



Diabetic Knowledge and the Predictors of Health-Related Quality of Life in Patients Living with Diabetes in University of Medical Sciences Teaching Hospital, Ondo State, Nigeria

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Abstract

Diabetes mellitus (DM) and its associated complications have a significant effect on the quality of the life of the affected individual. The study was conducted to assess the knowledge and health-related quality of life (HRQoL) in patients living with diabetes at the University of Medical Sciences Teaching Hospital, Akure. A descriptive cross-sectional research design was used for the study. A convenience sampling technique was used to select sixty-eight (68) respondents out of patients attending diabetes clinics and medical wards. A well-structured questionnaire was adapted from the Euro-Quality Five Domains Three Level (EQ-5D-3L) tool to assess the five (5) domains, three levels of HRQoL of the respondents. Data were analyzed using Statistical Package for Social Sciences (SPSS) software version 19. Descriptive data were summarised using frequencies and percentages while Pearson Product Momentum Correlation (PPMC) was used to test the relationship between knowledge, socioeconomic status and HRQoL. It was discovered that the majority of the respondents had good knowledge of diabetes mellitus. Findings from the HRQoL domains revealed that mobility, pain and discomfort, anxiety and depression and usual work have moderate HRQoL. There was the positive insignificant relationship between the HRQoL of diabetes patients and knowledge (at the 0.05 level of significance $r = 0.65$, $p > 0.05$) while the strong positive significant relationship was seen between the socio-economic status of the patients and HRQoL (0.05 level of significance $r = 0.946$, $p < 0.05$). Nurses need to pay more attention in managing mobility, self-care, pain and discomfort, anxiety and depression and usual work in patients living with DM in order to improve HRQoL.

Keywords: *Diabetes Mellitus, Patient Living with Diabetes Mellitus, Health-Related Quality of Life, Socio-Economic Status*

Introduction

Diabetes mellitus (DM) is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves (WHO, 2019). Diabetes is a chronic disease that occurs either when the pancreas does not

produce enough insulin or when the body cannot effectively use the insulin it produces (WHO, 2020). Diabetes is a serious, long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide. It is among the top 10 causes of death in adults and was estimated

to have caused four million deaths globally in 2017 (IDF, 2019).

According to Zimmet (2017), in the year 2000, International Diabetes Federation (IDF) estimated that there were 151 million people with diabetes globally and predicted that by 2030, there would be 324 million people in the world with diabetes. Now about 422 million people worldwide have diabetes, the majority living in low-and middle-income countries, and 1.6 million deaths are directly attributed to diabetes each year (IDF, 2019). The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. The prevalence is higher in urban (10.8%) than rural (7.2%) areas, and in high-income (10.4%) than low-income countries (4.0%) (IDF, 2019).

The pooled prevalences of DM in the six geopolitical zones of Nigeria were 3.0% in the north-west, 5.9% in the north-east, 3.8% in the north-central zone, 5.5% in the south-west, 4.6% in the south-east and 9.8% in the south-south zone, with risk factors were family history, urban-dwelling; unhealthy dietary habits; cigarette smoking; older age; physical inactivity and obesity (Uloko, Musa, Ramalan, Gezawa, Puepet, Uloko, Borodo, and Sada, 2018).

It has been discovered that the main factor responsible for poor control of blood glucose level is noncompliance to treatment regimen as prescribed and the poorer the management the more complications arise (Waari, Mutai & Gikunju, 2018). Physical inactivity is another risk factor for an increased risk of physical inactivity (Nelson, Reiber & Boyko, 2012). The presence of comorbidities poses an additional burden on the deteriorating health of diabetic patients leading to various life-threatening complications with the enormous financial burden (Norlund, Apelqvist, Bitzén, Nyberg & Scherstén, 2001). There are seven essential self-care behaviours in people with diabetes which predict good outcomes

namely healthy eating, being physically active, monitoring of blood sugar, compliant with medications, good problem-solving skills, healthy coping skills and risk-reduction behaviours. All these seven behaviours have been found to be positively correlated with good glycemic control, reduction of complications and improvement in quality of life. The role of clinicians in promoting self-care is vital and has to be emphasized (Shrivastava, Shrivastava, & Ramasamy, 2013)

In order to help prevent type 2 diabetes and its complications, people should: achieve and maintain healthy body weight; be physically active at least 30 minutes of regular, moderate-intensity activity on most days. More activity is required for weight control; eat a healthy diet, avoiding sugar and saturated fats intake; and avoid tobacco use (Sheri, Colberg, Sigal, Yardley, Riddell, Dunstan, Dempsey, et al, 2016; Chapman, 2016; Leontis, and Hess-Fischl, 2020).

