

THE FACTORS INFLUENCING DIABETIC PATIENTS' QUALITY OF LIFE IN THE UPPER WEST REGION OF GHANA

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ABSTRACT

Diabetes leads to premature death, poor health, and lowered quality of life (QoL). Understanding factors affecting the QoL of diabetic patients is crucial for effective disease management. A facility-based cross-sectional survey of 253 diabetic patients in the Wa Municipality was conducted in April 2023, guided by the Wilson and Cleary Health-Related QoL (HRQoL) framework. Data were analysed using descriptive statistics and quantile regression to explore factors associated with QoL. We found that the QoL of diabetic patients was not optimal across all six domains, with the environment, physical, and psychological domains associated with relatively low QoL scores while the spiritual and social domains had relatively high QoL scores. Being female was significantly associated with lower QoL across various quantiles. QoL also reduced with age, notably at the 75th percentile. Urban residents experienced significantly better QoL at the 25th percentile, though this effect lessened at higher percentiles. To enhance QoL, we recommend public education on making buildings more accessible to people with diabetes and engaging clinical psychologists at facility levels to improve psychological wellbeing. Additionally, the Ghana Health Service should strengthen diabetes education in non-urban areas, among women, and encourage early healthcare seeking for diabetes.

Keywords: Quality of Life, Diabetes, Resource-Scarce Settings, Quantile Regression, WHOQOL-BREF instrument.

INTRODUCTION

Diabetes is a major global health challenge, affecting millions of individuals worldwide (Magliano, Boyko, & Atlas, 2025). It is a chronic disease which occurs when the sugar (glucose) level in the blood is too high (hyperglycaemia) because the pancreas is unable to produce sufficient insulin to break it down (Type 1 Diabetes) or the human body becomes resistant to insulin (Type 2 Diabetes) (Aleksova, Ebeling, & Elder, 2025; Chen, Zhang, & Chen, 2025). The disease is associated with severe health complications including kidney failure, nerve damage, heart disease, stroke, and vision loss (Liao, Wang, Liang, Wu, & Liao, 2026). It imposes considerable strain on healthcare systems and economies (Cho et al., 2018; Lima et al., 2018; Yazbeck, Nguyen, & Escobar, 2025). Additionally, diabetes has a significant impact on quality of life (QoL) since affected individuals may suffer from chronic pain, persistent fatigue, and emotional distress, which can impede routine activities and social engagement (Borbjerg et al., 2025; Karakolias & Iliopoulou, 2025; Slowik, Kaczynski, Kaczor, & Wnuk, 2025). The risk factors of diabetes include ageing, family history, pre-existing medical conditions, and behavioural issues such as smoking, alcohol use, physical inactivity, stress, lack of sleep and unhealthy diets (Bonifacio & Ziegler, 2025). These risk factors, especially those related to lifestyles, contribute significantly to poor glucose regulation, obesity, and insulin resistance, hence increasing susceptibility to diabetes (Choo, Ravi, & Subramaniyan, 2026; Moazzam-Jazi et al., 2026; Semelka et al., 2026).

Diabetes poses a significant challenge to the achievement of Sustainable Development Goals (SDGs) 1 (poverty reduction), 3 (good health and well-being), 3.4 (reduction in premature death from NCDs), and 8 (economic growth). Diabetes increases the prevalence of premature deaths due to non-communicable diseases (Wagh, Kirpich, & Chowell, 2025). Besides, the disease also slows down productivity and increases household poverty due to its associated catastrophic health care expenditures, thereby negatively affecting the realisation of SDGs 1 and 2 (Akter et al., 2026; Tao, Zhang, MacGilchrist, Kirwan, & McIntosh, 2025; Wagh et al., 2025). The cost of managing diabetes constituted 12% of global health expenditure in 2024 (Beard et al., 2026). The disease is among the top ten causes of death and years of life lived with disability, particularly in many countries located in sub-Saharan Africa, South Asia, North Africa, the Middle East, Latin America, the Caribbean and other low- and middle-income countries (LMICs) where increasing urbanisation, dietary changes, physical inactivity, and increasing obesity rates have been reported (Liao et al., 2026; Wangou et al., 2023). In 2024, diabetes was responsible for 3.4 million deaths, constituting 9.3% of all deaths globally (Beard et al., 2026). Overall, between 2022 and 2024, over 80% of the 800 to 830 people living with diabetes were from LMICs (Global Burden of Diseases Collaborative Network, 2024). Meanwhile, these regions often face challenges in healthcare access, education, and resources for diabetes management, leading to higher rates of complications associated with the disease (Owusu & Doku, 2024). These complications and the range of self-care

activities often require lifestyle modifications, such as taking medications daily, monitoring blood glucose levels, exercising, and adjusting the quantity and type of food to eat, which significantly impact victims' QoL (Mukonka, Chironda, & Mtshali, 2026; Slowik et al., 2025).

QoL is a subjective multi-dimensional concept in line with World Health Organisation's (WHO's) presentation of it as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (Dorrance et al., 2026). This conceptualisation encompasses all aspects of health, such as physical, psychological, social relationships, spirituality, level of dependency, and environmental dimensions (Arcila-Arango et al., 2021). Evidence suggests that patients with type 2 diabetes (T2D) experience significantly lower QoL relating to their physical, mental, social, and environmental health due to the complications associated with the condition (Girma et al., 2020; Kijaj et al., 2025). In addition, socioeconomic factors such as age, gender, marital status, income, educational status, rural lifestyle, stigma perception, and retirement affect the QoL in both type 1 diabetic (TD1) and TD2 patients in the physical and psychological QoL (Akinbule, Tor-Anyiin, & Adenusi, 2025; Girma et al., 2020).

