

## Health-Related Quality of Life of Diabetes Mellitus Patients and Non-Diabetic Persons in Calabar, Cross River State, Nigeria

Article by Iquo Okon

Doctor of Philosophy Degree, Public Health, Texilla American University

E-mail: [iquokon@gmail.com](mailto:iquokon@gmail.com)

### Abstract

*Quality of life of persons living with diabetes measures their health status with a look at multiple aspects of their life, including: emotional reactions to life occurrences, disposition, sense of life fulfilment and satisfaction in life. This study compares Health related quality of life of persons living with diabetes and those without Diabetes in University of Calabar Teaching Hospital, Calabar. This is a facility based cross sectional descriptive study. Participants were given the World Health Organization quality of life (WHOQOL-BREF) to assess their quality of life. Data were analyzed using Statistical Packages for the Social Sciences (SPSS), version 24. The results were presented in Means, standard deviations, and statistical analyses were performed to compare between QOL between diabetic and non-diabetics. A total 400 respondents (200 people living with Diabetes and 200 people without diabetes) participated in this study. Clinical data of diabetic respondents showed that 70.5 percent (n=141) were living with other disease while 29.5 percent n= 59) of diabetic responds were not living with other diseases. Diseases mostly exhibited by diabetic patients were hypertension 40 percent (n=80) and arthritis 15 percent (n=30). Patients with diabetes had a significant lower mean score than the non-diabetics in their overall quality of life ( $P = 0.000$ ). Findings from this study also indicate that diabetics had a mean score of 23.17, 20.06, 10.20, 28.0 in their physical, psychological, social and environmental domain respectively compare with those without diabetes that reported a mean score of 24.17, 21.53, 11.43, 28.68 in their physical, psychological, social and environmental domain respectively. There is need for comprehensive management plan to minimize the daunting outcomes of DM and improve the QOL of the diabetics.*

### Introduction

Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia, from defects in insulin secretion. Diabetes affects more than 425 million adults have diabetes worldwide. Over 1 million children and adolescents have type1 diabetes worldwide. IDF estimates 366 million diabetes cases by 2030. In Africa; an estimated 147 million adults are affected. In Nigeria there is an estimated burden of about 8.4 million diabetic patients. Nigeria has the highest number of diabetic cases in Sub-Saharan Africa with the prevalence rate of 1.5 million cases. (Diabetes Atlas 2017 & WHO 2005).

Diabetes is the leading cause of non-traumatic amputation and blindness in working age adults; third leading cause of death among non-communicable diseases (NCDs). Its complications affect well-being and quality of life (QOL) of the individual negatively (Smeltzer, Bare, Hinkle & Cheever, 2010).

WHO QoL group 1998, refers to the individual's perception of their position in life in the contexts of culture and value system in which they live and in relation to their goals, expectations, standards and concerns. Health Related Quality of life (HRQOL) refers to aspects of functioning directly related to diseases and medical treatment. Researchers have reported lower HRQOL in people with diabetes (DM) than for non-DMs. In Nigeria, the HRQOL of diabetics has been understudied (Odili, Ugboka & Oparah, 2010).

### Purpose or need for study

The purpose of this study is to assess and compare the Health- Related Quality of Life (HRQOL) of diabetic patients and non-diabetic patients in Cross River State, Nigeria.

## Statement of the problem

Globally, an estimated 425 million adults have diabetes worldwide with estimate of 366 million cases by 2030. In Nigeria about 1,707,000 Nigerians live with Diabetes Mellitus thereby imposing a major and most challenging health problem in the region.

Along with the increase in incidence of diabetes, both individual and societal expectations on the quality of life of persons living with diabetes have also increased. Taking control of diabetes to improve quality of life has put the spotlight on the need for additional support and education for patients with type 2 diabetes (Hossain, *et. al.*,2010). Studies showed that DM has a strong negative impact on the HRQOL. It became imperative to study the health-related quality of life of Diabetes Mellitus and non-Diabetic population in University of Calabar Teaching hospital.

## Specific objectives

The specific objectives are to:

- Determine the Health -Related Quality of Life (HRQOL) scores of DM patients and that of non-DM using the WHOQOL-BREF.
- Compare the HRQOL scores of DM patients with that of non-DM
- Compare the HRQOL scores of DM patients with co-morbidities of those without
- Determine the influence of socio-demographic variables on the overall HRQOL mean score of the DM patients.

