Original Article

Health-Related Quality of Life in Type 2 Diabetes Mellitus Patients at Moi County Referral Hospital in Taita-Taveta County, Kenya

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ABSTRACT

Non-transmittable diseases are becoming a burden in Sub-Saharan Africa due to changing lifestyle habits like smoking, inactivity, and poor diet. Although diabetes was once thought to the affluents-only disease, it is now more commonly seen in low- and middle-income nations like Kenya. The cross-sectional study's goal was to determine socio-demographic and health-related characteristics affiliated to QOL (quality of life) as well as how this condition affected patients with T2DM (type 2 diabetes mellitus) at Moi County Referral Hospital (MCRH) in Taita-Taveta County. were. The study adopted ADDQOL (audit of diabetes dependent quality of life) tool with 19 items version 2006, no alterations were done, and license number HPR4458 was issued to utilize the tool in this study. The 165 patients were picked using a systematic random sampling method. 127(77percent) of the study's participants had a mean quality of life score concerning diabetes of -1.88, roughly corresponding to "quality of life would be much better in the absence of diabetes" at a score of –2. An average weighted impact score of -4.48, indicated an unfavourable impact on the patients' QOL by diabetes mellitus. Foot ulcers/sores (p=0.005; a OR=7.348) and numbness/pain in hands, legs, or feet (p=0.001; a OR=0.155) were associated to low quality of life. The socio-demographic characteristics were not related to the quality of life. The domain-specific element of "sex life" was considered the most essential and negatively impacted at a weighted impact score of -5.14. Overall, quality of life of T2DM patients in MCRH was low. It is important to focus on the often-overlooked health-related characteristics coupled with the disability adjusted life years of diabetic patients and how they both influence their quality of life.

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INTRODUCTION

An individual's perception of their current state of health in connection to their hopes, expectations, ideals, and fears in the cultural and societal contexts in which they live is defined as their health-related quality of life (World Health Organization, 2019). Globally, more than 280 million people have diabetes mellitus, and by 2030, the figure is projected to rise to over 400 million, with the majority of those affected living in low- and middle-income nations where 4 out of every 5 diabetics are men or women who support their families financially (World Health Organization, 2019). Moreover, data from the IDF (International Diabetes Federation) indicated that 19 million African adults aged 20 to 79 had diabetes prevalence rates of 3.9% in 2019. By 2045, this figure will probably rise by 143% (International Diabetes Federation, 2019). Contextual variations can affect how well life is experienced, and measuring the QOL (quality of life) of diabetics and its determinants can help policymakers and physicians create supportive and instructional initiatives, customizing treatments for particular groups. (e.g., patients with complications or comorbidities, caregivers (Lygidakis et al., 2021).

According to studies done in India and Brazil, medical, personal, and lifestyle factors were the best indicators of QOL even though these factors involved in this association are not yet thoroughly understood. Also, diabetics frequently have lower QOL than non-diabetics (Verma & Dadarwal, 2017). Type two diabetes mellitus affected 55 million people in the North Africa and Middle East section in 2019, with an incidence rate of 12.2 percent; this number is expected to rise to 108 million by 2045, with an incidence rate of 13.9 percent, type 2 diabetes mellitus is a serious public health concern due to its financial, treatment, social, and mental burden (Al-Matrouk & Al-Sharbati, 2022) . Demographic characteristics, particularly age, are independent indicators of HRQoL (health-related quality of life) in diabetics, substantially inversely correlated with HRQoL. Additionally, most studies show that long-term diabetes, painful insulin injections, and comorbidities lead to lower quality of life (Gebremariam et al., 2022). According to WHO (World Health Organization) data, middle- and low-income nations have seen an increase in its prevalence that is more rapid.

