HEALTH-RELATED QUALITY OF LIFE AND ASSOCIATED FACTORS AMONG ADULT TYPE 2 DIABETES PATIENTS ATTENDING FOLLOW-UP CARE AT PUBLIC HOSPITALS IN PUNTLAND, SOMALIA

MPH THESIS

BASHIR KHALIF FARAH (BSc)

March 2025

HARAMAYA UNIVERSITY, HARAR, ETHIOPIA

Health-Related Quality of Life and Associated Factors among Adult Type 2 Diabetes Patients Attending Follow-Up Care at Public Hospitals in Puntland, Somalia

A Thesis Submitted to the School of Public Health,

Post Graduate Programs Directorate

HARAMAYA UNIVERSITY

In Partial Fulfillment of the Requirements for the Degree of

MASTER OF PUBLIC HEALTH IN EPIDEMIOLOGY

BASHIR KHALIF (BSc)

Major Advisor: Shiferaw Letta (PhD, Assistant Professor)

Co-Advisor: Hassen Abdi (MPH, Assistant Professor)

March 2025

Haramaya University, Harar, Ethiopia

APPROVAL SHEET

HARAMAYA UNIVERSITY
Post Graduate Programs Directorate

I hereby certify that I have read and evaluated this Thesis, entitled "Health-Related Quality of Life and Associated Factors among Adult Type 2 Diabetes Patients Attending Follow-Up Care at Public Hospitals in Puntland, Somalia**"** prepared under my guidance by Bashir Khalif.

I recommend that it be submitted as fulfilling the thesis requirement.

Shiferaw Letta (PhD, Assistant professor) _____ _____

Major Advisor Signature Date

Hassen Abdi (MPH, Assistant Professor) _____ _____

Co-Advisor Signature Date

As a member of the Board of Examiners of the MPH Thesis Open Defense Examination, I certify that I have read and evaluated the thesis prepared by Bashir Khalif and examined the candidate.

I recommend that the thesis be accepted as fulfilling the thesis requirement for the degree of Masters of Public Health in Epidemiology.

_____ _____ _____

Chairperson Signature Date

_____ _____ _____

Internal Examiner Signature Date

_____ _____ _____

External Examiner Signature Date

Final approval and acceptance of the thesis is contingent upon submission of its final copy to the Council of Graduate Studies (CGS) through the candidate's school graduate committee (SGC).

STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis, and compilation of this Thesis. Any scholarly matter that is included in the Thesis has been given recognition through citation.

This Thesis is submitted in partial fulfillment of the requirements for a master's degree at Haramaya University. The Thesis is deposited in the Haramaya University Library and is made available to borrowers under the rules of the library. I solemnly declare that this Thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

A brief quotation from this Thesis may be made without special permission provided that accurate and complete acknowledgment of the source is made. Requests for permission for extended quotations from or reproduction of this Thesis in whole or in part may be granted by the Head of the School or Department when in his or her judgment the proposed use of the material is in the interest of scholarship. In all other instances, however, permission must be obtained from the author of the Thesis.

Name: Bashir Khalif Signature _____

Date: _____ /___ /_____

Department: Epidemiology

BIOGRAPHICAL SKETCH

My name is Bashir Khalif Farah, I was born and raised in Qardho, Puntland, Somalia, in 1994. I completed my primary and secondary education at Muntada Primary and Secondary School in Qardho from 2004-2015 after finishing my secondary education, I enrolled at Haramaya University in 2016 to pursue higher education. Following four years of study, I graduated with a degree of Bachelor of Science in Public Health in 2019.

Subsequently, I returned to my homeland, where I gained three years of work experience in both the public and private sectors. In 2023, I rejoined Haramaya University to pursue a Master's degree in Epidemiology.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Haramaya University, College of Health and Medical Sciences, School of Public Health, and the Postgraduate Programs Directorate for providing me with the opportunity and resources to conduct this study.

My heartfelt appreciation extends to my advisors, Dr. Shiferaw Letta and Mr. Hassen Abdi, for their invaluable insights, professional guidance, and technical support throughout this research endeavor.

I also wish to acknowledge the Puntland Ministry of Health and the hospital managers for their assistance in providing essential background information regarding the study area and access to relevant medical records.

Finally, I would like to recognize the study participants, as well as the dedicated data collectors and supervisors.

ACRONYMS AND ABBREVIATIONS

ADA	American Diabetes Association
B	Coefficient
BMI	Body Mass Index
DM	Diabetes Mellitus
GDM	Gestational Diabetes Mellitus
HU	Haramaya University
HRQOL	Health-Related Quality of Life
IDF	International Diabetes Federation
IHRERC	Institutional Health Research Ethics Review Committee
MDKT	Michigan Diabetes Knowledge Test
MLR	Multiple Linear Regression
QoL	Quality of Life
SD	Standard Deviation
SE	Standard Error
Seβ	Standard Error of the Coefficient
UK	United Kingdom
US	United States
VIF	Variance Inflation Factor
WHOQOL-BREF	World Health Organization Quality of Life-BREF
WHO	World Health Organization

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Introduction: Health-related quality of life is essential in managing diabetes mellitus, as compromised quality can negatively impact self-care and glycemic control, increasing complication risks. However, there is limited information on Health-related quality of life in Puntland, Somalia.

Objectives: This study aimed to assess Health-related quality of life and its associated factors among adults with type 2 diabetes attending follow-up care at public hospitals in Puntland, Somalia, from July 28 to August 28, 2024.

Methods: a cross-sectional study involving 403 randomly selected adult type 2 diabetic patients from public Hospitals. Data were collected through face-to-face interviews using Open Data Kit and validated instruments, including the World Health Organization Quality of Life - Brief and Diabetes Self-Care Activities Scale. Data were analyzed using StataMP 17, employing descriptive statistics, independent T-tests, one-way analysis of variances, and both bivariable and multivariable linear regression analyses.

Result: The mean overall health-related quality of life score was 52.9 ± 6.90, with the highest domain score in physical health (54.9 ± 12.43) and the lowest in the environmental domain (51.38 ± 16.65). The majority of participants were under 40 years old (41.19%), male (50.87%), and resided in urban areas (79.4%). Approximately 59.31% were married.

Behaviorally, 42.18% of participants reported poor self-care practices, 48.39% exhibited low patient empowerment.

Clinically, 83.37% had been diagnosed with type 2 diabetes mellitus for five years or less, and 27.79% reported complications, primarily depression (28.6%). Most participants (80.89%) were on oral medications.

