

**ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE IN TYPE 2
DIABETES MELLITUS PATIENTS AT MOI COUNTY REFERRAL
HOSPITAL, TAITA-TAVETA COUNTY IN KENYA**

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DECLARATION AND APPROVAL

Declaration by the Student

I, Dredah Wughanga Mwadulo, a student at Mount Kenya University, hereby swear that the project in consideration is entirely original to me and has not been presented anywhere for any professional qualification;


Signature.....  Date: **24th May 2024**

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Approval by the Supervisors

I confirm that this study paper was submitted for examination with my approval as the university's supervisor;

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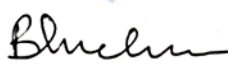
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DEDICATION

I dedicate this thesis to my spouse, Paul Muendo, whose unwavering support helped me finish writing it.



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I would like to say thank you to Dr. Nilufar for imparting the best research knowledge and abilities in me when she taught me research methodologies. Second, I'd like to thank Professor Bindu Madhavi and Ms. Beatrice Nkoroi, who served as my thesis advisers and whose unflinching guidance was crucial to its development. Lastly, I would like to say thank you to my spouse Paul Muendo for giving me the psychological support I needed to finish writing my thesis and to my colleague Mr. Stevenson Chea for helping with the analytical parts.



ABSTRACT

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. Although diabetes was once thought to be an affluent-only disease, it is now more commonly seen in low- and middle-income nations like Kenya. Non-transmittable diseases are becoming more and more of an issue in Sub-Saharan Africa as a result of changing lifestyle habits like smoking, inactivity, and poor diet. The study's goal was to determine which sociodemographic and health-related characteristics of the patients at Moi County Referral Hospital in Taita-Taveta County with T2DM (type 2 diabetes mellitus) were associated with Q.O.L. (quality of life), as well as how this condition affected the patients. Thus, the objectives of this study were to determine the Q.O.L. of the diabetics and identify the patient-related characteristics associated with the Q.O.L. The study adopted the ADDQOL (audit of diabetes-dependent quality of life) tool with 19 items, version 2006. The tool was developed by Professor Clare Bradley in the English version; the researcher did not make any alterations to the tool, 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 (77 percent) of the study's participants reported that living without diabetes mellitus would improve their HRQoL (health-related quality of life), whereby they had a mean quality of life score of -1.88, roughly corresponding to "quality of life would be much better in the absence of diabetes" at a score of -2. According to the AWI (average weighted impact) score of -4.48, type 2 diabetes mellitus had an unfavourable impact on the patients' QOL in terms of their health. The researcher used logistic regression to associate health-related characteristics such as foot ulcers or sores ($p = 0.005$; a OR = 7.348) and numbness or pain in hands, legs, or feet ($p = 0.001$; a OR = 0.155) with low quality of life. The other patient characteristics (sociodemographic) were not associated with quality of life. The 19 domain-specific elements were scored by the study participants, and "sex life" was considered to be the most essential and negatively impacted WI (weighted impact) score of -5.14. A higher score value in the impact score per life aspect (weighted impact) indicated that the life aspect of a patient was negatively impacted by type 2 diabetes, and at the same time, it was considered to be the most important life aspect for the patient. In summary, this study showed that the general HRQoL (health-related quality of life) of type 2 diabetic patients in Taita-Taveta County's MCRH (Moi County referral hospital) was low. Although the majority of research found no association between socio-demographic factors and health-related quality of life, it is still important to focus on the often-overlooked health-related characteristics of diabetic patients and how they affect quality of life.

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LIST OF ACRONYMS AND ABBREVIATIONS

a OR	-	Adjusted Odds Ratio
A.D.D.Q.o. L	-	Audit of Diabetes-Dependent Quality of Life
A.W.I	-	Average Weighted Impact
ANOVA	-	Analysis of Variance
B.M.I	-	Body Mass Index
D.M	-	Diabetes Mellitus
DALYs	-	Disability-adjusted life years
H.I.V	-	Human Immunodeficiency Virus
H.R.Q.O.L	-	Health-Related Quality of Life
Hb A1c	-	Hemoglobin A1c
I.D.F	-	International Diabetes Federation
M.C.R.H	-	Moi County Referral Hospital
N.C.D	-	Non-Communicable Disease
N.H.I.F	-	National Hospital Insurance Fund
OR	-	Odds Ratio
Q.O.L	-	Quality of Life
S.P.S.S	-	Statistical Package for Social Sciences
SD	-	Standard Deviation
T.2.D.M	-	Type Two Diabetes Mellitus
W.H.O	-	World Health Organization
W.I	-	Weighted Impact

CHAPTER ONE

INTRODUCTION

The context of the research, the statement of the problem, the study's purpose (general and particular objectives), the research questions, the study's justification, its scope, its inclusion and exclusion criteria, and its restrictions and delimitations are all included in this chapter.

1.1 Background of the Study

Insufficient insulin excretion by the pancreas or human cell resistance to the insulin that the pancreas generates are the two conditions that lead to long-term, progressive, non-transmittable diabetes mellitus. Diabetes has been linked throughout time to lifestyle changes like obesity, bad eating, and inactivity, which can result in problems like cardiovascular risks and kidney issues. In consequence, this lowers the standard of living and life expectancy of diabetics. Diabetes has socioeconomic implications that extend beyond the person and have an impact on families, societies, and the nation's production. In low- and middle-income nations, diabetes coexists with other illnesses such cardiovascular diseases. Being healthy is being complete in terms of one's physical, emotional, and social well-being, not only being free from illness or infirmity. It is necessary to measure improvement in the degree to which an individual's wellbeing has been impacted by a condition in order to determine whether they are healthy overall (World Health Organization, 2019a).

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 is probably going to rise by 143%. (IDF, 2019). Globally, more than 280 million people have diabetes mellitus, and by 2030, that 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 (Mwavua et al., 2016).

The audit of a person's quality of life focuses on the social, bodily, and psychological facets of their wellbeing that are impacted by their beliefs, aspirations, and life experiences. Therefore, it is important for healthcare professionals to understand how a chronic illness like diabetes affects the physical, social, and emotional aspects of a patient (Gebremedhin et al., 2019). Additionally, DM (Diabetes mellitus) has negative consequences on academic performance, life expectancy, social life, and quality of life, and the current approach to treating diabetic patients focuses on pharmaceuticals. (Gebremedhin et al., 2019). Evaluation of well-being is becoming an important outcome indicator for chronic illnesses (Daya et al., 2016).

Researchers and professionals in the field of healthcare view this assessment as a sign of how well health treatments and treatment plans are working as well as how much of impact chronic diseases have on patients' lives. In addition to the devastating effects of diabetes mellitus, individuals with DM are also at risk for premature aging, inactivity, and weight gain, all of which are detrimental to their QOL(quality of life) (Didarloo & Alizadeh, 2016). Most of the literature on this topic comes from developed nations as opposed to low- and middle-income nations, where little is known. Additionally, industrialized nations provide better healthcare than low- and middle-income nations, where diabetes impairment is linked to other morbidities (Rwegerera et al., 2018).

The World Health Organization (WHO) reports that diabetes mellitus is a significant contributor to renal failure, cardiac arrests, strokes, lower limb amputations, blindness, and heart attacks. According to WHO data, middle- and low-income nations have seen an increase in its prevalence that is more rapid. According to the 2015 STEPwise study

for noncommunicable illnesses, the prevalence in Kenya was 3.3 percent and predicted a rise to 4.5% by the year 2045. But two-thirds of diabetes may go misdiagnosed. The Ministry of Health in Kenya and partners are working with WHO Kenya to develop guidelines and standards for diabetes diagnosis and care to halt the rising trend. They are also raising public awareness of the disease (World Health Organization, 2019b). 5.3 percent of people in Kenya have type 2 diabetes, according to a recent survey. According to reports, higher age, family history, residing in cities, and being overweight or obese are all risk factors for T2DM and hypertension in Kenya (R. S. Mkuu et al., 2019). According to a report of Taita Taveta county in the year 2019, at 30-40% diabetes mellitus was the leading etiology 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). The results of this study can improve the health of Taita-Taveta County residents who have diabetes mellitus because health care providers will pay more attention to their social and emotional well-being, co-morbidities' effects on 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. As a result, their care can be individualized.

Both general and disease-specific measures were developed to measure patients' health-related quality of life (HRQoL). Professor Bradley's assessment 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 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
- Influence of diabetes in that area of life, whether favorable or unfavorable.
- 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 to life quality (Bradley et al., 2018).

The purpose of the study was to determine the influence of type 2 diabetes mellitus on patients at Moi County Referral Hospital (M.C.R.H) in Taita, Kenya, as well as the sociodemographic and disease-related features that were associated with patients' quality of life.

1.2 Statement of the Problem

The County of Taita-Taveta comes in as the second county in the coastal region after Mombasa County (48.2%), with overweight and obese women aged 15-49 years at 45%. This has been attributed to a sedentary lifestyle (Purdy et al., 2020). Researchers in Kenya have shown that being obese and overweight are linked to a greater risk of non-transmittable ailments such as heart ailments, cancer, and type two diabetes mellitus (R. Mkuu et al., 2021).

According to a report of Taita Taveta county in the year 2019, at 30-40% diabetes mellitus was the leading etiology of most disability and death combined amid 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.

1.3 Objectives

1.3.1 Broad Objective

To measure the health-related quality of life and the patient characteristics related to type two diabetes mellitus patients at Taita-Taveta's MCRH.

1.3.2 Specific Objective

1. To determine the socio-demographic characteristics associated with the health-related quality of life among type two diabetes mellitus patients at Moi County referral hospital.
2. To determine the health-related characteristics associated with the health-related quality of life among type two diabetes mellitus patients at Moi County referral hospital.
3. To determine the influence of type two diabetes mellitus on the health-related quality of life of patients at Moi County referral hospital.

1.4 Research Questions

1. What are the socio-demographic characteristics associated with the health-related quality of life among type two diabetes mellitus patients at Moi County referral hospital?
2. What are the health-related characteristics associated with the health-related quality of life among type two diabetes mellitus patients at Moi County referral hospital?
3. What is the influence of type two diabetes mellitus on the health-related quality of life of patients at Moi County referral hospital?

1.5 The Study's Justification

The patients were able to recognize essential areas of their lives thanks to the assessment of diabetes dependent quality of life (ADDQoL) tool, which also made clear how crucial each aspect of life is to the patients' quality of life. The researcher used a diabetic-specific instrument in this study, which is a tailored measure. By describing the precise effects that DM (diabetes mellitus) has on a person's daily living and wellbeing, this served to highlight the subtle but substantial clinical variances. The study's findings will be beneficial to health care professionals who will focus not only on patients' bodily functioning but also on their social and psychological well-being, co-morbidities' effect on a person's 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. As a result, their care can be customized.

1.6 Study Scope

The purpose of the investigation was to look into how patient characteristics of T2DM patients influence their QOL. In addition, whether the patients have low quality or high quality of life. The research investigation was carried out among type 2 diabetic patients visiting the outpatient clinic at the Moi County referral hospital in Taita Taveta County for follow-up clinic. Along the congested Nairobi-Mombasa highway, in Voi town, is the Moi County referral hospital. It is the primary referral facility in the County, receiving patients from outlying facilities within Taita-Taveta, and has a bed capacity of 112. Every Friday of the week, a diabetic clinic is held, seeing a total of 94 people a month. Therefore, any diabetic patient who sought healthcare at the diabetic clinic was recruited into the study. The data collection period took 2 months from July to August 2022 where 165 patients constituted the sample size. This research adopted Myra Levine's conservative model that looked into how patient care can be individualized depending on the patient's needs regardless of whether the patients have similar socio-demographic or health-related characteristics.

1.7 Inclusion Criteria

1. A patient who has been given a diagnosis of type 2 diabetes mellitus using the diagnostic criteria used in the research facility.
2. A type 2 diabetic patient who is at least 18 years old and willing to participate in an interview.

1.8 Exclusion Criterion

1. A person with type 2 diabetes who has had the disease for less than six months after being diagnosed.

1.9 The Study Limitations

1. Recall bias: Participants may not accurately recall past behavior or events, or they may 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.
2. The use of a cross-sectional research approach revealed a correlation between the variables but no causal associations.
3. 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.

1.10 Operational Definition of Key Terms

Health-related quality of life- the degree to which a person estimates how much a disease has impacted his or her wellbeing.

Diabetes mellitus- a metabolic condition brought on by inadequate insulin hormone synthesis or decreased sensitivity of human cells to insulin.

Insulin- a human hormone secreted by cells in the pancreas that aids in regulating blood sugar levels.

Life Domain- refers to the various facets and experiences that a person takes into account as they get older and mature.

Comorbidity- refers to the simultaneous occurrence of many diseases in a single patient, whether the disorders are linked or unrelated in nature.

Non-communicable disease- refers to illnesses that cannot be spread from one person to another.

Audit of Diabetes Dependent Quality of Life survey- a study was done on people who have diabetes mellitus to see how much it has changed patient outcomes.

