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Original Research Article

Health Related Quality of Life in Type 2 Diabetic Patients at Levy Mwanawasa University Teaching Hospital, Lusaka, Zambia

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Abstract: ***Introduction:*** The research was conducted to evaluate the health-related quality of life in individuals diagnosed with type 2 diabetes mellitus at Levy Mwanawasa University Teaching Hospital, located in Lusaka, Zambia. Diabetes mellitus has become a serious global public health concern with huge impact on human life and health expenditures (Khan *et al.*, 2020). With many people affected, diabetes mellitus has an impact on individual's functional capacities and quality of life, which leads to significant morbidity and mortality (Rantahal *et al.*, 2015). ***Methodology:*** The research employed an analytical cross-sectional research design to assess the health-related quality of life in patients with type 2 diabetes at Levy Mwanawasa University Teaching Hospital (LMUTH) in Lusaka, Zambia. It involved a comprehensive review of current knowledge and the gathering of primary sources to build a theoretical model based on existing evidence. The study sample consisted of 134 respondents, and data were collected using structured interview schedules. Simple random sampling method was used to select the study respondents, and a sampling frame was employed every day and randomly sampled some respondents. To assess and identify factors associated with health related quality of life in type 2 diabetes mellitus patients, Chi-square and multivariate logistic regression analyses were employed through SPSS version 23. The Odds Ratio with a 95% confidence interval was computed to determine the level of association. The variables with p-value less than 5%, in the multivariate analysis were considered as statistically associated, association between covariates and Health Related Quality of Life. ***Results:*** The findings revealed that a significant portion, 43.3%, of type 2 diabetes mellitus patients at LMUTH reported a low quality of life. This low quality of life was found to be associated with various socio-demographic factors. Specifically, individuals who were not employed, lacked regular exercise, and had lower levels of education were more likely to experience a lower quality of life. On the other hand, those with secondary or tertiary education, older individuals, and those who self-reported good management of their quality of life tended to have better outcomes. ***Conclusion:*** The study underscores the importance of patient empowerment, emphasizing the need for counseling and self-care education to enhance the quality of life among LMUTH's type 2 diabetes patients. Targeting interventions at younger patients with lower educational levels, those who are unemployed, and those with a sedentary lifestyle is crucial. One of the key recommendations arising from the study is the implementation of a comprehensive, multidisciplinary care approach. This approach would involve collaboration between medical professionals, psychologists, nutritionists, and social workers to provide holistic support to patients, addressing not only their medical needs but also their psychological well-being. This integrated approach aims to improve the overall quality of life for individuals living with type 2 diabetes at LMUTH.

Keywords: Health-related quality of life, Type 2 diabetes Socio-demographic factors.

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INTRODUCTION AND BACKGROUND

The aim of this research was to evaluate the Health-Related Quality of Life Among individuals diagnosed with type 2 diabetes mellitus patients at Levy Mwanawasa University Teaching Hospital in Lusaka, Zambia. Diabetes mellitus is a chronic, metabolic disease characterized by elevated blood glucose (sugar) levels, which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves (Gutierrez 2017). Diabetes mellitus is classified into juvenile, adult and gestational diabetes (Cameron *et al*., 2016). In juvenile diabetes mellitus, the body does not produce enough insulin to meet metabolic needs of the body resulting into the symptoms and signs of insulin deficiency or hyperglycemia; it may also be referred to as insulin-dependent diabetes, type I, or early-onset diabetes mellitus (Centre for Disease Control, 2020). Diabetes mellitus has become a serious global public health concern with huge impact on human life and health expenditures (Khan *et al.*, 2020). With many people affected, diabetes mellitus has an impact on individuals' functional capacities and quality of life, which leads to significant morbidity and mortality (Ramtahal *et al*., 2015).

In 2000, the global estimate of adults living with diabetes was 151 million. By 2009 it had grown by 88% to 285 million. In 2019, 9.3% of adults aged 20–79 years – a staggering 463 million people were living with diabetes mellitus**.** In 2010, the global projection for diabetes mellitus by 2025 was said to increase to 438 million people. With one year still to go, that prediction has already been surpassed by 25million people (International Diabetes Federation, 2019). In sub-Sahara Africa, the International Diabetes Federation (IDF) estimated that diabetes mellitus would affect 40.7 million people by the year 2045, from 15.9 million people in 2017. This burden is known to be further exacerbated by estimates which show that more than two-thirds of individuals in the region are living with diabetes mellitus that is undiagnosed (Assah and Mbanya, 2017). In Zambia, diabetes mellitus is estimated to affect more than 273,800 translating into 3.4% of the total adult population (IDF, 2017).

Significance of the study

Diabetes mellitus is a major cause of blindness, kidney failure, coronary heart diseases, cardiovascular accidents (CVA), lower limb amputations due to septic diabetic foot ulcers (WHO diabetes mellitus, 2021). Among the many complications of diabetes mellitus, diabetic foot ulcers develop in 10-15% of people with diabetes mellitus at some stage of their lives and almost 80% of all diabetic related admissions are due to diabetic foot problems in sub-Saharan African (Scheleme *et al*., 2021). The International diabetes federation (IDF) estimates the prevalence of diabetes mellitus in Zambia to be at 3.4% (IDF, 2019). The Ministry of Health in Zambia has taken keen interest in the plight of people living with diabetes and its complications. Measures have been put in place to ensure the availability of medicines for patients living with diabetes as well as promoting their welfare through public awareness campaigns on media platforms (Mwila, 2019).