Multivariable analysis identified several factors significantly associated with improved health outcomes among individuals with type 2 diabetes mellitus. Participants with secondary education or higher demonstrated better health outcomes ($\beta = 1.75$, $p = 0.040$, 95% CI: 0.084, 3.42). The absence of comorbidity was strongly correlated with better health ($\beta = 2.62$, $p < 0.001$, 95% CI: 1.15, 4.08). Conversely, waiting times exceeding 15 minutes negatively impacted health-related quality of life ($\beta = -2.32$, $p = 0.049$, 95% CI: -4.64, -0.008).

Conclusion: The health-related quality of life among patients with type 2 diabetes mellitus in Puntland, Somalia is moderate highlighting the significant influence of educational, clinical, and psychosocial factors. Major barriers to improved health-related quality of life include limited access to healthcare and diabetes-related complications.

Keywords: Health-Related Quality of Life, Type 2 Diabetes, Public Hospitals, Puntland, Somalia.

1. INTRODUCTION

1.1. Background

Diabetes is a chronic, metabolic disease characterized by persistently elevated levels of blood glucose (or blood sugar), which can lead gradually to significant damage to various organs such as the heart, blood vessels, eyes, kidneys, and nerves over time (WHO, 2024).

Globally, one out of every five individuals above the age of 65 has diabetes, and the majority of them reside in low- and middle-income countries(Tran Kien et al., 2021).

According to International Diabetes Federation (IDF, 2021) estimates that around 537 million people aged 20-79 years have diabetes, and this figure is expected to rise to 643 million by 2030 and 783 million by 2045(IDF, 2021).

The prevalence of Type 2 diabetes mellitus in Somalia has experienced a significant surge since the 1980s, and as of 2021, the estimated prevalence stands at 6.5% (IDF, 2021).

As a result, diabetes continues to be a significant global health concern (Bharamu Nyamagoud et al., 2023). There is a growing interest in understanding the impact of T2DM on health-related quality of life (Trikkalinou et al., 2017).

Existing evidence suggests that T2DM has a detrimental effect on overall HRQoL across various settings, with a wide range of potential risk factors involved(Redekop et al., 2002, Zhuang et al., 2020).

QoL is defined by World Health Organization as an individuals' perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns (Group, 1998). It is a comprehensive concept that is influenced in a multifaceted manner by a person's physical health, psychological state, level of independence, social relationships, and their connection to significant aspects of their environment (Ababio et al., 2017). HRQoL serves as a patient-reported tool that assesses how diseases, disabilities, and treatments impact the overall health status of individuals (A Abdallah et al., 2019).

Health-Related Quality of Life is a multidimensional construct that emphasizes an individual's physical, cognitive, emotional, psychological, and spiritual well-being in relation to their current health status (Iqbal et al., 2017) By encompassing both physical and mental well-being, which offers valuable insights into a person's comprehensive health condition (Gebremariam et al., 2022).

Although there is no available Previous studies conducted in Puntland and Somalia as a whole, studies carried out in Ethiopia used the SF-36 (Esubalew et al., 2024) and WHOQOL-BREF

(Gebremedhin et al., 2019a) instruments to explore patients' perspectives on the impact of the disease and its treatments have shown that general health, environment, psychology, physical well-being, pain, and vitality significantly impact HRQoL (Muze et al., 2017b).

These studies emphasize the importance of comprehensive intervention strategies to enhance HRQoL in diabetes patients, considering factors like diabetes-related complications, age, obesity, duration of diabetes, and medication use.

Additionally, these studies reveal that HRQoL is currently neglected in routine clinical practice in Ethiopia (Aschalew et al., 2020b, Girma et al., 2020b, Feyisa et al., 2020).

Therefore, measuring HRQoL is crucial because it predicts an individual's ability to manage a disease and uphold long-term health and well-being. Moreover, it is now widely acknowledged as a significant health outcome in its own regard, signifying the ultimate objective of all healthcare interventions.

1.2. Statement of the Problem

Health-Related Quality of Life (HRQOL) is a crucial aspect of well-being, reflecting the physical, mental, and social health status of individuals. For individuals with Type 2 Diabetes Mellitus (T2DM), HRQOL is significantly affected due to the disease's chronic nature and its associated complications (Mishra et al., 2015). The World Health Organization (WHO) recognizes that non-communicable diseases like diabetes contribute substantially to preventable mortality and morbidity, further diminishing HRQOL (WHO (World Health Organization), 2024).

The global burden of diabetes is alarming, with the International Diabetes Federation (IDF) estimating that approximately 415 million adults live with diabetes, and an additional 318 million adults have impaired glucose tolerance, placing them at risk of developing diabetes in the future (Saeedi et al., 2020, Cai et al., 2017). By 2040, the global prevalence of diabetes among adults aged 20 to 79 years is expected to rise to 10.4% (Pichon-Riviere et al., 2015). In Africa, the prevalence of diabetes is projected to reach 28 million individuals by 2030, constituting 5.1% of the population (Spasić et al., 2014).

In Somalia, the diabetes prevalence increased from 4.3% in 2011 to 6.5% in 2021 (IDF (International Diabetes Federation), 2021). However, the impact of T2DM on HRQOL remains poorly understood. Evidence from previous studies indicates that people with T2DM often experience reduced HRQOL compared to non-diabetic individuals, primarily due to the burden of managing the disease, its complications, and associated mental health issues (Thapa et al., 2019).

The effects of T2DM on HRQOL are multifaceted, including macrovascular complications like cardiovascular disease, microvascular complications, and non-vascular comorbidities (Mehta (Mehta et al., 2014, Olukotun et al., 2022) . Patients with diabetic complications and poor glycemic control are particularly susceptible to a diminished quality of life. Additionally, factors such as age, socioeconomic status, educational level, and access to healthcare services significantly influence HRQOL outcomes (Homady et al., 2023).

Studies in Saudi Arabia and other Middle Eastern countries have shown varying degrees of HRQOL impairment among individuals with diabetes, highlighting the importance of localized evidence to address these challenges (Al-Aboudi et al., 2015, Al Hayek et al., 2014, Elazhary et al., 2018, Jarab et al., 2019). In Somalia, a fragile healthcare system and limited resources further exacerbate the challenges faced by diabetes patients, leading to restricted access to essential medications, diagnostic tools, and comprehensive management (Gele et al., 2017).

This study aims to assess the HRQOL of T2DM patients attending follow-up care at public hospitals in Puntland, Somalia, and identify the factors influencing their HRQOL. By generating context-specific evidence, the findings will contribute to addressing the knowledge gap and supporting healthcare decision-makers in developing effective interventions to improve the HRQOL of individuals living with T2DM in Somalia.

1.3. Significance of the Study

This research endeavor holds substantial importance in unraveling the determinants of Health-Related Quality of Life (HRQOL) among individuals diagnosed with type 2 diabetes. The key beneficiaries and users of the study findings are as follows:

Healthcare professionals, the Puntland Ministry of Health, regional health bureaus, and health authorities, health facilities, patients and their families, and the nation at large.

