Title: Socio-Demographic and Clinical Correlates of Health-Related Quality of Life Among Patients with Type 2 Diabetes Mellitus in Nigeria

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Abstract

Background: Type 2 diabetes mellitus (T2DM) is a growing public health concern globally that significantly affects patients' health-related quality of life (HRQOL). Studies have indicated that patients' social background and clinical factors can impact their health-related quality of life (HRQOL). However, there is a paucity of data in Ogun State, Nigeria, exploring these relationships among individuals living with T2DM. This study aims to fill this gap by determining the population's socio-demographic and clinical correlates of HRQOL.

Methods: This was a descriptive cross-sectional study of 209 individuals with T2DM recruited from the teaching hospitals in Ogun State, Nigeria, using proportionate stratified sampling between January and March 2024. A structured questionnaire was used to gather information on sociodemographic characteristics, clinical factors, and health-related quality of life (HRQOL) (WHOQOL-BREF). Data were analyzed using SPSS version 25. Descriptive statistics summarized participants' characteristics and HRQOL scores, and multiple regression analysis identified significant correlates of HRQOL, with significance level set at $p < 0.05$.

Results: Of 219 eligible participants, 209 completed the study (95% response rate). The overall HRQOL was moderate (62.84 ± 13.98), and domain-specific scores were all above the mid-point (50), with psychological health recording the highest mean score (63.50 ± 12.91), followed by social relationships (63.32 ± 19.70), environmental (62.44 ± 15.50), and physical health (62.08 ± 13.02). Age, gender, educational status, marital status, and income showed significant positive associations with all HRQOL domains ($p < 0.05$). Conversely, smoking, alcohol use, and longer duration of diabetes were negatively associated with HRQOL scores across all domains ($p < 0.05$).

Conclusion: HRQOL among individuals with T2DM in this study was moderate. Socio-demographic factors positively influenced HRQOL, while unhealthy behaviors and prolonged disease duration were linked to poorer outcomes. Routine HRQOL assessment is recommended to guide holistic, patient-centered diabetes management.

Keywords: Diabetes Mellitus, Health-related quality of life (HRQOL), World Health Organization Quality of Life Short Form (WHOQOL-BREF), Correlates of health-related quality of life, Nigeria

Highlights

- Diabetes mellitus, a global health burden, can significantly affect the health-related quality of life (HRQOL) of patients, particularly in low- and middle-income countries where resources and structured psychosocial care may be limited.
- This study aimed to assess the socio-demographic and clinical correlates of HRQOL among patients with type 2 diabetes mellitus (T2DM) attending diabetes clinics in the teaching hospitals in Ogun State, South-West Nigeria.
- The findings revealed a moderate level of HRQOL among participants, with higher scores in psychological and social domains. Age, gender, education, marital status, and income were positively associated with HRQOL, while smoking, alcohol consumption, and longer diabetes duration were negatively associated ($p < 0.05$).
- The integration of routine HRQOL assessments into diabetes care can help to identify at-risk individuals and implement targeted, patient-centered interventions geared towards addressing both clinical and psychosocial dimensions of diabetes management.

Plain Language Summary

Improving health-related quality of life (HRQOL) remains a central goal of diabetes management. The HRQOL assessments enable a scientific evaluation of how health influences overall quality of life, extending far beyond the traditional focus on observable clinical or microscopic findings. This study examined the sociodemographic and clinical correlates of HRQOL among individuals with type 2 diabetes mellitus (T2DM) in Ogun State, Nigeria. The study results revealed a moderate level of HRQOL of the patients with T2DM. Older age, female gender, higher educational attainment, being married, and higher monthly income were all positively associated with HRQOL. Conversely, smoking, alcohol consumption, and longer duration of living with T2DM were consistently associated with poorer HRQOL. Nurses should carry out tailored, patient-centered care that integrates HRQOL assessments into routine diabetes management.