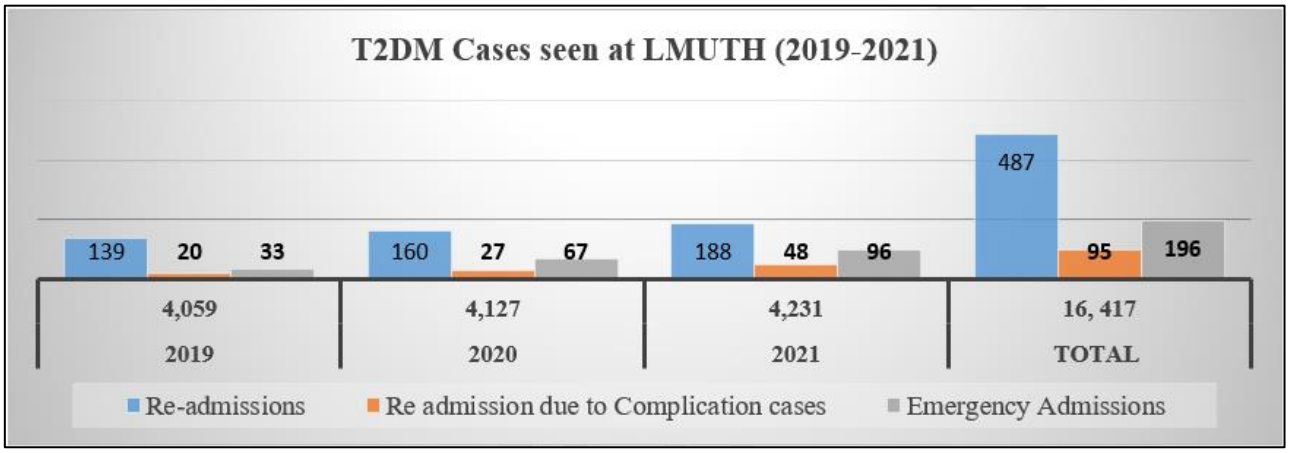

Figure 1: T2DM Cases seen at LMUTH (2019-2021)
Source: LMUTH Medical Health Information Management System, 2022

Despite the ministerial interventional measures and pronouncements, anecdotal evidence shows that the number of patients with T2DM seen at the Levy Mwanawasa University Teaching Hospital (LMUTH) Lusaka, Zambia has been steadily increasing. A review of statistics has shown that the numbers of re-admissions due toT2DM from 2019 to 2021 has steadily increased year on from139 in 2019 to 188 by the end of 2021. Re-Admissions due to complications have also increased from 20 cases to 48 cases. Furthermore, emergency admission cases have been ranging between 33 and 96 per year. This implies that their quality of life is also affected as patients spend most of their time on medical check-ups at a health facility instead of having leisure or engaging themselves in viable economic activities. This raises the question of the quality of life led by people living with diabetes, not only in the context of enduring

the condition but also the stress of where to find and how to afford medication (Mwila *et al.,* 2019).

Therefore, there was need to explore the physical, mental and spiritual effects of this lifelong disease in patients patronizing to the Levy Mwanawasa University Teaching Hospital in Lusaka, Zambia. In a well-controlled diabetic, the patient is basically supposed to be seen at a health facility an average of 3 times per year for follow up reviews (Scheleme *et al.*, 2021). Unfortunately, this is not the prevailing situation; T2DM patients are frequently visiting the hospital seeking medical services as they are not well most of the time. The review of patients' files at LMUVH showed an average hospital attendance of more than five visits per year mostly due to health complications brought about by diabetes mellitus.

The District Health Office has diligently undertaken extensive awareness campaigns to encourage both citizens and individuals dealing with Type 2 Diabetes Mellitus (T2DM) to embrace healthier lifestyles. Despite these earnest efforts, the persisting challenges necessitate a comprehensive study to delve into the root causes and identify effective interventions. Understanding the factors contributing to the sustained prevalence of T2DM will enable targeted strategies for improved outcomes. Despite these efforts the problem has persisted necessitating the need to conduct this study. By addressing the specific challenges faced by the community and T2DM sufferers, this study aims to enhance the effectiveness of health promotion efforts and contribute to a healthier community overall.

Rationale

Diabetes mellitus has become prevalent in Zambia; hence the need to assess its impact on the health-related quality of life among patients living with it. Currently, there is limited literature on the health-related quality of life of individuals living with diabetes mellitus in Zambia (Mwila *et. al*., 2019). This study on quality of life will help in the evaluation of psychological functioning of patients, identification of specific shortcomings, and the needs of patients at different stages of the disease. The study was pertinent to people living with type 2 diabetes mellitus as the findings of this research will help improve their quality of life through better structured care by care givers and effective policy formulation aimed at improving plight of people living with type 2 diabetes mellitus.

LITERATURE REVIEW

This section highlights the empirical, the theoretical review, literature gap and conceptual framework related to the study.

Empirical Review

A study in Turkey by Fevzi Ackinci *et al*., (2008) assessed health-related quality of life (HRQOL) in type 2 diabetes patients using the Diabetes Quality of Life (DQOL) instrument. They found that younger age, male gender, marital status, lower education levels, living with family, and no family history of diabetes were associated with higher total DQOL scores. Additionally, patients with shorter disease duration, no complications, insulin treatment, and a BMI less than 24 reported significantly better overall HRQOL. The study emphasizes the importance of HRQOL information for guiding interventions and improving the quality of life for individuals with type 2 diabetes mellitus.

Tang *et al.,* (2006), Shiu *et al.*, (2008), and Wexler *et al*., (2006) also showed in their results and conclusions that the QOL of type 2 diabetes mellitus was lower if the patients showed complications. Complications can affect the QOL of type 2 diabetic mellitus patients in different ways, such as increasing physical discomfort, decreased activity, and reduced physical state (Sarvimaki and Stenbock-Hult, 2013). A study in Brazil found that diabetes mellitus patients without complications had a better quality of life. As the number of complications increased, there was a decrease in the quality of life (Archaya *et al*., 2017). The quality-of-life assessment has been used to give a reference norm, better prognosis, and signal change in the patient's perspective (Viveke *et al*., 2017; Sheleme *et al*., 2020).