Comprehensive diabetes management programs, psychological support, and community resources can help improve the QoL for T2D patients (Kunhi, Arlappa, & Jaleel, 2026). Regular follow-ups with healthcare providers, education on self-management, and support groups can also play a crucial role in enhancing the overall wellbeing of individuals with T2D (Adu, Poku, Adu, & Owusu, 2024; Ahiale & Kumah, 2025; Tetteh, Saah, & Amu, 2024). Indeed, improved QoL is an essential health outcome for individuals managing diabetes (Gupta et al., 2021). While medical professionals often focus on the physiological aspects of diabetes, such as blood sugar levels and complications, it is equally important to consider the psychological, social, and emotional dimensions of living with this chronic condition (Mangoulia, Milionis, Vlachou, & Ilias., 2024). Patients may face a range of challenges, including dietary restrictions, the need for regular monitoring, and the psychological burden of managing a lifelong condition (Dumitrescu et al., 2025; Mukonka et al., 2026). Therefore, a holistic approach integrating physical health management with psychosocial support is essential.

To effectively integrate physical health management with psychosocial support, it is essential to consider the patient's perspective on their health, particularly the influence of psychological, social, and cultural factors (Grosso, 2025). Assessing QoL provides healthcare providers with insight into how diabetes affects various aspects of a patient's life, including physical health, emotional well-being, social interactions, and daily functioning, making QoL evaluations a critical tool in diabetes management. QoL evaluations guide therapeutic decisions and enhance the overall quality of care by focusing on patients' experiences and needs (Davis & Hui, 2017). Recently, a number of studies have assessed the QoL of patients with diabetes in sub-Saharan Africa (Boakye et

al., 2026; Tusa, Weldesenbet, Gemada, Merga, & Regassa, 2021). However, those studies relating to the Ghanaian context mainly focused on urban populations within the southern part of Ghana, such as Accra and Ho (Alor, Glozah, Kretchy, & Adongo, 2024; Amankwah-Poku, Akpalu, Sefa-Dedeh, & Amoah, 2021; Essuman, Abaidoo, Essuman, & Amissah-Arthur, 2024; Gyan et al., 2025). Given the existing differences in environmental, social, economic, and cultural conditions between urban populations in southern Ghana and predominantly rural populations in northern Ghana, including the Upper West Region, similar studies on the QoL of diabetes patients in northern Ghana are needed to complement existing evidence. Generally, the Upper West region is one of the resource-constrained, poorest and most deprived areas in Ghana (Ahmed et al., 2020), with many socioeconomic challenges, including high poverty levels, limited access to education and healthcare, and inadequate infrastructure. The interplay between socioeconomic deprivation and inadequate healthcare resources can impact patients' overall QoL. Our study, therefore, assesses factors related to the QoL of diabetes patients in the Wa municipality of Ghana's Upper West Region.

LITERATURE REVIEW

In the 1960s, practical research on social indicators of well-being led to the development of QoL studies (Armstrong, Lilford, Ogden, & Wessely, 2007). The concept is multifaceted and complex, making it difficult to define and quantify, as it involves the subjective assessment of an individual's level of life contentment (Gholami et al., 2013; Pisimisis, 2013; Theofilou, 2013). Defined by the WHO as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns, QoL encompasses all aspects of health, such as physical, psychological, social relationships, spirituality, level of dependency, and environmental dimensions (Arcila-Arango et al., 2021).

Since the concept is highly subjective, it is important to assess each patient to obtain individualised views of it. Factors such as body mass index (BMI), age, gender, marital status, income, and education may have strong positive or negative associations with QoL (van Oosterhout et al., 2019). However, some studies report that individuals with diabetes have low QoL, particularly in health-related quality of life (HRQOL), especially when complications set in (Moazzam-Jazi et al., 2026; Tusa, Weldesenbet, Gemada, Merga, & Regassa, 2021). Various instruments are used to assess QoL. Some instruments, such as the SF-36 (Short Form-36), World Health Organization Quality of Life - BREF (Brief) (WHOQOL-BREF), EQ-5D (EuroQol), Quality of Life Scale (QOLS), Expanded McGill Quality of Life Questionnaire (MQOL-E), and Nottingham Health Profile (NHP), are for use in the general population across some conditions (Brooks, Boye, & Slaap, 2020; Laviña, 2024). However, other disease-specific tools, such as Diabetes Quality of Life (DQOL), Audit of Diabetes-Dependent QoL (ADDQoL), Diabetes-39 (D-39), Diabetes Distress Scale (DDS), and Problem Areas in Diabetes (PAID), are also available for use to assess the QoL of diabetic patients (Laviña, 2024). These measurement tools have enabled evaluation of health beyond traditional morbidity and mortality indicators (Theofilou, 2013).

Undeniably, the cost of diabetes with its economic consequences appears to be taking a great toll on the QoL of people with diabetes. Although patients can improve their QoL by seeking early treatment (Trikkalinou et al., 2017), the ever-increasing cost of treatment often renders this approach ineffective. Early diagnosis and treatment can prevent complications, but the impact of costs means that many victims, particularly women in LMICs with relatively poor access to financial resources, may not be able to afford prescribed medicines for their condition (Zelege et al., 2026), thereby reducing the health-related QoL of such victims as they must deal with physical and psychological inability, which affects their satisfaction level (Murphy et al., 2020). To assess QoL, respondents are often asked to self-assess the various domains of QoL to determine if their QoL is low or high (Laviña, 2024). The six domains which normally form the basis for this self-assessment include physical, psychological, level of independence, social relationships, environmental, and spirituality/religion/personal (Palamenghi, Carlucci, & Graffigna, 2020). Conceptually, each domain contains 24 components (subdomains) (Wulfovich, Buur, & Wac, 2022). Under the physical, psychological, environmental health, and social relationship domains, Girma et al. (2020) cited 7, 6, 8, and 3 subdomains/items, respectively, using a five-point Likert scale. Of all the dimensions of health, the social dimension is the most complex and challenging to measure (Kaiser, Schuhmacher, & Bös, 2023) as it encompasses intimate and family life activities, social roles, beliefs, education level, vocation, friendship, leisure, and other aspects. The attempt to quantify the spiritual dimension of health in QoL assessment poses challenging questions, particularly because studies in this area have used a range of metrics to gauge spiritual wellbeing, leading to a lack of consensus (Nazam & Husain, 2024).