Morbidity- relates to the prevalence of an illness or its symptoms in a certain population.

Mortality- refers to the likelihood that a person will die from a disease

Occurrence- characterized as the occurrence of illness cases in a group at a certain time or point

Socio-demographic characteristics- the multiple social and demographic traits that a community or group shares

Health-related characteristics- refer to disease-related traits that control a population's or group's clinical outcome.

DALYs- refers to a summation of years of life lost due to premature death and years lived with disability due to the prevalence of cases of a disease in a population.



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The occurrence and burden of diabetes mellitus, patient characteristics related to quality of life in type 2 diabetes mellitus, and quality of life and diabetes mellitus are all covered in this chapter's literature review.

2.1 Empirical Literature

2.1.1 Prevalence and Burden of Diabetes Mellitus

A disease of major danger to growth and health globally in the twenty-first century is diabetes mellitus (DM). Early death, disability, and medical costs are significantly impacted by diabetes mellitus and its complications. Including 22.0 million undiagnosed cases, the incidence of DM in Europe is anticipated to be 8.8% of the adult population (58.0 million) by 2045 and surpass 66.7 million (Levterova et al., 2018). A long-term chronic disease called diabetes mellitus has a significant effect on people's lives, families, and communities all across the world. Globally, it was predicted that diabetes mellitus will be responsible for almost 4 million fatalities by 2017. In terms of the cost of treating diabetes mellitus, this has an economic impact on the nations. Nearly half a billion persons aged 20 to 79 had diabetes in 2019, which is an increase of about 60% over the previous ten years. From 2009 to 2019, there was an increase of more than 200 million people (Saeedi et al., 2019). Its prevalence was estimated to be 366 million in 2011 by the IDF (International Diabetes Federation), and by 2030, this figure is predicted to double. Furthermore, type two diabetes mellitus is seen to be more common than type one diabetes mellitus globally. Both type one and type two diabetes mellitus are known to worsen a patient's physical and social health (Gillani et al., 2019). According to

Ababio et. al. (2017), some diabetic individuals may have factors that influence their dietary modifications, knowledge related to diabetes, choice of treatment, and adherence to a recommended treatment regimen which may lead to treatment dissatisfaction thus they need to be addressed. Furthermore, social and material lack is assumed to be directly related to the prevalence and burden of diabetes mellitus, and is associated inversely with health status. Change in lifestyle, sedentary lifestyle, and change in eating patterns coupled with a higher life expectancy of the population has contributed to the elevated risk of chronic diseases such as DM, cardiovascular diseases, and high blood pressure. In Latin America, diabetes mellitus prevalence has risen drastically making it of public health importance (Corrêa et al., 2017).

Diabetes and its side effects can have a significant monetary effect on both systems and people, as well as early mortality and disability. When depending on physiological measures, the opinions and perceptions of patients are frequently overlooked. Additionally, reliable predictors of death and morbidity are psychological and social factors. In the presence of these additional characteristics, the QOL can be employed as an outcome measure (Lygidakis et al., 2021). By the year 2030, WHO (World health organization) estimates that T2DM (type two diabetes mellitus) will be the 7th leading etiology of demise. Moreover, in the United States, mortality due to type two diabetes is double that of individuals of the same age without diabetes mellitus type two. In Indonesia in both urban and rural settings, this type of diabetes has rapidly increased amongst the population over the past years. In the year 2011, there were approximately 7 million type two diabetes cases reported which increased to 10 million in the year 2017 (Arifin et al., 2019).

A study by Atun et. al., (2017) found that controlling diabetes mellitus and its predisposing factors is realistically achievable and affordable. Nevertheless, managing

its problems needs specialized care and highly skilled healthcare professionals, which raises the cost of therapy (Atun et al., 2017). In Europe an estimated 58 million adults of the population which is inclusive of 22 million unidentified cases. This is estimated to be over 66 million by the year 2045. In Bulgaria, an increase in overweight and obesity among the population has led to an increased incidence of diabetes mellitus (Levterova et al., 2018). In Brazil, the occurrences of diabetes mellitus among the aged was ranging from 18% to 23%. This coupled with the expense to control and treat diabetes mellitus has led to a detrimental effect on the quality of life among the elderly (Lima et al., 2018). In a study done in Vietnam, there was a substantial rise in the prevalence of diabetes mellitus for ten years. That is from the year 2002 from 2.7% to 5.4% in the year 2010. Furthermore, previous studies indicate a significant burden that diabetes mellitus imposes on patients (Pham et al., 2020).

In India a shift from outdated to contemporary lifestyle led to the intake of diets rich in fats in combination with mental stress, resulting in illnesses like diabetes mellitus (Verma & Dadarwal, 2017). In addition, economic advancement, industrialization, and urbanization led to a change in lifestyle leading to a rise in lifestyle-associated diseases. Less physically involving jobs (manual jobs were slowly replaced with office jobs) while outdoor games among children were replaced with indoor games that require less physical effort and exercise. This ultimately led to the emergence of lifestyle diseases like hypertension and diabetes mellitus (Verma & Dadarwal, 2017).

In Poland about 9% (3.5 million) of the inhabitants had diabetes whereby at least two million had type 2 diabetes and at least 180,000 had type 1 diabetes (Bąk et al., 2019). Complications due to diabetes have led to increased hospitalization which has affected the quality of life and imposed a burden on hospital care expenses. Nephropathy, neuropathy, and retinopathy just to mention a few have a physical and emotional effect

on the well-being of individuals leading to conditions like depression, low- self-esteem, etc. (Zurita-Cruz et al., 2018).

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. The enormous financial, treatment, social, and mental burden that type 2 diabetes mellitus places on clients, their relatives, healthcare professionals, and community at large makes it a serious public health concern (Al-Matrouk & Al-Sharbati, 2022). The world's lowest age-adjusted diabetes prevalence is found in Sub-Saharan African nations, where it is 3.9 percent. However, these nations are thought to have the greatest percentages of undetected cases (regional average: 59.7%), and by 2030, incidence is expected to increase by 48%. Additionally, there are higher diabetes-related complications in the area (Lygidakis et al., 2021). The complications of diabetes mellitus are currently a problem for the health care systems in the Sub-Saharan region. According to the W.H.O, there are deficiencies in some areas of the systems required to manage diabetes mellitus effectively (Atun et al., 2017). These deficiencies include a lack of monitoring and diagnostic equipment, a dearth of healthcare professionals with the necessary training, a shortage of medications, and a dearth of illness registries. Due to these deficiencies, many patients fail to complete the disease management process, either because they are not recognized or because they are detected but do not receive the necessary management and therapy (Atun et al., 2017). In addition, non-communicable diseases are rapidly displacing communicable illnesses as the main etiology of demise in the Sub-Saharan region. Due to the problems of an increased load of infectious and non-infectious diseases, this region comprises the majority of Africa's least developed nations (Atun et al., 2017). DM is a disease linked to high morbidity and mortality rates, and is of global health importance.

In Botswana, the incidence rate among adults aged between twenty to seventy-nine years is 52 per 1000 people whereby at least 30% per 1000 remain undiagnosed (Rwegerera et al., 2018).

According to the W.H.O, 3.3 percent of Kenyans have diabetes mellitus, and by 2045, that figure is expected to increase to 4.5 percent. Two-thirds of diabetic patients in Kenya go undiagnosed due to widespread ignorance, which presents a significant challenge to the medical community. The nation's efforts to combat and perhaps eradicate diabetes are hampered by a large number of undiagnosed diabetics. With 460 diabetic cases per 10,000 people, Kenya is the 31st most diabetic-affected nation in Africa according to the IDF (Katambo, 2021). In 2015, there were over 8,000 diabetes-related deaths in Kenya, with most of these occurring in those under 60. A healthcare system that is already underdeveloped is dared by the rise of non-communicable diseases like diabetes to adapt to the various needs of both severe and long-term diseases (Shannon et al., 2019). Routine diabetic care procedures include a wholesome diet, frequent blood glucose and monitoring blood pressure, a regular supply of insulin or oral hypoglycemic drugs, frequent exercise, as well as foot and eye care. However, many diabetics struggle to receive these treatments. This is a result of the obstacles to care that may include the accessibility of monitoring and diagnostic testing, the distance to the healthcare institution, the cost of medications, and the inadequate capacity of the health system (Shannon et al., 2019). A neglected form of diabetes mellitus, estimated to be 2-3 percent higher than the national survey on the condition's prevalence among Kenyans, existed, according to recent research, in rural Western Kenya. Additionally, the study noted that diabetes was not recorded as the primary etiology of death in cases where complications from diabetes had occurred in the area (Purdy et al., 2020).

2.1.2 Patient Characteristics Related to Quality of Life in Diabetes Mellitus Type 2

2.1.2.1 Socio-demographic characteristics

Age

Particularly in older people, DM has a bodily and emotional impact that lowers one's autonomy, self-confidence, and self-perception. As a result, these people believe that they are incapable of achieving their goals and living fulfilling lives (Lima et al., 2018). Lima et al. (2018) found that older adults with diabetes had higher quality of life ratings in the emotional domain compared to other domains. In spite of this being the case, a person's ability to adapt to a chronic illness is influenced by their mood. This is especially true when an elderly patient is informed from the start of treatment that there is no remedy for diabetes mellitus. Additionally, being cautious about unforeseen health issues might lead to unpleasant attitudes and expectations for the future (Lima et al., 2018). This investigation also demonstrated that older diabetics with more than ten years of disease had more physical restrictions, more pain, and more discomfort, all of which had a negative impact on their daily activities. This intensified negative emotions like grief, loneliness in social situations, and anxiety of passing away. These patients were consequently less physically active and more socially isolated (Lima et al., 2018). Moreover, these elderly patients felt embraced socially since the nurses who cared for them conducted conferences, tours, and opportunities to interact socially with friends to promote their participation in social groups. This demonstrated satisfaction among the patients. (Lima et al., 2018). An investigation conducted in China found that factors such as gender, regional economic development, and marital status all consistently affected the EQ-5D scores of diabetic patients (Lu et al., 2017).

In a Chinese research, where the EQ-5D score and EQ-5D VAS were both negatively correlated with age, it was considered that elderly individuals could not care for

themselves, are in pain, but are content with their current state of health(Lu et al., 2017). However, study respondents aged 50-59 had a poorer QOL score than the older persons, who had a higher score. This was explained by the fact that, in contrast to senior diabetic patients, younger diabetics were more concerned about how having diabetes will affect their lives and future (AL-Mahmood et al., 2018).

In a study done in Poland, the young patients had a positive attitude towards diabetes type two compared to the older patients. This was related to a decline in functioning capacity with advancement in age and also the young patients had more years ahead of them to look up to, unlike the older patients who felt that they have fewer years to live now that they had a chronic disease to deal with (Rogon et al., 2017).

According to research by Alshayban and Joseph (2020), type two diabetes mellitus patients' quality of life was thought to be affected by their age. Compared to younger responders aged under 50, where roughly 16 percent were considered to have poor quality of life, 30 percent of senior participants aged 50 and beyond had such a condition (Alshayban & Joseph, 2020). However, despite a decline in physical health as people age, a study from South Africa found no connection between age and HRQoL. This proved that elderly are not necessarily idle physically (Daya et al., 2016).

An Ethiopian study indicated that age was related to reduced quality of life due to physical changes and increased risk of comorbidities that come with advanced age. The American diabetes association also indicated that diabetes coupled with changes that come with aging like bones, joints, muscle, and ligament atrophy aggravates the condition(Aschalew et al., 2020).

Gender

Rogon et al (2017). investigation investigating the alleged quality of life and acceptance of type 2 diabetes in Poland found that the females felt an adverse effect on their quality

of life by diabetes. Aspects affected included physical appearance, motivation, self-esteem, holiday, and independence. This was because it was assumed that the women focused more on appearance, achieving life goals, and being independent. Moreover, the women had lower self-esteem and motivation compared to men of a similar age-group (Rogon et al., 2017). This study's findings are comparable to those of a study conducted in Lebanon, which found that male diabetics enjoyed an improved quality of life than their female counterparts. The females experienced more mental problems like anxiety and depression, they also had less physical activity. On the other hand, their male counterparts showed satisfaction with their diabetes treatment and were more involved in leisure activities (Verma & Dadarwal, 2017).

A study conducted in China found a significant gender disparity in quality of life in relation to health. Females had a lower quality of life score than the males, on average. Women typically spend more time inside performing housework, which could result in less physical activity and a poor diet. This discrepancy may be caused by disparities in conduct in daily life between men and women in the community. Otherwise, females were more susceptible to anxiety or depression (Lu et al., 2017). Indonesian women had lower quality in comparison to their male counterparts because women were more probable to report dissatisfaction with diabetes treatment, depression, and anxiety symptoms, and less likely to cope with the condition (Arifin et. al., 2019). Furthermore, women who were housewives had lower quality of life compared to those working since it was assumed that having T2DM in addition to house chores and taking care of the family meant an added burden in fulfilling these household tasks (Arifin et. al., 2019).