According to the 2015 Stepwise study for non-communicable illnesses, the prevalence in Kenya was 3.3 percent and predicted a rise to 4.5% by 2045, here two-thirds of diabetes may go misdiagnosed (Vos et al., 2020) . In accordance to a report of Taita Taveta County in the year 2019,

at 30-40% diabetes mellitus was the leading aetiology of most death and disability combined among other non-communicable diseases like depressive disorders, ischemic heart attack, and cirrhosis in the year 2019. This was further supported by the high body-mass index being a risk factor for diabetes mellitus that caused the most death and disability combined, having a percentage increase of 58.4% from 2009 to 2019 (Vos et al., 2020). In the year 2016, the highest rates of disability-adjusted life years (DALYs) attributable to non-transmittable diseases were in Taita-Taveta at 22 000 [95% UI 18 000–26 200] per 100 000) and followed by Homa-Bay at 21 500 [16 800–26 500] per 100 000) which were the highest compared to other counties (Achoki et al., 2019). Measuring the extent of an illness's impact on health is necessary for long-term management of chronic disorders. The impairment and effects of diabetes mellitus ultimately affect the diabetics' quality of life in regards to their health in Taita Taveta County. Diabetics visiting Moi County Referral Hospitals do not place a high priority on this indicator of quality of life (Achoki et al., 2019).

Professor Bradley's audit of the diabetes-dependent quality of life (ADDQOL) tool, version 2006, which purposes to investigate the impacts of diabetes mellitus, contains a single-item measure of life quality (Bradley et al., 2018). This tool was used in this study since it has advantages over other questionnaire-based tools as it permits patients to: Specify the parts of life that apply to them and which do not, the influence of diabetes in that area of life, whether favourable or unfavourable and lastly, the weight of each life factor is given concerning the person's subjective quality of life.

The 19 items gauge how diabetes mellitus affects particular facets of life and how crucial they are quality of life (Bradley et al., 2018). The study described the precise effects that diabetes mellitus has on a person's daily living and wellbeing, which served to highlight the subtle but substantial clinical variances.

This study's findings highlight the need for healthcare workers to not only focus on the patients' bodily functioning but also put emphasis on their social and psychological well-being, the effect of co-morbidities on a patients' quality of life, and how medications, dietary changes, and lifestyle modifications (such as quitting smoking, losing weight, changing their eating habits, exercising, and drinking less alcohol) affect these patients' outcomes. In addition, as a research gap, the findings of this study demonstrated that diabetic patients are aware of the influence of the condition on their health-related quality of life which most of the researches done among this population failed to illustrate.

MATERIALS AND METHODS

Research Design

This study adopted a cross-sectional research design to investigate variations and correlations among diabetic patients. The socio-demographic and health-related factors that affected patients with type 2 diabetes mellitus' Q.O.L were the independent variables while the dependent variable was the quality of life in health.

Inclusion and Exclusion Criteria

The patients recruited into the study included those aged at least 18 years and diagnosed with type two diabetes mellitus through the research facility's criterion. The patients excluded were

those who had the disease for less than six months after being diagnosed at the time of data collection.

Sample Size Determination and Sampling Technique

The researcher adopted the Yamane (1967) formula to calculate the sample size. A confidence interval of 95% and a sampling error of 0.05 were adopted for the study. The population size (P) was approximately 281 trimestral between January to March 2022 and e is 0.05. A sample size of 165 patients was obtained when this formula was applied. Selection of the study participants was via systematic random sampling.

$$p = \frac{p}{1+p(e^2)}$$

Equation (1) is Yamane's formula of sample size calculation. p= sample size; P= population size; e= level of precision

Data Collection

The ADDQoL (audit of diabetes-dependent quality of life)-19 survey tool and structured questionnaire were used to gather quantitative data. Before data collection, all study participants were explained the study's purposes and procedure. The nurses working in the diabetic clinic assisted the researcher in gathering data. The patients were allocated numbers 1 & 2 where every 2nd patient who visited the clinic was chosen to comprise a portion of the sample size. To increase consistency and reduce bias in data collection, all research assistants underwent training. The research assistants answered patients' questions concerning the questionnaire during data gathering. Face-to-face interviews were used to gather data on socio-demographic characteristics such as education and employment status, gender, age, marital status, and healthcare financing. The patient's medical records were consulted for information on the duration of type two diabetes mellitus, current anti-diabetic drugs, complications, and co-morbidities associated with diabetes. For the evaluation of the HRQoL, the ADDQOL survey tool was used which was administered by the interviewers.