The physical aspect of QoL refers to the ability to perform daily tasks with energy and mobility, and minimal or no pain (Gholami et al., 2013). Physical wellness ideally means not needing medications or medical devices. Diabetic patients often feel fatigued due to blood sugar fluctuations (Palamenghi et al., 2020), which can increase dependence on others and affect social relationships; the causes of fatigue are not discussed here. The psychological domain involves the desire to belong, the pursuit of health, and the avoidance of negative effects on well-being (O'Shea et al., 2020). In the context of diabetes, this domain captures how individuals think and feel about their condition and how they appraise their capacity to cope with day-to-day self-care demands. Positive mental health may be reflected in optimism, enjoyment of life, and a sense of meaning and purpose, which can buffer stress and support sustained self-management behaviours. Conversely, diabetes-related distress and broader mental health symptoms can undermine motivation, decision-making, and treatment adherence, thereby worsening health outcomes over time. Assessments, therefore, consider symptoms such as depression, anxiety, psychosis, perceived stigma, medication adverse effects, and low self-esteem as key indicators of psychological quality of life (Salleh et al., 2025). These indicators are important because they influence help-seeking, social participation, and patients' willingness to engage consistently with healthcare providers. Recognizing psychological challenges early and integrating appropriate counselling or mental health

support into routine diabetes care may help improve overall quality of life and reduce the risk of complications. When considering the social domain, numerous subdomains are used to evaluate how much family and friends contribute to solving personal and family concerns, one's ability and opportunity to love and be loved, one's capacity for emotional and physical intimacy, and how diseases such as diabetes affect these issues (Palamenghi et al., 2020). Therefore, how much satisfaction a person derives from caring for others, as well as whether or not they have difficulty managing the responsibilities that come with it, are important components of the social domain, but do not involve value judgments surrounding sex, even though childbearing is a highly valued role in various cultures (Kim, 2024). On the other hand, the environment domain of quality of life (QoL) refers to the surroundings and external conditions that impact an individual's physical, social, and psychological well-being. It covers both the natural environment (air, water) and built environments (housing, public transport), as well as safety, financial security, and access to services (Veenhoven, 2024).

Studies show a clear link between the quality of life (QoL) of diabetic patients and socioeconomic factors. Age, gender, marital status, lower income, education, rural living, perception of stigma, and retirement all independently reduce physical and psychological QoL in both T1D and T2D patients. Older individuals tend to have lower social and physical function scores, while men generally score higher than women on the SF-36 and D-39 scales (John et al., 2019). However, research using the Thai Version of Diabetes-39 found that younger age is associated with improved QoL, and female patients report better sexual functioning (Khunkaew et al., 2019). T2D patients report higher psychological, environmental, and social QoL than T1D patients (Ababio et al., 2017). Reliance on insulin therapy is associated with poorer QoL than oral medications. Obesity, comorbidities, and poor glycemic control further decrease QoL, whereas optimal HbA1c improves it. T2D patients in developed and low-income countries experience reduced QoL due to complications that affect physical, mental, social, and environmental health (Girma et al., 2020).

THEORETICAL FRAMEWORK

This study is guided by the Wilson and Cleary Health-Related Quality of Life (HRQoL) model (Wilson & Cleary, 1995), which provides an integrative pathway linking clinical factors to patients' perceived QoL. The model proposes that biological and physiological variables influence symptom status, which in turn affects functional status and individuals' general perceptions of health. These intermediate outcomes are expected to shape overall QoL, including the physical, psychological, social, and environmental aspects captured in QoL instruments. The framework also allows individual and environmental characteristics to modify these links, making it useful for interpreting QoL differences among diabetic patients in the Upper West Region.

The model is appropriate for this study because it explains how diabetes-related biological and clinical factors influence symptoms, functional status, and overall health perceptions,

which ultimately shape QoL (Garg & Duggal, 2022; Mangoulia et al. 2024). Importantly, the framework also recognizes that individual characteristics (e.g., age, sex, education, marital status) and environmental characteristics (e.g., place of residence, access to care, financial resources, social support, and cultural/spiritual context) can affect these pathways directly and indirectly. In a resource-constrained context such as the Upper West Region of Ghana, this emphasis on the determinants is useful for understanding variations in QoL among people living with diabetes. Following the literature (Kangwanrattanakul & Ingard, 2025), QoL is measured using the WHOQOL-BREF domains (physical, psychological, independence, social relationships, environment, and spirituality/religion/personal beliefs). Within the Wilson and Cleary (1995) model, these domains reflect outcomes across the pathway from symptom status (e.g., pain/discomfort, fatigue, sleep problems, and diabetes-related symptoms), through functional status (e.g., autonomy/mobility, activities of daily living, work capacity, and dependence on treatment), to general health perceptions and overall QoL.

METHODOLOGY

Study setting and design

The study was conducted in the Wa municipality of the Upper West Region of Ghana. The Municipality is the largest and most urbanized of the eleven districts/municipalities in the region (Ghana Statistical Service, 2022). Consistent with national trends, diabetes is rising in the Upper West Region, particularly in urbanizing areas (Boadu et al., 2024), such as the Wa municipality. Comprehensive data on diabetes in Ghana's Upper West Region is scarce, but studies show a growing problem with medication non-adherence. A 2026 study at the Upper West Regional Hospital reported that 51.5% of patients with Type 2 Diabetes did not adhere to their medication regimens (Arhin et al., 2026). This trend could worsen the QoL for diabetic patients, yet research remains limited. We sought to fill this gap by employing a quantitative research approach and conducting a facility-based cross-sectional study to investigate QoL among diabetic patients seeking care at the Upper West Regional Hospital (UWRH) and the Wa Municipal Hospital (WMH), where the diabetic clinics are located. The study participants included patients who received healthcare from these facilities for at least 12 months.