Healthcare professionals will gain insights into the associations between quality of life and various factors, enabling them to manage type 2 diabetes effectively.

Policymakers and health authorities can assess the effectiveness of existing policies and treatment strategies.

Health facilities can refine practices for better patient outcomes.Patients and their families will receive recommendations for self-management and improved quality of life. The study will also contribute to future investigations at the state level, benefiting the nation as a whole.

1.4. Objectives

1.4.1. General objective

To assess Health-Related Quality of Life and Associated Factors among Adult Type 2 Diabetes Patients Attending Follow-up Care at Public Hospitals in Puntland, Somalia, from July-28 to August 28, 2024.

1.4.2. Specific objectives

- To determine the level of Health-Related Quality of Life among Adult Type 2 Patients with Diabetes Attending Follow-up Care at Public Hospitals in Puntland, Somalia.
- To identify factors associated with Health-Related Quality of Life among Adult Type 2 Diabetes Patients Attending Follow-up Care at Public Hospitals in Puntland, Somalia.

2. LITERATURE REVIEW

2.1. Health-Related Quality of Life among Type 2 DM Patients

Health-related quality of life (HRQOL) among Type 2 Diabetes Mellitus (T2DM) patients has been extensively studied across different regions. Various cross-sectional studies have shown that a significant proportion of T2DM patients experience poor-to-moderate HRQOL. Physical and psychological health domains are commonly reported as the most affected, indicating the impact of diabetes on day-to-day activities and emotional well-being (Komaratat et al., 2021, Tamornpark et al., 2022)

In contrast, social relationships and environmental domains tend to reflect better HRQOL outcomes. Studies in Thailand and the UAE highlight relatively higher satisfaction in social and environmental aspects, suggesting the influence of cultural and community support systems (Lima et al., 2018, Al kaabi et al., 2021). However, disparities are observed in regions with limited healthcare access, where environmental factors are more likely to contribute to lower HRQOL scores (Aschalew et al., 2020a).

Similarly, studies from Ethiopia report challenges in physical and psychological health, with social support systems providing some buffer against the adverse effects of T2DM (Gebremedhin et al., 2019b, Wonde et al., 2022). The consistent pattern of lower physical health scores across various settings suggests the need for improved diabetes management and healthcare interventions to address the physical limitations faced by patients (Nwatu et al., 2019).

Moreover, psychological health remains a significant concern, particularly in settings with inadequate mental health support. Emotional distress, anxiety, and depression are prevalent among T2DM patients, further impacting their overall HRQOL (Feyisa et al., 2020, Girma et al., 2020a).

Overall, while social and environmental factors often serve as protective elements, the physical and psychological domains require targeted interventions. Future healthcare strategies should prioritize integrated care models to improve HRQOL in T2DM patients globally (Ababio et al., 2017, Doubova et al., 2013).

2.2. Factors Associated with HRQoL among Type 2 DM Patients

2.2.1. Socio-demographic factors

2.2.1.1.Sex

An observational study in Santo Domingo, Dominican Republic, found that women with Type 2 Diabetes Mellitus (T2DM) experienced a greater impact on their overall quality of life (QoL) than men, particularly in physical, psychological, and environmental domains (Marte et al., 2019, Espuela et al., 2020, Svenningsson et al., 2011, Pham et al., 2019). Similarly, studies from Saudi Arabia and Ethiopia reported significantly lower QoL scores among females across all domains (Homady et al., 2023, Al Hayek et al., 2014, Alshayban and Joseph, 2020, Feyisa et al., 2020).

2.2.1.2.Age

Age is a significant factor influencing QoL among T2DM patients. Studies from Saudi Arabia indicated that older adults (>50 years) experienced poorer QoL across all domains (Al Hayek et al., 2014, Homady et al., 2023). Conversely, a study in Bangladesh highlighted a notable decline in psychological well-being among patients aged over 80 years (Amin et al., 2022)

2.2.1.3.Marital status

Marital status is associated with QoL, with married individuals generally reporting higher scores across physical, psychological, social, and environmental domains compared to unmarried individuals. Although not all findings were statistically significant, studies from Nigeria and Ethiopia suggest a positive association between being married and better QoL (Nwatu et al., 2019, Issa and Baiyewu, 2006, Aschalew et al., 2020a).

2.2.1.4.Education

Educational attainment also plays a significant role in determining QoL. Studies in Bangladesh and Saudi Arabia found that uneducated or less educated individuals had lower QoL scores across all domains. In contrast, those with higher educational levels demonstrated better QoL outcomes (Amin et al., 2022, Homady et al., 2023, Pham et al., 2019, Kien et al., 2021).

2.2.1.5.Residence

Urban-rural disparities in QoL were evident in studies from Ethiopia. Rural residents consistently reported lower scores in the environmental, psychological, and social domains, with urban dwellers experiencing comparatively better outcomes (Aschalew et al., 2020a, Oguzturk, 2008, Weeks et al., 2004, Tusa et al., 2020).

2.2.1.6.Occupation

Employment status influences QoL, with unemployed individuals generally reporting lower QoL compared to those engaged in formal or informal occupations. Government employees, private

sector workers, and merchants demonstrated better outcomes (Reba et al., 2018, Issa and Baiyewu, 2006, Javanbakht et al., 2012).

2.2.1.7.Income

Higher household income was positively associated with QoL across all domains. Studies in Bangladesh reported that individuals with higher income experienced significantly improved social relationships and overall well-being compared to those in lower-income brackets (Amin et al., 2022, Esin et al., 2016).

2.2.2. Clinical and healthcare-related factors

2.2.2.1.HBA1c

Several studies have shown that changes in HbA1c levels are associated with variations in health-related quality of life (HRQoL). In the USA, a study demonstrated that a 1.2% reduction in HbA1c was linked to a 0.03 improvement in health utility (Peyrot et al., 2011)). Similarly, research from Denmark, Sweden, and the UK indicated a 1% HbA1c change correlated with a 0.025 improvement in health utility (Ridderstråle et al., 2016). Additionally, a study from Colorado, USA, found a 1% HbA1c increase led to a disutility of −0.03, negatively impacting HRQoL (McQueen et al., 2014) .

2.2.2.2.Dyslipidemia

Dyslipidemia remains prevalent among diabetic patients, influencing HRQoL. A study in Jimma Zone, Ethiopia, found a 37.5% prevalence of diabetic dyslipidemia among non-infected patients (Woyesa et al., 2021). In contrast, a Hawassa University study reported a significantly higher prevalence of 91.1% (Wube et al., 2020). Such elevated rates increase cardiovascular risks and reduce overall well-being.