The researcher observed that despite the health education on the importance of compliance with a treatment regimen of diabetes and the awareness campaign led through world diabetes day on 14th November every year, diabetes is still on increase in the country with low health-related quality of life as a result of complications. In addition to this, non-compliance to management has led to an inability to control blood glucose level and this has a detrimental effect on the health-related quality of life of the patient and the poorer the management the more complications. Also, a diabetes patient encounters several factors that might influence dietary regimen, diabetes-related knowledge, treatment choices, communication with provider, exercise, and ability to adhere to prescribed medication and this needs to be addressed to avoid patient's dissatisfaction with treatment outcome (Polonsky & Henry 2016). Diabetes if not properly managed reduces

health-related quality of life and its attending complications such as blindness, kidney failure, heart attacks, stroke, and lower limb amputation (WHO Global report on diabetes, 2016).

The study, therefore, assessed the predictors of health-related quality of life of patients living with diabetes in diabetes clinics and medical wards of the University of Medical Sciences Teaching Hospital, Akure.

Study Objectives

1. To assess the level of knowledge of respondents on diabetes.
2. To evaluate the association between respondent's knowledge and quality of life
3. To determine the relationship between respondent's socioeconomic factors and quality of life

Hypotheses

1. There is no significant relationship between the level of knowledge of respondents and HRQoL of patients living with DM in diabetes clinics and medical wards of the University of Medical Sciences Teaching Hospital, Akure.

There is no significant relationship between the respondents' socioeconomic status and HRQoL of patients living with DM in diabetes clinic and medical wards of University of the Medical Sciences Teaching Hospital, Akure,

Methods and Materials

Study Population

The study population comprises patients from diabetes clinics and medical wards of the University of Medical Sciences Teaching Hospital Akure. There were 9 patients in Male medical ward, 11 in Female medical wards and 62 patients in Diabetes outpatient clinics (Patient statistics from Wards and DM Clinic records, 2019??).

Design

A descriptive cross-sectional research design was used to assess knowledge and HRQoL of diabetes patients visiting the diabetes clinic and those in the medical wards of the University of Medical Sciences Teaching Hospital Akure.

Sampling size and sampling technique

A sum of 68 respondents was recruited for the study based on 82 estimated number of diabetic patients in the facility using Slovincs (1973) (formula $=N/(1+N_e^2)$). Using a convenient sampling, the total number of 68 respondents was selected among 82 diabetic patients available in this facility. Any willing and available respondent, who met the criteria for the study and was consented was recruited for the study.

Instrument for Data Collection

A questionnaire was used to obtain information from the respondents has three sections.

Socio-demographic Characteristics and knowledge of diabetes patient on DM sections were designed by the researcher. The questions on knowledge were worded to reflect negative response and positive response as Yes and No respectively. Where the response is expected to be Yes or No the percentage value will be determined. When the percentage score is 0-49 it is rated as Poor and 50-100 is rated Good Out of 10 items testing knowledge on diabetes, the decision rule goes thus: if respondents had 1-4 good = poor knowledge, 5-7= good knowledge, 8-10 = very good knowledge.

Health-related quality of life (HRQoL) section was adapted from EQ-5D-3L (EuroQoL Research Foundation, 2019) which has five domains and 3 levels (Mobility, Self-care, Pain and Discomfort, Anxiety and depression and Usual work). The responses of patients to questions under each domain were used to determine the problem (HRQoL) as follows: A= No problem (high quality of life=HQL) this is rated 3, B= Moderate problem (moderate

quality of life=MQL) this is rated 2 and C = Severe problem (low quality of life=LQL) this is rated 1.