The tool's initial two questions evaluated "current quality of life" and "quality of life for people with diabetes" respectively. The first item's rating range for responses on "current quality of life" was "Excellent" (+3), "very good" (+2), "good" (+1), "neither good nor bad" (0), "bad" (-1), "very bad" (-2), and "extremely bad" (-3). The second item's rating range for the responses on "quality of life in the absence of diabetes mellitus" was very much better" (-3), "much better" (-2), "a little better" (-1), "the same" (0), and "worse" (1). The other 19 particular facets of life followed. Items 1 and 2 of the diabetes-dependent quality of life assessment tool, for instance, addressed leisure and working life, respectively. A scale from -3 (maximum negative impact) to +1 (maximum positive impact) of diabetes was used to evaluate the effect on each particular facet of life. On a scale of +3 (very important) to 0 (not at all important), the patient then elaborated on the significance of this component to their quality of life (Bradley et al., 1999). Five of the nineteen particular facets of life allowed for an optional response of "not applicable". The product of the impact rating by the importance score yielded the weighted impact (WI) score for each facet. The weighted evaluation of each facet of life was added, and the AWI score was computed by dividing it by the total number of relevant specific facets of life. The AWI was

rated between -9 (the maximum negative) and +3 (the maximum positive). The influence of diabetes mellitus type two on specific aspects of the life of the patients was obtained by calculating the impact score (weighted impact) for each life aspect. The influence of diabetes on each domain-specific item (weighted impact score) per was calculated by multiplying the impact rating by the importance rating.

Data Analysis

Statistical package for the social sciences (SPSS) version 25 was used to process the quantitative data. For the socio-demographic and health-related factors, descriptive statistics were employed. Continuous variables were reported as mean and median while categorical variables were presented as percentages and frequencies. The mean which was acquired through the average weighted impact (AWI) scores for the specific life aspects was used to highlight the magnitude of the impact of diabetes mellitus on specified aspects of life of the patients. The researcher employed bivariable analysis to evaluate the socio-demographic and health-related characteristics related to quality of life in health. All variables that were connected to Q.O.L. in T2DM and had a P<0.25 in the bivariate analysis were considered in the multivariable analysis. Additionally, the multivariable analysis with a P<0.05 was deemed statistically significant for the health-related characteristics and hence correlated with the HRQoL of the patients.

Ethical Consideration

Permission to conduct the research was sought from the management at Moi County Referral Hospita through a letter from Mount Kenya University's Ethics and Research Committee. Additionally, authorization from NACOSTI (License No. NACOSTI/P/22/18413) was acquired. Before collecting data, the researcher obtained signed written informed consent from the study participants. All participants were promised their anonymity. The Moi County Referral Hospital's management gave its approval to this study. A use permit was requested from Professor Claire Bradley in the United Kingdom who gave authorization to adopt the tool. The license number is HPR 4458 from Health Psychology Research Limited in the United Kingdom.

RESULTS

The study obtained a response rate of 100%. This was dully possible as the respondents were interviewed after receiving their healthcare services from the outpatient clinic and thus most of the study participants were recruited into the study.

Social-Demographic and Health-Related Characteristics of the Patients

One hundred and sixty-five patients were recruited. Majority of the participants were female 116 (70%), married 127 (77%) and 114 (69%) had no source of income. Most of the study participants were unemployed 125(75.8%), aged above sixty years 95 (57.6%), and funded their healthcare through insurance/National hospital insurance fund (NHIF) 91 (55.2%). The majority of participants (113, or 69 percent) had diabetes for a duration of 6 months to 10 years; oral medication was the most popular form of treatment (145, or 88 percent); and the most prevalent co-morbidities were high blood pressure (113, or 69 percent); diabetic retinopathies (76, or 46 percent); and numbness or pain in the feet or legs (118, or 72 percent). 4 (2.4%) of the study's

participants reported having no co-morbidities, a small minority. This is illustrated in *Table 1*.