2.2.2.3.BMI

Research conducted at the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine, and Metabolic Disorders (BIRDEM) showed that overweight and obese individuals reported lower HRQoL, particularly in social relationship and environmental domains (Amin et al., 2022).

2.2.2.4.Duration of T2DM

Studies suggest that a shorter diabetes duration is associated with better HRQoL. In Saudi Arabia, patients with diabetes for ≤5 years reported significantly higher HRQoL scores across all domains compared to those with diabetes for over 10 years, whose scores were considerably lower (Homady et al., 2023, Al Hayek et al., 2014).

2.2.2.5.Complication of T2DM

Diabetes complications significantly reduce HRQoL. Studies have shown a strong correlation between complications and reduced HRQoL scores in all domains, with complications being independent risk factors for poor outcomes (Lloyd et al., 2001, Al Hayek et al., 2014, Jing et al., 2018, Pham et al., 2020, Homady et al., 2023).

2.2.2.6.Type of complication

Specific complications affect HRQoL differently. For instance, diabetic retinopathy negatively impacts all HRQoL domains, while peripheral artery disease (PAD) significantly affects psychological, social, and environmental domains (Amin et al., 2022, Safita et al., 2016). Additionally, nephropathy lowers physical health and environmental scores, while coronary artery disease (CAD) has a pronounced negative impact on psychological well-being (Abedini et al., 2020).

2.2.2.7.Number of complications

Patients with multiple complications experience a greater decline in HRQoL. In Ethiopia, individuals with two or more complications reported lower social domain scores compared to those with one complication (Girma et al., 2020a).

2.2.2.8.Co-morbidities

The presence of co-morbidities is associated with lower HRQoL. Ethiopian studies have shown that patients with co-morbidities report significantly reduced physical and overall HRQoL scores compared to those without (Aschalew et al., 2020a, Gebremedhin et al., 2019b).

2.2.2.9.Travel time (minute)

Longer travel times to healthcare facilities negatively influence physical HRQoL. A Nigerian study highlighted that increased travel time predicted poorer physical HRQoL among patients with both hypertension and diabetes (Bolarinwa et al., 2016).

2.2.2.10. Waiting time (minute)

Waiting time also negatively impacts mental HRQoL. Patients in Nigeria who experienced prolonged waiting times reported significantly lower mental HRQoL scores (Bolarinwa et al., 2016).

2.2.3. Behavioral and psycho-socical factors

2.2.3.1.Smoking

Smoking negatively affects the health-related quality of life (HRQOL) of diabetic patients, particularly in the physical health domain (Homady et al., 2023).

2.2.3.2.Exercise

Engaging in regular exercise is positively associated with improvements in both the physical and psychological domains of HRQOL (Aschalew et al., 2020a, Imayama et al., 2011, Adeniyi et al., 2015, Kaplan et al., 1987) .

2.2.3.3.Diet control

Diet control is significantly associated with better HRQOL, particularly in the social and environmental domains. Non-vegetarians with diabetes tend to have a poorer quality of life compared to vegetarians (Pandey et al., 2020, Aschalew et al., 2020a).

2.2.3.4.Medication adherence

Low medication adherence has both direct and indirect negative effects on the environmental health domain of HRQOL (Tusa et al., 2020, Rajgadhi et al., 2018, Pascal et al., 2012).

2.2.3.5.Foot care

Proper foot care is significantly associated with higher HRQOL, particularly in the environmental domain (Nyanzi et al., 2014).

2.2.3.6.Self-monitoring of blood glucose (SMBG)

Self-monitoring of blood glucose is significantly associated with improved HRQOL among diabetic patients (Sendekie et al., 2023).

2.2.3.7.Knowledge about diabetes

A Study Conducted in Kelantan, Malaysia Found That Diabetes Knowledge Was Not a Significant Predictor of QOL Impact.However, They Concluded That Diabetes Knowledge Could Serve as an Important Indicator in Mitigating the Negative Effects on QOL Suggesting That While it may not Directly Influence QOL (Kueh et al., 2017*)*.

2.2.3.8.Empowerment

Empowerment-based training programs have shown significant improvements in the HRQOL of individuals with type 2 diabetes (Ebrahimi et al., 2023).

2.2.3.9. Depression

Depression symptoms are linked to lower HRQOL in all domains, including physical, psychological, social, and environmental aspects (Girma et al., 2020a, Reba et al., 2018, Muze et al., 2017a, Mishra et al., 2015, Kintzoglanakis et al., 2024).

2.2.3.10. Diabetes related distress

Higher diabetes-related distress is associated with lower HRQOL, particularly in the psychological domain (Chew et al., 2015, Carper et al., 2014, Liu et al., 2010).

2.2.3.11. Stigmatized

Feelings of perceived social stigma negatively impact the physical HRQOL of diabetic patients (Girma et al., 2020a, Gredig and Bartelsen-Raemy, 2017).

2.2.3.12. Social support

Social support has a significant positive association with the mental health domain of HRQOL in Blacks compared to their counterparties (Olukotun et al., 2022).

2.3. Conceptual Framework

A conceptual framework is a collection of interconnected and logically organized ideas that establish the fundamental concepts within a research study and offer an understanding of how these ideas are interrelated or connected. It serves to illustrate the relationships and associations between different concepts within the study (Adom et al., 2018, LoBiondo-Wood and Haber, 2013).

This conceptual framework was developed by thoroughly reviewing the existing literature about the key variables influencing the Health-Related Quality of Life of adult patients with Type 2 Diabetes, as well as the Factors Associated with it (Espuela et al., 2020, Homady et al., 2023, Amin et al., 2022, Gebremedhin et al., 2019b, Aschalew et al., 2020a, Reba et al., 2018, Rajgadhi et al., 2018, Sendekie et al., 2023, Abedini et al., 2020, Girma et al., 2020b, Feyisa et al., 2020, Bolarinwa et al., 2016).