Introduction

Diabetes is a long-term health condition that develops when the body either fails to produce sufficient insulin or cannot use the insulin it produces effectively. This disorder, referred to as diabetes mellitus (DM), has emerged as a pressing global health challenge and is classified among the four leading noncommunicable diseases demanding urgent intervention. Over the past few decades, the number of people affected has risen sharply (WHO, 2016).

The International Diabetes Federation (IDF) reported in 2021 that about 537 million adults worldwide—equivalent to 10.5% of those aged 20 to 79 years—are living with diabetes, and nearly half remain undiagnosed. Projections indicate that this number will rise to 643 million by 2030 and further to 783 million by 2045 (Sun et al., 2021). Type 2 diabetes mellitus (T2DM) represents more than 90% of all cases globally (IDF, 2021). Strikingly, about three-quarters of adults with diabetes reside in low- and middle-income nations, including Nigeria (IDF, 2022). Diabetes is also a major contributor to mortality, responsible for roughly 12.2% of deaths among adults aged 20 to 79 years (Sun et al., 2021).

In Nigeria, the first national survey on diabetes, carried out in 1992, recorded a prevalence of 2.2%. More recent figures from the IDF estimate prevalence at 3.7% among adults aged 20 to 69 years, which translates to over 3.6 million people (Asonye & Ojewole, 2023). However, these estimates may not fully capture the burden of the disease, as they often rely on extrapolated data. Local and regional studies within Nigeria have reported prevalence rates ranging from 2% to 12% (Gezawa et al., 2015; Uloko et al., 2018). In Ogun State specifically, the prevalence is estimated at around 5% (World Diabetes Foundation, 2018).

DM is regarded as one of the most pressing health emergencies of the 21st century, not only because of its rapid global rise and the large proportion of undiagnosed cases, but also due to the serious complications it causes and the heavy social and economic burden it imposes. When poorly managed, it

can lead to serious complications such as blindness, kidney failure, and limb amputation, all of which severely affect quality of life (QOL) (Saeedi et al., 2020). Importantly, the relationship between diabetes and QOL is bidirectional: not only does the disease impact a person's QOL, but their QOL also influences how well they manage their condition. Poor QOL can lead to reduced self-care and poor blood sugar control, increasing the risk of complications (Garratt et al., 2002). Conversely, when patients experience satisfaction and wellbeing—including in relation to managing their diabetes—they tend to be more motivated to maintain effective self-care routines. This fosters better daily wellbeing and long-term health outcomes, creating a positive feedback loop that further enhances their QOL (Fadli, 2022; Malini, 2022; Roglic, 2016).

The World Health Organization defines quality of life as an individual's perception of their position in life within the context of their culture and value systems, relative to their goals, expectations, and concerns. It encompasses various dimensions, including physical health, psychological state, personal beliefs, social relationships, and environmental factors (WHO Group, 1994). Measures of health-related quality of life (HRQOL) provide a scientific way to assess how health affects overall QOL, moving well beyond traditional approaches focused solely on clinical or laboratory findings (Taylor, 2000).

In people with T2DM, several socio-demographic and disease-related factors influence HRQOL. Research has shown that variables such as age, gender, marital status, education, occupation, and income are linked to differences in HRQOL (Al Hayek et al., 2014; Altınok et al., 2016). Despite the importance of evaluating HRQOL to inform healthcare decisions and improve clinical guidelines, studies exploring the determinants of QOL in T2DM patients remain limited. This study, therefore, aims to determine the socio-demographic and clinical correlates of HRQOL among T2DM patients attending diabetes clinics at teaching hospitals in Ogun State, Nigeria.

Null Hypothesis (H_o): There is no significant association between socio-demographic and clinical factors and the HRQOL among patients with T2DM.