The total score for the 5 domains ranges between 1-15 scores. The high HRQoL score ranges between 12 to 15, moderate HRQoL score ranges between 8 to 11 while low HRQoL score ranges between 5-7

Data analysis

Data were entered into a computer and analyzed using Statistical Package for Social Sciences (SPSS) software version 19. The data were summarized using frequency distribution tables and percentages. Hypotheses were tested using Pearson moment correlation coefficient. All hypotheses were tested at 0.05% level of significance and (95%) Confidence interval.

Ethical consideration

Ethical approval was obtained from the ethical committee of Ondo State Ministry of Health with reference number

OSHREC/20/08/19/175. Permission was obtained from the EuroQoL Research Foundation, to use the EQ-5D-3L HRQoL tool. Informed consent was obtained from the participant before administering the questionnaires. Respondents were informed that participation is voluntary and that all information provided will be made confidential.

Results

Socio-Demographic Data of the Respondents

Table 1 shows that most (26.5%) of the respondents were between the ages of 51-60 years, with (20.6%) of the respondents recorded each between the ages of 30-40 years and 61-70 years respectively. Also, the distribution across Gender revealed that 45.6% of the respondents were male while 54.4% were female in which, 72.1% were married with 48.6% belong to low-income groups. Majority 94.1% lived in an urban area and (35.3%) was diagnosed less than a year ago. More than half, (58.8%), had a history of diabetes while 67.2% of the respondents are satisfied with the treatment received.

Table 1: Socio-Demographic Data of the respondents (n=68)

	Variables	Frequency	Percentages (%)
Age	30-40	14	20.6
	41-50	10	14.7
	51-60	18	26.5
	61-70	14	20.6
	71-80	7	10.3
	81-90	5	7.4
Gender	Male	31	45.6
	Female	37	54.4
Marital Status	Single	8	11.8
	Married	49	72.1
	Divorced	3	4.4
	Widowed	8	11.8
Educational Level	Primary	11	16.2
	Secondary	24	35.3
	Graduate	33	48.5
Employment status	Unemployed	10	14.7
	Employed	41	60.3
	Retired	17	25.0
Locality	Rural	4	5.9
	Urban	64	94.1
Date of diagnosis	<1year	24	35.3
	1-5years	23	33.8
	>5years	21	30.9
History of diabetes	Yes	40	58.8
	No	28	41.2
Treatment satisfaction	Satisfied	46	67.6
	Neutral	21	30.9
	Dissatisfied	1	1.5
Monthly income	10,000-40,000(low)	33	48.6
	41,000-69,000(moderate)	14	20.6
	70,000 Above (high)	21	30.9

Knowledge of Patient on Diabetes Mellitus

A majority (79.4%) of the respondents know about DM is that eating too much sugar and other sweet foods are causes of diabetes, also, more than half of the respondents, 58.8%, knew that the usual cause of DM is lack of effective insulin in the body. The majority, 70.6%, believed that diabetes can be cured. Majority of the respondents, 85.3% do not know that DM

runs in the family. Almost all the respondents, 97.1% had good knowledge about fasting blood sugar level in the body. However, 85.3% of the respondents know that exercise is an effective aspect of treatment. Also, majority, 88.3%, know that food high in calories cannot help in the management of diabetes. Finally, the respondents' knowledge about checking feet every day was poor as just 29.4% affirmed this.

