

Original Article

Health-related Quality of Life (HRQOL) of Patients with Type 2 Diabetes Mellitus and People without Diabetes at a Tertiary Hospital in Port-Harcourt, Rivers State, Nigeria

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ABSTRACT

Background: Health-related quality of life (HRQOL), a patient-sensitive outcome globally, has become the clinician's primary goal of care. Evidence suggests that diabetes mellitus (DM) and its treatment/care impair patients' HRQOL, which varies depending on patient population/factors. Diabetics' HRQOL in South-South Nigeria is largely unknown. **Objectives:** This study assessed and compared the HRQOL of patients with type 2 diabetes attending the outpatient diabetic clinic at a tertiary hospital in Port-Harcourt, Rivers State, South-South Nigeria with age-/gender-matched nondiabetics living within the same environment. **Materials and Methods:** This descriptive cross-sectional comparative study recruited 200 respondents, respectively those with type 2 diabetes (cases) and nondiabetics (controls). Data were collected by using the World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire and analyzed by using descriptive and inferential statistics at $P \leq 0.05$ level of significance. **Results:** The two groups (200 each) had no significant differences ($P = 0.35 - P = 0.98$) in terms of their demographic variables. The diabetic group mean scores were significantly ($P = 0.00$) lower than that of the non-diabetics in terms of WHOQOL-BREF overall, health satisfaction, physical, psychological, and social domains. Diabetics with tertiary education (58%) had a significantly higher mean score ($P = 0.012$) in terms of overall WHOQOL-BREF than those with secondary and primary education (42%). Ninety-two patients (46%) with diabetes had comorbidities that increased significantly with age ($P = 0.00$) and expressed less satisfaction with their health ($P = 0.04$). **Conclusion:** Patients with diabetes had lower HRQOL scores than non-diabetics, implying the negative impact of diabetes and its treatment/care on their life. Diabetics' HRQOL should be routinely evaluated and enhanced by empowering diabetic self-care activities that aid diabetes control and retard complications.

KEYWORDS: Diabetes mellitus, Nigeria, persons with diabetes, quality-of-life, World Health Organization Quality of Life-BREF

INTRODUCTION

DM is a group of metabolic diseases that is characterized by hyperglycemia resulting from defects in insulin secretion or action or both.^[1] It is no longer associated with affluence but has become a

global health problem, with low- and middle-income countries carrying almost 80% of the diabetes burden.^[2,3] Currently, Nigeria alone accounts for 20% of the total

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number of people living with diabetes in Sub-Saharan Africa (S.A.A).^[4] Though the actual current prevalence figure of DM in Nigeria is unknown, it is continuously increasing from 2.2% (as per the population estimate of 1992^[5]) to 5.5%. The overall prevalence estimate obtained in 2017 from a systematic review of population-based studies and a meta-analysis showed that DM varied from 3.4% in the northwest to 9.8% in the south-south geopolitical zones of the country.^[6] DM is a chronic disease with short- and long-term complications.^[7,8] Although the associated DM risk factors are modifiable by self-care actions,^[9] the regimen's nonadherence is common, making glycemic control difficult and leading to complications that negatively impact the health status and quality of life (QOL) of individuals living with diabetes.^[10] Thus, QOL studies have become an important health outcome and a primary goal in diabetes care.^[1,11]

QOL is a descriptive term that refers to people's emotional, social, and physical well-being and their ability to function in the ordinary task of living.^[12] The WHO Quality of Life (WHOQOL) group defined QOL as "an individual's perception of their position in life in the context of culture and value system in which they live and in relation to their goals, expectations, standards and concerns."^[13] Health researchers prefer the phrase "health-related quality-of-life" (HRQOL) to narrow the scope to aspects of functioning directly related to diseases and or medical treatment.^[14] Although definitions of HRQOL vary, the consensus in literature from its earliest beginning is that HRQOL is the functional effect of a medical condition and/or its consequent therapy on a patient.^[15] Thus, HRQOL is a subjective and multidimensional construct involving a variety of domains. These dimensions refer to a patient's perspective of how the disease in question is compromising one's well-being. Subsets with these dimensions vary with each HRQOL tool. It may include symptom distress, general physical functioning, mental/emotional state, social functioning, perceived burden of the treatment regimen, treatment satisfaction, and an overall sense of well-being.^[1] As health economic indices, reduced HRQOL implies that disease burden is higher with reduced life expectancy and decreased productivity.