Amer *et al.* (2008) conducted a cross sectional study in five primary health care centers in the Al-Khobar with an objective of determining the HRQOL and the factors affecting it in type 2 diabetic mellitus patients. They concluded that HRQOL was lower in type 2 diabetic mellitus patients than controls and was affected by numerous factors. Females had lower HRQOL than males, possibly because of a higher incidence of obesity. Diabetic mellitus patients with poorly controlled blood sugar levels had a lower HRQOL than controlled diabetics.

Eljedi A *et al*., (2006), analysed the effects of having diabetes mellitus on HRQOL under the living conditions in refugee camps in the Gaza strip. Their results showed that all domains were strongly reduced in diabetic patients as compared to controls, with stronger effects in physical health, psychological domains and weaker effects in social relationships and environment domains. The impact of diabetes mellitus on HRQOL was especially severe among females and older subjects (above 50 years). Low socioeconomic status had a strong negative impact on HRQOL in the younger age group (<50 years). They further concluded that HRQOL was strongly reduced and the women and elderly patients were most affected (Genga *et al*., 2014; Gutierrez, 2017).

A study in South Africa found the following results: 98% of diabetic patients perceived their DM to impact negative on their quality of life and glycemic control were significantly related. Quality of life assessment should therefore form part of management and should be culturally sensitive (Leanne 2008).

Another African study conducted in a Nigerian teaching hospital found that poor quality of life in diabetic mellitus patients was associated with some of the physical complications of diabetes mellitus, lower income, lower educational status, and type 2 diabetes mellitus (Issa *et al*., 2000). A similar study done in Botswana found that most diabetes mellitus patients had both worse physical score and mental score (Rwegerera *et al*., 2017).

Literature Gap

The empirical review highlights several international studies that investigated the health-related quality of life (HRQOL) in individuals with type 2 diabetes mellitus. The study by Fevzi Ackinci *et al*., (2008) in Turkey revealed associations between higher total DQOL scores and factors such as younger age, male gender, marital status, lower education levels, living with family, and no family history of diabetes. Patients with shorter disease duration, no complications, insulin treatment, and a BMI less than 24 reported significantly better overall HRQOL.

Other studies by Tang *et al*., (2006), Shiu *et al*., (2008), and Wexler *et al*., (2006) also found lower QOL in type 2 diabetes patients with complications. Complications were shown to impact physical discomfort, activity levels, and overall physical state. Similarly, studies in Brazil and Saudi Arabia identified a negative correlation between the number of complications and the quality of life in diabetes patients.

Furthermore, research conducted in the Gaza strip and South Africa revealed the profound impact of diabetes mellitus on HRQOL, with women, older individuals, and those with low socioeconomic status experiencing more significant reductions. Additionally, studies in Nigeria and Botswana associated poor quality of life in diabetic patients with physical complications, lower income, lower educational status, and type 2 diabetes mellitus.

This comprehensive review sets the stage for a similar assessment of HRQOL in type 2 diabetic mellitus patients at Levy Mwanawasa University Teaching Hospital in Lusaka, Zambia, emphasizing the need for culturally sensitive evaluations and interventions.

RESEARCH METHODOLOGY

The accessible population for this study included all type 2 diabetes mellitus patients who received care at LMUTH and were willing to participate in the study at the time of data collection period.

The study population consisted of 134 respondents, and data were collected using a structured interview schedules questionnaire. A structured interview schedule, presented exactly the same questions in the same order. The tool had closed ended questions comprising of individual characteristic in section A, environmental characteristic in section B and health related quality of life in section C. The study respondents included all male and female adult patients who consented and willing to participant in the study, aged 30 years and above living with type 2 diabetes mellitus for not less than 6 months and taking DM medication for at least 3 months. Those who declined to sign the consent, critically ill patients and newly diagnosed type 2 patients were excluded. The sample size was calculated using Yamane's formula. The researcher employed this formula because the facility has a limited number of patients who seeks medical services. Simple random sampling technique was used to select the study participants. A sampling frame was made according to the number of T2DM patients who came at that particular day and from there, random selection was done. During the interview process, the researcher had to read out the questions in the interview schedule and clarified for those who were having difficulties in understanding the questions. At the end of each interview, the researcher thanked each participant. The interview took 30 to 35 minutes with each respondent. The validity of the research instrument was measured by ensuring that all the domains of the study were included in the structured questionnaire by making questions simple, clear and concise. The data collection tool consisted of systematic questions. Data collected was analyzed, interpreted and presented as aggregate results of the study. Reliability was censured by standardizing the questionnaire through regular cross checking, inspecting and scrutinizing of information in it. This was to ensure accuracy, relevance, completeness, consistence and uniformity of the data collected across all respondents. The research instrument was pretested in a pilot study to increase on reliability of the responses. Further, the physical and psychological environment where data was being collected from was made comfortable by ensuring that there was privacy, confidentiality and general physical comfort. After data collection, data was screened for completeness and consistency and thereafter was coded and entered in Statistical Package for Social Science (SPSS) version 23. Data was analyzed using Chi square and binary logistic regression. Chi square test was employed to establish the relationship between HRQOL and the associated factors. The chi-square was used to cross tabulate in SPSS, where the statistic was evaluated by comparing the actual value against a critical value which was found in a chi square distribution. Frequencies on the outcomes was generated and presented in the report. The findings are presented in table and graphs generated in Microsoft word. Finally, analysis of data was carried out using binary logistic regression to adjust for confounders. A confidence level of 5% was set at 95% confidence interval. To determine factors associated and to rule out confounders, multivariable logistic regression was used. P- Value< 0.05 at 95% confidence interval was considered statistically significant.