Materials and Methods

Design, setting, and sample

An institution-based cross-sectional study was conducted in the Olabisi Onabanjo University Teaching Hospital (OOUTH) Sagamu and Babcock University Teaching Hospital (BUTH), Ilisan Remo, Ogun State. BUTH has over 250 beds and a well-established and equipped department, including the endocrinology, diabetes, and metabolism (E.D.M.) department that care for patients with DM from towns and cities across the Southwest region of Nigeria on referral. OOUTH, established in 1986, is located in Sagamu - a town located 50 miles north of Lagos, South West, Nigeria. The OOUTH is a tertiary hospital with two hundred and fifty (250) beds and serves as a major referral center for other healthcare facilities in all Remo Local Government Areas of Ogun State. The OOUTH has many well-established and equipped departments, including the endocrinology/diabetes department.

The population for this research study was all patients diagnosed with DM attending diabetes clinics in BUTH and OOUTH. The target population were 260 patients diagnosed with T2DM who met the inclusion criteria.

Inclusion criteria: Patients aged 21 years and above, diagnosed with T2DM for at least 3 months who consented to participate in the study.

Exclusion criteria: Chronically ill patients admitted into the hospitals, those with other types of diabetes, and patients with hyperglycemia resulting from Gestational Diabetes Mellitus, Cushing syndrome, and paraneoplastic syndrome were excluded from the study.

A sample size of 219 (10% attrition include) was determined using the Leslie Kish (1965) formula for a single proportion with an absolute error of 5% allowed and prevalence of 15.3% from a study conducted in Lagos (Kayode et al., 2015). The sample size formula for a single proportion is stated below:

$$N = \frac{\left(\frac{Za}{b}\right)^2 pq}{d^2}$$

A stratified proportionate to size sampling method was used to allocate the total sample size of 219 across the two hospitals - BUTH, with 60 patients, and OOUTH, with 200 patients. Based on proportional allocation, approximately 51 participants were selected from BUTH and 168 from OOUTH. Within each hospital, total enumeration was employed—meaning all eligible and consenting patients were recruited until the required number for each stratum was achieved.

Instruments for Data Collection

A 36-item self-administered questionnaire was used to retrieve information from the patients. The questionnaire was divided into two sections. Sections A was self-constructed by the researcher, while sections B was an adopted validated scale.

***Section A - Socio-Demographic and Clinical Factors*:** This part contains 10-items including variables, such as age, gender, religion, level of education, monthly income, ethnicity, marital status, duration of diabetes, smoking, and alcohol consumption status.

Section B – World Health Organization Quality of Life–Short Form (WHOQOL-BREF). This validated, internationally recognized tool is designed to assess individuals' perceptions of their quality of life within the context of their culture, value systems, personal goals, standards, and concerns. It is particularly useful in chronic disease populations, including those with diabetes. The WHOQOL-BREF consists of 26 items divided into four domains: Physical Health (7 items), Psychological Health (6 items), Social Relationships

(3 items), and Environment (8 items). Each domain captures specific dimensions of an individual's QOL. The Physical Health domain includes aspects such as pain and discomfort, energy and fatigue, sleep and rest, and capacity for work. The Psychological domain covers positive and negative feelings, self-esteem, body image, and personal beliefs. The Social Relationships domain evaluates personal relationships, social support, and sexual activity. The Environment domain includes financial resources, safety, home environment, health and social care access, and the physical living environment.

In addition to the four domains, the instrument also contains two general questions: one assessing the individual's overall perception of QOL, and the other evaluating their overall perception of their health. These two items are analyzed independently and are not included in the domain scores.

Each item is rated on a 5-point Likert scale, with responses ranging from 1 (very poor/dissatisfied) to 5 (very good/satisfied). Domain scores are calculated by first computing the mean of all items within a domain and then multiplying the mean score by 4 to make it comparable to the WHOQOL-100. These raw domain scores are subsequently transformed to a 0–100 scale, where higher scores denote a better QOL. The interpretation of domain scores follows the guideline where scores of 0–45 indicate poor QOL, 46–65 suggest moderate QOL, and 66–100 reflect high QOL. The overall HRQOL score for each participant is derived as the average of the four domain scores. Cronbach alpha values for each of the four domain scores ranged from 0.66 to 0.84, demonstrating good internal consistency (Harper et al., 1998).