Researchers outside Nigeria have found lower HRQOL among patients living with diabetes than the nondiabetics, along those with uncontrolled diabetes than those who have controlled diabetes, among females with diabetes than their male counterparts, and among older respondents and younger ones from lower socioeconomic groups.^[11,12,16-21] A systematic review of studies in Iran found that six studies reported

the negative effects of DM complications on HRQOL whereas nine reported that these complications were the predictors of their lower HRQOL.^[19] These results affirm that HRQOL is an important health outcome and primary goal of care.^[11,19]

In Nigeria, the accessed HRQOL studies also reported the negative impacts of DM on the lives of their respondents,^[14,22-27] with some factor variability effects on HRQOL. Thus, in some, lower income, lower education, low (economic) rated employment, physical/diabetic complications, and glycemic control were found to have adversely affected the HRQOL of patients with DM.^[22-24] However, these studies except one^[26] were descriptive cross-sectional studies of only patients with diabetes, with no controls to ascertain the predictable evidence of the disease impact on QOL. Further, although Rivers State is in the south-south geopolitical zone of Nigeria with the highest prevalence of DM,^[5] to the best of the researchers' knowledge, diabetics' HRQOL is greatly unknown in this state. These informed the current study that assessed and compared the HRQOL of patients medically diagnosed with DM attending a tertiary hospital diabetic clinic in Port Harcourt Rivers State Nigeria with that of age-/gender-matched people without diabetes.

MATERIALS AND METHODS

Design/sample

This was a descriptive cross-sectional comparative study. Using power analysis,^[28] a sample size of 200 (including 10% attrition rate) was calculated for each study arm from a population of registered patients with type 2 diabetes attending the outpatient clinic at the study site. The sample unit selection was purposive: all adult respondents with type 2 diabetes medically diagnosed, registered, and attending the diabetes clinic at the study site and residing in Port Harcourt. The nondiabetic respondents' reported not known to have DM or on treatment for any of the following chronic health problems that can impact HRQOL: hypertension, stroke, arthritis, duodenal/gastric ulcers, cancers, HIV/AIDS, asthma and also must have similar characteristics of being within same age range, including male and female and resident in PH as the diabetic patients age and gender. All recruited respondents must be alert and willing to participate.

Instrument for data collection

The adopted instrument for data collection was the WHOQOL-BREF,^[20] with 12 additional questions soliciting demographic and clinical data of the respondents. The WHOQOL-BREF has two parts containing two single items for respondents to rate

their overall QOL and health satisfaction and 26 items grouped into four domains,^[13] namely:

- a. Physical health (seven items): assessing the presence of pain and discomfort, dependence on medical treatment; energy and fatigue; mobility, sleep and rest; activity of daily living; perceived working capacity.
- b. Psychological health (eight items): assessing affect, cognitive functions, body image, and appearance; self-esteem, negative effects, and spirituality.
- c. Social relationship (three items): assessing personal relationship, social support, and sexual activity.
- d. Environmental domain (eight items): assessing physical safety and security; physical environment, e.g. pollution; noise; traffic; climates; financial resources; opportunities for acquiring new information and skills; participation in and opportunities for recreation/leisure activities, home environment; health and social care; accessibility and quality; transportation.