Sampling and data collection

As the sampling frame, a list of diabetic patients was obtained from the study facilities and used to randomly select participants. These patients must have been diagnosed with either T1D or T2D for at least 12 months. The study excluded patients who were severely ill and unable to respond to the questionnaire during data collection. Preliminary information from the Upper West Regional Health Directorate of the Ghana Health Service indicated that, as of 2021, the Municipality had 2,250 people with diabetes. This information served as the basis for determining an appropriate sample size. Using the

Yamane formula (Yamane, 1973)¹, we calculated the sample size to be 340. However, despite resampling, 253 patients participated in the data collection. This arose because the study was conducted at the health facility, and despite the population being 2,250, only a few reported to the diabetes clinics. At our subsequent visits, we had recurring patients reporting, making it impossible to reach our calculated sample size of 340. The patients were selected from the health facilities using simple random sampling (ballotting). In most cases, patients did not report to the UWRH. Thus, only 21 were covered there, while the remaining 232 were at the WMH. The data were collected through an interviewer-administered questionnaire in a facility-based survey in April 2023. We trained three research assistants to administer the questionnaire in both English and the local language (Waali/Dagaare) to ensure content validity. We pretested the questionnaire at a neighboring district hospital (Nadowli District Hospital). The relevant section of the questionnaire assessed respondents' QoL using the WHOQOL-BREF, which we adapted for diabetes by including diabetes-related items.

Analytical techniques

For analysis, we employed descriptive statistics to characterize the socio-demographics and the QoL dimensions and domains. We observed that the QoL scores are skewed and slightly right-tailed. In this case, the homogeneity assumption is violated. To account for this, we used quantile regression (specifically, median regression) to analyze factors associated with QoL in diabetic patients. Quantile regression (QR) quantifies the heterogeneous effects of covariates through conditional quantiles of the outcome variable and provides a comprehensive scan of the entire outcome distribution. Additionally, it is well known that when asymmetries and heavy tails are present, the sample median (the 50th percentile), one of the best-known quantiles, provides a better summary of centrality than the mean. As a consequence, compared to the standard mean regression models, QR is more robust to outliers and more flexible, because the distribution of the outcome does not need to be strictly specified as certain parametric assumptions (Huang, Zhang, Chen, & He, 2017). The QR approach is based either on minimizing weighted absolute deviations or on maximizing a Laplace likelihood. The Laplace likelihood is based on Koenker and Bassett (1978), who estimated the conditional median and a full range of other quantile functions by minimizing asymmetrically weighted absolute residuals (Koenker & Bassett Jr, 1978). In general, let y_i and x_i denote the outcome of interest and the corresponding covariate vector for the subject i ($i = 1, \dots, n$), where y_i is an independent continuous random variable. The QR model with q^{th} quantile for the response y_i given x_i takes the form of

$$Y_i(q|x_i) = f(x_i, \varphi) \quad (1)$$

with $0 < q < 1$ and $f(\cdot)$ is a known function. The regression coefficient vector β is estimated by minimizing

$$\sum_{i=1}^n \gamma_q(y_i - f(x_i, \beta)) \quad (2)$$

¹ $[n = \frac{N}{1+N(e)^2}]$; where n is the required sample size from the population under study, N is the whole population under study e is the precision or sampling error (which for this study is 0.05).

Where $\gamma_q(\cdot)$ is the check function defined by $\gamma_q(u) = u(q - I(u > 0))$.

Following the above, the empirical model for our study is as follows:

$$QoLscore = \beta_0 + \sum_{i=1}^r \beta_i X_i + e \quad (3)$$

Where QoL is the QoL score at the 25th, 50th, and 75th percentiles, β_0 is the constant term, X_i is the individual-level factors related to QoL, including sex, age, location, education, marital status, sector of employment, frequency of hospital admissions, whether the individual ever opted for alternative treatment, and β_i represents parameter estimates for the various factors. As a sensitivity analysis, we used logistic regression to examine the categorical version and obtained odds ratios with 95% confidence intervals (CIs). We performed all analyses using StataCorp LLC Stata (version 15.1)

Measurements of variables and data analysis

We calculated the QoL score in line with the scoring and coding of the WHOQOL-BREF instrument (Vahedi, 2010), which covers six domains of QoL. These include the physical, independence, and environment (each with four dimensions); psychological (five dimensions); social (one dimension); and spiritual, religious, and personal beliefs (two dimensions). First, we calculated QoL scores for all dimensions and domains, which served as the basis for the overall QoL score. We rated each item on a scale from 1 to 5, where higher scores indicate a better QoL. When calculating the overall score, the scores for all six domains were summed, divided by six, and then multiplied by four. The overall scores should range from 1 to 100. After calculating the overall QoL, we categorized scores as low or high using the mean QoL as the cutoff. We then used the overall score (continuous) and the categorized (binary) version as the outcomes for the regression analysis. Table 1 presents the measurements of the independent variables used in the regression analysis. For the regression analysis, we recategorized marriage and location into two categories (the options with the highest frequency relative to the other options combined – see Table 2 for details).

