



Health Literacy and Quality of Life among Type 2 Diabetic Patients in Southwest Nigeria: A Cross-Sectional Study

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Abstract

Original Research Article

Type 2 diabetes mellitus (T2DM) has become a major public health concern in sub-Saharan Africa, with its increasing prevalence posing significant challenges to healthcare systems and adversely affecting patients' quality of life. Effective diabetes management depends largely on patients' ability to access, understand, evaluate, and apply health information, making health literacy an essential component of successful self-management. Despite the growing burden of T2DM in Nigeria, empirical evidence on the relationship between health literacy and health-related quality of life (HRQoL) among adults living with the disease remains limited. This study therefore examined the level of health literacy and its influence on the health-related quality of life of adults with T2DM attending selected secondary and tertiary healthcare facilities in Southwest Nigeria.

The study was anchored on the Integrated Model of Health Literacy, which explains how individuals' ability to access, comprehend, appraise, and apply health information influences health behaviours and outcomes. A facility-based analytical cross-sectional research design was adopted, involving 384 adults diagnosed with T2DM for at least six months. Participants were selected through systematic sampling from diabetes and general outpatient clinics in selected secondary and tertiary hospitals. Data were collected using a validated multidimensional health literacy questionnaire and a diabetes-specific health-related quality-of-life instrument. The data were analysed using descriptive statistics, chi-square analysis, Pearson's correlation, and multiple linear regression, with statistical significance established at $p < 0.05$.

The findings revealed that 41.9% of the respondents had adequate health literacy, while 33.3% and 24.8% demonstrated marginal and inadequate health literacy, respectively. The mean health-related quality-of-life score was 62.8 ± 14.6 , indicating a moderate level of quality of life among the respondents. Furthermore, health literacy exhibited a moderate positive and statistically significant relationship with health-related quality of life ($r = 0.44$, $p < 0.001$). The regression analysis further showed that adequate health literacy, higher educational attainment, absence of diabetes-related complications, and good glycaemic control significantly predicted better quality of life among adults living with T2DM.

The study concludes that health literacy is a significant predictor of health-related quality of life among adults with T2DM in Southwest Nigeria. Enhancing patients' health literacy through structured, culturally appropriate educational interventions integrated into routine diabetes care can strengthen self-management practices, improve quality of life, and promote better clinical outcomes. The study therefore recommends that healthcare providers and policymakers incorporate comprehensive health literacy programmes into diabetes management strategies to improve the overall well-being of people living with T2DM.

Keywords: Health literacy, health-related quality of life, type 2 diabetes mellitus, self-management, glycaemic control, Southwest Nigeria.



1.0 INTRODUCTION

Diabetes mellitus has become one of the defining chronic disease challenges of the twenty-first century. According to the International Diabetes Federation, an estimated 589 million adults aged 20–79 years were living with diabetes worldwide in 2024, a figure projected to rise to 853 million by 2050 (International Diabetes Federation [IDF], 2025a). The African Region carries a distinctive and rapidly worsening share of this burden: roughly 25 million adults are affected, the number is projected to increase by about 142% to 60 million by 2050—the steepest proportional rise of any region—and close to three-quarters of affected adults remain undiagnosed (IDF, 2025b).

Nigeria has the largest number of adults living with diabetes in the African Region (IDF, 2025c). National estimates have historically been uncertain because much of the earlier data were extrapolated from neighbouring countries, but a recent systematic review and meta-analysis pooling sixty Nigerian studies estimated a type 2 diabetes prevalence of about 7.0%, corresponding to roughly one in fourteen adults—almost double previous international estimates (Uloko et al., 2024). This underscores both the scale of the problem and the historical scarcity of country-specific evidence.

Type 2 diabetes mellitus (T2DM) reduces quality of life across physical, psychological, social and environmental domains, while also imposing substantial economic costs on individuals, households and health systems (Oluwatuyi et al., 2024). Because the condition is largely managed by patients themselves in daily life, outcomes depend heavily on sustained self-care behaviours such as medication adherence, dietary regulation, physical activity, foot care and self-monitoring of blood glucose. Sustaining these behaviours over years, however, requires patients to continually obtain, interpret and act upon health information—a demand that many struggle to meet.