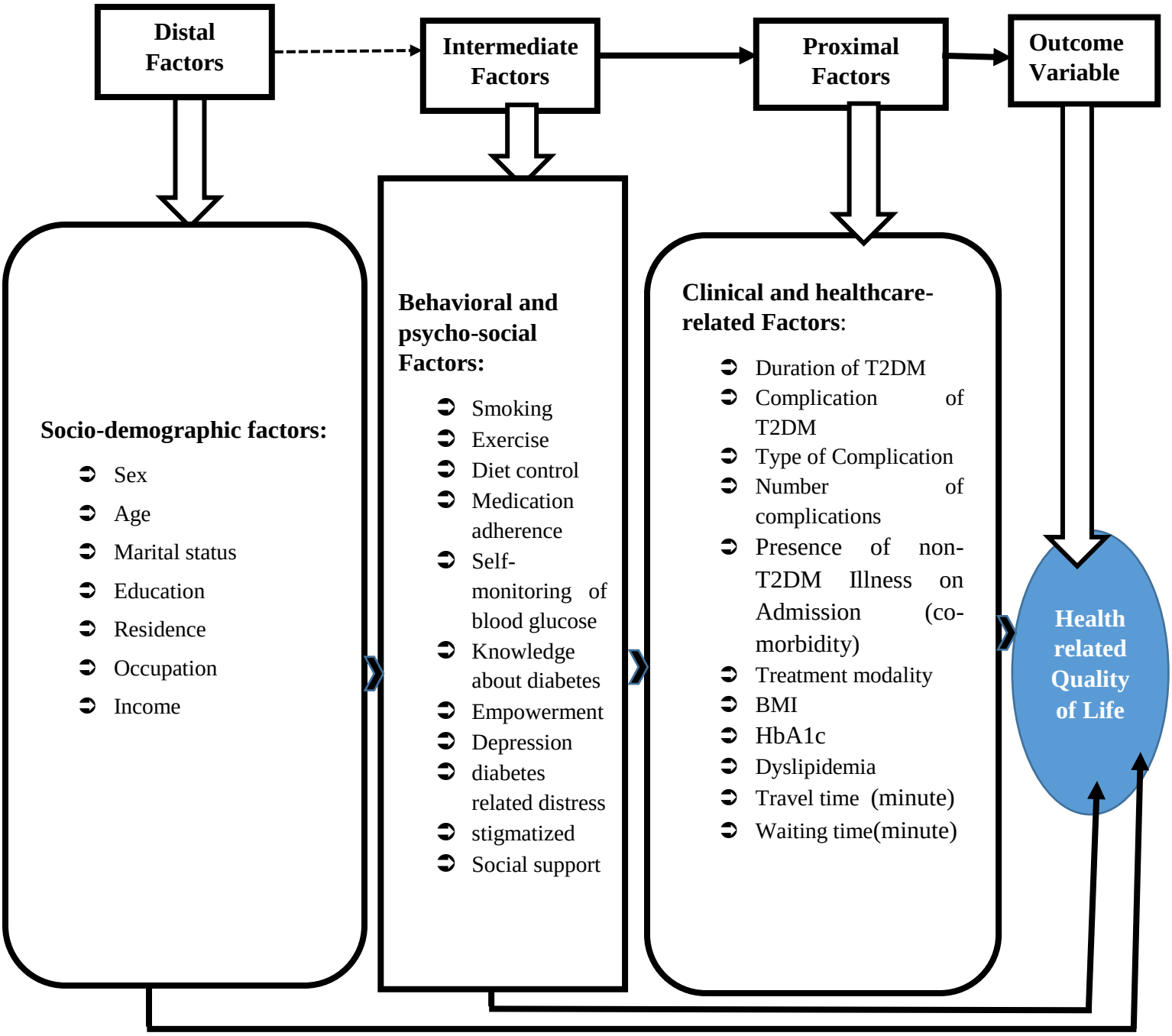


Figure 1. Conceptual framework of the study on health-related quality of life and associated factors among adult type 2 diabetes patients attending follow-up care at public Hospitals in Puntland, Somalia.
(Developed by the investigator reviewing different literatures).

3. MATERIALS AND METHODS

3.1. Study Area and Period

This study was conducted in three specific public hospitals located in three different cities within the state of Puntland, Somalia. The designated facilities for this study are Gardo General Hospital in Gardo City, Karkaar region, as well as two private healthcare settings: Caafi Diagnostic Diabetes Specialty Clinic in Bosaso City, Bari region, and Dalab Hospital in Growe, Nugaal region.

Puntland State of Somalia is in the northeastern part of Somalia. It shares borders with the Indian Ocean to the east, the Gulf of Aden to the north, the northwest region of Somalia (Somaliland) to the west, Ethiopia to the southwest, and the central regions of Somalia to the south. Puntland is comprised of nine regions, namely Cayn, Bari, Karkaar, Haylaan, Mudug, Nugal, Sanaag, Sool, and Gardafuu. It spans a landmass of approximately 212,510 km2, which accounts for roughly one-third of Somalia's total landmass (PSS (Puntland State of Somalia), 2020).

The study was scheduled to take place in Puntland, Somalia, from July 28 to August 28, 2024

3.2. Study Design

An institutional-based cross-sectional study was conducted

3.3. Population

3.3.1. Source population

All adult patients diagnosed with type 2 diabetes visited public hospitals in Puntland, Somalia.

3.3.2. Study population

Adult patients with type 2 diabetes mellitus in randomly selected public hospitals in Puntland, Somalia during the study period.

3.4. Inclusion and Exclusion Criteria

3.4.1. Inclusion criteria

- Those Adult type 2 diabetes mellitus patients attending public hospitals in Puntland for at least six months/six months follow-up visits and the permanent residents of Puntland, Somalia.

3.4.2. Exclusion criteria

- Those critically ill patients or did not attend the hospital during the study period

- Mother with gestational diabetes mellitus (GDM) and HIV–infected DM patients.

3.5. Sample Size Determination

The sample size was calculated by using a single mean formula, considering the following assumptions: the mean and standard deviation of the overall HRQOL among type 2 DM patients is estimated to be 51.50 ±15.78(Gebremedhin et al., 2019a), The margin of error is determined to be 1.6, and a 95% confidence interval (CI) is used with a 10% non-response rate. The critical value (zα/2) for a 95% confidence level is 1.96.

The overall HRQOL standard deviation is ± 15.78 (Gebremedhin et al., 2019a), computed as follows:

$$\mathbf{n} = \frac{(\mathbf{z}\,\boldsymbol{\alpha}/\mathbf{2})^{\mathbf{2}} * \boldsymbol{S}^{\mathbf{2}}}{\boldsymbol{E}^{\mathbf{2}}} = \frac{(\mathbf{1.96})^{\mathbf{2}} * (\mathbf{15.78})^{\mathbf{2}}}{(\mathbf{1.6})^{\mathbf{2}}} = \frac{\mathbf{956.6}}{\mathbf{2.56}} = \mathbf{374}$$

By incorporating a **10%** non-response rate, the final sample size is adjusted to **411 individuals**.

Where:

n = minimum required sample size for the study.

Z = standard normal distribution value (**z = 1.96**) corresponding to a **95%** confidence interval.

S = standard deviation (**SD = 15.78**) based on the study by (Gebremedhin et al., 2019a)

E = margin of error (**E = 1.6**)

For the second specific objective, which aimed to identify the factors associated with health-related quality of life, the sample size can be calculated using the single mean formula.

Table 1. Sample size determination for factors associated with health-related quality of life among adult type 2 diabetes patients attending follow-up care at public Hospitals in Puntland, Somalia, 2024.