All items were rated on a five-point Likert response pattern that inquired how the respondent felt during the previous two weeks to one month, and the selected responses were scored from five (their best feeling) to one (their worst feeling) for positively worded items. The negatively worded items had reversed scores and for purposes of interpretation, a higher score indicates a better QOL. Lower scores for responses for negatively worded statements and the presence of symptoms indicate a better QOL. There was no transformation of mean scores in this study from the WHOQOL-BREF to WHOQOL -100. The WHOQOL-BREF instrument was reported to have psychometric properties of reliability ranging from good to excellent and performed well in preliminary tests of validity.^[20] The reliability of the instrument in the present study was established by using a split-half method that yielded a Cronbach's alpha coefficient of 0.70 for the physical and environmental domains, 0.76 and 0.78 for the psychological and social domains respectively. Assessors of diabetics in Benin City Nigeria, using WHOQOL BREF cited that their alpha values within our reported range are acceptable limits for a group comparison.^[23]

Ethical considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the study site hospital (ethical approval number UPTH/ADM/90/S.II/VOL.X/362.), whereas administrative permits were obtained from the patients' consultant physician/endocrinologist and nursing staff in-charge of the

outpatient diabetic clinic; the presidents and community leaders of the control group. Informed consent was obtained from each respondent after explaining the purpose of the research and their roles. They were assured of the anonymity of information provided, with all questionnaires de-identified; freedom not to answer questions they feel uncomfortable with; and to withdraw from the study without any interference or ill treatment. They were informed that the information provided would be used for the study and any publications thereof.

Procedure for data collection

The patients for the study group who consented to participate were recruited as they reported at the nurses' desk, and they were interviewed in a room at the clinic before the physician's consultation commenced. Those in the control group who met the inclusion criteria and gave their informed consent were recruited on their community meeting days. The questionnaire was interviewer-administered by the first author and three trained research assistants (Registered Nurses) to accommodate literate and illiterate respondents. Data collection lasted for three months.

Data analysis

Data analysis was done by using IBM.SPSS Version 20 software. Data were summarized in proportions and mean scores, whereas hypotheses were tested by using Chi-square, student t-test, and analysis of variance (ANOVA) for data that meet the statistical application norms of these tests at $P \leq 0.05$ level of significance.

RESULTS

Demographic characteristics of respondents

Table 1 shows that the 400 respondents (cases and controls) were all Christians, predominantly married (81.8%), 51.0% were females whereas 49.0% were males, the majority (60.8%) had tertiary education, and (54.2%) were on salary paid jobs. Eleven percent (11%) of the diabetic respondents and 6.5% of nondiabetics were widowed. There were no significant differences ($P = 0.35$ - $P = 0.67$) between the demographic variables of the diabetics and the controls.

Type 2 diabetic respondents' clinical data

Table 2 shows that the mean duration of diabetic respondents' years of living with diabetes was 8.27 ± 6.45 years. The majority (119 = 59.5%) of them were being managed with diet, exercise, and oral diabetic drugs whereas an appreciable number (55 = 27.5%) were on diet, exercise, and oral diabetic drugs combined with insulin injection. Ninety-two (46%) respondents reported comorbidities that increased significantly with

Table 1: Demographic characteristics of the respondents

Variables	Diabetics	Controls	Total	P Value
	n = 200	n = 200		
Age groups				
30–49	63 (31.5%)	63 (31.5%)	126 (31.5%)	
50–69	120 (60%)	121 (60.5)	141 (60.2%)	0.98
70+	17 (8.5%)	16 (8.2%)	33 (8.3%)	
Mean age	54.21 ± 11.6	52.51 ± 11.4		0.54
Gender				
Female	104 (52.0%)	100 (50.0%)	204 (51.0%)	0.69
Male	96 (48.0%)	100 (50.0%)	196 (49.0%)	
Level of education				
No formal education	1 (0.5%)	1 (0.5%)	2 (0.5%)	
Primary	35 (17.5%)	24 (12.0%)	59 (14.8%)	0.47
Secondary	48 (24.0%)	48 (24.0%)	96 (24.0%)	
Postsecondary	116 (58.0%)	127 (63.5%)	243 (60.8%)	
Income source				
On-paid job	102 (51.0%)	115 (57.5%)	217 (54.2%)	
Self-employed	61 (30.5%)	58 (29.0%)	119 (29.8%)	0.35
Unemployed	37 (18.5%)	27 (13.5%)	64 (16.0%)	
Religion				
Christianity	200 (100.0%)	200 (100.0%)	400 (100.0%)	
Marital status				
Single	12 (6.0%)	18 (9.0%)	30 (7.5%)	
Married	161 (80.5%)	166 (83.0%)	327 (81.8%)	
Divorced	1 (0.5%)	1 (0.5%)	2 (0.5%)	0.37
Separated	4 (2.0%)	2 (1.0%)	6 (1.5%)	
Widow	22 (11.0%)	13 (6.5%)	35 (8.8%)	