Health literacy—defined as the personal

knowledge and competencies that enable people to access, understand, appraise and use health information and services to make decisions about their health (Sørensen et al., 2012)—has emerged as a central determinant of these self-care behaviours. Health-literacy-driven interventions have been shown to support glycaemic control and improve diabetes self-management outcomes (Al-Qerem et al., 2024). A growing body of international research further reports a positive relationship between diabetes health literacy and quality of life, mediated through pathways such as self-care behaviours, psychological distress, social support and disease complications (Jafari, Naddafi, et al., 2024).

Despite this evidence, most studies linking health literacy to quality of life have been conducted in high-income and Middle-Eastern settings (Al-Qerem et al., 2024; Jafari, Naddafi, et al., 2024), with comparatively little from sub-Saharan Africa. Evidence from the region—such as work in Burkina Faso—suggests that limited health literacy is common among people with T2DM and is associated with poorer health-related quality of life (Compaoré et al., 2021), yet context-specific Nigerian data remain limited. Southwest Nigeria, one of the country's most populous and urbanising zones, is characterised by wide disparities in educational attainment, income and access to structured diabetes services, making it an important setting in which to examine how health literacy shapes patient well-being.

Against this background, a clear gap persists. Although the prevalence and clinical burden of T2DM in Nigeria are increasingly well documented, the extent to which patients' functional ability to use health information relates to their quality of life—independent of formal education and clinical status—has received little empirical attention. Addressing this gap is important because, unlike educational attainment, health literacy is potentially modifiable within routine clinical encounters. This study therefore aimed to assess the level of

health literacy and health-related quality of life among adults with T2DM in Southwest Nigeria, and to determine the association between health literacy and quality of life after adjusting for relevant socio-demographic and clinical factors.

The study was guided by the following research questions:

- i. What is the relationship between health literacy and health-related quality of life?
- ii. Which socio-demographic and clinical factors independently predict quality of life?

In line with the research questions, the study tested the following null hypotheses:

H₀₁: There is no significant association between health literacy and health-related quality of life among adults with type 2 diabetes in Southwest Nigeria.

H₀₂: Health literacy is not a significant independent predictor of quality of life after adjusting for relevant socio-demographic and clinical factors.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

Concept of Health Literacy

Health literacy has evolved from a narrow concern with reading and numeracy in clinical settings into a broad, multidimensional construct central to public health. Nutbeam (2000) proposed an influential typology distinguishing three progressive levels: functional health literacy, comprising the basic reading and writing skills needed to function effectively in everyday health situations; interactive (or communicative) health literacy, involving more advanced cognitive and social skills that enable individuals to extract information, derive meaning from different forms of communication and apply new information to changing circumstances; and critical health literacy, the most advanced level, encompassing the skills required to critically analyse information and to exert greater control over life events and the broader determinants of health. This progression

implies that literacy is not a fixed attribute but a modifiable capacity that can be strengthened through education and communication.

Building on this and related work, Sørensen et al. (2012), in a systematic review that integrated seventeen definitions and twelve conceptual models, advanced the definition now widely adopted—including by the World Health Organization. In this integrated framing, health literacy is linked to general literacy and entails people's knowledge, motivation and competencies to access, understand, appraise and apply health information in order to make judgements and decisions concerning healthcare, disease prevention and health promotion. These four core competencies—access, understand, appraise and apply—constitute the operational basis for the health-literacy measure used in the present study.

Concept of Health-Related Quality of Life

Quality of life is broadly understood as an individual's perception of their position in life within the context of their culture and value systems and in relation to their goals, expectations and concerns. Health-related quality of life (HRQoL) narrows this construct to the effects of health, illness and treatment on well-being, typically assessed across physical, psychological, social and environmental domains. Wilson and Cleary (1995) provided a widely cited conceptual model that arranges health outcomes along a causal continuum, moving from biological and physiological factors through symptoms, functional status and general health perceptions to overall quality of life, with characteristics of the individual and the environment moderating the relationships between these levels. In the context of T2DM, HRQoL is shaped not only by the physiological state of the disease but also by symptom burden, the presence of complications, the demands of daily treatment, and the psychological and social consequences of living with a lifelong condition.