Table 1: Measurement of independent variables used in the regression

Variable	Measurement
Gender	Female=1; male =0
Age	Continuous, from the date of birth
Married (base is all else)	Married = 1; all else = 0
Urban location (base is other)	Urban = 1; rural/peri-urban = 0
Education	
<i>No formal education</i>	1 if the person has not attended formal education; 0 = otherwise
<i>JHS</i>	1 if the person completed JHS; 0 = otherwise
<i>SHS/SHTS</i>	1 if the person completed SHS/SHTS/TVET; 0 = otherwise
<i>Tertiary</i>	1 if the person completed tertiary; 0 = otherwise

Sector of employment	
<i>Formal</i>	1 = If the person is employed in the formal sector (public or private)
<i>Informal sector</i>	2 = If the person is employed in the informal sector (except for peasant farming)
<i>Unemployed</i>	3 = If the person indicates unemployed
<i>Other</i>	4 = Peasant farming
Frequency of hospital admissions	Number of hospital admissions in a month
Used alternative treatments	1= If the person resorted to herbal medicine or spiritual healing 0 = otherwise

Ethical considerations

We obtained ethical approval from the Kwame Nkrumah University of Science and Technology, Kumasi (CHRPE/AP/937/23). We also obtained permission from the Municipal Health Directorate and the two health facilities from which we collected the data. We obtained written informed consent from all participants in the study.

RESULTS

Sociodemographic characteristics of the respondents

Table 2 presents the sociodemographic characteristics of the respondents. The majority (80.24%) were females. Urban residents were more (58.40%) than those in other locations (peri-urban and rural). Most respondents were married (58.89%), had no formal education (49.8%), were Muslims (62.85%), and were employed in the informal sector (49.80%). The majority (86.00%) resorted to orthodox medicine, while a few (14.00%) opted for spiritual healers or herbal medicine. Furthermore, our results show diabetes often occurs among older people (average age 60).

Table 2: Sociodemographics of Respondents

Variable	Observation	Percentage
Sex		
<i>Female</i>	203	80.24
<i>Male</i>	50	19.76
Location		
<i>Urban</i>	146	58.40
<i>Peri-urban</i>	81	32.40
<i>Rural</i>	26	10.28
Marital Status		
<i>Married</i>	149	58.89

<i>Widowed</i>	87	34.39		
<i>Separated</i>	8	3.16		
<i>Never married</i>	5	1.98		
<i>Divorced</i>	4	1.58		
Religion				
<i>Islam</i>	159	62.85		
<i>Catholic</i>	68	26.88		
<i>Pentecostal/charismatic</i>	19	7.51		
<i>Traditonal</i>	4	1.58		
<i>Other</i>	3	1.19		
Educational Attainment				
<i>Primary</i>	28	11.16		
<i>JHS</i>	20	7.97		
<i>SHS and equivalence</i>	37	14.74		
<i>Tertiary</i>	41	16.33		
<i>No formal education</i>	125	49.80		
Sector of employment				
<i>Formal</i>	29	11.46		
<i>Informal</i>	156	61.66		
<i>Unemployed</i>	68	26.88		
Use alternative medicine (herbal and spiritual healers)				
<i>Yes</i>	35	14.00		
<i>No</i>	218	86.00		
Age	Mean	Std. Dev.	Min.	Max.
	60	12.4	20	103
Frequency of admissions	1.494	0.850	1	4

N=253 (Facility-based survey, 2023)

Dimensions of quality of life of diabetes patients

Table 3 presents overall QoL and disaggregated dimensions across the various domains. The results show that the average QoL score is 72.70, with a minimum of 28.00 and a maximum of 98.80, indicating that, in general, the QoL of diabetic patients in the municipality is high, even though not perfect.

Table 3: Dimensions of QoL

Dimension	Average QoL	Std. Dev.	Min	Max
<i>Physical domain</i>	11.75	2.98	4.00	20.00
Pain and Discomfort	2.93	0.87	1.00	5.00
Energy and Fatigue	2.91	0.89	1.00	5.00
Sleep and Rest	3.07	1.05	1.00	5.00
Symptoms of Diabetes	2.84	0.94	1.00	5.00
<i>Psychological domain</i>	17.56	2.55	6.00	25.00

Positive feelings	3.30	0.72	1.25	5.00
Thinking & Memory	3.26	0.89	1.25	5.00
Self-esteem	3.69	0.69	1.50	5.00
Body image	3.69	1.09	1.00	5.00
Negative feelings	3.62	1.01	1.00	5.00
<i>Independence domain</i>	<i>12.69</i>	<i>1.83</i>	<i>8.25</i>	<i>18.80</i>
Autonomy (mobility)	3.18	0.51	1.50	4.5
Activities of daily living	3.18	0.54	1.50	4.3
Dependence on medication or treatment	2.94	0.58	2.00	5.00
Work capacity	3.39	0.90	1.00	5.00
<i>Social relationship</i>	<i>4.29</i>	<i>2.61</i>	<i>2.25</i>	<i>5.00</i>
Social inclusion	4.29	0.65	2.25	5.00
<i>Environment domain</i>	<i>13.72</i>	<i>2.25</i>	<i>5.00</i>	<i>20.00</i>
Physical safety and security	3.56	0.58	1.75	5.00
Home environment	3.77	0.78	1.00	5.00
Financial resources	2.64	1.10	1.00	5.00
Health and social care	3.75	0.67	1.25	5.00
<i>Spiritual, religious and personal beliefs</i>	<i>8.4</i>	<i>2.15</i>	<i>2.50</i>	<i>10.00</i>
Spirituality	3.89	0.70	1.00	5.00
Forgiveness and blame	4.51	0.74	1.50	5.00
Overall QoL score	72.70	6.11	28.00	98.80

N=253 (Facility-based survey, 2023)

When considering the physical domain, the average QoL of diabetic patients in the municipality was 11.75 out of the expected maximum of 20, with a minimum of 4, indicating that QoL in this domain is slightly above average. Similarly, the various dimensions of QoL in the physical domain were each above average, with 3 out of the expected maximum of 5, and a minimum of 1. The psychological QoL considered together as a domain was also slightly above average (mean score for 17.56) out of the expected maximum of 25, in line with the individual dimensions of self-esteem, body image, and negative dimensions, with mean scores of about 3.6 each out of the expected maximum of 5, and 3.3 each for positive feelings; and thinking and memory. These findings suggest that, while diabetic patients in the municipality experience a quality of life that is slightly above average in both the physical and psychological domains, there is still considerable room for improvement. The physical domain scores indicate that most patients maintain a fair level of physical functioning, which may reflect successful symptom management and adherence to treatment regimens (Tusa et al., 2021). However, the presence of minimum scores as low as 4 in the physical domain highlights that a subset of individuals may be struggling, possibly due to comorbidities or barriers to accessing care.