* $P \leq 0.05$, that is, statistically significant

Table 2: Diabetic respondents' clinical data (n = 200)

Variables	No. of respondents/%
Duration of years living with DM	8.27 ± 6.45 years
**Comorbidities reported	97 (46)
Asthma	4 (2)
Hypertension	80 (40)
Congestive cardiac failure	3 (1.5)
Arthritis	30 (15.0)
Pulmonary tuberculosis	1 (0.5)
Ulcer (duodenal and stomach)	13 (6.5)
HIV/AIDS	1 (0.5)
Others (tuberculosis, obesity, partial stroke)	11 (5.5)
**Developed diabetic complications	97 (48)
Kidney disease	3 (3.1)
Nerve disease	27 (27.8)
Eye disease	46 (47.4)
Foot ulcer	23 (23.7)
Others (foot pain, erectile dysfunction)	20 (20.6)
Physician-prescribed diabetic treatment	
None	4 (2.0)
Diet and exercise only	8 (4.0)
Diet, exercise, and oral diabetic drugs (ODD)	119 (59.5)
Diet, exercise, and insulin injection	14 (7.0)
Diet, exercise, and ODD plus insulin injection	55 (27.5)

**Some respondents reported more than one comorbidity/DM complication

Bold fonts showed the proportion and percentage of respondents that reported comorbidity

age ($P = 0.00$) whereas diabetic-related complications reported included nephropathy (3.1%), neuropathy (27.8%), eye defects (47.4%), foot ulcer (23.7%), and others such as foot pain and erectile dysfunction (20.6%).

Respondents' overall quality of life

In Table 3, the diabetic group had a significantly lower overall HRQOL ($P = 0.00$) and expressed significantly ($P = 0.04$) less satisfaction with their health than the control group, whereas diabetics with comorbidities were significantly ($P = 0.04$) less satisfied with their health than those without comorbidities. The control group had a better HRQOL than the diabetic group in all the four domains of the WHOQOL-BREF ($P \leq 0.00$), with significantly higher mean scores in all but the environmental domain ($P = 0.19$). There were no significant mean score differences ($P \geq 0.09$) between diabetics with comorbidities and those without comorbidities in all the four domains of the WHOQOL-BREF.

Comparison of mean score differences in all WHOQOL-BREF items between diabetic and nondiabetic respondents

Table 4 shows significant mean differences between diabetics and controls in all the seven items in the physical domain ($P = 0.00$), with the former group

Table 3: Comparison of respondents' mean scores on WHOQOL-BREF overall QOL, health satisfaction, and domains between groups of respondents (n = 400)

Parameters	Group ratings		P Value
	Diabetics (n = 200)	Non-DM (n = 200)	
Overall QOL	3.80 ± 0.96	4.14 ± 0.58	0.000*
Satisfaction with health	3.51 ± 1.03	4.09 ± 0.58	0.000*
Physical domain	23.17 ± 3.39	24.17 ± 2.24	0.001*
Psychological domain	20.06 ± 3.32	21.53 ± 2.51	0.000*
Social domain	10.20 ± 2.47	11.43 ± 1.87	0.000*
Environmental domain	28.00 ± 5.15	28.68 ± 5.04	0.186
Diabetics with comorbidities	Yes (n = 92)	No (n = 108)	
Overall quality of life	3.70 ± 0.96	3.88 ± 0.89	0.176
Satisfaction with health	3.35 ± 1.05	3.65 ± 1.00	0.040*
Physical domain	22.73 ± 3.30	23.55 ± 3.43	0.089
Psychological domain	19.67 ± 3.08	20.39 ± 3.48	0.129
Social domain	9.96 ± 2.28	10.40 ± 2.62	0.209
Environmental domain	27.41 ± 4.98	28.50 ± 5.25	0.137