## Hypotheses

- There will be no significant difference between the quality of life of people living with diabetes and those without diabetes
- Socio-demographic characteristics does not affect the quality of life of Diabetic patients
- Co-morbidities does not affect the quality of life of Diabetes patients

## Literature review

Globally, 425 million adults have diabetes with 1 in 2 remain undiagnosed (IDF Atlas, 2017). World Health Organization (WHO, 2015) estimated that over four million Nigerians are living with type2 diabetes mellitus. Also, 40,815 deaths in adults due to diabetes were recorded.

Diabetes and its complications bring about substantial economic loss to people with diabetes and their families; health systems and national economies through direct medical costs and loss of work and wages.

Research indicates that coping skills and family stresses influence the management of diabetes. Depression is a serious co-occurring problem in diabetes that can affect glycaemic control (Glasgow *et al.*, 1999). Combination of educational interventions to increasing knowledge, control, and self-efficacy among diabetics with behavioural psychosocial interventions (for example, enhancing coping skills and peer support) provide greater success in improving both metabolic outcomes and quality of life (Clement, 1995 Padgett *et al.*, 1988).

Health-related quality of life (HRQoL) is a multi-dimensional concept that includes domains related to physical, mental, emotional and social functioning to measure population health, life expectancy, and causes of death, and focuses on the impact health status has on quality of life. A related concept of HRQoL is well-being, which assesses the positive aspects of a person's life, such as positive emotions and life satisfaction.

The World Health Organization Quality of Life (WHOQOL-BREF) instrument comprises 26 items, which measure four domains: physical, psychological, social relationships and environment. Sometimes a combination of generic and disease-specific HRQOL measures may be more appropriate for monitoring changes in a patient's health status due to an intervention (Chen T.H, Li L & Kochen MM. 2005).

## **Methodology**

### **Study type**

It is a descriptive cross-sectional study.

### **Study setting**

The study was conducted at University of Calabar Teaching hospital (UCTH), a high patients volume hospital and referral research centre to other hospitals in the state.

### **Study population**

The study population were diabetics and non-diabetics patients attending clinic at the UCTH.

### **Sample size calculation for respondents**

Sample size of 200 for each group was determined using power analysis.

The sample size was calculated using sample size calculator.Net

- Confidence level = 95% and 80% power
- Confidence Interval= 5%
- Population proportion = 50%
- Population size = 412patients

The calculated sample size was 200 patients

### **Sampling technique**

Purposive and convenient sampling procedure was applied in the selection of respondents based on inclusion criteria. All diabetes respondents were medically diagnosed patients while non-diabetes respondents were general outpatient and inpatient's in same hospital with no history of hypertension, stroke, arthritis, duodenal/gastric ulcers, cancers, HIV/AIDS and asthma.

### **Sampling procedure**

The DM patients were recruited and interviewed during their clinic check-ups while non- diabetics were interviewed at GOPD and inpatients wards. The questionnaire was interviewer administered.

### **Data collection and analysis**

Data collection lasted for three months. Instrument used for data collection was WHOQOL-BREF (28 items) with 12 additional questions soliciting demographic and clinical data of the respondents. Instrument were pre-tested for validity and viability.

Data analysis used Statistical Package for Social Sciences (SPSS) software. Summarized in proportions and mean scores. Hypotheses tested using Chi-square, student t-test and analysis of variance (ANOVA) at a significant level of  $P \leq 0.05$ . Health related quality of life were measured on 5-point Likert scale with higher score indicating better quality of life.

### **Ethical considerations**

Ethical approval was obtained from hospital, state ministry of health ethical committee and respondents.

## Results

**Table 1.** Demographic characteristics of respondents, (n=200)

Variable	Subcategory	Percentage (%)
Sex	Female	104 (52%)
	Male	96 (48%)
Marital status	Married	161(80.5%)
	Single	12(6%)
	Divorced/separated/widowed	27(13.5% )
Religion	Christianity	100
Median Age	50-59yrs; (35%); 60yrs+ (65%)	53.9yrs
Median years living with diabetes		8.27yrs±6.45
Occupation	Salary paid jobs	102 (51%)
	Self employed	61 (30.5%)
	Unemployed	37 (18,5%)
Level of Education	Did not go to school	1(0,5%)
	Primary	35(17.5%)
	Secondary	48 (24%)
	Post-Secondary (Diploma &Degree)	116 (58%)

Respondents were all Christians; predominantly married (81.8%). more females (52%) than males (48%). Mean age 53.9yrs was modal age= 50-59yrs; (35%); 50yrs+ (68.5%). Median years living with diabetes 8.27years. Majority (58%) had tertiary education. Those on salary paid jobs were (54.5%). Mean duration of years with diabetes 8.27yrs±6.45. No significant difference between demographic variable of diabetics and non-diabetics ( $p>0.05$ ).