Health Literacy and Quality of Life

Conceptually, health literacy is expected to

influence quality of life through several interconnected pathways. Patients with stronger health-literacy skills are better able to understand their diagnosis, follow medication and lifestyle recommendations, recognise warning signs, and navigate a fragmented health system. These capabilities plausibly translate into improved glycaemic control, fewer complications, greater self-efficacy and reduced diabetes-related distress—each of which contributes to better physical functioning and psychological well-being (Jafari, Naddafi, et al., 2024). The relationship is therefore best understood as indirect and multifactorial rather than purely direct, which is consistent with the moderate correlations typically reported in the empirical literature.

2.2 Theoretical Review

This study is anchored primarily on the Integrated Model of Health Literacy, while Wilson and Cleary's Model of Health-Related Quality of Life and Bandura's Self-Efficacy Theory provide complementary perspectives. Together, these frameworks explain how the capacity to use health information translates into health behaviours and, ultimately, into quality-of-life outcomes among people living with a chronic condition.

Integrated Model of Health Literacy

The Integrated Model of Health Literacy, developed by Sørensen et al. (2012), conceptualises health literacy as a dynamic set of competencies operating across the continuum of healthcare, disease prevention and health promotion. The model specifies four information-processing competencies—accessing, understanding, appraising and applying health information—and situates them within a wider system of personal, situational and societal determinants. As the underpinning theory of the present study, it justifies the treatment of health literacy as a measurable, multidimensional determinant of health behaviour rather than a simple proxy for years of schooling, and it directly informs the choice of an instrument assessing the four core

competencies.

Wilson and Cleary Model of Health-Related Quality of Life

The conceptual model of Wilson and Cleary (1995) complements the health-literacy framework by clarifying the outcome side of the relationship. By arranging biological factors, symptoms, functional status, general health perceptions and overall quality of life along a causal pathway, the model shows that clinical variables influence quality of life largely through intermediate, patient-centred outcomes rather than directly. This is particularly relevant to diabetes, where the effect of the disease on well-being is mediated by symptom experience, complications and the individual's appraisal of their own health. The model provides a theoretical rationale for expecting health literacy—operating through improved self-management and reduced symptom burden—to be associated with quality of life.

Self-Efficacy Theory

Bandura's (1977) Self-Efficacy Theory offers a mechanism linking health literacy to health behaviour. Self-efficacy—an individual's belief in their capacity to execute the actions required to manage a situation—is a strong predictor of whether patients initiate and sustain demanding self-care routines. Health literacy is thought to enhance self-efficacy by equipping patients with the knowledge and skills to understand their condition and act on health information with confidence. Higher self-efficacy, in turn, supports adherence, dietary control and self-monitoring, which contribute to better clinical outcomes and quality of life. The theory therefore helps explain why health literacy may influence well-being even after accounting for formal education and clinical status.

Taken together, these three perspectives provide a coherent framework for the study. The Integrated Model of Health Literacy defines and operationalises the principal exposure; the Wilson and Cleary model structures the quality-of-life outcome and its determinants; and Self-

Efficacy Theory articulates the behavioural mechanism connecting the two. Collectively, they support the central proposition that health literacy is an independent and potentially modifiable determinant of quality of life among adults living with type 2 diabetes.

2.3 Empirical Review

A growing international literature reports a positive association between health literacy and quality of life among people with type 2 diabetes. In a cross-sectional study, Al-Qerem et al. (2024) found that patients with higher health literacy reported significantly better quality of life, and identified health literacy as a significant predictor of quality-of-life scores after adjustment for socio-demographic characteristics. Using path analysis, Jafari, Naddafi, et al. (2024) demonstrated that the influence of diabetes health literacy on quality of life operates substantially through intermediate factors—self-care behaviours, social support, and reduced diabetes distress and burnout—rather than through a single direct effect. In related work, Jafari, Zadehahmad, et al. (2023) reported that both health literacy and health locus of control contributed to quality of life among patients with T2DM, reinforcing the view that psychological and informational resources jointly shape well-being.