According to a study done in Brazil, diabetic women sought health services more than diabetic men. Despite this, the women presented with the lowest score in their quality of life compared to the men. This may have been due to the many responsibilities that

women have in caring for the family that prevented the women from participating in physical activities that are beneficial in controlling diabetes mellitus (Correa et. al., 2017).

QOL was gendered in favor of the male participants in the Middle East (Saudi Arabia) due to the fact that the severity of health status among the female participants was 5.5 times greater than that of the male participants. This was linked to the fact that Arab men and women have different societal norms and that males participate in greater physical exercise than women (Alshayban & Joseph, 2020).

According to research done in Malaysia in 2018, despite having a higher prevalence of poor physical functioning than males, women had significantly higher/better emotional health and health perception ratings. In contrast, men (43.1%) reported less pain than the women (64.9%) (Gillani et al., 2019). The HRQoL among diabetic women and its correlations also showed that, regardless of age or gender, study participants with physical disability tended to place higher weight on health-related aspects. Diabetes exposure/duration, comorbidities, glycemic control (HbA1c), and physical functioning were among the health-related characteristics. Compared to the men, the physical functioning of the women was more affected. Women with longer exposure to diabetes and more comorbid illnesses performed worse than men in the HRQOL domains of health perception, role functioning, and social functioning (Gillani et al., 2019), whereas women with shorter exposure to diabetes had an average age that was higher than that of males (years).

Poor HRQOL was shown to primarily impair the bodily and psychological well-being of diabetic patients in a study conducted in Botswana on HRQOL and its associated components. Poorer physical functioning ratings were also correlated with being female

and being older. Additionally, scores for physical and mental functioning decline the more diabetic problems there are (Rwegerera et al., 2018).

Level of education

Women with diabetes who could read and write had a higher quality of life than their illiterate counterparts, according to Iranian research. The educated women had greater access to knowledge and were more inclined to change their lives to comply with the healthcare recommendations offered to them, which helped to explain this. Literate women were more empowered with knowledge of diabetes mellitus type two and thus were able to make informed decisions regarding their health status (Didarloo & Alizadeh, 2016).

In a study conducted in China, the link between education level and QOL scores were inverted U-shaped, with illiteracy receiving the lowest ratings and secondary or high school receiving the highest. For persons with good education, adopting a healthy lifestyle and making an attempt to better their own well-being may result in worry and psychoneurosis. People with low levels of education tended to be from underdeveloped areas. They might not have received the proper medical care because of a lack of awareness (Lu et al., 2017).

In a study done in Indonesia study participants who reported an advanced level of education (university) had a high QOL than those who studied up to the high school level. This was maybe due to the association of a high level of education with a better understanding of diabetes treatment regimen, a positive attitude towards diabetes mellitus treatment, and the effect of complications related to the condition (Arifin et. al., 2019). This study's findings are comparable to those of a study conducted in Ethiopia, which showed that individuals with a minimum of a high school education outperformed those with less education in terms of their Q.O.L assessments. This could be explained

by the fact that education is crucial for comprehending self-care management, the impacts of diabetes, and greater awareness of the difficulties linked to the condition. Therefore, participants who had an education level lower than high school were linked with poor scores in their Q.O.L assessment (Aschalew et al., 2020).

Higher education levels were associated with better results on the both "energy and mobility" and "social burden" measures in a Rwandan study. It is reasonable to believe that education, together with the person's financial position and access to care, is a key factor in self-management and personal-care of the disease (Lygidakis et al., 2021). The results of this investigation are in line with those of Nyanzi et al (2014) study, which stated that patients with greater levels of education had an improved quality of life. This can be as a result of their ease in reading and comprehending the negative impact that diabetes mellitus has on their health. They can therefore adapt to the lifestyle modifications and treatment plans that the disease requires. Additionally, knowledge determines if a person will comprehend how to control their diabetes on their own (Nyanzi et al., 2014). According to a related study conducted in Ethiopia, people with higher levels of education may be more knowledgeable about their condition, treatment plans, and complications caused by diabetes. As a result, individuals might be more diligent about managing their condition and taking their medications, which would improve their HRQoL (Gebremariam et al., 2022). Despite the socioeconomic cost of diabetes mellitus and patients' significant involvement in decision-making regarding their health state, research conducted at Kenyatta National Hospital in that country found no correlation between education level and quality of life (E.K et al., 2014).

Marital Status

Research conducted in Malaysia found that married individuals had poorer quality-of-life ratings than single participants, suggesting that peripheral diabetic neuropathy has a

greater effect on the social health domain among diabetic in-patients. This was accounted for by the fact that diabetics tend to engage in less sexual activity overall (AL-Mahmood et al., 2018). There was a trend toward improved physical and mental health among Botswana's singles, but the improvement was not statistically significant in terms of quality of life (Rwegerera et al., 2018). This study's findings are comparable to those of a study among non-insulin-dependent diabetic patients at Kenyatta National Hospital, which found that having a spouse or not had no effect on those patients' Q.O.L in terms of their health (E.K et al., 2014).

When compared to married patients, a Kuwaiti study found that divorced patients had poorer social relationships. This can be explained by a lack of close personal interactions and the social support and participation that the spouse gave; as a result, the death of the spouse might worsen the QOL for diabetic patients. Additionally, patients with university education had worse social relationships than patients without education. This may be explained by patients with high levels of education having overly demanding work schedules that leave little time for socializing (Al-Matrouk & Al-Sharbaty, 2022).

An Ethiopian study illustrated that marital status was related to how individuals socially interacted. The singles had a lower score compared to those who were married. This may be because those who were not married received less social support (Aschalew et al., 2020).

Health-care funding

Healthcare finance is important for diabetes patients because it affects their ability to pay for medications, the expense of doctor appointments, and the affordability of a restricted diet. Diabetes-suffering Iranian women's income was correlated with their HRQOL. Women with enough incomes or who received assistance in getting better health services and care were less concerned about the expense of care. A beneficial economic situation

was linked to a fulfilling income, which improved/bettered one's quality of life (Didarloo & Alizadeh, 2016).

In the less economically developed regions, the EQ- 5D ratings were much lower, according to a Chinese study. In their daily lives, the vast majority of individuals were located in less developed areas engaged in painful and uncomfortable hard labor or farming. Depression which was caused by a lack of income, and poor medical treatment may also have contributed to low quality-of-life ratings (Lu et al., 2017).

According to a South African study, there was no connection between a diabetic's income source and their QOL. With the intention of determining the respondents' socioeconomic position, the researcher looked at their employment, which occasionally may not be a reliable indicator of their financial situation (Daya et al., 2016).

2.1.3 Health-related characteristics

Duration of living with Diabetes mellitus

The longer women are exposed to diabetes and have uncontrolled blood glucose levels, the lower their quality-of-life scores on aspects of their impression of their health, social functioning, and bodily functioning, according to research by Gillani et al. (2019) done in Malaysia. This study concluded by showing that women's physical health was worse than the men.

According to Didarloo & Alizadeh's (2016) research, a longer duration of the condition was related to lower quality of life since the rates of complications related to diabetes increased over time, adversely affecting QOL.

There is a substantial link amid the patients' satisfaction with their life achievements and their participation in social activities, according to a Brazilian study on the Q.O.L and time since diagnosis among elderly diabetes. This may be due to the disease's severity

and its complications, which make it difficult to engage in enjoyable activities and raise worry about the future (Lima et al, 2018). Therefore, it is critical that medical personnel are aware that people with diabetes mellitus have a social burden in addition to the disease, which can be damaging to their overall quality of life (Lima et al, 2018). As stated by Lima et al., elderly diabetics who had been ill for longer than 10 years experienced more physical limitations, pain and discomfort that was more intense and had an unfavorable impact on their daily lives, as well as increased emotions of social isolation, sadness and worry about dying. These patients were consequently less physically active and more socially isolated (Lima et al, 2018).

Another study done in Brazil revealed that individuals diagnosed with diabetes mellitus type two less than 13 years ago presented with worse QOL compared to those who were diagnosed with the DM more than 13 years. This may be due to the individuals with a short duration of living with diabetes suffering immediate consequences like acceptance of treatment regimen, self-care and control, and comorbidities. It is therefore important that individuals with diabetes are given education on diabetes to equip them with specific skills to help them curb diabetes and thus improve their quality of life (Correa et. al., 2017).

In research done in Rwanda, when patients with diabetes for less than five years (mean=3.62, standard deviation (SD)=1.37) were compared with diabetics who had the illness for more than five years, individuals who had survived with diabetes for >5 years reported feeling that their condition was more severe (mean=4.04, SD=1.41) (Lygidakis et al., 2021). This study's findings are comparable to an Ethiopian study, where the length of diabetes mellitus and its consequences were both statistically significant. Patients with diabetes for <5 years had better scores on the Q.O.L scale than patients with diabetes for five years or more. However, there was no discernible change in the mean HRQoL

(Bodily Health and Psychological Health summary) score among diabetics who had the illness for six to ten, eleven to fifteen, and more years (Degu et al., 2019).

Presence of Comorbidities

A substantial body of research demonstrates how diabetes, its significant effect on self-care, ailment management, behavior change, along with its acute and chronic consequences, and the existence of long-term medical disorders, impairs quality of life. Comorbidity has been shown to have a detrimental impact on diabetics' quality of life, and this impact can be categorized as additive, synergistic, or subtractive. Improved QOL and reduced adverse effects such as decreased eyesight, retinopathy, nephropathy, leg & knee amputations, and mental ailments can be achieved through care coordination, prompt diagnosis, secondary prevention, and person-centered methods. (Lygidakis et al., 2021). There is a clear association between these patients' happiness with their life achievements and their social participation, according to a research that was conducted in Brazil that examined the quality of life and length of time after diagnosis among senior diabetes. The study was conducted in Brazil. This was linked to the disease's severity and complications that make it difficult to complete enjoyable tasks, causing concern about the future (Lima et al., 2018). Therefore, it is crucial that medical practitioners are aware of the fact that people with diabetes mellitus bear the burden of their illness in addition to social burden which may be detrimental to their overall Q.O.L. In addition, Lima et al. (2018) found that over 17% of the elderly individuals had foot sores, suggesting a decline in autonomy and social engagement due to mobility limitations caused by vascular or neuropathic pain.

According to a study employing the SF (Short form) 36 questionnaire on quality of life, diabetic retinopathy had no influence on a patient's quality of life when considering how diabetes complications affected that QOL in terms of health. However, it was found that

patient's Q.O.L was suggestively impacted by vision loss caused by diabetic retinopathy in a study that examined the impact of diabetic retinopathy on Q.O.L using the 26-domain retinopathy dependent quality of life (QOL) questionnaire (Emade et al., 2023). Study participants in India completed the National Eye Institute's 25-item Visual Function Questionnaire to assess their overall health and vision-related quality of life, QoL was lower in diabetic retinopathic respondents than in non-diabetic retinopathic respondents (Emade et al., 2023).

In a Mexican study, acute myocardial infarction (AMI) and cerebral vascular accident are both 2- to 4-fold more likely to occur in patients with diabetes mellitus type two, along with diabetic foot syndrome, microvascular consequences include neuropathy, retinopathy, and nephropathy. Individuals with diabetes mellitus type two who are afflicted by these issues experience mental and physical effects that change their personal and family well-being. Diabetes mellitus can have an adverse effect on mood and self-esteem because of the chronicity of the condition and the challenges in managing it. In addition, dietary limitations and sexual comorbidities can generate disputes and have a poor impact on the patient's Q.O.L (Zurita-Cruz et. al., 2018).

An Australian study indicated that the respondents who had both diabetes and depression had poor Q.O.L compared to non-diabetics. This is because the disease posed psychological constraints, anxiety on loss of their jobs, exhaustion, lack of recall, loss of motivation to better oneself, and reduces social interaction (Verma & Dadarwal, 2017).

A study carried out in Saudi Arabia revealed that just 31% of those with type 2 diabetes reported having no pain or discomfort, whereas 69 percent of those with type 2 diabetes had an imperfect health state. In light of this, the bodily health area was impacted by some type of pain, discomfort, or mobility concerns caused by diabetes mellitus in more than half of the study participants. Thus, it is crucial to assess the factors affecting Saudi

Arabia's diabetes type 2 patients' Q.O.L in terms of their health (Alshayban & Joseph, 2020).