**Table 2.** Clinical data of diabetic respondents' (n=200)

Variable	No of Respondents	Percentages
Co-morbidities:		
Yes	141	70.5
No	59	29.5
<b>Co-morbidity Diseases Reported (n=141)</b>		
Asthma	4	2
	80	40
Hypertension	3	1.5
	30	15
Congestive cardiac failure	1	0.5
	11	5.5
Arthritis	1	0.5
	11	5.5
Pulmonary tuberculosis	<b>141</b>	<b>71%</b>
Ulcer (Duodenal and stomach)		

HIV/AIDS		
Others ( TB, obesity, partial stroke)		
<b>Total Co-morbidity Diseases Reported</b>		
<b>Developed complications of Diabetes</b>		
Yes	99	49.5
No	101	50.5
<b>Total respondents</b>	<b>200</b>	<b>100</b>
<b>Diabetes complications reported (n=99)</b>		
Eye disease	46	23
	27	13.5
Nerve disease	23	11.5
	3	2
	<b>99</b>	<b>50</b>
Foot ulcer		
Kidney disease		
<b>Total diabetes complications reported</b>		
<b>Respondents' reported Medical regimen (n=200)</b>		
	4	2
None	8	4
	47	23.5
	12	6
Diet and exercise only	32	16
	72	36
Oral diabetic drugs (ODD) only	2	1
	23	11.5
	<b>200</b>	<b>100</b>
Insulin injection only		
ODD plus Insulin injection		
Diet & exercise plus ODD		
Diet & exercise plus Insulin injection		
Diet & exercise plus ODD plus		
<b>Total Respondents' reported Medical regimen</b>		

Clinical data of diabetic respondents showed that 70.5 percent (n=141) were living with other disease while 29.5 percent (n= 59) of diabetic respondents were not living with other diseases.

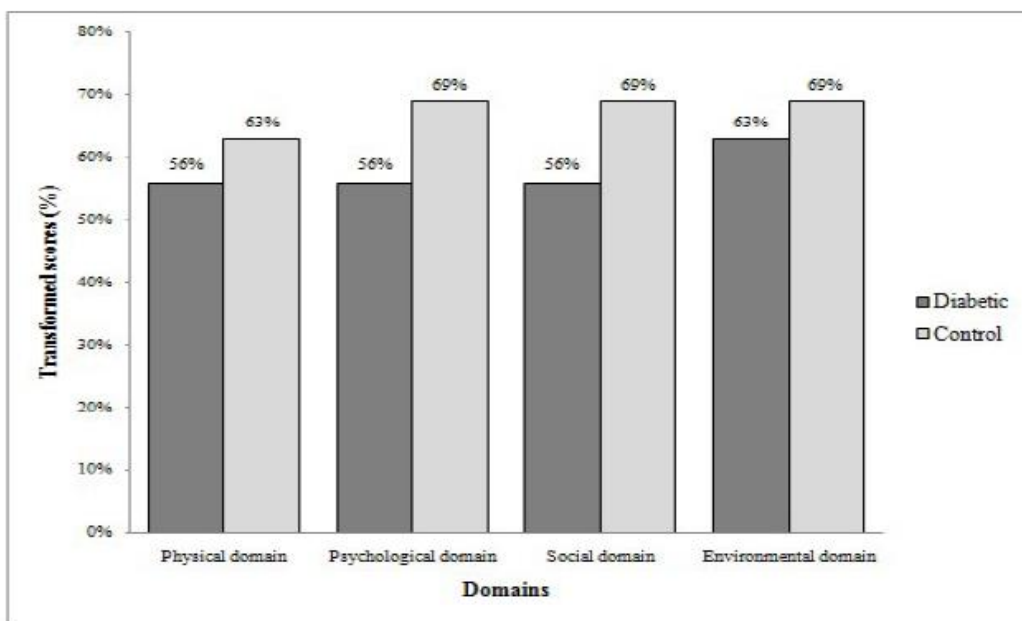
Diseases mostly exhibited by diabetic patients were hypertension 40 percent (n=80) and arthritis 15 percent (n=30).

Diabetic disease related complications developed by diabetic respondents were approximately fifty percent (n=99). Such diseases as nerve disease fourteen percent (n= 27), foot ulcer eleven percent (n=23), kidney disease two percent (n=3) with eye disease ranking higher with twenty-three percent (n=46).

The responses revealed that the medical regimen mostly used by diabetic patients were diet, exercise plus oral diabetic drugs thirty-six percent (n=72); oral diabetic drugs (ODD) only twenty three and half percent (n= 47); ODD plus Insulin injection sixteen percent (n=32); diet, exercise and ODD plus eleven percent (n=23); insulin injection only six percent (n=12) with the least use of diet, exercise plus Insulin injection of one percent.