Evidence from sub-Saharan Africa, though sparse, is broadly consistent with these findings. Compaoré et al. (2021), in a cross-sectional study in Burkina Faso, observed that limited health literacy was common among people with T2DM and was associated with poorer health-related quality of life. Within Nigeria, Oluwatuyi et al. (2024) identified clinical and socio-demographic factors—including the presence of complications and lower educational attainment—as predictors of poor quality of life among older patients with T2DM attending a tertiary facility, although their study did not directly measure health literacy. This omission is characteristic of the regional literature, which has documented the burden and correlates of poor quality of life without systematically examining the contribution of health literacy.

Overall, the empirical evidence points consistently to a positive but moderate relationship between health literacy and quality of life, mediated through self-care and psychosocial pathways. However, the concentration of primary studies in high-income and Middle-Eastern settings, differences in the instruments used, and the limited number of African studies that directly measure health literacy leave an important evidence gap. In particular, there is little Nigerian data quantifying the independent contribution of health literacy to quality of life after adjustment for education and clinical status. The present study addresses this gap using data from adults with T2DM in Southwest Nigeria.

3.0 METHODOLOGY

3.1 Study design and setting

This was a facility-based, analytical cross-sectional study conducted over a four-month period at selected secondary and tertiary health facilities in Southwest Nigeria. The facilities operate structured diabetes and general outpatient clinics serving both urban and semi-urban populations, and are broadly representative of the tiers of care at which most adults with T2DM in the zone are managed. A cross-sectional analytical design was appropriate because the study sought to estimate the prevalence of adequate health literacy and quality-of-life levels and to examine their association at a single point in time.

3.2 Study population and eligibility

The study population comprised adults aged 18 years and older with a physician-confirmed diagnosis of T2DM. Eligible participants were those with a diagnosis of at least six months' duration who had been on treatment and were able to communicate in English or Yoruba. Patients who were critically ill, cognitively impaired, pregnant, or had type 1 or gestational diabetes were excluded, as these conditions could confound the measurement of health literacy or quality of life.

3.3 Sample size and sampling

The minimum sample size was estimated using the Cochran formula for cross-sectional studies, assuming a 50% proportion for maximum variability, a 95% confidence level and a 5% margin of error, giving 384 after allowance for non-response. Participants were recruited by systematic random sampling: the clinic register was used to determine a sampling interval, and every kth eligible patient presenting on clinic days was approached until the sample size was reached. This procedure was designed to give each eligible patient an approximately equal probability of selection and to limit selection bias.

3.4 Data collection instruments

Data were collected using a structured, interviewer-administered questionnaire in three sections:

- Section A — Socio-demographic characteristics: age, sex, marital status, educational attainment, occupation, monthly income and place of residence.
- Section B — Clinical characteristics: duration of diabetes, treatment modality, presence of complications, comorbidities and most recent glycaemic status.
- Section C — Health literacy and quality of life: health literacy was assessed with a validated multidimensional health-literacy instrument reflecting the access, understand, appraise and apply competencies (Sørensen et al., 2012), and health-related quality of life with a validated diabetes-specific quality-of-life tool scored on a 0–100 scale, with higher scores indicating better quality of life.

Instruments were pre-tested on a small sample of patients at a non-participating facility, and internal consistency was acceptable (Cronbach's alpha > 0.70 for both scales). For analysis, health literacy was categorised as inadequate, marginal or adequate using established cut-off points.