Factors	Category	zα/2	SD	E	Final sample size	References
Age		1.96	13.3	1.6	292	(Letta et al., 2022)
Number of complication	0	1.96	6.67	1.6	74	(Zan et al., 2024)
	1	1.96	6.7	1.6	75	(Zan et al., 2024)
	2	1.96	7.74	1.6	99	(Zan et al., 2024)
	≥3	1.96	15.56	1.6	398	(Zan et al., 2024)
Duration of T2DM (years)	≤5	1.96	7.03	1.6	83	(Zan et al., 2024)
	6–10	1.96	6.88	1.6	78	(Zan et al., 2024)
	11–15	1.96	7.97	1.6	106	(Zan et al., 2024)

Finally, the sample size calculated for Objective One, which is 411, is considered as the final sample size.

3.6. Sampling Procedure/ Technique

Simple random sampling is used to select study hospitals. From each hospital, participants are selected by systematic sampling with proportional allocation to size (PAS) based on the total number of type II diabetes mellitus patients' flow in the study hospitals per month.

The total number of patients who visited the selected public hospitals in the previous months' period was 766.

A total of 387 patients with T2DM were under follow-up at Caafi Diabetes Specialty Clinic, of whom 208 were selected for the study. At Dalab Hospital, there were 226 diabetic patients, out of which 121 were included in the study. Similarly, Gardo General Hospital had 153 diabetic patients, and 82 of them were selected for the study (Figure 2).

The sampling interval was determined by dividing the expected number of diabetic patients per month into the sample size of 766/411, resulting in a sampling interval of two.

Therefore, every second patient visiting the follow-up service was interviewed until the total sample size is reached, using a systematic random sampling technique. The first case at each hospital was selected using a lottery method as presented below.

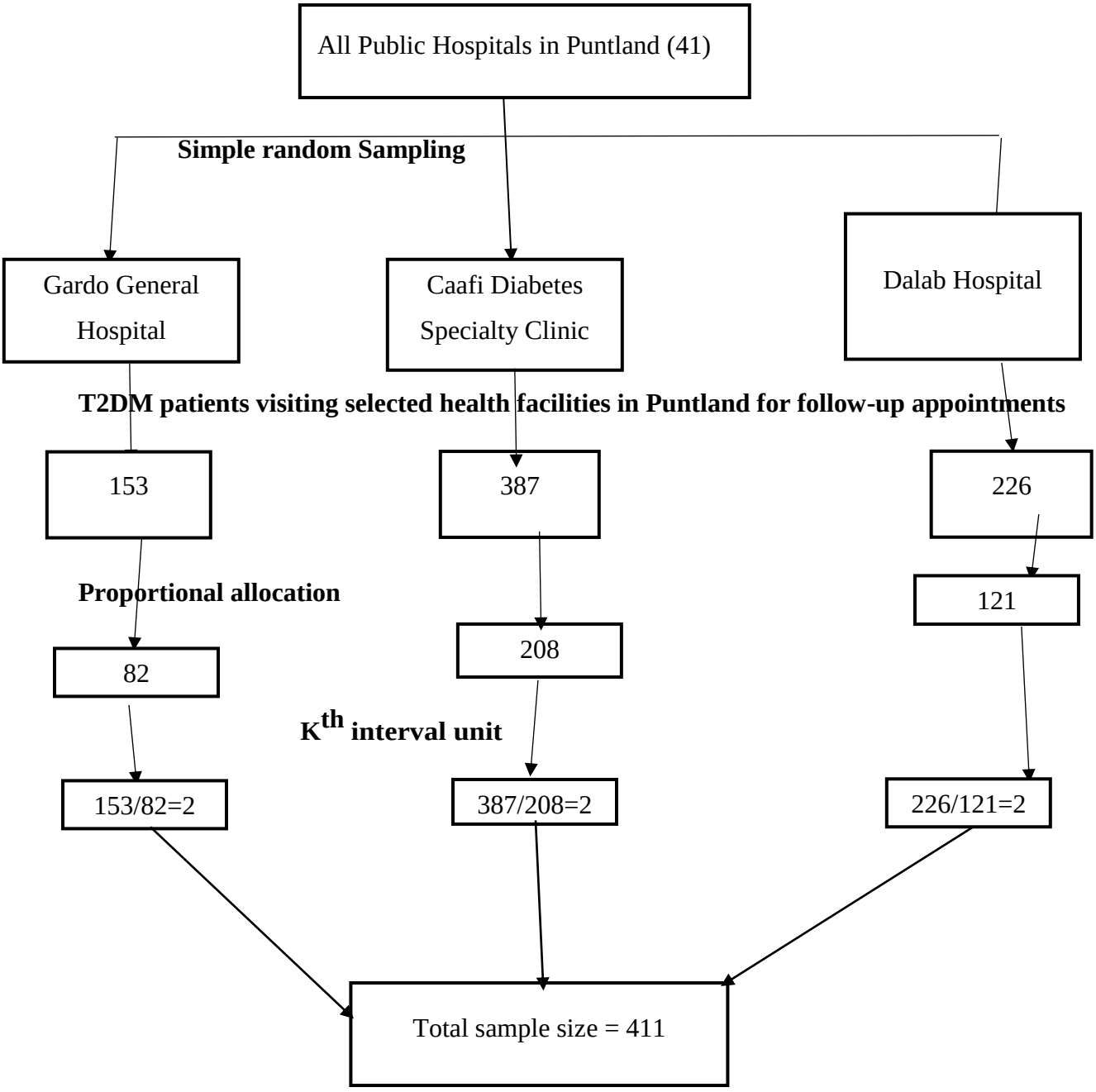


Figure 2. Schematic presentation of the sampling procedure of the study

3.7. Data Collection Methods

3.7.1. Data collection instruments

The instrument comprises socio-demographic characteristics, clinical-related questions, and the WHO-QOL-BREF tool. The WHOQOL-BREF is a 26-item instrument consisting of four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items), the overall perception of QOL and general health (2items). Each item of the WHOQOL-BREF is scored from 1 to 5 on a response scale, which is stipulated as a five-point ordinal scale. Three negatively worded items are reversely coded before analysis.

The score for each domain was calculated by summing the scores of its corresponding items. The scores were then transformed linearly to a 0–100 scale. The English version of the questionnaire was adopted from the World Health Organization (WHO) and translated into Somali.

To ensure consistency, it is then translated back into English. In addition, other validated tools are used accordingly, such as Diabetes Self-Care Activities Scale, Diabetes Knowledge Scale, Diabetes Empowerment Scale, Phq-9 Questionnaire, Diabetes-Related Distress 17 Items Scale (Dds-17), and Oslo Social Support Scale (Osss-3).