RESULTS

Table 1: Baseline demographic characteristics of diabetes mellitus at LMUTH in Lusaka, Zambia, August 2022 (N= 134)

Characteristics	**Median (IQR)**	
Age in years, median (IQR)	**57 (44 - 68)**	
Gender	**Frequency**	**Percentage (%)**
Male	49	43.8
Female	85	56.2
Residence		
High density	93	70.7
Low density	41	29.3
Employment status		
Employed	53	39.1
Not employed	81	60.9
Marital status		
Married	70	52.6
Not married	64	47.4
Education level		
Primary	35	25.6
Secondary	70	52.6
Tertiary	29	21.8
Are you the breadwinner of the family?		
Yes	57	41.2
No	77	58.8
How far is the nearest health facility?		
Walkable	69	51.5
Use transport	65	48.5
Why did you come to LMUTH?		
It is near	12	8.9
Referred	106	79.1
Preference	16	12.0
Do get support from other people?		
Yes	115	85.8
No	19	14.2
Get drugs for DM from hospital?		
Yes	77	57.4
No	34	25.4
Sometimes	23	17.2

IQR = Interquartile range; LMUTH = Levy Mwanawasa University Teaching Hospital; DM = Diabetes Mellitus.

Table 1: shows that most of the study participants were in the median age of 57 (44-68), were females 85 (63.4%) and married 70 (52.2). The majority 93(69.4%) came from high density area, 70(52.2) had reached secondary education level, 81(60.4%) were not employed, 77(57.4%) were not breadwinners. Slightly half 69(51.5%) had to walk to the nearest health facility. Those referred were 106(79.1%), support from other people were 115(85.8%) and get drugs for DM from hospital 77(57.4%).

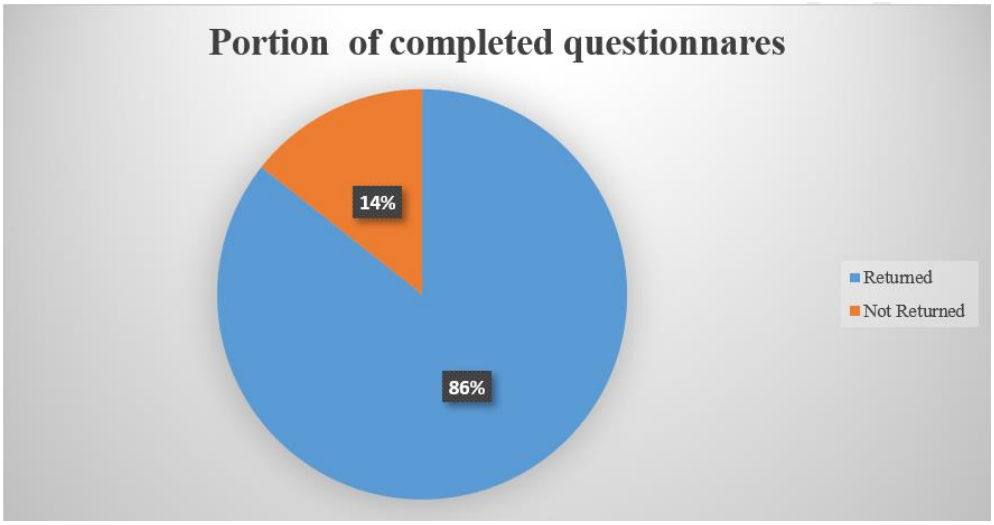

Figure 2

Figure 2 above shows that out of 158 questions administered 134(84.8%) were returned while 24(14.2%) were not returned. This is a high response rate considering that for large samples 60-80 % is good response rate (Saunders *et al.*, 2016)

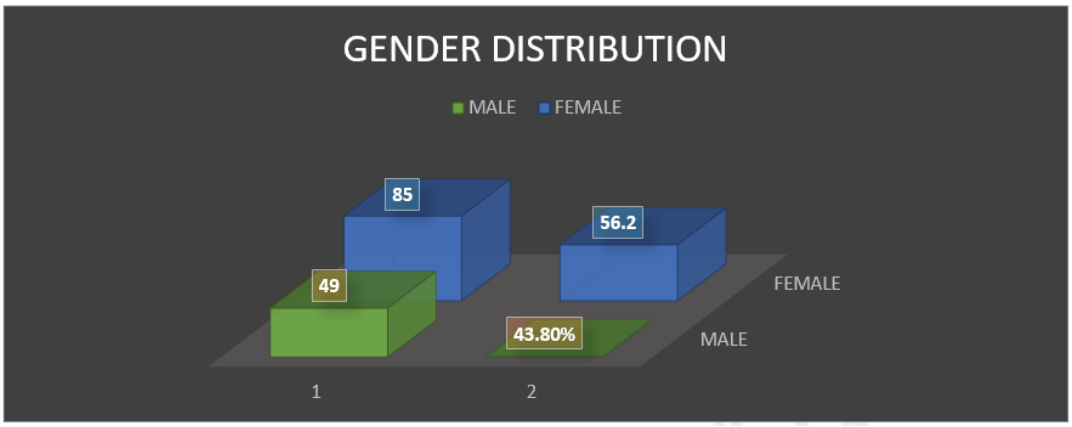

Figure 3: Gender distribution

The figure above shows the gender distribution of the respondents. The Female respondents were 85 comprising 56.2% of the total respondents while the male respondents were 49 comprising 43.8 % of the respondents

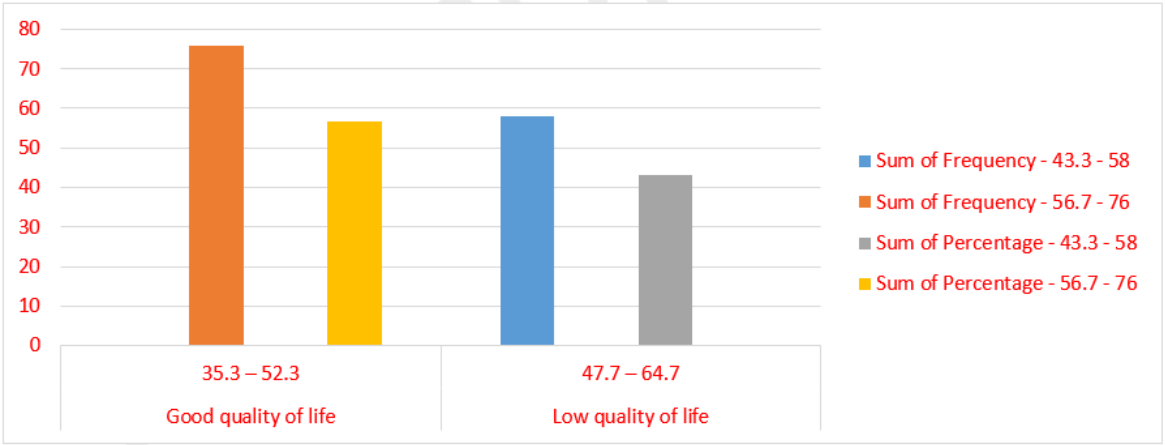

Figure 4: Proportion of low quality of life among diabetes mellitus patients at LMUTH (N=134)
CI = confidence interval; LMUTH = Levy Mwanawasa University Teaching Hospital