The psychological domain scores, with mean values slightly above average, reveal that diabetic patients generally maintain positive self-esteem and body image, but negative feelings and challenges with thinking and memory persist for some. This pattern underscores the importance of holistic diabetes care that goes beyond glycemic control, incorporating psychological support and interventions to improve mental health and cognitive function (Ahmed et al., 2025). By identifying these areas of relative strength and weakness, healthcare providers and policymakers can tailor interventions to better support diabetic patients' overall well-being. For the independence domain, the average QoL score was 12.69, with a minimum of 8.25 and a maximum of 18.80 (out of the expected maximum of 20). Even though it is slightly above average, the QoL in this domain is lower than in the other domains. When considering the various dimensions within the independence domain, the scores for autonomy, activities of daily living and work capacity were above 3 (out of the expected maximum of 5), while that of dependence on medication or treatment was below 3. The social relationship domain was represented by one dimension (social inclusion). The QoL for this was very high (4.29 out of the expected maximum of 5). The QoL score for the environment domain was 13.72 out of the expected maximum of 20. Regarding the individual dimensions of the environment domain, QoL for financial resources was the lowest (below 3, out of the expected maximum of 5). The QoL for spiritual, religious, and personal beliefs domain was high, averaging 8.4 out of the expected maximum of 10, as reflected in the two dimensions of spirituality (3.89 out of the expected maximum of 5) and forgiveness and blame (4.51 out of the expected maximum of 5).

Our findings highlight important nuances in the QoL among diabetic patients. The independence domain, while slightly above average, lags behind other domains, suggesting that factors such as autonomy and daily living activities are somewhat compromised. This is consistent with recent studies, which indicate that diabetes can restrict patients' independence due to the need for ongoing management and reliance on medication or treatment (Smith et al., 2024). The lower score for dependence on medication underscores the impact that treatment burden has on perceived autonomy. The high QoL score for social inclusion is encouraging, as social relationships are a key protective factor for mental health and overall well-being among populations with chronic disease. Strong social networks can help mitigate the psychological and practical challenges associated with diabetes, promoting resilience and a sense of belonging. In the environment domain, financial resources remain a concern. The below-average score for this dimension aligns with contemporary evidence showing that financial strain can adversely affect diabetic patients' access to care, medication, and healthy lifestyle choices (Hernández-Negrín et al., 2022). Addressing economic barriers is thus critical for improving QoL in this group. Finally, the high scores in the spiritual, religious, and personal beliefs domain suggest that these factors may serve as important sources of coping and psychological support. Interventions that integrate spiritual care and promote positive beliefs may further strengthen this domain and overall well-being.

1.1. Factors related to the QoL of Diabetic patients

Table 4 presents our main results from the multivariate quantile regression on factors related to QoL, along with sensitivity analysis from the logistic regression.

Table 4: Factors related to Quality of Life of diabetic patients [regression results]

Regression model	Quantile regression						Logistic regression	
	Q 1 (25 th percentile)		Q2 (50 th percentile)		Q3 (75 th percentile)		ME	[95% C I]
	Coef.	[95% C I]	Coef.	[95% C I]	Coef.	[95% C I]		
Gender (base is male)	-2.86** (1.41)	-5.65 – - 0.08	-3.23* (1.77)	-6.71 – 0.26	-4.29** (1.86)	-7.96 – - 0.62	-0.19 (0.12)	-0.43 – 0.04
Age	-0.01 (0.04)	-0.10 – 0.07	-0.04 (0.05)	-0.14 – 0.07	-0.17*** (0.06)	-0.28 – - 0.06	-0.00 (0.00)	-0.01 – 1.01
Married (base is all else)	0.70 (1.03)	-1.34 – 2.74	0.38 (1.29)	-2.17 – 2.93	0.96 (1.36)	-1.72 – 3.64	0.12 (0.08)	-0.05 – 0.28
Urban location (base is other)	3.27*** (0.97)	1.37 – 5.17	2.07* (1.21)	-0.32 – 4.45	0.92 (1.27)	-1.59 – 3.42	0.143* (0.08)	-0.02 – 0.30
Education (base category is no formal education)								
<i>Primary</i>	2.07 (1.50)	-0.89 – 5.04	-0.15 (1.89)	-3.87 – 3.56	0.25 (1.98)	-3.66 – 4.16	0.09 (0.12)	-0.15 – 0.33
<i>JHS</i>	-1.31 (2.09)	-5.44 – 2.81	-4.07 (2.62)	-9.24 – 1.10	-3.36 (2.76)	-8.79 – 2.08	-0.07 (0.16)	-0.39 – 0.24
<i>SHS/SHTS</i>	1.92 (1.45)	-0.93 – 4.78	1.58 (1.81)	-1.99 – 5.16	1.88 (1.90)	-1.88 – 5.65	0.16 (0.12)	-0.06 – 0.39
<i>Tertiary</i>	1.49 (1.80)	-1.97 – 5.15	0.53 (2.26)	-3.93 – 4.99	1.58 (2.38)	-3.12 – 6.27	0.10 (0.15)	-0.18 – 0.39
The sector of employment (base is the formal sector)								
<i>Informal sector</i>	3.02 (2.00)	-0.93 – 6.98	-0.79 (2.51)	-5.74 – 4.17	1.43 (2.60)	-3.78 – 6.64	0.04 (0.16)	-0.28 – 0.37
<i>Unemployed</i>	2.12	-1.75 – 6.00	-1.83	-6.69 – 3.03	1.52	-3.58 – 6.63	-0.01	-0.32 – 0.31