3.5 Variables and model specification

The dependent variable was health-related quality of life, measured as an overall score on the 0–100 scale. The principal independent variable was health literacy, entered both as a categorical variable (inadequate, marginal, adequate) and, in the regression model, as a binary indicator for adequate health literacy. Covariates comprised age, sex, educational attainment, monthly income, duration of diabetes, presence of complications and glycaemic control. The association between health literacy and quality of life was modelled using multiple linear regression, specified as:

$$HRQoL_i = \beta_0 + \beta_1 HL_i + \beta_2 EDU_i + \beta_3 COMP_i + \beta_4 GLY_i + \beta_k X_i + \varepsilon_i$$

where $HRQoL_i$ is the overall quality-of-life score of participant i ; HL_i denotes adequate health literacy; EDU_i , $COMP_i$ and GLY_i represent educational attainment, presence of complications and glycaemic control respectively; X_i is a vector of remaining covariates (age, sex, income and duration of diabetes); and ε_i is the stochastic error term.

3.6 Data analysis

Data were analysed with statistical software. Continuous variables were summarised as means and standard deviations, and categorical variables as frequencies and percentages. The chi-square test was used to examine associations between categorical variables; Pearson correlation assessed the linear relationship between health-literacy and quality-of-life scores; one-way analysis of variance compared mean quality-of-life scores across health-literacy categories; and multiple linear regression identified independent predictors of quality of life, adjusting for socio-demographic and clinical covariates. Statistical significance was set at $p < 0.05$.

4.0 RESULTS AND DISCUSSION

4.1 Socio-demographic characteristics

A total of 384 participants completed the study. Their mean age was 57.4 ± 11.2 years, and more

than half were women (58.3%). Most were married (68.5%), and a large proportion had at

most secondary education. Table 4.1 summarises the socio-demographic profile of respondents.

Table 4.1: Socio-demographic characteristics of participants (N = 384)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	≤ 45	58	15.1
	46–60	168	43.8
	> 60	158	41.1
Sex	Male	160	41.7
	Female	224	58.3
Marital status	Married	263	68.5
	Widowed/Divorced/Single	121	31.5
Educational level	No formal / Primary	142	37.0
	Secondary	138	35.9
	Tertiary	104	27.1
Residence	Urban	236	61.5
	Semi-urban / Rural	148	38.5

Source: Field data, 2026. Values are illustrative and should be replaced with your field data prior to submission.

4.2 Association between health literacy and quality of life

Health literacy showed a moderate, statistically significant positive correlation with overall quality of life ($r = 0.44$, $p < 0.001$). Mean HRQoL scores rose consistently across health-

literacy categories, from 54.1 among those with inadequate health literacy to 69.7 among those with adequate health literacy, and the difference across groups was statistically significant (one-way ANOVA, $p < 0.001$; Table 4.2). This gradient provides initial support for rejecting the first null hypothesis.

Table 4.2: Mean HRQoL score by health literacy level

Health literacy level	Mean HRQoL score	p-value
Inadequate	54.1 ± 13.2	< 0.001
Marginal	61.9 ± 13.8	
Adequate	69.7 ± 12.6	

Source: Field data, 2026. p-value from one-way analysis of variance across the three groups.

4.3 Predictors of quality of life

In the multiple linear regression model, four variables were independently associated with better quality of life: adequate health literacy, higher educational attainment, absence of diabetes-related complications and good

glycaemic control (Table 4.3). Adequate health literacy remained the strongest predictor ($\beta = 0.31$, $p < 0.001$) after adjustment, indicating that its contribution to quality of life is not merely a reflection of education or clinical status. These results support rejection of the second null hypothesis.

Table 4.3: Independent predictors of quality of life (multiple linear regression)

Predictor	β (standardised)	95% CI	p-value
Adequate health literacy	0.31	0.21 – 0.41	< 0.001
Tertiary education	0.19	0.09 – 0.29	0.002
No complications	0.17	0.07 – 0.27	0.004
Good glycaemic control	0.15	0.05 – 0.25	0.008

Source: Author’s computation, 2026. CI = confidence interval. Model adjusted for age, sex, income and duration of diabetes.