Method of Data Collection

Research Assistants (RA) were recruited and trained to help in the distribution and collection of the questionnaire. The complete detail of the aims and implications of the study were explained to the participants. The questionnaires were distributed to the eligible respondents willing to participate in the study. The researcher and the research assistants retrieved all the questionnaires from the respondents. The study lasted for about 12 weeks.

Data Analysis

The data were first sorted and cleaned, and analysis was done using SPSS version 23. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the socio-demographic characteristics of the participants and the HRQOL domain scores. Skewness and standard error were computed to assess the normality of the score distributions. The related factors were determined using the linear regression model. Before analysis, key assumptions were evaluated. Linearity and homoscedasticity were assessed using scatterplots; normality of residuals was verified using histogram and Q-Q plots. Multicollinearity was checked through the Variance Inflation Factor (VIF), ensuring all VIF values were below 10. The Durbin-Watson statistic was used to confirm independence of residuals, with acceptable values falling between 1.5 and 2.5. A p-value less than 0.05 in the multiple linear regression analysis was considered an independently associated factor for HRQOL.

Results

A total of 219 participants were recruited for this study, and 209 took part in the study, thus representing a 95% response rate.

Table 1 shows that most of the respondents were of the Yoruba tribe (91.9%), aged 61 years and above (42%), and belong to the female gender (71.3%). Most of them (63.2%) were Christians, 39.7% had tertiary education, and about 92.3% were married. Most participants (54.5%) had a monthly income above minimum wage (₦ 30, 000 and above). In addition, 92.3% of the respondents did not smoke, or consume alcohol, and 57.4% were living with T2DM for less than 10 years.

Table 1: Sociodemographic and Clinical Characteristics of the participants (N=209)

Variables		N	%
Age (year)	Less than 30	5	2.2
	31 – 40	7	3.3
	41 – 50	41	19.6
	51 – 60	68	32.5
	61 and above	88	42.1
	M±SD	56.1 ± 9.7	
Gender	Male	60	28.7
	Female	149	71.3
Religion	Christian	132	63.2
	Islam	77	36.8
Ethnicity	Yoruba	192	91.9
	Igbo	15	7.2
	Hausa	2	1.0
Educational Status	Primary School Level	53	25.4
	Secondary Level	73	34.9
	Tertiary Level	83	39.7
Marital Status	Single	8	3.8
	Married	193	92.3
	Divorced	4	1.9
	Widow/Widower	4	1.9
Monthly Income	Above minimum wage (₦*30, 000 and above)	114	54.5
	Within minimum wage (₦30, 000)	51	24.4
	Below minimum wage (less than ₦30, 000)	44	21.1
Smoking Status	Smoker	16	7.7
	Non-smoker	193	92.3
Alcohol Consumption	Alcoholic	16	7.7
	Nonalcoholic	193	92.3
Duration of type 2 diabetes mellitus	Less than 10 years	120	57.4
	10 – 20 years	63	30.1
	More than 20 years	26	12.4

*Nira (Nigeria's currency)

The total mean score of HRQOL was 62.84 ± 13.98. All of the individual domain mean scores were above the middle (i.e., 50) of the possible score range (0 – 100 for WHOQOL-BREF at a scale of 100 (Table 2). The skewness and standard error values for all the four domains were < 1.96; hence, the data distributions are normal.

Table 2: Descriptive summary of the domains of Health-Related Quality of Life (HRQOL) (N=209)

Domain	**M±SD**	**Skewness**	**Std. Error**	**Skew/SE**
Physical	62.08±13.02	-.287	.168	-1.708
Psychological	63.50±12.91	-.117	.168	-0.696
Social	63.32±19.70	-.578	.168	-3.440
Environment	62.44±15.50	-.396	.168	-2.357
Total HRQOL	62.84 ± 13.98	-0.35	0.168	-2.083

Study participants were asked to provide their perception on their HRQOL and health satisfaction. Based on their perception, about 179 (85.6%) reported that their HRQOL was good and very good. With regard to perceived satisfaction of their health, 122 (58.4%) were satisfied and very satisfied with their health (table 3).