Table 1: Socio-demographic and Health-related characteristics

Characteristic	Category	N (%)
Age	18 -59yrs	70 (42.4)
	60yrs+	95 (57.6)
Marital status	Married	127 (77)
	Single/Widowed/Divorced	38 (23)
Gender	Male	49 (29.7)
	Female	116 (70.3)
Education	None/Primary	95 (57.6)
	High school/Technical/vocational/College/ University	70 (42.4)
Employment status	Employed	40 (24.2)
	Unemployed	125 (75.8)
Source of Income	None	114 (69)
	Employment/ Business	51 (31)
Healthcare financing	Cash payment	74 (44.8)
	Insurance/NHIF	91 (55.2)
Duration of living with diabetes	6 months – 10yrs	113 (68.5)
	11yrs -20yrs	43 (26.1)
Type of treatment	Diet/Oral medication only	145 (87.9)
	Insulin + oral medication	20 (12.1)
High Blood pressure	No	52 (31.5)
	Yes	113 (68.5)
Diabetic nephropathies	No	163 (98.8)
	Yes	2 (1.2)
Elevated cholesterol level	No	164 (99.4)
	Yes	1 (0.6)
Cardiac disease	No	158 (95.8)
	Yes	7 (4.2)
Foot ulcers/sores	No	153 (92.7)
	Yes	12 (7.3)
Diabetic retinopathies	No	89 (53.9)
	Yes	76 (46.1)
Cardiovascular disease	No	164 (99.4)
	Yes	1 (0.6)
Pain/numbness in hands/legs/ feet	No	47 (28.5)
	Yes	118 (71.5)
Other comorbidities	No	161 (97.6)
	Yes	4 (2.4)
Nil/ No comorbidities	No	161 (97.6)
	Yes	4 (2.4)

Impact of Type Two Diabetes Mellitus on Quality of Life

The first two ADDQOL tool items evaluated "present quality of life" and "diabetes-dependent quality of life," which are quality-of-life indicators. The majority of research participants, 108 (65%) said their present Q.O.L was "neither good nor poor," while only three (2%) said it was "bad" (*Table 3*). Over half of the 127 study participants (77%) said that their Q.O.L would be "much better" if they had not been diagnosed with diabetes, whereas only two (1%) said that their

quality of life would remain "the same". This is illustrated in *Table 2*:

Table 2: Impact of type two diabetes on quality of life

Particulars	Response	Frequency (N=165)	Percentage (%)
Perceived Present Quality of Life	Bad	3	1.8
	Neither good nor bad	108	65.5
	Good	48	29.1
	Very good	6	3.6
	Total	165	100.0
Quality of Life in the Absence of Diabetes Mellitus	Very much better	10	6.1
	Much better	127	77.0
	A little better	26	15.8
	The same	2	1.2
	Total	165	100.0

The AWI (average weighted impact) score, which represents the cumulative burden of the condition on all 165 patients, was determined by the researcher to state the overall influence of diabetes mellitus type 2 on HRQoL (health-related quality of life). Since the range for scoring the AWI was -9 (the maximum negative impact of diabetes) to +3, the mean AWI score for the domain-specific items for the 165 study participants was -4.48, indicating a significant seeming negative influence of T2DM on the health-related quality of life of the patients (maximum negative impact of diabetes). The responses for the overview item one of the ADDQOL tool are scored between -3.00 and 3.00. "Excellent" (3), "very good" (2), "good" (1), "neither good nor bad" (0), "bad" (-1), "very bad" (-2), and "extremely bad" (-3) were the scores assigned to each response. The replies to the first question on the ADDQOL-19 instrument, which examined the patients' "present quality of life," produced a mean generic quality of life score of 0.35, which is roughly equivalent to "neither good nor bad" (0) as opposed to "good" (1) or "very good" (2). The responses for overview item two of the ADDQOL questionnaire are scored between -3.00 and 1.00. The following are the scores for each response: "very much better" (-3), "much better" (-2), "a little better" (-1), "the same" (0), and "worse" (1). Overview Question 2 of the ADDQOL-19 tool examined "perceived quality of life in the absence of diabetes mellitus." The replies produced an average score of -1.88, approximating "much better" at (-2). This suggested that living without diabetes mellitus will improve one's health quality of life. This is illustrated in *Table 3*.

Table 3: Average weighted impact of diabetes mellitus

Particulars	N=165	Mean	Median (Range)
Overall perceived present quality of life (+3, excellent to -3, extremely bad)	165	0.35	0 (-3.00, 3.00)
Overall quality of life in the absence of diabetes mellitus (-3, Very much better (if I did not have diabetes) to 1, Worse (if I did not have diabetes)	165	-1.88	-2.00 (-3.00, 1.00)
AWI (Average Weighted Impact) score which indicates the cumulative impact of the disease on the 19 domain-specific life aspects (-9 maximum perceived negative impact of diabetes, to +3 maximum perceived positive impact of diabetes)	165	-4.48	-4.00 (-9.00, 3.00)