*P ≤ 0.05 statistically significant

Table 4: Comparison of mean scores (t test) differences in all WHOQOL-BREF items between diabetic and nondiabetic respondents (n = 400)

Parameters	Mean ± SD	Mean ± SD	P Value
	Diabetics (n = 200)	Controls (n = 200)	
Overall QOL	3.80 ± 0.96	4.14 ± 0.58	0.000*
Satisfaction with health	3.51 ± 1.03	4.09 ± 0.58	0.000*
Physical domain	23.17 ± 3.39	24.17 ± 2.24	0.001*
Activities of daily living	3.42 ± 0.96	3.99 ± 0.68	0.000*
Dependence on medicinal substances and medical aids	3.33 ± 0.93	2.31 ± 1.00	0.000*
Energy and fatigue	3.23 ± 0.96	3.83 ± 0.73	0.000*
Mobility	3.64 ± 0.95	4.00 ± 0.64	0.000*
Pain and discomfort	2.57 ± 1.09	2.11 ± 0.91	0.000*
Sleep and rest	3.70 ± 0.97	4.02 ± 0.72	0.000*
Work capacity	3.29 ± 1.04	3.93 ± 0.69	0.000*
Psychological domain	20.06 ± 3.32	21.53 ± 2.51	0.000**
Body image and appearance	3.39 ± 1.03	3.93 ± 0.75	0.000*
Negative feelings	2.37 ± 0.99	2.22 ± 0.71	0.082
Positive feelings	3.30 ± 0.87	3.54 ± 0.69	0.000*
Self-esteem	3.58 ± 1.02	4.13 ± 0.63	0.000*
Spirituality/religion/personal beliefs	3.89 ± 0.85	3.98 ± 0.70	0.248
Thinking, learning, memory, and concentration	3.55 ± 0.80	3.75 ± 0.69	0.006*
Social domain	10.20 ± 2.47	11.43 ± 1.87	0.000**
Personal relationships	3.75 ± 0.91	4.05 ± 0.61	0.000*
Social support	2.99 ± 1.30	3.77 ± 1.00	0.000*
Sexual activity	3.46 ± 1.05	3.62 ± 0.83	0.091
Environmental domain	28.00 ± 5.15	28.68 ± 5.04	0.186
Financial resources	2.99 ± 0.99	3.21 ± 0.86	0.018*
Freedom, physical safety, and security	3.77 ± 0.78	3.89 ± 0.66	0.097
Health and social care: accessibility and quality	3.67 ± 0.92	3.77 ± 0.80	0.224
Home environment	3.84 ± 0.90	3.87 ± 0.79	0.768
Opportunities for acquiring new information and skills	3.49 ± 0.94	3.40 ± 0.82	0.336
Participation in and opportunities for recreation/leisure	3.02 ± 1.02	3.06 ± 0.90	0.678
Physical environment (pollution/noise/traffic/climate)	3.87 ± 0.76	3.96 ± 0.86	0.650
Transport	3.37 ± 1.13	3.53 ± 0.95	0.138

*P ≤ 0.05 statistically significant item

**Statistically significant domain mean differences

Bold fonts showed the specific domains different from particular items under the domains

Table 5: Analysis of variance (ANOVA) between sociodemographic and WHOQOL-BREF overall quality of life mean scores of diabetic respondents (*n* = 200)