The Global Burden of Disease Study determined that the age-standardized prevalence of diabetic retinopathy-related blindness grew by 15% between 1990 and 2020, whereas the number of persons aged >50 years who were blind from diabetic retinopathy rose by 50%. The comparable percentages in Sub-Saharan region were 17 and 26 percent, respectively. Additionally, new research has indicated the importance of Q.O.L in the control of diabetes. The majority of research on diabetic retinopathy and Q.O.L comes from high-income nations, and the data collection tools were created in that manner. As a result, they are typically not suitable for all demographics (Emade et al., 2023). According to studies by Pham et al., (2020) those with T2DM had significantly inferior Q.O.L than people without the condition. This was due to the difficulties associated with T2DM, including heart disease, diabetic neuropathy, and diabetic retinopathy. Similar research findings are seen in a study done in Ethiopia where after ruling out other potential causes, diabetic peripheral neuropathy (DPN) was referred as diabetics having peripheral nerve impairment. 11 percent of patients with 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 had a significant impact on the patient's ability to function because it caused them to be less mobile and dependent on others for daily tasks. One of the most psychologically damaging conditions, DPNP can have a substantial effect on an individual's Q.O.L (social and mental welfare, and physical health) (Degu et al., 2019).

According to a study conducted in South Africa, clients with type 2 diabetes who received basic healthcare had a comorbidity prevalence of 65.2% and a hypertension prevalence of 63.1%. This study's findings are comparable to a study from Rwanda where 58.1% of the patients had at least one comorbid ailment. Hypertension and HIV infection were the two comorbid diseases that individuals most frequently reported (47.3 percent and 7.8 percent, respectively). Furthermore, the D-39's "energy and mobility" scale showed lower scores for hypertensive males (54.8%) and females (43.2%) patients ($p=0.019$, $r=0.164$) (Lygidakis et al., 2021). In Ethiopia, an increased number of days of foot care led to improved Q.O.L in patients with foot ulcers. Foot care increased the chances of the patients participating in recreational activities, sense of physical safety increased and ultimately led to a reduced number of hospitalizations and amputations (Aschalew et al., 2020).

During a study at Kenyatta National Hospital, individuals with diabetic retinopathy had considerably lower overall vision-related quality of life (VRQoL) than those without diabetic retinopathy. The patients' overall opinion of their vision was the least impacted. Although the diabetic retinopathy patients thought their vision was generally satisfactory, they nonetheless had trouble carrying out several regular tasks. In terms of the psychosocial status of the patients, some were fearful of going blind, worried about burdening others, and reluctant to engage in social activities (Emade et al., 2023).

Diabetes Control

Diabetes mellitus requires constant monitoring of blood glucose levels, frequent exercise, adherence to medications, and stringent dietary restrictions. The majority of cross-sectional research discovered that a diabetic had HRQoL than a person of a similar age who does not have the disease. Uncertainty still exists regarding the relationship between HRQoL and HbA1c and blood sugar levels (Lu et al., 2017). Having poor glycemic

control has also been linked to a lot of problems from diabetes. Consequently, regardless of the type of diabetes, comorbidities have been found to affect all facets of quality of life. They impede everyday tasks, resulting in bodily impairments and discomfort, cause generalized mental anguish and sadness, and disrupt interpersonal relationships, all of which deteriorate physical, psychological, and social elements of life (Lygidakis et al., 2021). According to study done in South Africa, a number of factors, such as food limitations, obstacles to social contact and commitment, and the amount of time required to reach the ideal weight and glycemic level, contribute to the link between quality of life and diabetes control (Daya et al., 2016). Additionally, because only 50% of research participants reported exercising regularly, regular exercise was linked to participants' ages. The majority of study participants were older than 58 years old, which helped to explain this (median age). Thus, as people aged, they became increasingly sedentary, which ultimately resulted in a decline in their health and a poor QOL (Daya et al., 2016). According to research by Correa et. al. (2017), a diet for diabetics has an unswerving effect on their Q.O.L. Study participants who followed strict dietary modifications that come with the disease were less probable to have a poor QOL since this ensured maintenance of the required blood glucose levels and avoidance of possible complications. According to WHO (World Health Organization), nutrition and diet are linked to overweight and obesity in type two diabetes mellitus since 90 to 95% of the diabetes population that constitutes type two diabetes are either obese or overweight (Correa et. al.,2017).

Treatment modality and QOL did not exhibit any association, according to a study conducted in Botswana. This was due to the patients' varying definitions of how much a disease had damaged their well-being and the study's lower number of respondents with type one diabetes compared to those with T2DM (Rwegerera et al., 2018).

2.1.4 Quality of Life and Diabetes Mellitus

Diabetics worry about their blood glucose levels and any potential or existing consequences. Moreover, patients' HRQoL is influenced by ongoing care and lifestyle changes such as dietary changes and exercise (bodily, psychological, and social well-being). Numerous investigations have demonstrated that having diabetes lowers the bodily, emotional, social, and environmental determinants of health and has consequence on the Q.O.L in health. In comparison to non-diabetics, people with diabetes have significantly lower their Q.O.L in terms of their health (Aschalew et al., 2020). An individual's Q.O.L is measured by how satisfied they feel with aspects of their health that are impacted by their present state of health. When determining a population's health needs and evaluating its access to healthcare, especially for people with chronic conditions, measuring the Q.O.L is essential (Nazir et al., 2016). The majority of studies reveal a connection between people with chronic illnesses and a decline in their quality of life. The patient will benefit from this improvement, and it will also lessen the financial, psychological, and social burdens correlated with chronic conditions (Nazir et al., 2016). Diabetes, like other chronic diseases, can lower a patient's quality of life related to health. To enhance this, diabetics need life-saving and ongoing therapies, daily blood glucose monitoring, and cautious dietary habits (Wonde et al., 2022). Traditional methods that were used to check the effect of diabetes on one's life included mortality, morbidity, and biochemical tests although currently focus has shifted to measuring the quality of life (Aschalew et al., 2020). One of the most popular tools for evaluating the effect of chronic illness management on health is HRQoL, which tracks one's bodily, social and mental well-being. Expectations, beliefs, perceptions, and experiences all have an impact on them (Lu et al., 2017).

Contextual variations, such as sociodemographic, cultural, and epidemiological traits of the populations, might affect how well life is experienced and therefore should be considered. Measuring QOL and figuring out its determinants can help with service planning, evidence-based targeted preventative program development, and understanding patient requirements. For instance, the association between educational attainment and anxiety may be due to inadequate coping skills. Such data can be used by policymakers and physicians to create supportive and instructional initiatives, customizing treatments for particular groups (e.g., patients with complications or comorbidities, caregivers) (Lygidakis et al., 2021). As a multidimensional concept integrating psychological, social, and bodily health, quality of life (QoL) includes cognitive and emotional components. Clinical and diagnostic examinations reveal the patient's current state of health as well as whether or not his or her condition is improving or deteriorating. Every individual views their QoL differently and is influenced by variety of factors, including mental health, level of service, dependency, social interactions, individual standards, and relationship to the environment (Levterova et al., 2018). The recommendations for diabetes mellitus care underline that raising the Q.O.L is one of the main aims. The influence of the disease on a patient's present Q.O.L is sometimes overlooked in efforts to avert complications from the disease. Quality of life concerns are crucial since they may accurately anticipate a person's ability to control their diseases and uphold long-term health and well-being (Levterova et al., 2018).

A person's assessment of pleasure with aspects of his or her health that are impacted by their present health state is referred to as their HRQOL. When determining a population's health-related requirements and assessing health treatment, especially for people with chronic conditions, quality of life measurement is essential (Saeedi et al., 2019). Most research indicate a connection between people with chronic conditions and declines in

HRQOL. Enhancing QOL will benefit the patient and lessen the financial, emotional, and social difficulties associated with chronic illnesses. Globally, chronic diseases account for 59 percent of fatalities and are the leading cause of disability. Healthcare professionals must comprehend the psychological, social, and physical effects of having a chronic disease (Saeedi et al., 2019). Researchers and healthcare practitioners use HRQoL to recognize factors and components that affect individuals with T2DM who experience illness outcomes. HRQoL in diabetic patients has been influenced by both physical and psychological variables, such as the inability to engage in physical activity due to problems from T2DM and the frustration brought on by high blood glucose levels. A person with T2DM often has a lower Q.O.L when it comes to their health than someone of a similar age who does not have the disease, and an increase in complications is linked to this decline. To improve diabetic outcomes, a measure of HRQoL is required to assess patients' current states of health and supplement the clinical data(Wonde et al., 2022). Self-management of the disease involves one's feelings, actions, and judgments which enable an individual to attain the required health outcome. This lays immense responsibility on an individual and thus those who cannot control their blood sugar level become emotionally overwhelmed and thus have a low quality of life. Ultimately, the required health outcome is not attained leading to the emergence of complications and further deterioration in the Q.O.L (Ababio et al., 2017). The majority of diabetic patients experience both micro- and macro-vascular long-term consequences, such as coronary artery disease, heart attack, cerebral vascular accident, and amputation. Micro-vascular long-term sequelae include neuropathy, nephropathy, and retinopathy. Additionally, the inconvenience of multiple intake of oral antidiabetic drugs daily, the anxiety of receiving insulin injections via the skin, and instances of low blood sugar level may weaken diabetic patients and further lower HRQoL (Lu et al., 2017).

The physical domain assesses how a condition affects a person's capacity to do activities of daily living, dependence on medication, level of energy, initiative, mobility, and capacity to work. An individual's ability to function and adjust to a situation depends on their physical health. It can be assessed using the person's perceptions of their level of energy and weariness, the presence of pain and discomfort, and their patterns of sleep and rest (Gebremedhin et al., 2019). The bodily health domain and overall Q.O.L are positively correlated because people perceive their quality of life as being good or high when their physical status is good or high (Gebremedhin et al., 2019). Demographic characteristics, particularly age, are independent indicators of HRQoL in diabetics, which is substantially inversely correlated with HRQoL. Additionally, individuals with diabetes may experience a decline in their HRQoL due to poor glycemic management and adverse effects related to their diabetes. Additionally, numerous studies have shown that diabetics have lower HRQoL than those without the disease. Additionally, studies show a link between long-term diabetes, the usage of insulin, which may be painful due to repeated injections, and a poor Q.O.L. Additionally, it has been demonstrated that individuals with T2DM who have comorbidities have lower quality of life in regards to their health (Gebremariam et al., 2022).

59 percent of deaths worldwide are caused by long-term ailments, which also make up for the majority of disabilities and mortality. Healthcare professionals must be aware of the psychological, physical, and social consequences of having a chronic disease (Nazir et al., 2016). Diabetes mellitus is becoming more common everywhere, with a sharp increase in middle- and low-income nations. One of the numerous worldwide health crises is diabetes mellitus, which is linked to obesity and physical inactivity and can cause complications and higher cardiovascular risks, lowering life expectancy and Q.O.L (Gebremedhin et al., 2019). In addition, health care professionals have limited knowledge

of their patient's subjective Q.O.L and thus it is a hindrance to effective intervention towards type two diabetes (Gebremedhin et al., 2019). The ideology of HRQoL is not clear despite its importance in health. Initially, diabetes mellitus is asymptomatic up to the point of diagnosis when complication related set in. Diabetes affects lifestyle due to the psychological changes it imposes leading to a decline in Q.O.L (Rogon et al., 2017). Age advancement in type two diabetes mellitus comes with microvascular and macrovascular complications that reduce the HRQoL (Gillani et al., 2019).

Diabetes mellitus is associated with vast financial burden due to debilitating microvascular and macrovascular complications that can impair an individual's quality of life. (Didarloo & Alizadeh, 2016). Furthermore, quality of life is of significance to healthcare professionals as it is an indicator of the extent of the influence of chronic illnesses like diabetes mellitus on the Q.O.L. However, another research indicator is that diabetics had a better Q.O.L in comparison to other chronic diseases like epilepsy, stroke, cardiac diseases, etc. (Verma & Dadarwal, 2017).

According to several research, medical, personal, and lifestyle factors are the best indicators of QOL, and individuals with diabetes mellitus tend to have reduced QOL than people without the condition. The studies further suggest that early diagnosis of diabetes mellitus may improve the quality of life (Verma & Dadarwal, 2017). This study's findings are comparable to those of Spanish research, which stated that most diabetes patients had inferior quality of life (QOL) in comparison to healthy people. (Didarloo & Alizadeh, 2016). In recent years the quality of life has become a significant indicator of the outcome of health care. Medicine should restore and preserve the well-being of a diabetic patient thus, harmony needs to be attained between the physical and psychological health (Zurita-Cruz et al., 2018). In spite of the fact that the factors

involved in this association are not yet thoroughly understood, investigations have shown that diabetics frequently have lower QOL than non-diabetics. (Corrêa et al., 2017).

According to research done in Brazil, modifiable factors like physical exercise, glycemic level, diet, and nutrition were directly linked to the Q.O.L of the study participants. Education on diabetes individuals will help nurture a positive attitude toward the disease. These modifiable factors can also be incorporated into some of the nursing theory models to identify health deviation in this population(Corrêa et al., 2017).