Body mass index (BMI) is calculated by dividing a person's weight in kilograms by the square of their height in meters. Variables, such as fasting blood sugar (from the most recent visits), were collected, and the presence of documented comorbidities was obtained from the patient's medical records.

3.7.2. Data collectors and supervisors

Two diploma nurses and two BSc nurses collected the data under the supervision of two BSc public health officers who are fluent in the AF Somali language.

3.7.3. Data collection procedures

The data was collected by conducting face-to-face interviews utilizing ODK collect, the questionnaire had been translated from English to AF Somali version. Furthermore, specific clinical information was confirmed by referring to patient records. It is important to mention that nearly all consecutive eligible patients were included in the study, with a response rate of 403 out of 411.

3.8. Variables

3.8.1. Dependent variable

Health-related quality of life (HRQoL) (measured by WHOQOL-BREF).

3.8.2. Independent variables

Socio-demographic factors: Sex, Age, Marital status, Education, Residence, Occupation, and Income.

Behavioral and psycho-social factors: smoking, exercise, diet control, medication adherence, self-monitoring of blood glucose, knowledge about diabetes, empowerment, depression, diabetes-related distress, stigmatization, and social support.

Clinical and healthcare-related factors: duration of T2DM, complication of T2DM, type of complication, number of complications, presence of non-T2DM illness on admission (co-morbidities), treatment modality, HBA1c, dyslipidemia, BMI, travel time, and waiting time.

3.9. Operational Definitions

Health-related quality of life (HRQOL): Patients with higher scores (scores approaching 100) indicate better HRQOL, while lower scores (approaching 0) indicate worse HRQOL(Ware, 1993).

BMI: The Body Mass Index (BMI) is categorized into several groups. Patients with a BMI of 18.5 to 24.9 kg/m² are considered to have a normal BMI. Those with a BMI ranging from 25 to 29.9 kg/m² are classified as overweight. Patients with a BMI between 30 and 34.9 kg/m² fall into the class I obese category. Individuals with a BMI of 35 to 39.9 kg/m² are categorized as class II obese, while patients with a BMI of 40 kg/m² or higher are classified as class III obese, also referred to as morbidly obese (Safita et al., 2016).

HbA1C level: Patients with an HbA1C level of ≤7% was considered to have good glycemic control. Conversely, patients with an HbA1C level > 7% is considered to have poor glycemic control (Association, 2017).

Duration of diabetes mellitus: Patients with type II diabetes categorized into four groups based on the duration of living with diabetes since diagnosis: 1-5 years, 6-10 years, 11-15 years, and more than 15 years (Mikailiūkštienė et al., 2013).

Diabetes-related complications: the occurrence of adverse effects attributed to diabetes, such as peripheral neuropathy, retinopathy, nephropathy, and diabetic foot ulcer (IDF, 2016).

Diabetes self-care activity: It is the practice of activities that individual diabetics was initiated and perform on their behalf to control their disease, and maintain life, health, and well-being (Sorato et al., 2016).

Depression: is extreme sadness or despair that lasts more than days. It interferes with the activities of daily life and can cause physical symptoms such as pain, weight loss or gain, sleeping pattern disruptions, or lack of energy (Association, 2024).

Empowerment: It is a process whereby patients have the knowledge, skills, attitudes, and self-awareness necessary to influence their own behavior and that of others to improve their quality of life (Funnell et al., 1991).

3.10. Data Quality Control

The questionnaire was translated into AF Somali language and then translated back into English again to ensure its consistency. Data collectors received a two-day training session, which covered the study objectives, the procedures to be followed, the proper method for completing the questionnaires using the ODK tool, and the ethical considerations when engaging with study participants.

Before commencing the actual data collection process, a pre-test of the questionnaire was conducted on a subset comprising 5% (21 individuals) of the total sample size, specifically T2DM patients, at Gutale Primary Hospital.

The purpose of this pre-test was to evaluate the clarity, simplicity, and comprehensibility of the questionnaire based on the findings obtained. To ensure the quality of data collection, the data collectors received daily supervision, and the supervisors, along with the principal investigator, examined the completed questionnaires daily to ensure their completeness.

3.11. Data Processing and Analysis

Data was entered into ODK collect and then exported to StataMP version 17.0, cleaned for inconsistencies and missing values for analysis. Descriptive statistics and Independent T-test/One-Way ANOVA were used to describe the Characteristics of participants accordingly and compare the mean HRQOL score across the groups, respectively.

To identify factors associated with health-related quality of life among individuals with type II diabetes mellitus, both simple linear regression and multiple linear regression models were employed.

For the linear regression analysis, several assumptions were checked. These include linearity, normality, homogeneity of variance, the presence of outliers, and multicollinearity between the predicted variables. A scatter plot was used to assess the linearity assumption between the outcome variable and the independent variables. When the plot of standardized residuals versus standardized predicted values shows no obvious signs of funneling, it suggested that the assumption of homoscedasticity had been met.

Additionally, the P-P plot was examined to determine if the dots lie closer to the diagonal line, indicating that the assumption of normality of the residuals has been met. Collinearity statistics were analyzed to ensure that there is no multicollinearity between the independent variables.

This is assessed using the variance inflation factor (VIF) scores, with values below 4 indicating no significant multicollinearity, and tolerance scores above 0.1 suggesting no issues with collinearity. Furthermore, Cook's Distance values are examined, with values under 1 suggesting that individual cases are not unduly influencing the model.

In the selection of independent variables for the multiple linear regression analysis, a p-value less than 0.25 was used as a cutoff point. Variables that met this criterion were considered eligible for inclusion in the multiple linear regression model. Finally, in the multiple linear regression analysis, a p-value less than 0.05 is considered statistically significant and indicative of an independently associated factor for health-related quality of life.

3.12. Ethical Considerations

The ethical considerations of this study were overseen by the Haramaya University College of Health and Medical Sciences Institutional Health Research Ethical Review Committee (IHRERC). Prior to data collection, a formal permission letter with "**Ref.No. IHRERC/121/2024"** was obtained from the committee and presented to the selected public hospitals.

Before conducting interviews or administering questionnaires, the objectives and benefits of the study were clearly explained to the participants. Informed consent was obtained in writing, and participants were obtained informed, voluntary, written, and signed consent before the beginning of data collection from the participant as well as from the head of the institution. Throughout the study, confidentiality was maintained to ensure the privacy of the participants. They were informed

that their participation is voluntary and that they can withdraw from the study at any time if they choose to do so.

All information provided by the respondents was used solely for research purposes. To protect the anonymity of the participants, code numbers instead of personal identifiers were used. Additionally, the questionnaires were securely maintained with highly secured passwords after data was imported to Stata MP.

3.13. Information Dissemination

The findings of this study were submitted and will be presented to the College of Health and Medical Sciences, Haramaya University, upon receiving approval from the Institutional Health Research Ethics Review Committee (IHRERC).