Figure 4 shows that, there were 58 (43.3%; 95% CI: 47.7 – 64.7) diabetes mellitus with low quality of life while 76 (56.7% CI: 35.3 – 52.3) had good quality of life.

Figure 4 reveal that a considerable proportion of diabetes mellitus patients at LMUTH experience low quality of life, with 43.3% falling into this category. Conversely, 56.7% of patients have good quality of life. These findings highlight the need for targeted interventions to enhance the quality of life for those facing challenges related to diabetes management. Healthcare providers should prioritize addressing factors contributing to low quality of life, such as disease management and psychological support, to improve overall well-being and health outcomes among diabetes patients at LMUTH.

Table 2: Association between demographic characteristics and quality of life among diabetes mellitus patients at LMUTH in Lusaka, Zambia (N = 134)

Variable	Good quality	Low quality	P-value
Age in years (IQR)	63 (48 – 70)	52 (38 – 68)	0.006[M]
Gender			
Male	24 (32.0)	25 (41.4)	0.264[C]
Female	51 (68.0)	34 (58.6)	
Residence			
High density	54 (72.0)	40 (68.9)	0.703[C]
Low density	21 (28.0)	19 (31.1)	
Employment status			
Not Employed	50 (66.7)	52 (87.9)	0.004[C]
Employed	25 (33.3)	7 (12.1)	
Marital status			
Married	37 (49.3)	26 (43.1)	0.386[C]
Not married	38 (50.7)	33 (56.9)	
Education level			
Primary	12 (16.9)	17 (29.8)	0.107[C]
Secondary	39 (54.9)	32 (54.4)	
Tertiary	20 (28.2)	9 (15.8)	
Do you exercise			
Yes	52 (69.3)	30 (50.8)	0.023[C]
No	23 (30.7)	29 (49.2)	
Are you the main provider of the family?			
Yes	29 (38.7)	27 (46.6)	0.361[C]
No	46 (61.3)	31 (53.5)	
How far is the nearest health facility?			
Walkable	36 (48.0)	33 (56.9)	0.309[C]
Use transport	39 (52.0)	25 (43.1)	
Why did you come to LMUTH?			
It is near	7 (9.3)	4 (6.9)	0.741[F]
Referred	58 (77.3)	48 (82.7)	
Preference	10 (13.3)	6 (10.3)	
Do get support from other people?			
Yes	67 (89.3)	48 (82.8)	0.272[C]
No	8 (10.7)	10 (17.2)	
Get drugs for DM from hospital?			
Yes	50 (66.7)	27 (47.4)	0.030[C]
No	18 (24.0)	16 (28.1)	
Sometimes	7 (9.3)	14 (24.6)	

LMUTH = Levy Mwanawasa University Teaching Hospital; C = Chi-square test; F= Fisher's exact test; Mann-Whitney test

The implications of the findings from Table 2 are as follows:

Age

Patients with a good quality of life tend to be older, with a median age of 63 years compared to those with low quality of life, who have a median age of 52 years. This suggests that older individuals may have developed better coping mechanisms or have better access to healthcare, contributing to their higher quality of life.

Employment Status

Employed individuals have a significantly higher proportion of good quality of life compared to unemployed individuals (87.9% vs. 66.7%). This indicates the potential positive impact of employment on the overall well-being and quality of life of diabetes mellitus patients. Employment may provide financial stability, access to healthcare, and a sense of purpose, all of which can contribute to a better quality of life.

Education Level

Although not statistically significant, there is a trend suggesting that patients with a secondary and tertiary education have a higher proportion of good quality of life compared to those with primary education. This highlights the potential role of education in health literacy and self-management of diabetes mellitus, which can affect quality of life outcomes.

Exercise

Patients who exercise have a higher proportion of good quality of life compared to those who do not exercise (69.3% vs. 50.8%). This underscores the importance of physical activity in managing diabetes mellitus and improving overall well-being.

Access to Healthcare

Patients who use transport to reach the nearest health facility have a higher proportion of good quality of life compared to those for whom the facility is walkable (56.9% vs. 48.0%). This suggests that better access to healthcare services may positively impact quality of life outcomes among diabetes mellitus patients.

Medication Adherence

Patients who consistently get their diabetes medications from the hospital have a higher proportion of good quality of life compared to those who do not (66.7% vs. 47.4%). This highlights the importance of medication adherence in disease management and overall quality of life improvement for diabetes mellitus patients.