Impact of Diabetes on the Domain Specific Life Aspects

The WI (weighted impact) score indicated which life aspects were negatively influenced by diabetes mellitus type two. The range of scoring the WI score was (-9.00) "maximum negative impact" to (+3.00) "maximum positive impact" of diabetes mellitus. The patients rated "sex life" as being substantially more negatively influenced at (WI= -5.14) than other items among the 19 life aspects. This life aspect was followed closely by "Do you have or would like to have a close personal relationship?" at a weighted impact (WI) score of -4.94. The least impacted life aspects were "Do you ever go on holiday or want to go on holiday?" with a WI score of -3.89 and "If I did not have diabetes, I would have to depend on others when I do not want to" at WI score of -3.58. This is illustrated in *Table 4*:

Table 4: Impact of diabetes on domain specific life aspects

Specific Aspects of Life	N (%)	Mean Weighted Impact Score for Each Aspect of Life
Enjoyment of leisure activities	165 (100%)	-4.06s
A need to work	37 (22.4%)	-4.78
Going on long/local journeys	165 (100%)	-4.26
A need to go on holiday	9(5.5%)	-3.89
Physical activities I would do	165 (100%)	-4.56
A need for family/ Family life	163 (98.8%)	-4.71
A need for friendship and a social life	165 (100%)	-4.63
A need for a close personal relationship	102 (61.8%)	-4.94
A need for a sex life	97 (58.8%)	-5.14
My physical appearance	165 (100%)	-4.65
My self-confidence	165 (100%)	-4.66
My motivation	165 (100%)	-4.39
How people react to me generally	165 (100%)	-4.49
My hopes/worries about the future	165 (100%)	-4.59
My economic situation	165 (100%)	-4.74
My living conditions	165 (100%)	-4.73
My independence	165 (100%)	-3.58
To eat what I want, when I want	165 (100%)	-4.57
I can drink as much I want.	165 (100%)	-4.56

Multivariable Analysis of Socio-Demographic and Health-Related Characteristics with Health-Related Quality of Life

In multivariable logistic regression, a cut-off of P<0.25 was used. None of the socio-demographic characteristics were significantly related to the patient's quality of life concerning their health. The characteristics related to the health-related quality of life of the patients like duration of living with diabetes mellitus, co-morbidities like high blood pressure, foot ulcers/sores, and numbness/ pain in the hands or feet, or legs were analysed. Health-related characteristics that remained statistically significant after controlling other variables included foot ulcers/sores and numbness/ pain in the hands, legs, or feet. Out of the 165 study participants, 6(4.5%) who indicated to have foot ulcers/ sores were more likely to have a low health related quality of life compared to those who did not have this co-morbidity. This meant that they were seven times more likely (a OR=7.348; 95% CI 1.824-29.605; P= 0.005) to

have lower quality of life in comparison to those who did not have these sores. In addition, patients with pain/ numbness in hands or legs or feet at 105(78.4%) were more likely to have a lower health-related quality of life at (a OR= 0.155; 95% CI 0.062-0.389; P<0.001) compared to those who did not have the co-morbidity. This meant that patients who have comorbidities of foot ulcers and numbness/ pain in the hands or legs or feet were at risk of having lower quality of life as opposed to patients who suffered from other comorbidities like 7(5.2%) with cardiac disease, 64(47.8%) with kidney disease, and 95(70.9%) with high blood pressure at p values of 0.999, 0.364 and 0.169 respectively. Health-related characteristics like duration of living with diabetes mellitus and high blood pressure were weakly related to the HRQoL. This is illustrated in *Table 5*.

Table 5: Multivariable analysis of Patient's Characteristics with health-related quality of life

