethiopia, whereas the present study was carried out in Nigeria.

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Conclusion

Based on the findings of the study, it is concluded that the predictors of quality of life among nurses with diabetes mellitus in public tertiary health institutions in Rivers State were basically disease-specific factors such as presence of complications, blood sugar control, and duration of illness,

Recommendations

The following recommendations were made based on the findings of the study:

1. Families, caregivers and colleagues of nurses with diabetes should give support to manage the emotional and physical challenges of living with diabetes, and not to stigmatize in order to reduce the duration of diabetic illness.
2. Healthcare organizations and Diabetes support group should provide regular diabetes education and awareness, provide information on diabetes management, treatment options and lifestyle changes, promote a healthy work environment, provide social connections and design proactive strategies to reduce impact and complications of diabetes, and ensure that nurses with diabetes have access to quality healthcare services.
3. Nurses with diabetes mellitus should prioritize self-care, and engage in regular self-care activities such as maintaining a healthy weight, regularly track blood glucose level to improve overall quality of life.

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