**Table 3.** Comparison of Respondents' mean scores differences on overall quality of life and satisfaction with health (n=200)

Parameters	Groups		t-test		
	Diabetics (n=200)	Non-DM (n=200)	t-test	df	P-value
Overall quality of life	3.80±0.96	4.14±0.58	-4.365	398	0.000*
Satisfaction with health	3.51±1.03	4.09±0.58	-6.935	398	0.000*
<b>Co-morbidities</b>	Yes	No			
Overall quality of life	3.70±0.96	3.88±0.89	-1.357	198	0.176
Satisfaction with health	3.35±1.05	3.65±1.00	-2.068	198	0.040*



**Figure 1.** Bar charts showing the trasformed scores of HRQOL for Diabetic and Non-diabetic groups

**Table 4.** Comparison of mean scores differences in Four WHOQOL-BREF domains between diabetics and non-diabetics

Parameters	Groups		t-test		
	Diabetic (n=200)	Non-DM (n=200)	t-test	df	P-value
Physical domain	23.17±3.39	24.17±2.42	-3.398	398	0.001*
Psychological domain	20.06±3.32	21.53±2.51	-5.001	398	0.000*
Social domain	10.20±2.47	11.43±1.87	-5.640	398	0.000*
Environmental domain	28.00±5.15	28.68±5.04	-1.325	398	0.186
<b>Co-morbidities</b>	Yes	No			
Physical domain	22.73±3.30	23.55±3.43	-1.711	198	0.089
Psychological domain	19.67±3.08	20.39±3.48	-1.525	198	0.129
Social domain	9.96±2.28	10.40±2.62	-1.261	198	0.209
Environmental domain	27.41±4.98	28.50±5.25	-1.494	198	0.137

**Table 5a.** Comparison of mean scores differences in all the items of WHOQOL-BREF sub-scales for diabetics and non-diabetic groups

Parameters	Groups		t-test for equality of Mean:		
	Diabetic (n=200)	Non-DM (n=200)	t-test	df	P-value
<b>1. Physical domain (7 items)</b>					
	3.42±0.96	3.99±0.68	-6.851	398	0.000*
Activities of daily living	3.33±0.93	2.31±1.00	10.622	398	0.000*
Dependence on medicine & medical aids	3.23±0.96	3.83±0.73	-7.033	398	0.000*
Energy and fatigue	3.64±0.95	4.00±0.64	-4.453	398	0.000*
Mobility	3.64±0.95	4.00±0.64	-4.453	398	0.000*
Pain and discomfort	2.57±1.09	2.11±0.91	4.574	398	0.000*
Sleep and rest	3.70±0.97	4.02±0.72	-3.684	398	0.000*
Work capacity	3.29±1.04	3.93±0.69	-7.268	398	0.000*

**Table 5b.** Comparison of mean scores differences in all the items of WHOQOL-BREF sub-scales for diabetics and non-diabetic groups

Parameters	Groups		t-test for equality of Mean:		
	Diabetic (n=200)	Non-DM (n=200)	t-test	df	P-value
<b>2, Psychological domain (6 items)</b>					
Bodily image and appearance	3.39±1.03	3.93±0.75	-6.037	398	0.000*
Negative feelings	2.37±0.99	2.22±0.71	1.745	398	0.082
Positive feelings	3.30±0.87	3.54±0.69	-2.991	398	0.000*
Self-esteem	3.39±1.03	3.93±0.75	-6.037	398	0.000*
Spirituality/Religion/Personal beliefs	2.37±0.99	2.22±0.71	1.745	398	0.082
Thinking, learning, memory and concentration	3.30±0.87	3.54±0.69	-2.991	398	0.000*

**Table 5c.** Comparison of mean scores differences in all the items of WHOQOL-BREF sub-scales for diabetics and non-diabetic groups

Parameters	Groups		t-test for equality of Mean:		
	Diabetic (n=200)	Non-DM (n=200)	t-test	df	P-value
<b>3. Social domain (3)</b>					
Personal relationships	3.75±0.91	4.05±0.61	-3.871	398	0.000*
Social support	2.99±1.30	3.77±1.00	-6.691	398	0.000*

Sexual life satisfaction	3.46±1.05	3.62±0.83	-1.694	398	0.091
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**Table 5e.** Comparison of mean scores differences in all the items of WHOQOL-BREF sub-scales for diabetics and non-diabetic groups