	(1.97)		(2.46)		(2.59)		(0.16)	
<i>Other</i>	1.60 (1.91)	-2.17 – 5.37	-1.21 (2.39)	-5.93 – 3.51	3.67 (2.52)	-1.30 – 8.64	0.13 (0.16)	-0.19 – 0.44
Frequency of hospital admissions	0.65 (0.57)	-0.47 – 1.77	0.82 (0.71)	-0.58 – 2.22	-0.29 (0.75)	-1.76 – 1.19	0.06 (0.05)	-0.03 – 0.16
Used alternative treatments	-2.17 (1.50)	-5.24 – 0.79	-3.71 (1.88)	-7.42 – - 0.00	0.35 (1.98)	-3.55 – 4.25	-0.23 (0.13)	-0.49 – 0.03
Constant	52.13*** (3.91)	44.4 – 59.9	60.18** * (4.94)	50.4 – 69.9	76.28 (5.20)	66.0 – 86.5		
Model summary statistics								
<i>Raw sum of deviations</i>	377.68		485.63		398.20			
<i>Min. sum of deviations</i>	336.22		446.13		358.44			
<i>Pseudo R²</i>	0.11		0.08		0.10			
<i>LR chi2(13)</i>							25.27	
<i>Prob > chi²</i>							0.02	
<i>Observations</i>	253						253	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; N=253 (Facility-based survey, 2023)

The results of quantile regression indicate that gender, age, and location were significantly associated with the QoL of diabetic patients. Specifically, being female is significantly associated with reduced QoL, decreasing across the QoL continuum from -2.86 [CI = -5.65 – -0.08] at the 25th percentile to -3.23 [CI = -6.71 – 0.26] at the 50th percentile and -4.29 [CI = -7.96 – -0.62] at the 75th percentile. The results further indicate that QoL declines with age, with a significant effect at the 75th percentile [coef = -0.17; CI = -0.28 – -0.06]. Those in urban areas (compared to peri-urban and rural locations) had their QoL significantly improved by 3.27 [CI = 1.37 – 5.17] at the 25th percentile, even at the 1% level, but the effect diminished at the 50th and 75th percentiles and was significant at the 10% level. On the other hand, the results show that marital status, education, location, and employment sector were not significantly associated with QoL. The logistic regression results did not show any significant association between the factors and QoL at the 5% level. We therefore discuss the results of the quantile regression.

FINDINGS AND DISCUSSION

The results on the sociodemographic characteristics confirm that diabetes is more common among older people, but it also affects younger age groups (Biswas et al., 2022; Mordarska & Godziejewska-Zawada, 2017). This pattern is consistent with evidence that advancing age is associated with physiological and metabolic changes that increase the risk of diabetes. Aging is also linked to cumulative exposure to behavioural and environmental risks and a higher likelihood of comorbid conditions. However, the presence of diabetes among younger people indicates that the disease is not confined to later life. In particular, physical inactivity, unhealthy diets, overweight/obesity, psychosocial stress, and rapid urbanisation may be shifting the age profile of diabetes and accelerating onset among working-age adults. This finding underscores the need to strengthen prevention efforts beyond older populations and address modifiable risk factors earlier in the life course. It also highlights the importance of timely screening, early diagnosis, and continuity of care across age groups to reduce complications and protect quality of life.

Results across the six domains of QoL indicate that QoL remains an essential focus in diabetes management and that perceived competence is substantially correlated with overall diabetes control and adherence to self-care activities (Raaijmakers et al., 2014). Different QoL dimensions influence patients' opinions of their QoL (Gyan et al., 2025; Wulfovich, Buur, & Wac, 2022). Similarly, various individual domains, such as the individual's capacity to perform daily tasks, contribute to the overall quality score. Generally, people who believe their agony is unjust may endure worsening discomfort, disability, mental health issues, and a worse QoL (Sullivan & Sagala, 2020). The energy and fatigue dimension of the physical domain was moderate. As in previous studies (De La Rosa, Webb-Murphy, Fesperman, & Johnston, 2018), fatigue is influenced more by other factors than work requirements and energy usage. Elevated levels of exhaustion can harm overall economic efficiency by reducing productivity, increasing absenteeism, and increasing error rates in the workplace. Sleep disorders frequently affect QoL (Huang et al.,

2025). In this study, patients appear moderately satisfied with their sleep and rest (3.07 out of 5.0). Adequate, restorative sleep can boost productivity, reduce absenteeism, improve work efficiency, and ultimately affect the nation's economy. Previous studies have not found significant differences in subjective memory complaints between people with type 2 diabetes and matched controls (Bruce, Davis, Hunter, & Davis, 2019). In this study, however, participants were reasonably satisfied with their cognitive and memory functions. Our findings on the body image dimension (3.68 out of 5) indicate that favourable body image significantly impacts an individual's wellbeing and mental health, enhancing QoL, social relationships, and self-confidence, consistent with other studies (Heyman, Baucom, Giresi, Isaac, & Slep, 2020).

The independence domain assesses patients' autonomy level and activities (Şahin et al., 2018). In this study, the QoL score for independence is moderately high (3.18 out of 5), which aligns with the view that a sizable portion of patients moderately depended on medicinal interventions, even though each patient has a different degree of dependence (Molina-Mula & Gallo-Estrada, 2020). We also found that diabetic patients perceived their social inclusion as high (4.28 out of 5). This suggests that, despite the demands of long-term self-care and periodic engagement with health services, many participants still feel connected to their families, friends, and community networks. Higher reported levels of social inclusion are linked to improved relationships, stronger social support, and a higher QoL, as supportive networks can provide emotional reassurance and encouragement to adhere to recommended lifestyles and treatment plans (Charlton, McQuaid, & Wallace, 2023; Önal, Güblü, Akyol, Kişioğlu, & Uskun, 2024). In the Ghanaian context, such support may also reflect the buffering role of extended family systems and community ties in coping with chronic illness. On the contrary, chronic diseases can make it difficult for people to integrate fully into social environments, which may increase isolation and worsen psychological well-being (Khan, Addo, & Findlay, 2024). Strengthening peer-support groups and community-based education could therefore help sustain social participation while improving patients' overall wellbeing.