Diabetes mellitus of both types (type 1&2) were proven to have a detrimental effect on every component of the diabetic-specific tool employed in a study conducted in Poland. There was a strong correlation between depression symptoms in T2DM and diabetic complications in type 1 and gender. Complications related to DM occurred in type 1 male patients and type 2 patients with depression as a result of predisposing variables linked to a lower Q.O.L (Bak et al., 2019). In a study of type 2 diabetics receiving outpatient treatment in Greece, it was shown that living alone and being older were associated with worse quality of life ratings. This was brought on by the fact that older patients rely more on their careers, have more comorbid diseases, and are more likely to experience anxious thoughts when they live alone (Papazafiropoulou et al., 2015).

In 2017, 39.9 million adults in North Africa and the Middle East (a 9.2 percent adult population) with an age range of 18 to 99 had diabetes mellitus. Researches from this region have shown that diabetes mellitus lowers Q.O.L, though the level of infirmity varied across studies. Saudi Arabia was among the top countries in the region for the occurrence of diabetes (17.7 percent), and these explores all showed that diabetes mellitus lowers Q.O.L. (Alshayban & Joseph, 2020). Analysis via regression revealed that patients in the Al-Farwaniyah health section reported lower quality of life than patients in the Al-Ahmadi health section, according to a study conducted in Kuwait for

the total QoL. Patients in the Al-Farwaniyah health section reported poor physical and mental health, as well as lower-than-average healthcare service quality, sociodemographic patient characteristics, for instance educational and economic status, and lastly, low disease knowledge (Al-Matrouk & Al-Sharbati, 2022).

A global study (Belgium, France, Germany, Greece, etc.) found that diabetes mellitus had a detrimental influence on respondents' Q.O.L, with an AWI score of (-1.69). "Freedom to eat as I wish" was the domain-specific aspect that was most undesirably impacted (WI= -3.35). (Bradley et al., 2018). The Bulgarian study, where "freedom to eat" was most significantly impacted (WI= -4.0), revealed similar study findings. Additionally, 67.1 percent of those polled said that having diabetes would improve their Q.O.L (Levterova et al., 2018).

According to Malaysian research of women with diabetes and their correlates, physical limitations, regardless of age or sexual orientation, are more likely to be associated with health-related issues. These included physical functioning, the length of the diabetes, the prevalence of concomitant conditions, and glucose level control. Compared to the men, the physical functioning of the women was more affected. In comparison to men, women with a limited history of diabetes exposure had a greater mean age (years). In addition, compared to males, women with longer histories of diabetes and more concomitant conditions scored worse in the domains of health perception, role performance, and social functioning (Gillani et al., 2019).

According to research done in Brazil, diabetic individuals who underwent specialized care and participated in physical activities were less probable to have a poor quality of life. Individuals who lived a sedentary lifestyle were seen to have the worst quality of life. Physical activities curbed insulin resistance and also helped in weight reduction thus improving health status (Corrêa et al., 2017).

Once thought to be relatively rare in Africa, the incidence of diabetes—one of the non-communicable diseases—has grown in recent years due, in part, to changes in lifestyle (Nyanzi et al., 2014). Non-communicable diseases are fast replacing communicable diseases as the primary cause of death in the Sub-Saharan Africa area. This is due to the fact that non-communicable illnesses are now the leading cause of mortality in the region. This region is home to the majority of Africa's least developed nations due to the challenges brought on by an increased load of infectious and non-infectious diseases (Atun et al., 2017). In West Africa (Nigeria and Ghana), the quality of life in diabetics is affected by factors that are patients' traits, disease traits, and healthcare provider-related. These factors are then affected by features like body mass index (BMI), gender and age (Ababio et al., 2017).

An investigation on the Q.O.L. of diabetic patients in Botswana indicated reduced Q.O.L., mostly harming their physical and mental health. Poorer physical functioning ratings were also correlated with being female and being older. Furthermore, scores in both psychological and physical functioning are negatively correlated with the number of diabetic problems (Rwegerera et al., 2018).

Ethiopia is a nation in the sub-Saharan region with the highest number of diabetics at around 1.3 million of its' population. The incidence of diabetes is at 3.8% among other major chronic illnesses (Aschalew et al., 2020). The bodily functioning element was the most damaged, according to an Ethiopian study among type 2 diabetics. However, it was found that many factors impacted Q.O.L. (Gebremedhin et al., 2019). These factors included age, BMI, the number of diabetes complications, the presence of documented comorbidities, blood glucose levels, and the length of the disease. An Ethiopian study discovered that having diabetes for a longer period of time, having uncontrolled blood sugar levels, using insulin, being obese, and having diabetes-related comorbidities were

all adversely connected with low quality of life scores (Gebremariam et al., 2022). Diabetics with type two and clinicians should concentrate on maintaining sufficient blood glucose levels, preventing complications from diabetes, maintaining a normal body mass, and managing comorbidities, in addition to regulation of blood sugar in patients with T2DM to achieve optimal blood sugar control in these patients and HRQoL (Gebremariam et al., 2022). The results of this analysis are in agreement with a study done at the KNH (Kenyatta National Hospital), which suggested the need for intervention programs to help with glucose level control and the inclusion of this assessment as part of the care of patients with diabetes mellitus who were being followed up (E.K et al., 2014). The study also found that elderly people with long-term diabetic issues who were unable to pay for medical aid got the lowest scores for overall quality of life. Over 50% of study participants had a lower wellness status with regard to their health because only 35–40% of respondents agreed that they were satisfied with their health (E.K et al., 2014). Furthermore, the age range in which type 2 diabetes peaked in this study (35–55) coincides with the age range with the most dynamic economic activity for both family and self-care. Diabetes mellitus affects all areas of this measure, with the social and physical domains being the most affected. It places demands on both self-care and resource consumption (E.K et al., 2014). Medical professionals should be aware that enhancing patients' quality of life is a fundamental goal of diabetes care. Patients' quality of life will be enhanced across the board thanks to the positive visual outcomes, early detection, and treatment of diabetic retinopathy (Emade et al., 2023). Quality of life does not only indicate the impact of diabetes on life expectancy but also allows for the incorporation of new treatment and education methods thus broadening the patient's perception of education, treatment, self-care, and control (Rogon et al., 2017). The physiological disturbance and level of deterioration brought on by diabetes can be

determined by medical professionals. However, signs and functional restrictions which are inversely proportionate to bodily and structural anomalies, do not directly affect a patient's opinion of their health or sense of well-being. Therefore, mental, societal, and cultural factors modulate and modify the consequences of biological abnormalities on HRQoL (Aschalew et al., 2020)

After a review of the above literature, a lot of studies are done on the HRQoL among diabetics in high-income countries which have better healthcare facilities compared to studies done in low and middle-income nations. In addition, in low and middle-income nations most of the individuals present with comorbidities that further reduce their quality of life.

2.2 Theoretical Framework

The study used Myra Estrin Levine's conservative model as its theoretical foundation. A fresh and efficient approach to patient care was what the theoretician set out to discover. This paradigm seeks to provide tailored, adaptable patient care that is more concerned with the context of each patient as an individual than with specific medical treatments (McEwen & Wills, 2018). In order to achieve a positive outcome for the patient, this paradigm focuses primarily on promoting the patient's physical and emotional well-being.

The following principles are used in the model to solve patient problems:

Energy conservation means striking a balance between a patient's activity and their available energy.

To preserve structural integrity means to maintain or repair the body's integrity in order to stop structural breakdown and encourage healing.

Personal integrity preservation enables the patient to take part in decision making about their care and treatment.

Preservation of Social Integrity: Encourage interaction between the patient and their family, their social networks, and their community connections to ensure their well-being both while the patient is receiving treatment and after discharge.

Promoting adaptation is the process of helping a client come to terms with the realities of their new health circumstances. A patient will respond better to treatment and care and achieve the targeted patient result if they are able to adapt well to changes in their health. The care giver must make an effort to address both the client's internal and exterior environments in order to maintain completeness. It enables the patient to be seen as a whole person rather than just a person with a condition.

To determine and organize tailored holistic nursing care for diabetic patients on follow-up, this model consequently offers a framework (McEwen & Wills, 2018).

2.3 Conceptual Framework

The conceptual framework and its variables are shown in the figure below;

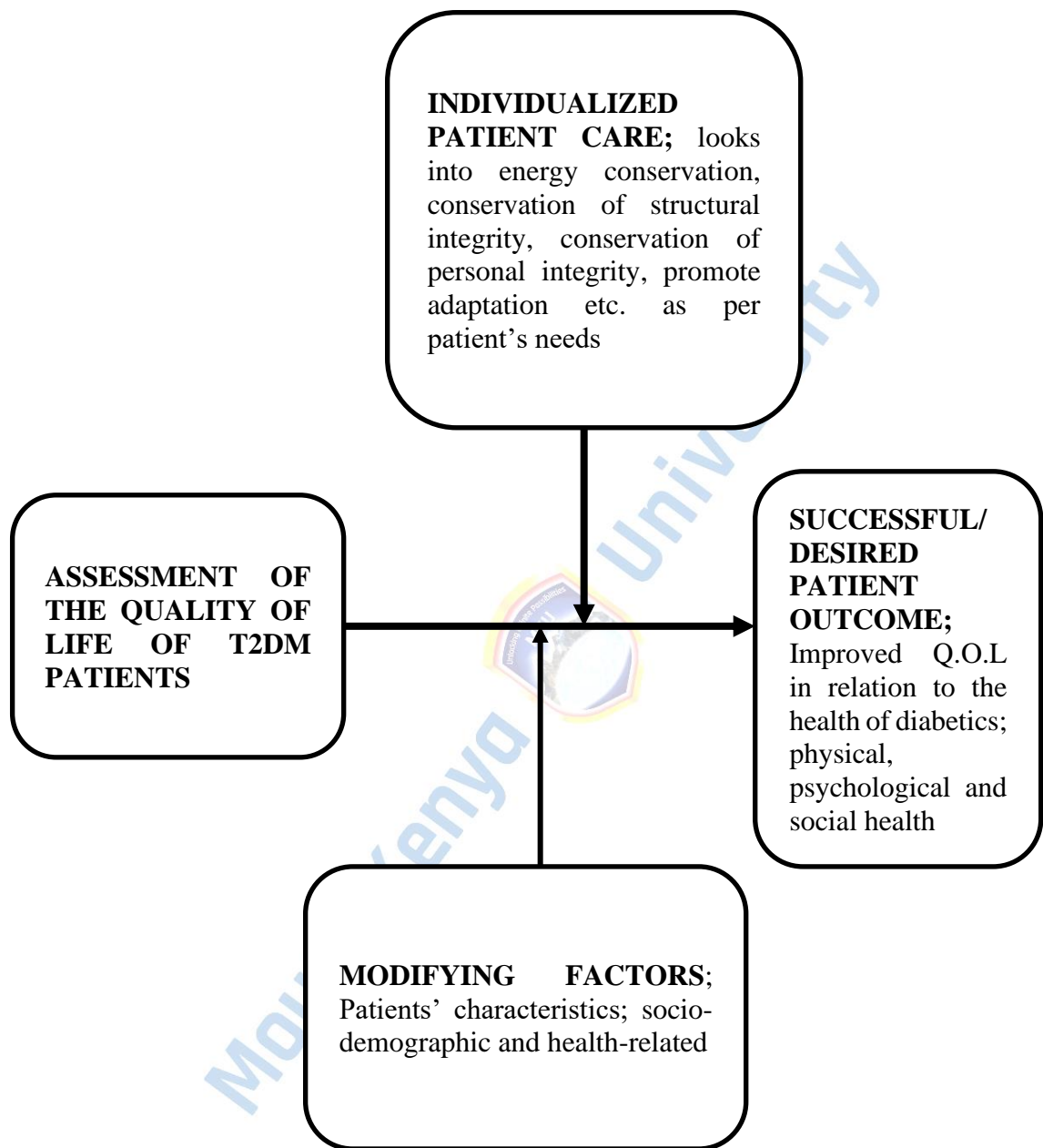


Figure 1: Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter entails the methodology (research design, area of study, study population, determination of sample size & technique of sampling, data collection, management and analysis).

3.1 Research Design

To investigate variations and correlations among diabetic patients, a cross-sectional research methodology was employed. The sociodemographic 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.

3.2 Area of Study

About 360 miles to the southeast of Nairobi and 200 km to the northwest of Mombasa is where you'll find Taita-Taveta County. Voi, Taveta, Mwatate, and Wundanyi are some of the county's larger towns. There are 1,142 nurses per estimated 381,210 people, or one nurse for every 1,142 people. There are five level-4 public hospitals in the county, including the Moi County Referral Hospital in Voi, the Wesu, the Wundanyi, the Taveta, and the Mwatate sub-county hospitals. The study investigation was carried out at the only referral hospital in the county, Moi County Referral Hospital, which serves Taita-Taveta County's four sub-counties (Taveta, Wundanyi, Mwatate, and Voi), and has a bed capacity of 112 patients. Every Friday is when the diabetes clinic is mostly open, and at least 90 patients are seen there each month (Taita Taveta County Integrated Development Plan 2018-2022, 2018).