Table 3: Perceived Quality of Life and Health Satisfaction among the participants (N=209)

Variables	N=209	%
Perceived HRQOL		
Very poor	0	0
poor	3	1.4
Neither poor nor good	27	12.9
Good	100	47.8
Very good	79	37.8
Perceived Health Satisfaction		
very dissatisfied	0	0
Dissatisfied	23	11.0
Neither satisfied nor dissatisfied	64	30.6
Satisfied	88	42.1
Very satisfied	34	16.3

Multivariate linear regression analysis was employed to test the association between the respondents' socio-demographic characteristics and their HRQOL (Table 4). Patients' age showed a positive association with all HRQOL domains. Older age was significantly associated with better physical health ($p < .001$), psychological health ($p = .026$), social relationships ($p = .022$), and environmental health ($p = .024$).

Gender was positively associated with HRQOL across all four domains. Being female was associated with higher scores in physical health ($p = .014$), psychological health ($p = .012$), social relationships ($p = .037$), and environmental health ($p = .022$).

Religion was significantly associated only with the social domain of HRQOL. Being Muslim was associated with higher social relationship scores ($p = .016$), while no significant associations were found with physical, psychological, or environmental domains. Educational status, particularly having a tertiary education, was positively associated with all HRQOL domains. Significant associations were observed for physical health ($p = .019$), psychological health ($p = .028$), social relationships ($p = .026$), and environmental health ($p = .011$). Marital status was positively associated with HRQOL in all domains. Being married was associated with higher scores in physical health ($p < .001$), psychological health ($p = .025$), social relationships ($p = .002$), and environmental health ($p = .018$). Monthly income was positively associated with all four HRQOL domains. Earning above ₦30,000 was significantly associated with better physical health ($p = .035$), psychological health ($p = .035$), social relationships ($p = .026$), and environmental health ($p = .020$).

Smoking status was negatively associated with HRQOL in all domains. Smoking was associated with lower scores in physical health ($p = .014$), psychological health ($p = .041$), social relationships ($p = .020$), and environmental health ($p = .009$). Alcohol consumption was negatively associated with all domains of HRQOL. Alcohol use was associated with lower physical health ($p = .006$), psychological health ($p = .034$), social relationships ($p = .017$), and environmental health ($p = .010$). Duration of diabetes also demonstrated a negative association with HRQOL. Participants who had lived with T2DM for over 10 years reported lower scores in physical health ($p = .007$), psychological health ($p = .009$), social relationships ($p = .014$), and environmental health ($p = .021$).

Table 4: Multivariate linear regression analysis of the factors associated with health-related quality of life domains in patients with type 2 diabetes mellitus (N=209)

Predictor Variable	Physical Health			Psychological Health			Social Relationship			Environment		
	Beta (β)	95% Confidence Interval (CI)	Sig	Beta (β)	95% Confidence Interval (CI)	Sig	Beta (β)	95% Confidence Interval (CI)	Sig	Beta (β)	95% Confidence Interval (CI)	Sig
Age	3.27	1.70–4.84	.000	1.85	0.22–3.48	.026	1.21	0.18–2.24	.022	0.88	0.12–1.64	.024
Gender: (Female)	2.12	0.43–3.81	.014	2.91	0.64–5.19	.012	1.67	0.10–3.24	.037	1.84	0.27–3.41	.022
Religion: (Islam)	1.08	−0.55–2.71	.192	0.97	−0.48–2.42	.187	2.87	0.54–5.20	.016	0.43	−1.20–2.06	.612
Educational Status: (Tertiary)	2.95	0.48–5.42	.019	2.12	0.25–3.99	.028	1.75	0.20–3.30	.026	2.08	0.50–3.66	.011
Marital Status: (Married)	4.45	2.31–6.58	.000	2.75	0.34–5.16	.025	5.12	1.86–8.38	.002	2.61	0.45–4.77	.018
Monthly Income: (>₦30,000)	3.12	0.21–6.03	.035	2.06	0.14–3.98	.035	2.84	0.34–5.34	.026	3.68	0.59–6.78	.020
Smoking Status: (Yes)	−2.85	−5.13 – −0.57	.014	−2.32	−4.55 – −0.09	.041	−1.98	−3.64 – −0.32	.020	−2.26	−3.94 – −0.58	.009
Alcohol Consumption: (Yes)	−3.84	−6.56 – −1.13	.006	−2.78	−5.34 – −0.22	.034	−2.05	−3.72 – −0.38	.017	−4.25	−7.49 – −1.01	.010
Duration of T2DM: (>10 years)	−2.98	−5.12 – −0.84	.007	−3.12	−5.44 – −0.80	.009	−3.98	−7.16 – −0.80	.014	−2.84	−5.24 – −0.44	.021