In addition, results from this study show that diabetic patients are open to discussing spirituality in relation to their diabetes care (Korsah, Dyson, & Anthony, 2022). This openness suggests that spiritual beliefs and practices influence how some patients understand the causes and meaning of their illness, as well as how they cope with symptoms and treatment demands. The average QoL score (3.89 out of 5) indicates that participants generally perceived their spirituality as high. This rating aligns with their rating (4.51 out of 5) for the forgiveness and blame dimension. Discussing spirituality in a respectful, patient-centered manner can therefore help providers identify patients' values, sources of support, and potential barriers to self-management. Integrating these discussions where appropriate may strengthen therapeutic relationships and improve adherence to recommended care plans. This view is contrary to the position that patients blame themselves for failing to meet treatment goals or for their incapacity to practice self-care (Li, 2025), which makes it challenging to reach their treatment objectives.

Turning attention to the factors related to QoL, we found that diabetes disproportionately affects older people (Zurita-Cruz et al., 2018) and reduces the QoL of women. Our finding that female diabetic patients tend to experience reduced QoL is consistent with earlier evidence (Prata, Martins, Ramos, Rocha-Goncalves, & Coelho, 2016) that the QoL of women was significantly lower on the majority of the SF-36 questionnaire's subscales, and that women with long-term health issues experienced lower QoL in both the physical and psychological dimensions than men (Ljungman et al., 2022). This gender difference in the QoL experience of diabetic patients in the Wa Municipality prompts questions regarding possible social and economic discrimination that may have distinct effects on men's and women's QoL.

Access to healthcare leads to improved health outcomes and socioeconomic status among aging adults (McMaughan, Oloruntoba, & Smith, 2020). Our findings that those who were frequently admitted had improved QoL point to the importance of access to needed healthcare. Previous studies have shown that access to healthcare positively impacts other chronic conditions, such as spinal cord injury (Barzallo et al., 2020). Medical interventions prevent diseases, help relieve pain, and give patients the comfort they need to live everyday lives. Even though usually underreported, the general population in Sub-Saharan Africa (James, Wardle, Steel, & Adams, 2018) and other parts of the world (Keene, Heslop, Sabesan, & Glass, 2019; Kemppainen, Kemppainen, Reippainen, Salmenniemi, & Vuolanto, 2018) are increasingly resorting to the use of complementary and alternative medicine (CAM) for the treatment of NCDs, such as cancer (Kemppainen et al., 2018) and diabetes (Joeliantina, Soedirham, Agil, Qomaruddin, & Kusnanto, 2019; Radwan et al., 2020). Nevertheless, the literature on the effect of CAM on QoL is relatively scarce. Our results show that CAM reduces the QoL of diabetic patients. This observation is likely because alternative medicine gives patients false hope that their condition is improving when, in fact, it might be deteriorating. Such a situation would delay care-seeking, thereby reducing patients' QoL.

CONCLUSION

Diabetes leads to early death, poor health, and lower QoL. Understanding what affects quality of life helps to manage the disease. We surveyed 253 diabetic patients at two facilities and used frequencies, averages, and quantile regression to identify factors associated with their QoL. We found that being female is significantly associated with reduced QoL, with QoL decreasing across the continuum. The results further indicate that QoL declines with age, with a significant effect at the 75th percentile. Those in urban areas (compared to peri-urban and rural locations) had their QoL significantly improved at the 25th percentile, but the effect diminished at the 50th and 75th percentiles. We conclude that the QoL of diabetic patients was not optimal across all six domains, with the environment, physical, and psychological domains being the worst affected. However, QoL in the spiritual and social domains was comparatively better, suggesting that social connectedness and spiritual resources may serve as important coping mechanisms for some patients, even when physical health and living conditions are constrained. Overall,

the findings highlight the need for diabetes care that extends beyond glycaemic control to address the broader social, psychological, and environmental circumstances that shape patients' day-to-day wellbeing.

Significant factors related to the QoL of diabetic patients in the Wa Municipality were location, frequency of hospital admissions, and the use of complementary and alternative treatments. The positive association between urban residence and QoL suggests that proximity to services and supportive infrastructure may enable better access to follow-up care, information, and resources that facilitate self-management. Similarly, more frequent admissions may reflect increased contact with the health system and opportunities for monitoring, counseling, and timely management of complications. In contrast, the negative association between the use of alternative medicine and QoL highlights the potential risks of delayed care-seeking, inconsistent treatment, and fragmented care pathways. These results emphasise the importance of strengthening accessible, continuous, and culturally appropriate diabetes services, particularly for patients in peri-urban and rural settings.

To improve QoL in the environment and independence domains, we recommend that policymakers in physical planning and works departments intensify public education and enforcement of disability-friendly building designs (e.g., ramps, handrails, safe walkways, and accessible sanitary facilities) in homes, public buildings, and health facilities. The observed sub-optimal QoL in the psychological domain can be addressed by integrating routine mental health screening, counselling, and referral pathways into diabetes clinics; consequently, we recommend that the Ghana Health Service incorporate clinical psychology sessions and psychosocial support into diabetes management. Finally, we recommend intensified community-based education on diabetes prevention and early reporting to health facilities in non-urban areas, using locally appropriate communication channels to address misconceptions and encourage timely care-seeking. Such public education should also highlight the risks of relying on complementary and alternative treatments in place of evidence-based diabetes care, while promoting respectful dialogue that helps patients disclose and safely navigate concurrent use when it occurs.

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