Table 2: Knowledge of Patient on Diabetes Mellitus

Variables	Yes	No	Strength of Knowledge
Eating too much sugar and other sweet foods is a cause of diabetes	54 (79.4%)	14 (20.6%)	Poor
The usual cause of diabetes is a lack of effective insulin in the body	40(58.8%)	24(35.3%)	Good
Diabetes can be cured	48(70.6%)	20(29.4%)	Poor
If I am diabetic, my children have an increase chance of being diabetic	10(14.7%)	58(85.3%)	Poor
A fasting blood sugar level of 210 is too high	66(97.1 %)	2(2.9%)	Good
The best way to check my diabetes is by testing my urine	23(33.8%)	45(66.2%)	Good
Exercise is an effective aspect of my treatment	58(85.3 %)	10(14.7%)	Good
Medication is more important than diet and exercise to control my diabetes	6(8.8%)	62(91.2%)	Good
Food high in calories helps my diabetes	8(11.8%)	60(88.3%)	Good
My feet should be properly checked every day	20(29.4%)	48(70.6%)	Poor

Poor = 0-49, Good = 50-100, (Poor Knowledge = 1-4 score, Good Knowledge = 5-7 score, Very Good Knowledge = 8-10 score)

Health-related Quality of Life of Diabetes Mellitus Patient<

The results in table 3 using 5 domains of assessment of the health-related quality of life (HRQoL) of diabetic patients result revealed that respondents had the moderate health-

related quality of life (HRQoL) regarding mobility (60.3%), pain and discomfort (55.9%), anxiety and depression, (41.2%) and performance of usual work (58.8%) The respondents had good HRQoL regarding self-care (64.7%).

Table3: Health-related Quality of Life of Diabetes Mellitus Patients (n=68)

Parameter	Categorization of level of HRQoL	F (%)	Score
Mobility			
A. I have no problems walking about	HQoL	21(30.9)	
B. I have some problems in walking about	MQoL	41(60.3)	2
C. I am confined to bed	LQoL	6(8.8)	
Self-care			
A. I have no problems with self-care	HQoL	44(64.7)	3
B. I have some problems washing or dressing myself	MQoL	18(26.5)	
I am unable to wash or dress myself	LQoL	6(8.8)	
Pain and Discomfort			
A. I have no pain or discomfort	HQoL	20(29.4)	

B. I have moderate pain	MQoL	38(55.9)	2
C. I have extreme pain or Discomfort	LQoL	10(14.7)	
Anxiety and depression			
A. I am not anxious or depressed	HQoL	15(22.4)	
B. I am moderately anxious or depressed	MQoL	28(41.2)	2
C. I am extremely anxious or depressed	LQoL	25(36.8)	
Usual work			
A. I have no problem performing my usual activities	HQoL	20(29.4)	
B. I am unable to perform my usual activities	MQoL	40(58.8)	2
C. I have some problems with performing my usual activities	LQoL	8(11.8)	
Total score for HRQoL			11

Key A= 3. HQoL= High quality of life, B= 2MQoL= Medium Quality of life, C=1 LQoL = Low quality of life
 12- 15= HHRQoL, 8- 11= MHRQoL, 5-7 = LHRQoL

Hypotheses Testing:

Hypothesis One:

The relationship between the variable was tested using Person Product Momentum Correlation (PPMC). The result revealed the

Pearson correlation coefficient, r, is 0.65, p = .235, p> 0.05. This shows that there is positive insignificant relationship between knowledge and health-related quality of life. The hypothesis is therefore accepted.

Table 5: Relationship between the Level of Knowledge and Health-related Quality of Life of Patients Living with Diabetes

		Knowledge	Health-related Quality of life
Knowledge	Pearson Correlation	1	.650
	Sig. (2-tailed)		.235
	N	10	5
Health-related quality of life	Pearson Correlation	.650	1
	Sig. (2-tailed)	.235	
	N	5	5

Hypothesis Two

The result revealed that there was a strong positive significant relationship between the socio-economic status of diabetic patients

and the related health quality of life. Pearson correlation coefficient, r, is 0.946, P< 0.05 hence, the hypothesis is rejected

Table 6: Relationship between the Socioeconomic Status and Health-related Quality of Life of Patients Living with Diabetes

		Health-related Quality of life	Socioeconomic Status
Health	Pearson Correlation	1	.946*
	Sig. (2-tailed)		.015
	N	5	5
Socioeconomic Status	Pearson Correlation	.946*	1
	Sig. (2-tailed)	.015	
	N	5	5