Table 3: Multivariable regression analysis for the factors associated with poor quality of life among diabetes patients from LMUTH Lusaka, Zambia (N=134)

Variable	Aor	95% CI	P-value
Age in years	0.97	0.94 – 0.99	0.033
Employment status			
Employed	Ref		
Not Employed	2.51	1.15 – 6.59	0.023
Education level			
Primary	Ref		
Secondary	0.22	0.12 – 0.68	0.010
Tertiary	0.13	0.10 – 0.58	0.008
Do you exercise			
Yes	Ref		
No	1.70	1.03 – 3.95	0.041
Get drugs for Diabetes Mellitus from hospital?			
Yes	Ref		
Sometimes	1.01	0.92 – 1.23	0.093
No	1.13	0.97 – 1.18	0.067
Quality of life			
Below average	Ref		
Good manageable	0.14	0.11 – 0.34	<0.001

aOR = adjusted odds; Ref = reference category; CI = confidence interval; LMUTH = Levy Mwanawasa University Teaching Hospital

Table 3: shows multivariable regression for factors associated with low quality of life (adjusted Odd Ratio- Aor), were age 0.97 as somebody is increasing in age chances of them have low quality of life is reducing meaning young one were more likely to have poor quality of life that was significant. For every one-unit increase in age statistically there was 3% chance less likely to have T2DM. Those who were not employed were 2.5 more likely to have poor quality life compared to those who were employed statistically significant (p-value 0.023). Education both secondary and tertiary education they are less than 1, meaning as someone gets educated they are less likely to have poor quality of life (statistically significant) meaning education is protective. Exercise - those with no exercise Aor was 1.7 insignificant meaning those who were not exercising were more likely to have poor quality of life compare to those who are doing exercises.

FINDINGS AND DISCUSSION

The main aim of this study was to assess quality of life and associated factors among type 2 diabetes mellitus patients from LMUTH in Lusaka, Zambia. When quality of life was assessed, 43.3% of study

respondents experienced low quality of life, which is similar to the results of Khunkaew *et al*., 2019 study which demonstrate that people with T2DM have a poor HRQOL. The low quality of life is associated with many factors not limited to the factors discussed in this study.

Factors associated with low quality of life among type 2 diabetic mellitus patients were unemployment, lack of exercises, young age and low education while a unit increase in age (year), secondary and tertiary education as well as those who self-reported that quality of life was manageable were protective.

The respondents in this research study were 63.4% representing 85 females and 36.6% representing 49 males. In a study conducted by Safita *et al*., (2016) have higher numbers of females than males who have type 2 Diabetes mellitus. Notably, females tended to report worse QOL than males, possibly related to the higher prevalence of DM in females and their increased likelihood of obesity.

In this study, one of the key findings was that females were more likely to report worse quality of life compared to males although there was no sufficient evidence. Similarly, other studies have reported that females with diabetes mellitus are more likely to have worse quality of life than their male counterparts (Wan *et al.,* 2016; Luk *et al*., 2014). The probable reason why women were more likely to be associated with poorer quality of life remains unresolved. However, others have suggested that a female preponderance in the prevalence of diabetes mellitus could also explain why females are more likely to have poor quality of life especially that a number of researchers have also suggested that they are also prone to be more obese compared to males (Egede *et al.,* 2005; Pala *et al.,* 2004). This may suggest why researchers such as (Tramunt *et al.,* 2020) have advocated for such as emphasizing the need for sex-specific approaches in the management of diabetes mellitus.

An analysis was done to determine an association between marital status on quality of life in T2DM patients and marital status had no significant association (p-value of 0.386). This finding is in agreement with other previous studies (Edwards *et al*., 2013; Shaw *et al*., 2015) but contrary to studies by Wan *et al.,* (2016) and Alaofe *et al*., (2022) which revealed that married patients were more likely to have better quality of life compared to unmarried patients. One plausible explanation could be supportive role that spouses play which would enhance patients' perception and awareness about the disease resulting in improved quality of life.

In this study, unemployment was associated with low quality of life among type 2 diabetic mellitus patients. The association was significant with a p-value of $0.004 < 0.05$ which is consistent with prior studies by Aschalew *et al.,* 2020 and Eljedi *et al.,* 2006. In this study, respondents who reported that they were employed were more likely to have good quality of life compared to those who were unemployed. This finding is in line with other studies from developing countries such as Iran (Abedini *et al.,* 2020). One plausible explanation for the similarity could be due to higher opportunity for the employed participants for having a better socioeconomic status which facilitates better health seeking behavior and capacity to afford disease expenses. However, some studies in developed countries have reported no difference (You *et al*., 2017).

Other researchers have indicated that employment is a determinant factor in the life style of the diabetic patients and is sequential to the amount of income earned by the individual which affect the life style adopted by the patients with regards to the illness (Al-Aujan *et al*., 2014; Saatei *et al.,*2010).

In the current study, increase in age was found to be significantly (P- value 0.023) associated with good quality of life. In concordance with previous studies, older patients are more likely to have good quality of life among type 2 diabetes mellitus patients (Iman *et al*., 2018) probably due to the fact that older patients are more likely to understand the disease resulting in good self-care and management. However, other studies have suggested that older patients have increased chance of poor quality of life (Ekback *et al.,* 2014). For example, a study reported that majority of the complaints and problems among type 2 diabetic patients were among those older than 50 years (Bukari *et al*.,2015) and is consistent with other studies (Lee *et al.,* 2012; Quah *et al*., 2011). One probable explanation could be due to different life styles and economic as well as social conditions in different societies which result in different quality of life (Muze *et al*.,2017). Further, other researchers have reported that elder diabetic patients are more likely to have poor quality of life. Part of the possible reasons could be that the older the patient the more likely to have had the disease for a longer period of time and increase the chances of a smaller pancreatic cell reserve and hence less insulin production and poorer blood glucose control. Also, older patients especially beyond retirement age in resource-poor settings have reduced financial capacity to fund the disease, including strict prescribed diabetic diet which is usually expensive, required drugs, and other logistical demands such as hospital appointments and transportation to the hospital to keep clinic appointments (Kumarul *et al*., 2010).

Patients with secondary education (p-value of 0.010) or tertiary education (pvalue of 0.008) were significantly more likely to possess a better quality of life than those with primary education level. This finding is in line with other studies which showed that higher education level had positive effects on improving the quality of life among diabetes mellitus patients with better disease control and treatment (Solli *et al.,* 2010;

Quah *et al.*, 2012). This finding has support in the psychological domain health model which postulates that the patient's own thoughts about body image and appearance, negative feelings, self-esteem and personal beliefs. Psychological well-being is the focus of intense research attention and is relevant to the experience. Furthermore, studies such as those by Burrough *et al*., (2014) and Al- Aujan *et al*., (2012) revealed that being educated is key to enhancing and improving health seeking behavior, ability to understand, appreciate and utilize diabetic education. This in turn is important to increase self-efficacy and coping skill of the diabetic patients and ultimately improve quality of life among diabetic patients (Burrough *et al*, 2014; Al- Aujan *et al.*, 2012).Others have suggested that the difference in the quality of life between patients with higher and lower education level is due to lack of sufficient knowledge regarding the disease and its potential health consequences.