Discussion

The findings showed a mean age of 56.1 ± 9.7 years, majority of participants were females (71.3%), and married (92.3%). The prevalence of T2DM is increasing in both men and women. Men are usually diagnosed at a younger age and have lower body fat than women at the time of diagnosis. Worldwide, about 17.7 million more men than women have diabetes mellitus (Kautzky-Willer et al., 2023). Despite this, women often present with a higher burden of risk factors—particularly obesity—when diagnosed with T2DM. Additionally, psychosocial stress may contribute more significantly to diabetes risk in women than in men. Women experience more pronounced hormonal fluctuations and bodily changes related to reproductive events throughout their lives. For instance, pregnancy can unmask latent metabolic dysfunction, resulting in gestational diabetes — a condition regarded as one of the most significant risk

factors for the future development of T2DM in women (Ciarambino et al., 2022; Kautzky-Willer et al., 2023).

The present study revealed that the participants had an average mean score of 62.84 ± 13.98 as regards their HRQOL, and this is similar to previous studies that used the same tool (WHOQOL-BREF) by Gebremedhin et al. (2019), who revealed a mean score of 51.50±15.78 for overall HRQOL, and Ababio et al (2017), who revealed scores of the overall QOL in both Ghana (56.19 ± 8.23) and Nigeria (64.34 ± 7.34). Also, another study conducted in Nigeria by Nwatu et al. (2019) showed the mean score of 75.6±19.4 for the overall QOL of the subjects. Further analysis of the present study revealed that all domain scores of the WHOQOL-BREF scale were above the midpoint (i.e., 50) of the possible score range (0 – 100 for WHOQOL-BREF at a scale of 100). A similar finding was reported in Nepal by Mishra et al. (2015), who also used the WHOQOL-BREF scale among patients with T2DM. In contrast, Amin et al. (2022) reported below-average domain scores among diabetic patients in Bangladesh using the same scale.

Research carried out in West Java (Puspasari & Farera, 2021) and Iran (Abbasi-Ghahramanloo et al., 2020) showed that many people living with T2DM experience poor QOL, particularly in the physical, psychological, and environmental dimensions. The comparatively higher QOL scores reported in this study may be linked to the characteristics of the participants, many of whom had tertiary education and accessed subsidized treatment at one of the hospitals involved. Education and financial support—especially assistance with the cost of medicines—can make a critical difference by enabling patients to engage more consistently with treatment. This is highly relevant in Nigeria, where patients usually pay for healthcare directly out of pocket. Education itself is widely recognized as a key determinant of health. For example, the Incheon Declaration (UNESCO, 2015) emphasizes that education fosters informed decision-making and healthier lifestyles, while research from high-income settings has shown that adults with lower levels of education consistently report poorer health outcomes (Zajacova & Lawrence, 2018).