3.3 Study Population

The study comprised all T2DM patients who sort for treatment at the diabetic clinic (outpatient department) of the MCRH in Taita-Taveta County. At least 90 diabetic patients are seen each month in the facility's outpatient diabetic clinic.

3.4 Determination of Sample Size & Technique of Sampling

3.4.1 Calculation of Sample Size

The researcher adopted the Yamane formula to calculate the desired 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 the months of January to March 2022 and e is 0.05

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

$$p = \frac{281}{1 + 281(0.05)^2}$$

$$p = 165 \text{ patients}$$

p = sample size P = population size e = level of precision

To cover for non-response, the sample size was adjusted by using the following formula:

$$\text{Adjusted Sample size} = \frac{\text{Effective sample size}}{(1 - \text{Non-response rate anticipated})}$$

$$= \frac{165}{(1 - 0.1)}$$

$$= \frac{165}{0.9}$$

$$= 183 \text{ patients (165 patients were chosen as the viable sample size}$$

from the researcher's adjusted sample size of 199 after data collection.).

3.4.2 Sampling Technique

Systematic random sampling was used to select every second patient (Kth patient) from the diabetes clinic, with a sampling interval of two taken into account (Taherdoost, 2016). The target sample size was 165, while the total population was 281. See depictions below:

Sampling interval = $\frac{\text{Population size}}{\text{Desired sample size}}$

$$\text{Sampling interval} = \frac{281}{165}$$

Sampling interval= 1.7 approx. 2

Therefore, every 2nd patient who met the inclusion criteria was counted in the sample size.

3.5 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. In order to increase consistency and reduce bias in data collection, all research assistants underwent training. The research assistants answered patients' questions concerning the questionnaire during the gathering of data. Face-to-face interviews were used to gather data on sociodemographic 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.

Professor Claire Bradley developed the ADDQoL-19, a Patient-Reported Outcome Measure (PROM), for chronic illnesses like T2DM (Bradley et al., 1999). In the United Kingdom, Professor Claire Bradley is employed by Health Psychology Research Limited (United Kingdom). The respondent's ability to assess only personally relevant life domains on the ADDQoL demonstrates the significance and influence of diabetes. 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 assessment of diabetes-dependent quality of life 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 score) and +3 (the

maximum positive score). At the Kilifi County Referral Hospital, the tool's preliminary testing (reliability and validity) was conducted with 16 participants which was 10% of the sample size. The structured questionnaire was edited to remove or replace any questions that were irrelevant or unclear.

3.6 Data Management and Analysis

Statistical package for the social sciences (SPSS) version 25 was used to process the quantitative data. For the sociodemographic 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. To evaluate the sociodemographic and health-related characteristics related to quality of life in health, the researcher employed bivariable analysis. 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.

3.7 Ethical Consideration

The management at Moi County Referral Hospital was asked for permission to conduct the research through a letter from Mount Kenya University's Ethics and Research Committee. Additionally, authorization from NACOSTI (**License No. NACOSTI/P/22/18413**) was requested. Before collecting data, the researcher obtained

written informed consent from the study subjects. All study subjects signed the informed consent form. All participants were promised their anonymity. There were no monetary rewards provided for taking part in the study. 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.

The researcher assured the subjects that their anonymity and the confidentiality of their replies would be maintained at all times. The research team assured them that providing their information was entirely optional and that it would be kept private and used only for research purposes. Since the participants' names and institutions did not display on the data collection equipment in any way other than a coded fashion that could only be deciphered by the researcher, they felt comfortable providing detailed and accurate replies.

Participants were urged to give careful consideration to the consent form before signing it to show that they are participating in the research freely. All of these measures are taken to ensure that study participants are not treated poorly as a consequence of their participation.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.0 Introduction

The research findings and the interpretation of the specific objective outcomes are highlighted in this chapter.

4.1 Response Rate

According to (Mugenda & Mugenda, 2003), researchers can't analyze the results without access to data from at least half of the completed surveys. The decision to use a 50% minimum threshold for a satisfactory response rate for data analysis was informed by the work of Babbie (2007), who found that a response rate of 70% or more was regarded good. As a result, the researcher concluded that the response rate was high enough to warrant continuing the study. The study obtained a response rate of 100%. This was dully possible as the researcher was present during collection and filling of the questionnaires

4.2 Research Findings

4.2.1 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%). That is demonstrated in Table 1 below:

Table 1: Participants distributed according to their sociodemographic characteristics (sample size (N)=165).

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)

Source: Field Data (2022)

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, which is a small minority. This is illustrated in Table 2 below:

Table 2: Participants distributed according to health-related characteristics (sample size (N)=165).

Characteristic	Category	N (%)
Duration of living with diabetes	6 months – 10yrs	113 (68.5)
	11yrs -20yrs	43 (26.1)
	21yrs+	9 (5.5)
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)

Source: Field Data (2022)

4.2.2 The Impact of type two diabetes on the patient's quality of life in terms of their health.

The first two ADDQOL tool items evaluated "present quality of life" and "diabetes-dependent quality of life," both of 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 3 below:

Table 3: Responses to the ADDQOL tool's Overview Items One and Two, "Perceived Present Quality of Life" and "Quality of Life in the Absence of Diabetes Mellitus" respectively.

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

Source: Field Data (2022)

The AWI score, which represents the cumulative burden of the condition on all 165 patients, was determined by the researcher to determine the overall influence of diabetes mellitus type 2 on HRQoL. 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 positive impact of diabetes). This is illustrated in Table 4.

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). This research finding is consistent with Table 3's findings, which demonstrated that the majority of patients described their current quality of life as "neither good nor terrible." This is illustrated in Table 4.

The responses for overview item two of the ADDQOL questionnaire are scored between -3.00 and 1.00. 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 that approximated to "much better" at (-2). This suggested that living without or without diabetes mellitus will improve one's health quality of life. This research finding is in tandem with the results in Table 3 that showed most of the patients indicated a perceived quality of life

that would be “much better” in the absence of diabetes mellitus. This is illustrated in Table 4 below.

Table 4: Measures of Central tendency for the Patient-reported Outcome measures of the quality of life

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)

Source: Field Data (2022)

4.2.3 The impact of Diabetes mellitus type two on the 19 domain-specific life aspects of the ADDQOL

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. 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 5.



Table 5: Impact item score of Diabetes mellitus on each of the 19 domain-specific life aspects

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

Source: Field Data (2022)

4.3 Multivariable analysis of Socio-demographic and health-related characteristics of the patients 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 with the patient's quality of life in relation to their health. The characteristics related to the health 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 analyzed. Health-related characteristics that remained statistically significant after controlling other variables included foot ulcers/sores and numbness/ pain in the hands or legs or feet. Foot ulcers/sores were at (a OR=7.348; 95% CI 1.824-29.605; $P = 0.005$) while pain/ numbness in hands or legs or feet was at (a OR= 0.155; 95% CI 0.062-0.389; $P < 0.001$). 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 low quality of life as opposed to patients who suffered from other comorbidities like heart disease, kidney disease, and high blood pressure. 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 6 below.

Table 6: Multivariable analysis of Patients' characteristics (sociodemographic and health-related) related to the health-related quality of life (N=165)

Characteristics	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.

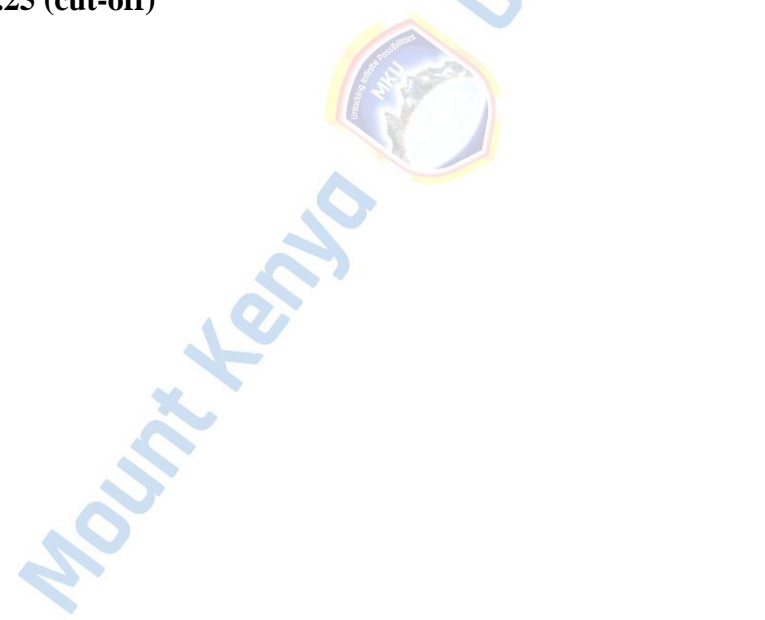
	Employment/ Business	9 (29.0)	42 (31.3)	1.116 (0.474-2.630)	0.802	-	-
Characteristic	Category	Higher QOL N (%)	Lower QOL N (%)	Crude OR [95% CI]	P-value	Adjusted OR [95% CI]	P-value
Healthcare financing mode	Cash only	14 (45.2)	60 (44.8)	Ref.	Ref.	Ref.	Ref.
	Insurance/ NHIF	17 (54.8)	74 (55.2)	1.016 (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	-	-
Characteristic	Category	Higher QOL N (%)	Lower QOL N (%)	Crude OR [95% CI]	P-value	Adjusted OR [95% CI]	P-value
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*
Diabetic retinopathies	No	19(61.3)	70(52.2)	Ref.	Ref.	Ref.	Ref.
	Yes	12(38.7)	64(47.8)	0.691(0.311-1.535)	0.364	-	-
Cardiovascular disease	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	105	0.199	<0.001**	0.155	<0.001*

		(41.9)	(78.4)	(0.088-0.454)		(0.062-0.389)	
Other comorbidities	No	30 (96.8)	131 (97.8)	Ref.	Ref.	Ref.	Ref.
	Yes	1 (3.2)	3 (2.2)	1.456 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)



CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

This chapter illustrates a discussion of the findings of the results, conclusions that the researcher drew from the research findings, and possible recommendations.

5.1 Summary of Findings

The study aimed to find out 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.

T2DM had a cumulatively unfavorable 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. This study's conclusion 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). A Bulgarian survey also 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 (Levterova et al., 2018). Quality of life is negatively affected by diabetes mellitus,

according to research conducted in this area (Alshayban & Joseph, 2020), albeit the extent to which this occurs varies across investigations.

Saudi Arabia was one of the nations with the highest prevalence of diabetes mellitus in North Africa and the Middle East, at 17% (Alshayban & Joseph, 2020). A deterioration in QOL is related with diabetes mellitus, according to the majority of researches.

The influence of diabetes mellitus type two on specific aspects of the life of the patients was obtained by calculating the WI score for each domain-specific life aspect. The weighted impact (WI) score per domain-specific item was calculated by multiplying the impact rating by the importance rating. 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 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.

There was no statistically significant correlation in the current investigation between the socio-demographic characteristics and the quality of life of the patients with type two diabetes mellitus despite most research studies showing an association between the two

variables. This research finding differs from an investigation conducted in China 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). Also, 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 sociodemographic, cultural, and epidemiological traits of the populations, might affect how well life is experienced and should be taken into consideration. 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 that were found to be statistically significant following multivariable logistic analysis. The results of the study showed that among those with type two diabetes mellitus, foot ulcers/sores (aOR7.348; p=0.005) and numbness in the hands/legs/feet (a OR=0.155; p=0.001) were the health conditions that were most closely associated with poor HRQOL. In comparison to patients without a comorbidity, those who had foot ulcers or sores were seven times more probable to have poor quality of life related to health (aOR7.348; p=0.005).

In addition, the patients who had numbness/pain in their hands/legs/feet were more probable to have a low health-related quality of life compared to those who did not have the co-morbidity. 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 (Alshayaban & Josep2020). 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 had a significant impact on 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).

5.2 Conclusion

According to the results of this research, people with type 2 diabetes at the Moi County referral hospital in Taita-Taveta county had a poor health-related quality of life. This is consistent with the fact that most research participants reported a decline in their health-related quality of life, suggesting that these patients were aware of the impact that T2DM had on their health.

Low health-related quality of life was related to co-morbidities of foot ulcers/sores and pain/numbness in the hands, legs, and feet. This might be the case since one of the numerous symptoms of diabetes mellitus is neuropathy, which includes neuropathic pain. The most severely impacted and significant area of the patient's quality of life was sexual satisfaction/sexual function, whereas "self-dependence" was the area with the least severe effects.

This may be the case since diabetes mellitus is linked to microvascular problems including impotence and sexual dysfunction.

The study indicated that despite there being no link between socio-demographic characteristics and HRQoL which most studies indicated, there is a need to put more emphasis on health-related characteristics which at times are overlooked. The study brought new knowledge that high rates of disability-adjusted life years attributed to non-communicable diseases-like diabetes mellitus in Taita-Taveta county may be an indication of low quality of life.