Characteristic	Category	Higher QOL N (%)	Lower QOL N (%)	Crude OR [95% CI]	P-value	Adjusted OR [95% CI]	P-value
Age	18 -59yrs	16 (51.6)	54 (40.3)	0.633 (0.289-1.387)	0.253	-	-
	60yrs+	15 (48.4)	80 (59.7)	Ref.	Ref.	Ref.	Ref.
Marital status	Married	25 (80.6)	102 (76.1)	0.765 (0.288-2.029)	0.590	-	-
	Single/Widowed/Divorced	6 (19.4)	32 (23.9)	Ref.	Ref.	Ref.	Ref.
Gender	Male	8 (25.8)	41 (30.6)	Ref.	Ref.	Ref.	Ref.
	Female	23 (74.2)	93 (69.4)	0.789	0.599	-	-
Education	None/Primary	20 (64.5)	75 (56.0)	0.699 (0.311-1.573)	0.387	-	-
	Highschool/technical/ vocational/College/University	11 (35.5)	59 (44.0)	Ref.	Ref.	Ref.	Ref.
Employment status	Employed	6 (19.4)	34 (25.4)	Ref.	Ref.	Ref.	Ref.
	Unemployed	25 (80.6)	100 (74.6)	0.85 (0.536-3.746)	0.76	-	-
Source of income	None	22 (71.0)	92 (68.7)	Ref.	Ref.	Ref.	Ref.
	Employment/ Business	9 (29.0)	42 (31.3)	1.116 (0.474-2.630)	0.802	-	-
Healthcare financing mode	Cash only	14 (45.2)	60 (44.8)	Ref.	Ref.	Ref.	Ref.
	Insurance/NHIF	17 (54.8)	74 (55.2)	1.016 (0.463-2.227)	0.969	-	-
Duration of living with diabetes	6 months – 10yrs	22 (71)	91 (67.9)	2.068 (0.479-8.924)	0.330	1.502 (0.258-8.747)	0.651
	11yrs -20yrs	6 (19.4)	37 (27.6)	3.083 (0.603-15.775)	0.176**	4.853 (0.797-29.562)	0.087
	21yrs+	3 (9.7)	6 (4.5)	Ref.	Ref.	Ref.	Ref.
Treatment regimen	Diet/Oral medication only	29 (93.5)	116 (86.6)	0.444 (0.098-2.025)	0.295	-	-
	Insulin + oral medication	2 (6.5)	18 (13.4)	Ref.	Ref.	Ref.	Ref.
High Blood pressure	No	13 (41.9)	39 (29.1)	Ref.	Ref.	Ref.	Ref.
	Yes	18 (58.1)	95 (70.9)	0.568 (0.254-1.271)	0.169**	0.494 (0.194-1.257)	0.139
Diabetic nephropathies	No	31 (100.0)	132 (98.5)	Ref.	Ref.	Ref.	Ref.
	Yes	0 (0.0)	2 (1.5)	<0.001	0.999	-	-
High cholesterol level	No	31 (100.0)	133 (99.3)	Ref.	Ref.	Ref.	Ref.
	Yes	0 (0.0)	1 (0.7)	<0.001	1.000	-	-
Cardiac disease	No	31 (100.0)	127 (94.8)	Ref.	Ref.	Ref.	Ref.
	Yes	0 (0.0)	7 (5.2)	<0.001	0.999	-	-
Foot ulcers/sores	No	25 (80.6)	128 (95.5)	Ref.	Ref.	Ref.	Ref.
	Yes	6 (19.4)	6 (4.5)	5.120 (1.527-17.170)	0.008**	7.348 (1.824-29.605)	0.005*
	No	19 (61.3)	70 (52.2)	Ref.	Ref.	Ref.	Ref.

Characteristic	Category	Higher QOL N (%)	Lower QOL N (%)	Crude OR [95% CI]	P-value	Adjusted OR [95% CI]	P-value
Diabetic retinopathies	Yes	12 (38.7)	64 (47.8)	0.691 (0.311-1.535)	0.364	-	-
Cardiovascular diseases	No	31 (100.0)	133 (99.3)	Ref.	Ref.	Ref.	Ref.
	Yes	0 (0.0)	1 (0.7)	<0.001	1.000	-	-
Numbness/ pain in hands/legs/ feet	No	18 (58.1)	29 (21.6)	Ref.	Ref.	Ref.	Ref.
	Yes	13 (41.9)	105 (78.4)	0.199 (0.088-0.454)	<0.001**	0.155 (0.062-0.389)	<0.001*
Other comorbidities	No	30 (96.8)	131 (97.8)	Ref.	Ref.	Ref.	Ref.
	Yes	1 (3.2)	3 (2.2)	1.456 (0.146-14.484)	0.749	-	-
Nil/No comorbidities	No	30 (96.8)	131 (97.8)	Ref.	Ref.	Ref.	Ref.
	Yes	1 (3.2)	3 (2.2)	1.456 (0.146-14.484)	0.749	-	-