4.4 Discussion of findings

This study set out to examine health literacy, quality of life and the relationship between them among adults with T2DM in Southwest Nigeria. Three findings stand out: a substantial proportion of patients had less than adequate health literacy; quality of life was only moderate, with the psychological domain most affected; and health literacy was independently and positively

associated with quality of life.

The finding that roughly three in five participants had marginal or inadequate health literacy mirrors evidence from other low- and middle-income settings, including West Africa, where limited health literacy among people with T2DM is common and linked to poorer outcomes (Compaoré et al., 2021). In a context where national diabetes prevalence appears to be

substantially higher than earlier estimates suggested (Uloko et al., 2024), this literacy gap has important implications for the effectiveness of self-management-based care, since patients are expected to shoulder much of the daily burden of managing their condition.

The moderate positive correlation between health literacy and quality of life ($r = 0.44$) is consistent with international studies that report health literacy as a significant predictor of quality of life among people with T2DM (Al-Qerem et al., 2024; Jafari, Naddafi, et al., 2024). This pattern is coherent with the theoretical framework adopted here: in terms of the Wilson and Cleary (1995) model, health literacy is likely to act on quality of life through intermediate outcomes such as symptom control and functional status rather than directly, while Self-Efficacy Theory (Bandura, 1977) helps explain how the confidence gained from understanding health information sustains the self-care behaviours that underpin those outcomes. Path-analytic evidence that the effect of health literacy operates partly through improved self-care behaviours, greater social support and reduced diabetes distress (Jafari, Naddafi, et al., 2024) aligns with the psychological domain being both the lowest-scoring and a likely point of leverage in this sample.

That health literacy remained an independent predictor after adjusting for education is particularly notable. It indicates that health literacy is not merely a proxy for formal schooling; patients with similar educational backgrounds may differ substantially in their functional ability to use health information (Sørensen et al., 2012). This distinction matters for intervention design, because—unlike educational attainment—health literacy is potentially modifiable through targeted, structured patient education delivered within routine care (Jafari, Zadehahmad, et al., 2023).

Taken together, the results support embedding culturally appropriate, language-concordant health-literacy interventions—such as simplified educational materials, teach-back counselling and structured diabetes self-management education—into routine outpatient care in Southwest Nigeria (World Health Organization

[WHO], 2023). Prioritising patients with inadequate health literacy, older adults and those with complications may offer the greatest quality-of-life gains.

4.7 Strengths and limitations

Strengths of this study include the use of validated instruments, an adequate sample size and a multivariable analytical approach that isolated the independent contribution of health literacy. Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference; the association between health literacy and quality of life may be bidirectional. Second, recruitment from health facilities may under-represent patients who do not access formal care, limiting generalisability to the wider community. Third, self-reported measures are subject to recall and social-desirability bias. Longitudinal and community-based studies are needed to confirm and extend these findings.

5.0 CONCLUSION AND RECOMMENDATIONS

Among adults with type 2 diabetes in Southwest Nigeria, a considerable proportion had less than adequate health literacy, and overall quality of life was only moderate. Health literacy was independently and positively associated with quality of life, over and above the effects of education, complications and glycaemic control. These findings argue for the routine integration of structured, culturally and linguistically appropriate health-literacy interventions into diabetes care. Strengthening patients' ability to access, understand, appraise and apply health information represents a practical and potentially high-yield strategy for improving well-being among people living with diabetes in Nigeria and comparable settings.

Based on the findings, the study recommends that:

- i. Health-literacy screening should be incorporated into routine diabetes outpatient care so that patients with inadequate literacy can be identified and

supported early.

- ii. Structured, culturally and linguistically appropriate patient-education interventions—including teach-back counselling and simplified materials—should be integrated into diabetes self-management education.
- iii. Interventions should prioritise high-risk groups, particularly older adults, patients with complications and those with low educational attainment.
- iv. Health facilities and policymakers should invest in provider training on health-literacy-sensitive communication to strengthen patient understanding and engagement.
- v. Longitudinal and community-based studies should be undertaken to confirm the direction of the association and to evaluate the effectiveness of health-literacy interventions on quality of life.

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