5.3 Recommendations

1. Since a considerable number of the study participants were aware of the negative influence of diabetes mellitus on their health status and Q.O.L then it is important for healthcare workers at Moi-county referral hospital to identify individual patient needs (individualized care) and intervene appropriately in order to improve illness management, and ultimately improve the HRQoL in type two diabetes mellitus. In addition, patient education by the healthcare workers of Moi County referral hospitals to these patients will be integral to encouraging behavioral changes amongst the patients.
2. The healthcare workers at Moi County referral hospital should perform foot and leg ulcer care independently for the patients. This is due to the strong association between co-morbidities of foot ulcers/sores and neuropathic pain, and HRQoL. Screening for micro and macro-vascular complications may ultimately lead to an improved HRQoL among type two diabetes mellitus patients in Moi County referral hospital.

3. HRQoL aspects such as sexual life, personal relationship, working life, financial situation, and living conditions just to mention but a few which were negatively impacted, can be incorporated into the care rendered to patients at Moi County referral hospital. During follow-up care of the patients at Moi County referral hospital, inquiries into how the patients are coping with dietary modification and treatment adjustments should be made to be part and parcel of the care offered. Challenges that come about with these modifications need to be identified and the necessary interventions incorporated into their care. By focusing more on the context of each patient and less on medical processes, this will offer patients holistic care that will enhance their quality of life in terms of their health.

5.4 Further research suggestions

- One facility served as the study's sole location, which presented a study restriction. The study, therefore, suggests that a future comparative study may be done amongst several facilities/ geographical areas to see if similar research findings will be found/ replicated.
- The study also suggests that a future study may look into whether T2DM patients adhere to the behavioral and treatment modification guidelines despite most of the study participants being aware of the negative impact of T2DM on their quality of life.
- A study can be conducted to see if there is an association between quality of life in type two diabetics and disability-adjusted life years.

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APPENDICES

Appendix I: Informed Consent

Introduction

You are asked to take part in this study that **examines how patients with type 2 diabetes mellitus rate their quality of life in terms of their health.**

I request you to go through this consent form and if you have any questions before agreeing to take part in this study, do not hesitate to ask the researcher. Before you decide to take part in the study, you must know the following:

- a) Your participation in this study is voluntary and refusal to participate will not be used against you.
- b) Information acquired from this study will be kept confidential and the researcher will ensure the anonymity of “you” the participant.

You are permitted to leave the study at any point. There won't be any repercussions for your choice; it will be honored.

If you choose to participate in this research project, what will happen?

If you agree to take part in the study, the researcher will interview you in a private setting where you can feel at ease while responding to the questions. About 30 minutes will pass throughout the interview. The researcher will ensure the confidentiality of the information given and the anonymity of the study participant.

Potential benefits and importance of the knowledge gained

There are no direct benefits to you as a study participant in this study.

The information acquired from this study will help the researcher to advise Moi County referral hospital on the care of patients with diabetes mellitus type two.

Inquiries regarding this study can be directed to:

Principal Researcher

Dredah Mwadulo on mobile no 0726684128 or email: dmwadulo@gmail.com

REQUEST FOR CONSENT

Participant's Assertion

The information on this permission form has been read to me or I have read it myself.

My inquiries have been addressed in a language that I can understand. I am aware that my participation in this study is completely optional, and I am free to end it at any moment. I'm willing to participate in this research project. I am aware that every attempt will be taken to protect my identity's confidentiality.

Participant signature: _____ Date: _____

Appendix II: Structured Questionnaire

Instructions:

- Do not fill out any of the questionnaire with your name or personal information.
- Please answer each question that applies to you. If a part doesn't apply, skip it. E.g. If you are not using insulin, skip the parts that ask about it.
- Mark the checkbox next to each question with an X.
- Keep in mind that there is no right or incorrect response. I'm simply curious about your current outlook on life and how you are handling your diabetes.

Thank you for your participation.

Date.....

1. What is your age bracket?

18-28 years 40-49 years 60-69 years 80 years and above
29-39 years 50-59 years 70-79 years

2. What gender are you?

Male

Female

3. What is your marital status?

Single

Divorced/separated

Married

Widowed

4. Which is the highest level of education that you have achieved?

Primary school

Technical/ vocational

High school

College/ university

5. What means do you use to pay for your health needs?

Health/ Medical Insurance

Cash payment

N.H.I.F

6. What is your employment status?

Employed/self-employed

Unemployed

7. What is your source of income?

Business

Employment

None

8. How long have you been living with diabetes since you first found out?

6 Mos-1 year

1-5 years

11-15 years

21-25 years

6-10 years

16-20 years

26 years and above

9. What type of diabetes medication are you using right now?

Oral diabetes medication only

Insulin and oral diabetes medication

10. Do you suffer from any of the following illnesses?

High blood pressure

Diabetic retinopathies

Diabetic nephropathies

Foot ulcers/sores

High cholesterol


Numbness/pain in hands/feet/legs

Heart disease

Cardiovascular disease



Appendix III: ERC Letter



Mount Kenya University

REF: **MKU/ERC/2195** Date: 06 May 2022

TO: **DREDAH WUGHANGA MWADULO**

REG: **MSCN/2018/36461**

Dear Sir/Madam,

RE: ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE IN TYPE 2 DIABETES MELLITUS AT MOI COUNTY REFERRAL HOSPITAL, TAITA-TAVETA COUNTY

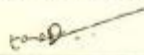
This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1268**. The approval period is **06/05/2022 - 05/05/2023**.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including informed consents, study instruments, MTA will be used
- ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
- vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,



The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Peter G. Kirira
Chairman, Mount Kenya University IERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000,
Cell: +254 720 790 796, 0709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke

Appendix IV: Postgraduate Letter

Mount Kenya University



DIRECTORATE OF GRADUATE STUDIES

MSCN/2018/36461

7th June, 2022

*The Director, Research Coordination Division
National Commission for Science, Technology & Innovation
Utalii House, 8th & 9th Floor
P.O Box 30623-00100
NAIROBI*

Dear Sir/Madam,

RE: DREDAH WUGHANGA MWADULO - REG. NUMBER, MSCN/2018/36461

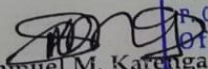
The purpose of this letter is to introduce the above named student who is pursuing Master of Science in Nursing in the Department of Nursing Education, Leadership Management and Research in the School of Nursing.

The title of her research is "*Assessment of Health-Related Quality of Life in Type 2 Diabetes Mellitus at Moi County Referral Hospital, Taita-Taveta County.*"

She has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data for her research between **June and September, 2022.**

Any assistance accorded to her will be highly appreciated.


Thank you.


Dr. Samuel M. Karenga,
Director, Graduate Studies


Mount Kenya University
P.O. Box 342 - 01000, THIKA
Office of the Director,
Graduate Studies

Enc.

Appendix V: NACOSTI Authorization



REPUBLIC OF KENYA




**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Date of Issue: **01/July/2022**

RefNo: **931212**

RESEARCH LICENSE



This is to Certify that Ms. Dredah Wughanga Mwadulo of Mount Kenya University, has been licensed to conduct research in Taita-Taveta on the topic: ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE IN TYPE 2 DIABETES MELLITUS AT MOI COUNTY REFERRAL HOSPITAL, TAITA-TAVETA COUNTY for the period ending : 01/July/2023.


License No: **NACOSTI/P/22/18413**

Applicant Identification Number
931212

Wadhwa

**Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION**

Verification QR Code



NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix VI: Letter of permission from Moi County Referral Hospital



TAITA TAVETA COUNTY
MINISTRY OF HEALTH
MOI COUNTY REFERRAL HOSPITAL

THE MEDICAL SUPERINTENDANT
P O BOX 18-80300
YOI
Email: moivoi.hospital@gmail.com
1st July 2022

REF: MCRH/HMB/VOL.1

Dredah Wughanga Mwadulo
Reg. No MSCN/2018/36461
School of Nursing
Mount Kenya University

Dear Dredah,

RESEARCH PROPOSAL: ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE
IN TYPE TWO DIABETES MELLITUS PATIENTS AT MOI COUNTY AND REFERRAL
HOSPITAL IN TAITA-TAVETA COUNTY.

This is to inform you that the hospital management board has reviewed and approved your
above research proposal. The approval period is 1st July 2022 to 3rd July 2023.

This approval is subject to adherence to the following requirements:

- i. Confidentiality and privacy of the study participants should be upheld throughout the study period.
- ii. Only approved documents (study instruments, informed consents) will be used.
- iii. Alterations that may pose a risk to the safety and welfare of the study participants or affect the integrity of the research need to be brought to the attention of the hospital management board.

-
- iv. Submission of a request for renewal of approval should be at least 60 days prior to expiry of the approval period.
 - v. Submission of a study report within 90 days upon completion of the study.

Yours Sincerely,




Dr. Felix Kimotho
Medical Superintendent
Moi County and referral hospital
Taita-Taveta County

ity

Mount

Appendix VII: Figure 2: Sample of ADDQOL Tool

ADDQoL

This questionnaire asks about your quality of life – in other words how good or bad you feel your life to be.

Please put an “X” in the box that best indicates your response for each item.

What we would like to know is how you feel about your life now.

I) In general, my present quality of life is:						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
excellent	very good	good	neither good nor bad	bad	very bad	extremely bad

Now we would like to know how your quality of life is affected by your diabetes, its management and any complications you may have.

II) If I did <u>not</u> have diabetes, my quality of life would be:				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
very much better	much better	a little better	the same	worse

Please respond to the more specific statements on the following pages. For each aspect of life described, you will find two parts:

For Part (a): put an "X" in one box to show how diabetes affects this aspect of your life;
 For Part (b): put an "X" in one box to show how important this aspect of your life is to your quality of life.

1	(a)	If I did <u>not</u> have diabetes, I would enjoy my leisure activities: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><input type="checkbox"/> very much more</div> <div style="text-align: center;"><input type="checkbox"/> much more</div> <div style="text-align: center;"><input type="checkbox"/> a little more</div> <div style="text-align: center;"><input type="checkbox"/> the same</div> <div style="text-align: center;"><input type="checkbox"/> less</div> </div>
	(b)	My leisure activities are: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><input type="checkbox"/> very important</div> <div style="text-align: center;"><input type="checkbox"/> important</div> <div style="text-align: center;"><input type="checkbox"/> somewhat important</div> <div style="text-align: center;"><input type="checkbox"/> not at all important</div> </div>

2	Are you currently working, looking for work or would you like to work? Yes <input type="checkbox"/> If yes , complete (a) and (b). No <input type="checkbox"/> If no , go straight to 3a.
	(a) If I did <u>not</u> have diabetes, my working life would be: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><input type="checkbox"/> very much better</div> <div style="text-align: center;"><input type="checkbox"/> much better</div> <div style="text-align: center;"><input type="checkbox"/> a little better</div> <div style="text-align: center;"><input type="checkbox"/> the same</div> <div style="text-align: center;"><input type="checkbox"/> worse</div> </div>
	(b) For me, having a working life is: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><input type="checkbox"/> very important</div> <div style="text-align: center;"><input type="checkbox"/> important</div> <div style="text-align: center;"><input type="checkbox"/> somewhat important</div> <div style="text-align: center;"><input type="checkbox"/> not at all important</div> </div>

3	(a)	If I did <u>not</u> have diabetes, local or long distance journeys would be: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><input type="checkbox"/> very much easier</div> <div style="text-align: center;"><input type="checkbox"/> much easier</div> <div style="text-align: center;"><input type="checkbox"/> a little easier</div> <div style="text-align: center;"><input type="checkbox"/> the same</div> <div style="text-align: center;"><input type="checkbox"/> more difficult</div> </div>
	(b)	For me, local or long distance journeys are: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><input type="checkbox"/> very important</div> <div style="text-align: center;"><input type="checkbox"/> important</div> <div style="text-align: center;"><input type="checkbox"/> somewhat important</div> <div style="text-align: center;"><input type="checkbox"/> not at all important</div> </div>

4	<p>Do you ever go on holiday or want to go on holiday?</p> <p>Yes <input type="checkbox"/> If yes, complete (a) and (b).</p> <p>No <input type="checkbox"/> If no, go straight to 5a.</p>
(a)	<p>If I did <i>not</i> have diabetes, my holidays would be:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>For me, holidays are:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

5 (a)	<p>If I did <i>not</i> have diabetes, physically I could do:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much more much more a little more the same less </p>
(b)	<p>For me, how much I can do physically is:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

6	<p>Do you have any family / relatives?</p> <p>Yes <input type="checkbox"/> If yes, complete (a) and (b).</p> <p>No <input type="checkbox"/> If no, go straight to 7a.</p>
(a)	<p>If I did <i>not</i> have diabetes, my family life would be</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>My family life is:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

7 (a)	<p>If I did <i>not</i> have diabetes, my friendships and social life would be:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>My friendships and social life are:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