*- p<0.05   **- p<0.25 (cut-off)

DISCUSSION

The study aimed to determine which patient-related characteristics were linked with the Q.O.L in type two diabetes mellitus patients and the influence of T2DM on the Q.O.L in patients at M.C.R.H in Taita-Taveta County, Kenya. A majority of the study participants, 108(65.5%) perceived their quality of life as neither good or bad. However, 127(77%) of the study participants were dissatisfied with their health as they perceived that their quality of life would be much better in the absence of diabetes mellitus as compared to 2(1.2%) who perceives that it would remain the same in the absence of the disease. This research finding differs with research done in Ethiopia where 33.7%(one-third) of the respondents perceived their quality of life to be "good" and 86(32.2%) were satisfied with their health (Gebremedhin et al., 2019). A possible explanation is that the current research used the ADDQoL while the other used the WHOQOL-BREF questionnaire. T2DM had a cumulatively unfavourable effect on the 165 patients' health-related quality of life. The majority of patients believed that if they were not diagnosed with type two diabetes mellitus, their health-related quality of life would be better. The responses to the "perceived quality of life in the absence of diabetes mellitus" gave an average quality of life score of -1.88 that is roughly equivalent to "much better" (-2) while the mean AWI score for the domain-specific items for the 165 patients was -4.48, indicating a substantial perceived detrimental influence of T2DM on the HRQoL of the patients. Therefore, this finding not only did they indicate that the patients were aware of the influence of diabetes mellitus on their quality of life but also the negative effect it had on their quality of life as over half 127 (77%) of the study participants felt that their quality of life would be better if they did not have diabetes mellitus. This study's finding is similar to a multinational study (Belgium, France, Germany, Greece...etc.), where the average weighted impact score was (-1.69) indicating that diabetes mellitus negatively impacted the quality of life among the respondents (Bradley et al., 2018), and also a

Bulgarian survey by Levterova et al., (2018) revealed that 275 respondents (67.1%) thought their quality of life would be better without T2DM since the diabetes-specific quality of life mean score was -1.8 and their AWI score was -2.9. A possible explanation for this similarity is that the current study and the Bulgarian plus the multinational studies utilized the audit of diabetes dependent quality of life tool to measure HRQoL among the study participants. This research's findings indicate that the quality of life of the study participants was measured by how satisfied they felt with aspects of their health that were impacted by diabetes, whereby 97 (58.8%) and 102 (61.8%) of the respondents perceived that a need for a sex life and a close personal relationship respectively, were the most unsatisfying aspects of their health which were negatively impacted compared to other life aspects. A Pakistan study is in tandem with this study's findings where an individual's Q.O.L was measured by how satisfied they felt with aspects of their health that were impacted by their present state of health (Nazir et al., 2016). There is a similarity in this study's findings and other studies because when determining a population's health needs and evaluating its access to healthcare, especially for people with chronic conditions like diabetes mellitus, measuring the quality of life is essential.

The study participants assessed "sex life" as being substantially more negatively influenced at (WI= -5.14) than other items among the 19 domain-specific items. This domain-specific item was closely followed by "Do you have or would like to have a close personal relationship?" at a weighted impact (WI) score of -4.94. This research result contrasts with the majority of other studies employing the ADDQoL, where "Freedom to eat as I wish" was the item representing the biggest detrimental impact of diabetes on the health-related quality of life. According to a study by (Bradley et al., 2018), "freedom to eat as I wish" had the biggest negative influence, with a WI score of -3.35. Additionally, a study conducted in Bulgaria revealed that "family life" was severely impacted with a