With regards to support from other people, this study found that patients with support from other people had better quality of life compared with individuals who reported that they had no support. It was even more evident that those who live alone reported poor quality of life in comparison to those who lived with family or friends although it was not statistically significant. In this regard and considering the fact that diabetes mellitus is a lifelong disease and needs support for effective care and management, care and support is key for good quality of life (Katibeh *et al*., 2015).

Conversely, other studies have demonstrated that with or without support among diabetic patients showed no significant associations with quality of life (Lewis *et al*., 2020).

The results of this study indicated that respondents who exercised had significantly better good quality of life with a (P-value 0.023) than those who did not exercise. A similar study in Ethiopia (Aschalew *et al*., 2020), showed that exercising having a significant association with physical and psychological domains. Furthermore, studies in Nigeria and Canada recorded a positive impact that exercises have on the HRQOL of patients (Adeniyi *et al.*, 2015; Imaya *et al.*, 2011). Generally, diabetes mellitus patients are more likely to have weakness of the immune system and more vulnerable to various types of infections as revealed by Sepulveda *et al*., (2017). Also, the probability experiencing acute and chronic complications is high compared to the non-diabetic patients due to the illness' nature (Longman *et al*., 2013). Exercises among diabetic patients have been reported that could improve quality of life compared to their counterparts who do not exercise (Jing *et al.*, 2018).

In the present study, a history of longer than 5 years of diabetes mellitus was not significantly associated with poor quality of life. However, other studies such as those by O'Reilly *et al.*, (2011) and Madmoli *et al*., (2019) have reported that patients who have lived with the disease for longer than 5 years' experience poor quality of life. Furthermore, the older is someone the more significant, develops problems such as nephropathy, mobility difficulties and pain are increased (O'Reilly *et al.*, 2011; Madmoli *et al*., 2019).

In keeping with this study, several studies have reported non-significant association between quality of life and diabetes-related factors (i.e. duration of type 2 diabetes, insulin and oral hypoglycaemic agent usage, and blood glucose monitoring frequency). However, negative associations between quality of life and duration of diabetes mellitus is shown elsewhere (Shim *et al.*, 2012).

The study underscores the complex interplay of socio demographic and health-related factors influencing QOL in DM patients, emphasizing the need for tailored interventions and comprehensive healthcare approaches.

4.5 Summary of the Findings and Implications

The study aimed to explore the demographic characteristics and quality of life among Type 2 Diabetes Mellitus (T2DM) patients at Levy Mwanawasa University Teaching Hospital (LMUTH) in Lusaka, Zambia. A total of 158 questionnaires were distributed, with a response rate of 84.8%, resulting in 134 returned questionnaires.

Demographic Characteristics: The study participants had a median age of 57 years, with a majority being females (56.2%). Most participants were from high-density areas (70.7%), married (52.2%), had a secondary education level (52.2%), and were not primary breadwinners (57.4%). The majorities were referred to LMUTH (79.1%) and had support from others for their condition (85.5%). More than half lived within walking distance to LMUTH (51.5%), and 58.3% obtained diabetes mellitus drugs from LMUTH.

Quality of Life: The study found that 43.3% of T2DM patients had a low quality of life, while 56.7% reported a good quality of life.

Association between Demographic Characteristics and Quality of Life: The analysis revealed several associations between demographic factors and the quality of life among T2DM patients. Notably, patients with poor control of diabetes were significantly younger than those with good control. Females were more likely to have a good quality of life, and employment was associated with a higher likelihood of a good quality of life. Additionally, education played a role, with higher education levels linked to a reduced likelihood of poor quality of life. Patients who reported not exercising and those who did not receive diabetes mellitus drugs from LMUTH were more likely to have a poor quality of life.

Multivariable Regression Analysis: The multivariable regression analysis identified significant factors influencing the quality of life. Participants who were not employed were two and a half times more likely to have a poor quality of life. Older age was associated with a lower likelihood of poor quality of life. Those with secondary and tertiary education levels were significantly less likely to have a poor quality of life.

Implications: These findings underscore the importance of considering demographic factors in understanding the quality of life among T2DM patients. Employment status, age, and education level emerged as significant predictors, highlighting the need for targeted interventions to improve the well-being of diabetic individuals. Additionally, the study emphasizes the multifaceted nature of diabetes management, requiring a comprehensive approach that addresses both medical and socio-demographic aspects. Further research and tailored interventions can build on these insights to enhance the overall care and outcomes for T2DM patients at LMUTH and similar healthcare settings.

Recommendations

The study's recommendations for enhancing the well-being of Type 2 diabetic patients at Levy Mwanawasa University Teaching Hospital, Lusaka, Zambia include:

Multidisciplinary Care Approach

Implement a comprehensive, multidisciplinary care approach involving medical professionals, psychologists, nutritionists, and social workers to provide holistic support addressing both medical and psychological needs.

Patient Education and Empowerment

Develop tailored educational programs to empower diabetic patients with knowledge and skills for effective self-management, including diabetes care practices, healthy lifestyle choices, and stress management techniques.

Regular Quality of Life Assessments

Integrate routine assessments of health-related quality of life into patient care to track well-being, identify concerns, and customize interventions accordingly.

Community Support Programs: Establish support groups and community engagement initiatives to provide peer support, shared experiences, reduce isolation, and promote emotional well-being among diabetic patients.

Policy Advocacy

Advocate for policy changes prioritizing diabetes prevention, early detection, and accessible healthcare services. Collaborate with governmental and non-governmental organizations to raise awareness about diabetes and its impact on quality of life.