Demographic	Variables	<i>n</i> = 200	Mean ± SD	<i>P</i> Value
Age range	30–49	63	3.75 ± 1.12	0.511
	50–69	120	3.85 ± 0.86	
	70 and above	17	3.59 ± 1.00	
Gender	Male	104	3.88 ± 0.95	0.169
	Female	96	3.70 ± 0.96	
Level of education	No formal and only/primary	36	3.42 ± 1.06	0.012*
	Secondary	48	3.75 ± 1.12	
	Tertiary	116	3.93 ± 0.81	
Source of income	Employed in a salary job	102	3.89 ± 0.88	0.265
	Self-employed	61	3.64 ± 1.05	
	Unemployed	37	3.78 ± 1.00	
Marital status	Never married	12	3.83 ± 1.19	0.731
	Married	161	3.77 ± 0.92	
	Divorced/separated/widowed	27	3.93 ± 1.07	
Variables	Diabetics with comorbidities			
	Yes	No	Total	
Age groups	F (%)	F (%)	F (%)	
30–49	17 (27.0%)	46 (73.0%)	63 (100)	
50–69	65 (54.2%)	55 (45.8%)	120 (100)	
70+	10 (58.8%)	7 (41.2%)	17 (100)	
Total	92 (46.0%)	108 (54.0%)	200 (100)	

**P* ≤ 0.05 statistically significant

reporting lower HRQOL. In the psychological domain, there were significant item mean differences ($P \leq 0.01$) between the two groups, except in spirituality/religion/personal belief ($P = 0.14$) and negative feelings ($P = 0.08$), in which the diabetics had lower mean scores. The study group had lower mean scores in the social domain while the control group's mean scores were higher indicating lower financial resources for the study group. The two groups did not report significant mean difference in their sexual activity ($P = 0.09$).

Analysis of variance between sociodemographic and WHOQOL-BREF overall quality of life mean scores of type 2 diabetic respondents

According to Table 5, diabetics with tertiary education had a significantly higher mean score ($P = 0.01$) (better overall HRQOL), than those respondents with no formal and secondary education.

DISCUSSION

Findings from this study showed that the adults living with type 2 diabetes the overall HRQOL and satisfaction with life among adults living with type 2 diabetes in study group were lower compared with adults living without diabetes in control group. Respondents with diabetes also had lower mean scores than controls in all the domains and items of the WHOQOL-BREF. The lower mean scores imply a lower QOL, and this

could be attributed to the respondents' perceived impact of the disease and its management on their life and functioning. Previous research also found such lower HRQOL in their studies.^[16,17] Similarly, other researchers also found significant HRQOL differences in the physical, psychological, and social domains.^[2,11] This finding can be attributed to the fact that the item result in one domain could explain the change found in another item in the same or another domain. For instance, in the physical domain, the diabetic group reported more pain and discomfort, which can disturb sleep and rest, with more fatigue and less energy for work. Also, they reported dependence on medicinal products, which can explain why financial constraints showed a significant difference in the environmental domain. Whether the diabetic group earns a similar amount as controls or not, the former spends more of their financial resources in managing their disease and its complications.

The study also revealed a statistically significant lower HRQOL among the diabetics in the psychological domain, as 97 (48.5%) of the respondents had already developed diabetic complications that led to the decrease in their HRQOL. These specifically negatively impacted aspects of their physical, psychological, and social domains, as reported in other studies.^[14,17,23] These findings imply that there is a greater need for diverse forms of support for individuals living with

diabetes to enhance their HRQOL, as also reported in other studies.^[13,17]

The respondents who were diabetic also showed a significantly lower mean score in personal relationships and social support but not in sexual life, contrary to other studies within and outside Nigeria that reported poor sexual activities among their study groups.^[14,15,20] They argued that changes in sexual activities worsen with age, and it is worse in people with DM as one of the complications of diabetes is sexual dysfunction in men. However, the two groups' mean age was 54.2 ± 11.6 and 52.5 ± 11.1 years for the diabetics and controls, respectively, with no significant difference ($P = 0.54$) between the groups; however, a previous study in Nigeria found a significantly ($P = 0.00$) higher mean age (59 years) among the diabetic group than the control group (53.5 years).^[14] Since sexual dysfunctions increase with age, this significant age difference may explain the significant poor sexual activities reported among the diabetic group in their study; however, the mean duration with DM in the current study was 8.27 ± 6.45 years, which may not have been long enough for most patients to develop and report significant sexual dysfunction such as erectile dysfunction, as a result of vascular and/or neurological complications, which is a part of the long-term complications of diabetes, especially in men.