weighted impact (WI) score of -3.9, followed closely by "freedom to eat as I wish" at (WI=-4.0) (Levterova et al., 2018).This may be due to a difference in study settings where the sample size used in the current study was 165 respondents while that of the above-stated studies was 5,813 and 540 respondents respectively. Although there was no statistically significant correlation between the socio-demographic characteristics and the patients' quality of life, 113 (68.5%) of the study participants had lived with diabetes for 10 years and less and the most common complication was pain/numbness in hands and feet at 118 (71.5%) followed closely by high blood pressure at 113 (68.5%).This research finding is similar to a research done in Kenya by E.K et al., (2014) that indicated about half of the study patients (52.5%) had diabetes for less than 5yrs and the most common complication was neuropathy with 41 % of the study population. A possible explanation is that over the years there has been a gradual rise in the number of diabetic cases reported in Kenya and microvascular co-morbidities are one of the most common complications in these target population. Also, the current research finding differs from an investigation conducted in China which found that factors such as gender, regional economic development, and marital status all consistently affected the quality-of-life scores of diabetic patients (Lu et al., 2017). Likewise, a study done in Ethiopia indicated that demographic characteristics, particularly age, are independent indicators of health-related quality of life (HRQoL) in patients with diabetes, which is substantially inversely correlated with the health-related quality of life (Gebremariam et al., 2022). This variation in the current research findings with other studies may be due to contextual variations, such as socio-demographic, cultural, and epidemiological traits of the populations which might affect how well life is experienced and should be considered. Nevertheless, some of the health-related traits revealed a correlation with the patients' HRQoL. Foot ulcers/sores and numbness/pain in the hands/legs/ feet were the health-related factors found to be statistically significant following multivariable logistic analysis. Out of the 165 study participants,

6(4.5%) who indicated to have foot ulcers/ sores were more likely to have a low health related quality of life compared to those who did not have this co-morbidity. This meant that they were seven times more likely (a OR=7.348; 95% CI 1.824-29.605; P= 0.005) to have lower quality of life in comparison to those who did not have these sores. In addition, patients with pain/ numbness in hands or legs or feet at 105(78.4%) were more likely to have a lower health-related quality of life at (a OR= 0.155; 95% CI 0.062-0.389; P<0.001) compared to those who did not have the co-morbidity. This meant that patients who have comorbidities of foot ulcers and numbness/ pain in the hands or legs or feet were at risk of having lower quality of life as opposed to patients who suffered from other comorbidities like 7(5.2%) with cardiac disease, 64(47.8%) with kidney disease, and 95(70.9%) with high blood pressure at p values of 0.999, 0.364 and 0.169 respectively. The results of this study are similar to those of a Brazilian study by (Lima et al., 2018), which found that 34 (17%) elderly diabetic participants with foot wounds had a lower quality of life due to a reduction in autonomy and social participation brought on by a reduction in mobility and neuropathic/vascular pain (Lima et al., 2018). Similar study results were discovered in Saudi Arabia by (Alshayban & Joseph, 2020), who found that, despite the study participants' overall health-related quality of life being moderate, 69 percent of them experienced pain or discomfort, which resulted in a severe to extreme health state and a low health-related quality of life (Alshayban & Joseph, 2020). Also, a study done in Ethiopia indicated that 11 percent of the patients with diabetic peripheral neuropathy (DPN) experienced discomfort referred to as diabetic peripheral neuropathic pain (DPNP). Clinically, DPNP may manifest as aching, shooting, or searing pain. Allodynia, hyperalgesia, and numbness may also be present; these symptoms frequently worsen at night and may cause insomnia as well as worry and sadness. Lack of energy brought on by sleep deprivation significantly impacted the patient's ability to function because it caused them to be less mobile

and dependent on others for daily tasks (Degu et al., 2019).

Limitations

Recall bias: Participants may not accurately recall past behaviour or events or omit certain aspects. This was lessened by the researcher using clearly worded study questions to prevent misunderstandings and by training the interviewers to give respondents enough time to recall their answers. The use of a cross-sectional research approach revealed a correlation between the variables but no causal associations. Because the study was carried out in a facility (a hospital), it is not possible to generalize the findings to the rest of Kenya's diabetic community.

CONCLUSION

In summary, the health-related quality of life of the diabetic patients visiting Moi County referral hospital was low with a maximum influence being on the aspects of a need for sex life and a close personal relationship. The quality of life was associated with the health-related characteristics of pain/ numbness and foot ulcers/ sores. The results of these study are relevant since they demonstrate that diabetic patients are aware of the negative influence that the condition has on their quality of life. Health-care professionals should pay more attention to the social and emotional well-being, co-morbidities' effects on their quality of life, and how medications, dietary changes, and lifestyle modifications (such as quitting smoking, losing weight, changing their eating habits, exercising, and drinking less alcohol) have affected these patients' outcomes. Other than the benefits which come from early detection and treatment of co-morbidities so as to improve quality of life, an individualized plan of care can be adopted where quality of life features as one of the measures incorporated in the care of these patients.

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