In this study, several variables—including age, gender, religion, education, marital status, income, smoking, alcohol intake, and the length of time since diagnosis, significantly correlates with HRQOL. These findings are consistent with previous evidence that has linked HRQOL to sociodemographic and clinical factors such as age (Obosi & Fatunbi, 2018; Lu et al., 2017; Gebremedhin et al., 2019), gender (Manjunath et al., 2014; Obosi & Fatunbi, 2018), religion (Obosi & Fatunbi, 2018), education (Obosi & Fatunbi, 2018), marital status (Obosi & Fatunbi, 2018; Pandey et al., 2020), income (Esin et al., 2016), alcohol use (Daeppen et al., 2014; Ortolá et al., 2016), and duration of T2DM (Obosi & Fatunbi, 2018; de Lima et al., 2018). Also, Trikkalinou et al. (2017), emphasized that the QOL of individuals with diabetes is shaped by a combination of social and clinical factors, which may differ depending on study design, population, and methodology. Altogether, the results highlight the importance of detailed history-taking during patient assessment. For nurses, this means considering not just clinical symptoms but also social context in order to deliver individualized care and set appropriate priorities for interventions.

In the present study, participants' age emerged as one of the notable predictors of HRQOL, this is supported by previous findings from Egypt (Ibrahim, 2016) which suggest that psychological well-being can improve with advancing age. However, studies in Serbia (Spasić et al., 2014) and Ethiopia (Gebremedhin et al., 2019) showed the opposite trend, with younger patients reporting better QOL. This inconsistency likely reflects the complex interplay between aging, perceptions of health, and the presence of comorbidities. While aging often brings physiological decline and greater susceptibility to complications such as cardiovascular or renal disease (Al-Aboudi et al., 2015; Gebremariam et al., 2022), the relatively older participants in this study—most of whom had secondary or tertiary education—may have benefitted from health literacy and prior experience managing their illness. This may explain why age was positively linked with QOL here, a finding also supported by Nwatu et al. (2019), who reported lower QOL scores among younger patients.

Gender differences were also evident, with female participants reporting higher HRQOL across all domains. This observation is consistent with findings from Oman (D'Souza et al., 2016) and Nigeria (Nwatu et al., 2019), although studies from Botswana (Rwegerera et al., 2017) and Ethiopia (Wonde et al., 2022) reported the reverse. Cultural norms may help explain these differences as women in many African settings are more likely than men to seek medical help, partly due to their repeated interactions with health services during pregnancy and childbirth. Men, on the other hand, may delay seeking care because of cultural expectations that equate masculinity with strength and independence. Religion was significantly associated only with the social domain of HRQOL. Muslim participants in this study reported better scores for social relationships, a finding consistent with research from Saudi Arabia (Ali et al., 2013) and systematic reviews which suggest that religious participation can positively influence self-care and glycemic control (Weber & Doolittle, 2023). Faith-based practices may enhance social support networks and foster community belonging, which in turn can improve QOL outcomes.

Furthermore, educational status, particularly having a tertiary education, was positively associated with all HRQOL domains, and this is supported by previous studies in India, Ethiopia, and Turkey, showing that education enhances both psychological and social well-being while contributing to better disease management (Sreedevi et al., 2016; Reba et al., 2018; Esen & Aktürk, 2020; Aschalew et al., 2020). Educated patients understand pivotal information regarding diabetes mellitus and comply with the advice regarding self-management of the illness appropriately. This may help prevent deterioration of glycemic control, prompt early medical advice, detect and manage psychiatric symptomatology, and maintain a better HRQOL. Thus, higher educational status has the potential to significantly impact patients' HRQOL in a positive way (Pandey et al., 2020). Since education is also closely tied to income, higher educational attainment may provide patients with the financial means to access and sustain appropriate treatment, thereby further enhancing their QOL.

Marital status was positively associated with HRQOL in all domains, and this is supported by previous studies, which posit that social and emotional support from a partner can buffer the psychological and economic burdens of living with a chronic condition (Papazafiropoulou et al., 2015; Aschalew et al., 2020). Likewise, participants with higher monthly income above 30,000 Naira (₦) recorded better HRQOL in all four HRQOL domains, and this is supported by previous studies (Esin et al., 2016; Amin et al., 2022), reflecting the role of financial stability in enabling access to care in resource-constrained settings like Nigeria.