Education and Counselling Sessions

Introduce education and counselling sessions during clinic visits, especially for patients with lower education levels, highlighting potential dangers that may lead to poor quality of life and promoting awareness of protective measures.

Encourage Physical Activity

Encourage patients to engage in regular exercise, shown to be protective against low quality of life in diabetes. This could be emphasized during counselling sessions.

Financial Empowerment

For unemployed patients, encourage engagement in activities that can generate income to alleviate the financial burdens associated with managing diabetes as a chronic condition.

These recommendations collectively aim to improve the overall care, well-being, and quality of life for Type 2 diabetic patients, emphasizing a patient-centered and comprehensive approach to diabetes management.

Contribution of the study

This study makes a significant contribution to understanding the multifaceted factors influencing the quality of life (QOL) in diabetes mellitus (DM) patients at Levy Mwanawasa University Teaching Hospital in Lusaka, Zambia. By identifying specific determinants, including employment status, physical activity, and educational levels, the research offers insights into potential avenues for intervention and support. The study sheds light on the gender disparities in QOL, emphasizing the need for sex-specific approaches in managing DM. Moreover, the findings underscore the importance of social support networks and regular physical activity in enhancing QOL, providing valuable information for healthcare professionals and policymakers. The non-significant impact of longer DM duration challenges previous assumptions, contributing to the nuanced understanding of the relationship between disease duration and QOL. Overall, this study contributes to the development of targeted strategies for improving the well-being of DM patients in resource-limited settings like Zambia.

Ministry of Health Policy Formulation

Recommendation: Develop and implement policies that prioritize comprehensive diabetes care, emphasizing patient-centered approaches. Integrate mental health services into diabetes care policies to address psychological aspects affecting health-related quality of life. Establish protocols for regular HRQoL assessments within healthcare facilities.

Nursing Practice

Enhance diabetes-focused nursing training programs to include holistic care approaches,

emphasizing patient education, psychosocial support, and HRQoL assessment skills. Encourage collaborative care models, facilitating interdisciplinary communication for more comprehensive patient support.

Nursing Education

Recommendation: Integrate HRQoL assessment training into nursing curricula, ensuring that future nurses are equipped with the skills to address the holistic needs of diabetic patients. Emphasize cultural competence in diabetes care to enhance patient-centered approaches.

Nursing Research

Recommendation: Encourage and fund research initiatives exploring innovative interventions for improving HRQoL in Type 2 diabetic patients. Foster collaborative research efforts between nursing professionals, psychologists, and endocrinologists to gain a comprehensive understanding of factors influencing HRQoL.

Nursing Administration

Recommendation: Implement systems for routine HRQoL assessments as part of standard nursing care protocols. Allocate resources for continuous professional development on HRQoL assessment and intervention strategies. Establish support structures within nursing administration to address the psychosocial needs of nursing staff dealing with diabetic patients.

Recommendations for Ministry of Health, Hospital Management, and DHMT:

Ministry of Health

Recommendation: Develop a national diabetes strategy that includes HRQoL as a key outcome measure. Allocate resources for diabetes education campaigns, emphasizing the importance of holistic care. Foster collaboration with academic institutions for continuous research on diabetes care improvements.

Hospital Management (LMUTH)

Recommendation: Establish a dedicated diabetes care unit with a multidisciplinary team, including endocrinologists, nurses, psychologists, and dieticians. Implement regular training programs for healthcare staff on diabetes management and HRQOL assessment. Prioritize patient-centered care in hospital policies.

District Health Management Team (DHMT)

Recommendation: Implement community outreach programs for diabetes education and awareness. Establish diabetes support groups at the community level to provide ongoing support for patients. Collaborate with local organizations and NGOs to enhance resources for diabetes care at the community level.

These recommendations aim to create a more comprehensive and patient-centered approach to diabetes care, acknowledging the significance of health-related quality of life in the well-being of Type 2 diabetic patients at LMUTH and beyond.

Contributions of the study

This study on health-related quality of life (HRQoL) in Type 2 diabetic patients at Levy Mwanawasa University Teaching Hospital, Lusaka, Zambia makes unique contributions to the field. Firstly, it offers valuable insights into the specific factors influencing HRQoL in a Zambian healthcare context, addressing the cultural and contextual nuances that may impact patient well-being. Secondly, the study incorporates a multidisciplinary approach by considering psychological, social, and physical aspects of HRQoL, providing a holistic understanding. Additionally, it contributes to the development of targeted interventions tailored to the needs of the local diabetic population, potentially influencing healthcare policies and practices. By shedding light on the unique challenges faced by these patients, the study contributes to the broader conversation on optimizing diabetes care, both locally and in similar healthcare settings globally.

Further Research

Encourage further research to explore additional factors influencing health-related quality of life in Type 2 diabetic patients, such as cultural and socioeconomic aspects, and to evaluate the long-term effectiveness of interventions aimed at improving their well-being.

CONCLUSION

The present study showed that there was low quality of life among 43.3% of participants with type 2 diabetes mellitus at LMUTH. The results also showed that the low quality of life is associated with several socio demographic factors such as not employed and lack of exercises while secondary and tertiary education level, increase in age and those who self-reported that they had good management of their quality of life was protective.

Consequently, patient empowerment, starting with counseling and self-care education are needed to improve quality of life among patients at LMUTH. However, such programs should be targeted to diabetes mellitus patients who are younger, low education, not employed status and those who lack exercises. In conclusion, the evaluation of Type 2 diabetic patients' health-related quality of life at Levy Mwanawasa University Teaching Hospital in Lusaka, Zambia, has shown the complex connection between diabetes and patients' wellbeing. This study has shed light on the difficulties faced by these individuals and the effects of diabetes on their physical, emotional, and social aspects through a careful evaluation of numerous quality of life dimensions. In order to improve the entire quality of life for diabetic patients, the findings highlight the

significance of holistic care and treatments that target not just medical management but also psychological and social support.

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