8	<p>Do you have or would you like to have a close personal relationship (e.g. husband / wife, partner)?</p> <p>Yes <input type="checkbox"/> If yes, complete (a) and (b).</p> <p>No <input type="checkbox"/> If no, go straight to 9.</p>
(a)	<p>If I did <u>not</u> have diabetes, my closest personal relationship would be:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>For me, having a close personal relationship is:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

9	<p>Do you have or would you like to have a sex life?</p> <p>Yes <input type="checkbox"/> If yes, complete (a) and (b).</p> <p>No <input type="checkbox"/> If no, go straight to 10a.</p>
(a)	<p>If I did <u>not</u> have diabetes, my sex life would be:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>For me, having a sex life is:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

10 (a)	<p>If I did <u>not</u> have diabetes, my physical appearance would be:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>My physical appearance is:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

11 (a)	<p>If I did <u>not</u> have diabetes, my self-confidence would be:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very much better much better a little better the same worse </p>
(b)	<p>My self-confidence is:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </p> <p style="text-align: center;"> very important important somewhat important not at all important </p>

12 (a)	If I did not have diabetes, my motivation would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My motivation is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

13 (a)	If I did not have diabetes, the way people in general react to me would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	The way people in general react to me is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

14 (a)	If I did not have diabetes, my feelings about the future (e.g. worries, hopes) would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My feelings about the future are:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

15 (a)	If I did not have diabetes, my financial situation would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My financial situation is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

16 (a)	If I did not have diabetes, my living conditions would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My living conditions are:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

17 (a)	If I did not have diabetes, I would have to depend on others when I do not want to:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much less	much less	a little less	the same	more
(b)	For me, not having to depend on others is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very important	important	somewhat important	not at all important	

18 (a)	If I did not have diabetes, my freedom to eat as I wish would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much greater	much greater	a little greater	the same	less
(b)	My freedom to eat as I wish is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very important	important	somewhat important	not at all important	

19 (a)	If I did not have diabetes, my freedom to drink as I wish (e.g. fruit juice, alcohol, sweetened hot and cold drinks) would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much greater	much greater	a little greater	the same	less
(b)	My freedom to drink as I wish is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very important	important	somewhat important	not at all important	

If there are any other ways in which diabetes, its management and any complications affect your quality of life, please say what they are below:

Thank you for completing this questionnaire.

Appendix VIII: Figure 2: License Agreement to Adopt Data Collection Tool

Draft 01

1st February 2021

HPR 4458

(1) HEALTH PSYCHOLOGY RESEARCH LTD

and

(2) Dr. BINDU MADHAVI

and

(3) DREDAH MWADULO

Ref: HPR 4458

LICENCE AGREEMENT

for the use of the **ADDQOL-19** Questionnaire in a study ENTITLED

Assessment of the health-related quality of life in type 2 diabetes mellitus
at Moi County Referral Hospital, Taita-Taveta County

THIS AGREEMENT dated [Date of Last Signature] is made **BETWEEN:**

- (1) **HEALTH PSYCHOLOGY RESEARCH LTD.**, 188 High Street, Egham, Surrey TW20 9ED ("HPR"); and
- (2) **Dr, BINDU MADHAVI**, ("Licensee"), Mount Kenya University; and
- (3) **DREDAH MWADULO**, ("Licensee"), Mount Kenya University

Each "party" (2) and/or (3) "Licensee" and together "parties" or (2) and (3) "Licensees"

Note: the use of the singular shall include the plural, and vice versa, as appropriate; the use of its/his/her is interchangeable.

WHEREAS:

- Licensees intend to carry out a study using questionnaire(s) in which the copyright is owned by Prof Clare Bradley (Prof Bradley), and
- Prof Bradley has authorised HPR to sub-licence her questionnaires, and
- HPR agrees to grant Licensees a licence to use questionnaire(s) defined below, strictly on a non-commercial basis in the study described in the Protocol attached hereto subject to the terms of this agreement.

NOW THEREFORE THE PARTIES HEREBY AGREE AS FOLLOWS:

1. Definitions

1.1 "Questionnaire(s)" shall mean:

- **ADDQOL-19**

in the language(s) specified below:

- **English for UK ***

*** English for UK ADDQOL-19 has not been validated for use in Kenya. Licensees must satisfy themselves that the language and wording are suitable for use with English-speaking respondents in Kenya, and that they convey the intended meanings. Because the English for UK ADDQOL-19 has not been linguistically validated for Kenya the UK wording may not be culturally or socially equivalent in Kenya.**

1.2 "Study" shall mean Assessment of the health-related quality of life in type 2 diabetes mellitus at Moi County Referral Hospital, Taita-Taveta County

as set out in the Protocol attached hereto.

1.3 "Format" shall mean paper Questionnaire(s).

1(a) Validity

- 1(a).1 Licensees confirm that the licensed questionnaire(s) shall be used ONLY in the study; that it will NOT be used by Licensees in any other study without a separate licence; and that it will NOT be given to others for use in any other study.
- 1(a).2 "Licence Period" shall mean from the date above until one year after the completion of the Study, or until three years from the date of last signature, whichever shall be sooner.

2. Copyright and Licences Thereto

- 2.1 Ownership of all copyrights in the Questionnaire(s) vests in Prof Bradley, and nothing in this Agreement shall be construed either expressed or implied as conferring any transfer of or rights of ownership upon Licensees in the Questionnaire(s).
- 2.2 HPR hereby grants to Licensees a non-exclusive non-transferable licence to:
- use the Questionnaire(s) in the Study for their own internal, non-commercial research purposes
 - make copies of the Questionnaire(s) from a master copy submitted to them only where reasonably necessary for the purpose of carrying out the Study.

SUBJECT TO Licensees' agreement that

- The integrity of the Questionnaire(s) is important and Licensees undertake to make no alterations or amendments of any kind to the Questionnaire(s) (including but not limited to, shrinking by photocopier or scanner), and that they will be used in the Study exactly as supplied.
 - Licensees undertake to supply to respondents only the number of copies of the Questionnaire(s) as is strictly necessary for the purpose of carrying out the Study.
- 2.3 Questionnaire(s) may be provided "For Information". These are intended for review and assessment and may be used for submission to Ethics Committees and Review Boards. They may not be given to third parties.
- 2.4 "For Use" Questionnaire(s) may be used only in the study for which they are licensed. They may not be sent to Ethics Committees or Review Boards, included in protocols, manuscripts or theses or passed on to others, except for the purposes of the study for which they have been licensed.
- 2.4.1 **Questionnaire(s) may not be reproduced in any manuscript, abstract, poster, paper, website or any other online resource or report which is intended for publication or presentation.**
- 2.5 Licensees may not amend, adapt or translate a licensed questionnaire without the express written agreement of HPR. An unauthorised amended, adapted or translated questionnaire shall not be a valid licensed instrument.

Copyright in all authorised amendments, adaptations and translations and all interim versions thereof shall remain vested solely in Prof Clare Bradley.

- 2.6 Licensees may not adapt questionnaire(s) for online, electronic or handheld device use without the written agreement of HPR, and such adaptation shall be subject to HPR's validation procedures before use. All expenses in connection with such adaptation shall be borne by Licensees. Copyright in such adaptation shall remain vested solely in Prof Clare Bradley.
- 2.7 The Questionnaire(s) may be given ONLY to fluent speakers of the language(s) specified in para 1.1. Questionnaire(s) must not be translated or used through an interpreter, either formally or informally. Translation without proper linguistic validation may result in unreliable data and HPR and/or Prof Bradley will not acknowledge or offer advice regarding such data.
- 2.8 Licensees' data from authorised and licensed versions of Questionnaires remain the sole property of Licensees; HPR and/or Prof Bradley will not analyse, interpret or offer advice regarding such data except at the sole discretion of HPR and/or Prof Bradley.
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- You must use it only with fluent English-speakers
- You acknowledge that the UK English ADDQoL has not been linguistically validated for use in Kenya, so examiners/regulators/editors may query or object to this.
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- The footer with copyright information must remain on all copies of the ADDQOL.

Draft 01

1st February 2021

HPR 4458


.....
Jonathan Gilbride


Director of HPR Ltd
.....
Position

Feb 1, 2021
.....
Date


.....
Dr Bindu Madhavi

Licensee/ Supervisor
.....
Position

Feb 2, 2021
.....
Date


.....
Dredah Mwadulo

Licensee/ Student
.....
Position

Feb 3, 2021
.....
Date

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Ref: HPR 4458

1. a. Title of Study

Assessment of the health-related quality of life in type 2 diabetes mellitus at Moi county Referral hospital, Taita-Taveta county

b. Purpose of Study (e.g. PhD thesis)

Master of Science in Nursing thesis

c. What is your hypothesis, or what is the aim of the study?

The aim of this study will be to highlight the effect that diabetes mellitus type 2 has on the well-being of these patients since its effect is not fully highlighted in developing countries (Kenya). This is because health-related quality of life is not an assessment that is included in the care given to these patients during their follow-up visits at the Moi county referral hospital.

2. Place of Study

Moi County Referral Hospital in Taita-Taveta County, Kenya

2a Title and Name of Supervisor

Doctor Bindu Madhavi

2b Email address of supervisor

mbindu@mku.ac.ke

3. Purpose of questionnaire(s) (what are you measuring?)

The questionnaire will assess the effect of Diabetes mellitus type 2 on the Physical, Psychological and Social health domains.

4. Questionnaire(s) requested

The UK English Audit of Diabetes Dependent Quality of Life survey tool (ADDQoL)- 19

4a Questionnaire Format to be used (e.g. paper, tablet, online)

Paper format

Please note, for student projects we will only licence questionnaires for use in PAPER format, as supplied by us as PDFs.

5. Language(s) requested (please note, questionnaires should be used only with patients fluent in the language(s) requested, and without the help of interpreters or translators, and for the country in which the study will be carried out.)

English

6. Non-HPR questionnaires that will be used and what they measure

No non-HPR questionnaire will be used

7. Study design (randomised cross-over, observational etc.)

Cross-sectional descriptive design

8. Date of start21st June 2021**9. Date of finish**23rd August 2021**10. Inclusion criteria**

- A patient diagnosed with type 2 diabetes mellitus via the World Health Organization (WHO) criteria.
- A type 2 diabetic patient who is aged 18 years and above as these individuals can consent for an interview.
- A type 2 diabetic patient who has been living with type 2 diabetes mellitus for at least one year since the time of diagnosis.

11. Exclusion criteria

- A patient with a medical diagnosis of a psychiatric disorder that will prevent the patient from responding to the questions in the data collecting tool.
- A patient diagnosed with type 1 diabetes, gestational diabetes or any other form of diabetes other than type 2 diabetes mellitus.

12. Age of patients

Above 18 years of age

13. First language of patients

English

14. Number of patients and how they are selected and recruited to the study

The desired sample size will be calculated by the use of the Yamane formula. The study will adopt a confidence interval of 95% and a sampling error of 0.05. The population size (P) will be 200 in a period of one month and e is 0.05

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

$$p = \frac{200}{1 + P(e)^2}$$

$$1 + 200 (0.05)^2$$

p= 133 patients (number of patients)

p= sample size P= population size e= level of precision

The patients will be selected and recruited in the study by assigning them numbers and then randomly be chosen by use of a sampling interval. The sampling interval will be considered by dividing the population size by the desired sample size. That is,

$$\text{Sampling interval} = \frac{200}{133}$$

Sampling interval= 2

Every 2nd patient will be a member that will be included in the sample size

15. How and where patients will complete the questionnaires (e.g. by self, with supervision, by post / at clinic etc.)

The patients will complete the questionnaire with supervision at the diabetic out-patient clinic at Moi-county referral hospital

16. Time since diagnosis

One year from the time of diagnosis

17. Time on current treatment (a patient will need to have been on a stable treatment regimen for at least 4 weeks before being asked about his/her satisfaction with treatment)

The patient will need to be on a stable treatment regimen for at least 1 month before being asked about his/her satisfaction with treatment.

18. Timings of questionnaire(s) (e.g. baseline (0 weeks) and end of study (16 weeks))

Baseline- 0 weeks
End of study- 8weeks

19. Approved by supervisor?

Yes

20. Submission to Ethics required?

Yes

21. Any other information you think is relevant to help us advise you on the use of HPR questionnaires? How will the various values for each question answered in the ADDQOL be scored so as to give the total score of the health-related quality of life of a patient?

Appendix IX: Similarity Index

ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE IN TYPE 2 DIABETES MELLITUS PATIENTS AT MOI COUNTY REFERRAL HOSPITAL, TAITA-TAVETA COUNTY IN KENYA

by Mwadulo Dredah Wughanga

Submission date: 24-May-2023 08:33PM (UTC+0300)

Submission ID: 2100992352

File name: Dredah_s_Final_Thesis_document.docx (15.66M)

Word count: 20102

Character count: 111801

ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE IN TYPE 2 DIABETES MELLITUS PATIENTS AT MOI COUNTY REFERRAL HOSPITAL, TAITA-TAVETA COUNTY IN KENYA

ORIGINALITY REPORT

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