The lower but nonsignificant difference ($P = 0.18$) in mean score in the environmental domain showed that only financial resources had a significant mean difference between the two groups. Therefore, none of the factors in this domain, except financial resources, had specific implications to the disease and its treatment. All other factors were experienced uniformly among the two groups, which can be attributed to a common culture and way of life of the groups since they came from the same environment.^[16] The study was dissimilar to the findings by Issa and Baiyewu,^[24] where 79% of their respondents had a lower composite score in the environmental domain.

Though not statistically significant, the diabetic group with comorbidities had lower mean scores in HRQOL in all the domains than those without comorbidities. Other researchers who also used the WHOQOL-BREF to measure their patients' HRQOL reported similar results between the respondents with complications and comorbidities and those without comorbidities.^[20,25,29] Similarly, studies that used tools other than WHOQOL-BREF reported lower mean scores in HRQOL in respondents with comorbidities.^[18,27,30] WHOQOL-BREF, being a generic instrument, may not have the specificity and sensitivity to select and discriminate

marginal changes between the groups. This weakness in generic instruments has been reported in HRQOL literature.^[1,20-23] Further, the present study did not check patients' clinical records for medical diagnoses and assessment of the degree of the comorbidity severity, which can explain the nonsignificant differences.

There were no significant relationships between the demographic variables of the two groups and their HRQOL scores, except with the level of education. Those with tertiary education reported better HRQOL than the less educated, as also seen with the other studies.^[22,26] This could be attributed to the fact that the tertiary educated are more likely to access information, read and understand the self-care management needed, and have a higher rated employment job with a higher income to manage their disease/access treatment. On the contrary, studies carried out in Nigeria and other countries reported lower HRQOL among respondents ≥ 65 years whereas those ≤ 40 years had better HRQOL.^[17,23] Further, other studies reported lower HRQOL in women than in men.^[2,22,25] Obesity was an associated factor (more in females) in those studies. Obesity was not observed as impacting respondents in the present study ($<5\%$). Obesity was not tested to check for its impact on respondents in the present study because of the few people ($<5\%$) who reported it, which suggests that there could be other factors associated with the diabetics' HRQOL that were not captured in this study.

Practice implications

DM is on the increase; therefore, it is necessary to create more awareness in order to prevent diabetes and its complications that negatively impact the HRQOL of people living with DM. Diabetic care teams and policy makers should devise and implement appropriate interventions for achieving better management of DM, which will increase support to patients and improve the subjective HRQOL of people living with DM. Such interventions should, in addition to optimal medical treatment, include educational and behavioral interventions that are aimed at facilitating the patients' ability to cope with diabetes.^[1]

Limitations and strengths

- This study used patients who attended the clinic in a tertiary hospital where expert care is expected and patient disease is more likely under control.
- Hospitalized patients whose health status is compromised and those in the communities who may not be utilizing best health-care services may report worse HRQOL.
- The instrument used to measure HRQOL is generic and is likely to have a lower specificity to capture

symptom specifics of the disease, which limited the comparison of the results of the HRQOL obtained to only studies that used a similar instrument.

- However, building into the study a matched comparison group, living in the same environment within the same culture, became a major strength of this study and was in line with the WHOQOL group conception of QOL.

Recommendations

- The HRQOL of patients with diabetes should be inculcated into the assessment protocol and during intermittent evaluation of care and treatment.
- Longitudinal studies involving a wider population of diabetics with a combination of disease-specific and nonspecific instruments is recommended.

CONCLUSION

This study revealed that DM negatively impacts the HRQOL of patients with type 2 diabetes in the four domains of WHOQOL-BREF when compared with age- and sex-matched people without DM living in the same locality.

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Conflicts of interest

There are no conflicts of interest.

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