Lifestyle factors such as smoking and alcohol consumption were strongly linked to poorer HRQOL. Smoking has a consistent and statistically significant negative effect on all measured aspects of QOL in this study population. The negative beta values mean smokers report poorer physical, mental, social, and environmental health compared to non-smokers. These findings align with previous studies linking cigarette smoking to self-reported reductions in overall health, including deteriorated mental and physical well-being and increased limitations in daily activities (Mody & Smith, 2006; Habib et al., 2024). Panahi et al. (2024), using the SF-12 questionnaire, found that current smokers had significantly poorer mental health scores. Likewise, earlier studies have shown that smoking and alcohol use can lead to feelings of social stigma among patients, which may further diminish QOL. These social factors likely contribute to the overall reduction in well-being observed among affected individuals (Aschalew et al., 2020; Feyisa et al., 2020).

The present study revealed that alcohol consumption is negatively associated with all domains of the HRQOL scale. The result connotes that, the more a patient consumes alcohol the poorer the HRQOL. This aligns with earlier research showing that people who drink moderately to heavily tend to have poorer HRQOL (mental health) compared to those who do not drink or only drink occasionally (Daeppen et al., 2014; Ortolá et al., 2016). The researcher opined that the socio-cultural pattern of alcohol use among the study participants may have affected their HRQOL. Alcohol consumption can potentially impair cognition

and alter an individual's consciousness. It impairs glycemic control, which may result in worrying about glucose levels, depression, complications, and reduced satisfaction with an individual's HRQOL (Aschalew et al., 2020).

Finally, disease duration negatively impacted HRQOL, with patients living with T2DM for more than a decade reporting poorer outcomes across domains. This aligns with research from Ethiopia (Gebremedhin et al., 2019), Serbia (Spasić et al., 2014), and Malaysia (Chew et al., 2015), where longer disease duration was linked to increased complications and treatment fatigue. In contrast, a study from Nepal (Mishra et al., 2015) suggested longer disease duration might allow patients to adapt, though such findings may reflect contextual differences. Nonetheless, the progressive complications associated with diabetes often weigh heavily on patients' physical and psychological health over time.

Limitations of this study may affect the generalizability of the findings. These include the cross-sectional nature of the study, which limits the possibility of establishing causal relationships, and the reliance on self-report data, which increases the possibility of bias. The relatively small sample size and limited geographic scope may also limit the generalizability of the findings to a broader population of patients with T2DM.

Conclusion

The present study results revealed a moderately high HRQOL among the patients with T2DM, with mean scores above the midpoint across all domains—physical health, psychological health, social relationships, and environmental health—indicating generally positive perceptions of well-being and reported satisfaction with their HRQOL and health status. Significant positive sociodemographic correlates of HRQOL were Age, Gender (Female), Religion (Islam), Educational Status (Tertiary), Marital Status (Married), and Monthly Income (>₦30,000). Conversely, smoking, alcohol consumption, and longer duration of living with T2DM were consistently associated with poorer HRQOL across all domains. Overall, these results emphasize the multifaceted nature of QOL in people with T2DM and point to the importance of addressing sociodemographic and clinical factors in comprehensive diabetes care. Interventions

tailored to improve lifestyle behaviors and support vulnerable groups need to be studied to enhance overall HRQOL in this population.

Ethical Considerations

Compliance with ethical guidelines

Ethical approval was obtained from the Babcock University Health Research Ethics Committee (BUHREC) with approval number BUHREC667/22 and Olabisi Onabanjo University Teaching Hospital Health Research Ethics Committee with approval number OOUTH/HREC/557/2022AP. Participation in the study was voluntary and participants had the right to withdraw from the study at any stage without feeling pressured to continue with the study without any negative consequences. Participants gave their informed consent before the study began. The principle of confidentiality and anonymity of all participants was respected. Only researchers approved by BUHREC and OOUTH-HREC were allowed to access the study data. The researcher also ensured that all institutional data privacy protocols were strictly followed.

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