***Correlation is significant at the 0.05 level (2-tailed).**

Discussion

Socio-Demographic Data of the respondents

The distribution of disease among the age groups revealed that all the age groups have almost equal percentages. The implication of this is that DM could affect an individual with effect from ages 30. Also, the distribution across sexes revealed that 45.6% of the respondents were males while 54.4% were female meaning that more female is affected than male. Economic data of the respondents revealed that almost half of the respondents (48.6%) belong to a low-income group. The implication of this is that there will be a challenge complying with management regimen as DM treatment is capital intensive. However, this finding is contrary to the submission of IDF (2019), that says the prevalence of DM is higher in high-income (10.4%) than low-income countries (4.0%) (IDF, 2019). More than half, 58.8%, had a history of diabetes. This is evidence that diabetes mellitus runs in a family. The result is supported by Van Zon, Snieder, Bültmann, & Reijnevel, (2017). whose study discovered that the combination of low socio-economic position and having a family history of Type 2 Diabetes mellitus (T2DM) had a stronger association with T2DM than the sum of the associations of separate factors in females, but not in males

Knowledge of the Patient on Diabetes Mellitus

The results on knowledge revealed that the respondents demonstrated good knowledge about DM. Meaning that the respondents are having poor understanding regarding DM in some areas. These findings were partially supported by a study carried out by Kassahun & Mekonen (2017) and Daniel et al. (2019) where it was reported that diabetes patients showed very good knowledge about diabetes mellitus. In essence, there is a need to promote very good knowledge among people living with DM and the public as this is essential in ensuring prevention and compliance with the management of this disease condition.

Health-related quality of life

The findings using EQ_5D-3L assessment tool of HRQoL revealed that respondents had moderate HRQoL regarding mobility, pain and discomfort, anxiety and respondents had moderate depression and performance of usual work while respondents had good HRQoL regarding self-care. The implication of this is that the respondents are actually having moderate challenges with their health. The disease process has affected the quality of life of the respondents leading to the inability to function optimally. According to Ali & Zilla. (2013). there is potential for decreased coping ability and role limitations due to emotional problems in diabetic patients and that women showed the significantly greater

perceived impact of bodily pain and role limitations due to physical problems than men. This is coupled with the fact that the majority of respondents belong to low-income groups with attending economic burden the disease condition is posing on them. Regarding self-care, the respondents had good HRQoL. This finding is expected as some of these patients had good knowledge about the disease process and they know that effective management of DM is hanging on the patient's ability to perform self-care activities such as bathing, eating, exercise, test blood glucose and even administration of insulin. The ability of patients to perform all these self-care activities will determine the outcome of the disease condition. Generally, the findings on the HRQoL of diabetes patients studied revealed that the patients' HRQoL is not impressive based on five domains of assessment. Just one out of five domains (self-care) was discovered to be the area where the patients are not having a problem. The HRQoL could be concluded to be moderate

The findings further revealed that a positive insignificant relationship exists between the knowledge and HRQoL of the patient. Also, there is a strong positive significant relationship between the socio-economic status of the patients and HRQoL. This is supported by Mielck, Vogelmann, & Leidl, (2014).who concluded that HRQL and socio-economic status (SES) maybe significantly associated.

Conclusion

It was found out that the respondents had good knowledge of DM. However, it was noticed that respondents are still deficient in understanding some items of the instrument about the DM disease process. This is a huge gap to fill healthcare workers in improving patients' psycho-education. HRQoL of DM patient was discovered to be moderate. The implication is that the Diabetic patients need more attention to be paid to areas where they are still having challenges so as to be able to enjoy optimal health. Socioeconomic status of the patients had a strong positive and

significant relationship on HRQoL. This requires health personals and researcher to come up with a model to boost the economic status of the respondents in order to enhance compliance and better prognosis in DM management.

Recommendations

It is therefore recommended that:

1. Free screening and subsidized treatment be put in place for diabetic patients to reduce the economic burden of the treatment regimen
2. Public jingles and media educational talks on diabetes should be promoted to enhance prevention and proper management of DM
3. Nurses should assist patients living with diabetes by giving appropriate education regarding how to effectively comply with the routine treatment regimen

Conflict of Interest: None declared

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