Parameters	Groups		t-test		
	Diabetic (n=200)	Non-DM (n=200)	t-test	df	P-value
<b>4. Environmental domain (8 items)</b>					
Financial resources	2.99±0.99	3.21±0.86	-2.368	398	0.018*
Freedom, physical safety and security	3.77±0.78	3.89±0.66	-1.664	398	0.097
Health and social care: accessibility and quality	3.67±0.92	3.77±0.80	-1.218	398	0.224
Home environment	3.84±0.90	3.87±0.79	-0.296	398	0.768
Opportunities for acquiring new information and skills	3.49±0.94	3.40±0.82	0.963	398	0.336
Participation in and opportunities for recreation/leisure activities	3.02±1.02	3.06±0.90	-0.415	398	0.678
Physical environment (pollution/noise/traffic/climate)	3.87±0.76	3.96±0.86	-0.454	398	0.650
Transport	3.37±1.13	3.53±0.95	-1.487	398	0.138

**Table 6.** Analysis of Variance in mean scores between socio-demographic and overall HRQOL scores of diabetic groups

Socio demographic	Parameter	Mean + SD	t-test ANOVA	df	P-value
<b>Sex</b>	Female (n=104)	3.88±0.95	1.380	198	0.169
	Male (n=96)	3.70±0.96			
<b>Level of education</b>	Did not go to school (n=1)	5.00	3.775	3.196	0.012*
	Primary Six (n=35)	3.37±1.06			
	Secondary (n=48)	3.75±1.12			
	Post Secondary (n=116)	3.93±0.81			



<b>Occupation</b>	Employed in salary job(n=102)	3.89±0.88			
	Self-employed (n=61)	3.64±1.05	1.337	2, 197	0.265
	Unemployed (n=37)	3.78±1.00			
<b>Marital Status</b>	Single (n=12)	3.83±1.19			
	Married (n=161)	3.77±0.92	0.314	2, 197	0.731
	Divorced/Separated/Widowed(n=27)	3.93±1.07			

## Discussion

Mean scores presented on Tables 5a – 5e showed that diabetes had lower mean scores and reported lower overall health related quality of life (HRQOL) showing dissatisfaction in all the four domains of WHOQOL-BREF.

The mean scores differences were all statistically significant except in the: i) environmental domain. ii) Spirituality/Religion/Personal belief and negative feelings items in psychological domain. (iii) Satisfaction with sexual life in the social domain and iv) Between the diabetics with and without co-morbidities.

Odili et al (2010) found lower HRQOL among diabetics than the non-diabetic group in all the domains with the largest difference in the physical, psychological and social domains.

In current study 99(50%) of the respondents developed diabetic complications which could have impacted negatively on their domains resulting in reduced HRQOL.

Patients with diabetes had a significant lower mean score than the non-diabetics in personal relationship and social support ( $P = 0.000$ ). Current study showed lower satisfaction with sexual life among diabetics than the non-diabetic group ( $P=0.091$ ). Odili et al (2010) reported on poor sexual activities among diabetic patients.

Environmental domain analysis showed that only financial resources had significant difference between the two groups. All other factors in environmental domain except financial resources were impacted upon by diabetes disease. There were lower mean scores in HRQOL in all the domains among diabetics with co-morbidities than those without co-morbidities.

Diabetics with higher education and better paid job had a significant higher mean score than the less educated ( $p < 0.05$ ). reported

## Limitations and strengths

The studied patients received care in tertiary hospital, whose conditions were likely to be under control. Worse HRQOL might be reported by respondents who were not accessing specialist care. World Health Organization quality of life instrument is a generic tool which has lower sensitivity to elicit symptoms as disease specific instrument. This limit the generalization of findings.

## Recommendations

Awareness creation on spread of diabetic disease and the provision of appropriate education on self-care management to the society will reduce complications associated with diabetes.

Diabetic care team (clinicians and family members) and policy makers should implement appropriate strategies to improve quality of life of diabetic patients.

Further research with wider population using disease specific instrument is recommended for wider generalization of findings.

## Conclusion

Diabetes impacts negatively (mostly on physical domain) on the health-related quality of life of diabetics when compared with non-diabetic persons in Cross Rivers State of Nigeria. Financial resource is one environmental domain factor that significantly impacted upon by diabetes and its management. Diabetics need support, both tangible and intangible to enable them cope with their health problem. Awareness creation on the occurrence, prevention and management of diabetes will reduce the prevalent of diabetes disease in Nigeria. World Health Organization quality of life (WHOQOL-BREF) generic tool lowers sensitivity to elicit symptoms as disease specific instrument thereby limiting the generalization of findings and comparison of the results obtained. Studying comparison group, with the same hospital became a major strength which enabled the researcher to identify the magnitude of the impact of the disease and its management on the respondents' HRQOL in each domain.

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