These findings will be communicated to relevant stakeholders through comprehensive reports. Additionally, the study findings will be disseminated to the Ministry of Health in Puntland, as well as to the respective health facilities, including Gardo General Hospital, Caafi Diabetes Specialty Clinic, and Dalab Hospital.

Furthermore, the findings will be shared in various workshops and conferences, with diligent efforts being made to publish them in reputable, peer-reviewed journals. Every attempt will be made to publish the findings in national and international high-standing journals.

4. RESULTS

4.1. Socio-Demographic Characteristics of Respondents

Participants aged less than 40 years comprised 166 (41.19%), while those aged 40-60 years accounted for 162 (40.20%).

Individuals over 60 years represented 75 (18.61%) of the sample, with a substantial proportion of 320 (79.4%) residing in urban areas.

Sex distribution was nearly balanced, with slightly more males 205 (50.87%) than females 198 (49.13%). Marital status indicated a predominant rate of married individuals 239 (59.31%).

In terms of occupation, employees constituted the largest group of 154 (38.21%), while housewives represented 65 (16.13%).

Educational attainment showed a notable proportion with no formal education 145 (35.98%).

Income levels were predominantly clustered in the lower brackets, with 180 (44.67%) earning less than $200 and 189 (46.90%) earning between $200 and $400 (Table 2).

Table 2. Socio-demographic characteristics of participants in selected public Hospitals in Puntland, Somalia, 2024 (n= 403)

Variables	Categories	Frequency	%
Age (Years)	<40	166	41.19
	40-60	162	40.20
	>60	75	18.61
Sex	Male	205	50.87
	Female	198	49.13
Residence	Urban	320	79.4
	Rural	83	20.6
Marital status	Married	239	59.31
	Unmarried	164	40.69
Occupation	Housewife	65	16.13
	Employee	154	38.21
	Merchant	58	14.39
	Other*	126	31.27
Education	No formal education	145	35.98
	Primary education	128	31.76
	Secondary and above	130	32.26
Income	<200$	180	44.67
	200-400	189	46.90
	>400$	34	8.44

Other* (Farmer, Laborer, Student)

4.2. Behavioral and Psycho-Social Characteristics

The findings indicate that a significant proportion of participants, specifically 57.82%, demonstrated good self-care practices, characterized by achieving favorable outcomes in at least three domains. Conversely, 42.18% exhibited poor self-care practices, with two or fewer domains rated positively.

In terms of knowledge about diabetes, 61.54% of participants displayed good understanding, while the remaining 38.46% had inadequate knowledge.

The empowerment levels among participants were relatively balanced, with 51.61% indicating good empowerment and 48.39% reporting poor empowerment.

Regarding mental health, nearly half of the participants (48.64%) were classified as not depressed or only mildly depressed, whereas 51.36% experienced moderate to severe depression.

Notably, a vast majority, 98.75%, reported experiencing diabetes-related distress, leaving only 1.25% of participants indicating no distress.

Social support was perceived positively by more than half of the participants (57.32%) (Table 3).

Table 3. Behavioral and psycho-social characteristics of adult type 2 diabetes patients attending follow-up care at public Hosptals in Puntland, Somalia, 2024 (403)

Variables	**Categories**	**Frequency**	**Percent %**
Self-care practice	Por	170	42.18
	Good	233	57.82
Knowledge about Diabetes	Poor	155	38.46
	Good	248	61.54
Patients' Empowerment	Poor	195	48.39
	Good	208	51.61
Depression	None /mildly Depressed	196	48.64
	Moderately /Severely depressed	207	51.36
Diabetes-related distress	Not distressed	5	1.25
	Distressed	396	98.75
Social support	Poor	172	42.68
	Good	231	57.32
Perceived stigma	yes	87	21.59
	No	316	78.41

4.3. Clinical and Health-Care Related Characteristics

A significant majority of participants (336, 83.37%) had Type 2 Diabetes Mellitus (T2DM) for five years or less. Complications associated with T2DM were 112 participants (27.79%), with the most common being depression (32 cases, 28.6%) and foot damage (26 cases, 23.2%), followed closely by neuropathy (23 cases, 20.54%).

Most participants (291, 72.21%) did not experience any complications, while 98 participants (24.3%) had one complication. Additionally, 102 participants (25.31%) presented with non-T2DM illnesses upon admission. The predominant treatment modality was oral medication, utilized by 326 participants (80.89%) (Table 4).

Table 4. Clinical characteristics of the study participants in selected public Hospitals in Puntland, Somalia, 2024 (n= 403)

Variables	Categories	Frequency	%
Duration of T2DM	≤5 years	336	83.37
	>=5 years	67	16.63
Complication of T2DM	Yes	112	27.79
	No	291	72.21
Type of Complication	CVD	16	14.27
	Neuropathy	23	20.54
	Nephropathy	7	6.25
	Retinopathy	8	7.14
	Depression	32	28.6
	Foot Damage	26	23.2
Number of complications	None	291	72.21
	One	98	24.3
	Two	10	2.48
	Three	4	0.99
Presence of non-T2DM Illness on Admission	Yes	102	25.31
	No	301	74.69
Treatment modality	Injection	77	19.11
	Oral medication	326	80.89
BMI	Underweight (< 18.5)	48	11.91
	Normal weight (18.5–24.9)	224	55.58
	Overweight (25–29.9)	83	20.60
	obese (≥30)	48	11.91
HbA1c	Good glycemic control	69	17.12
	Poor glycemic control	334	82.88
Dyslipidemia	Optimal	165	40.95
	borderline	41	10.17
	high	193	47.89
	very high	4	0.99
Travel time	Mean±SD	28.56 ±13.62	
Waiting time	≤15 minutes per visit	373	92.56
	>15 minutes per visit	30	7.44

CVD= cardiovascular disease**, T2DM=** type 2 diabetes mellitus**, BMI=** body mass index**, HbA1c**= glycated heamoglobin**, SD=** standard deviation.

4.4. Health-Related Quality of Life and its Domains

The findings reveal that the overall Health-Related Quality of Life (HRQOL) score is 52.9 (± 6.90). In terms of specific domains, the physical Health domain has a mean score of 54.9 (± 12.43), indicating a moderate level of physical well-being. This is closely followed by the psychological Health domain, which has a mean score of 53.9 (± 12.53). The social relationships domain recorded a mean score of 51.38 (± 16.65), suggesting a moderate experience in social connectivity. Lastly, the environmental domain achieved a mean score of 50.91 (± 11.72), highlighting some challenges related to the surrounding environment.

Additionally, responses to specific items (Q1 and Q2) yielded mean scores of **2.8 ±1.33** and

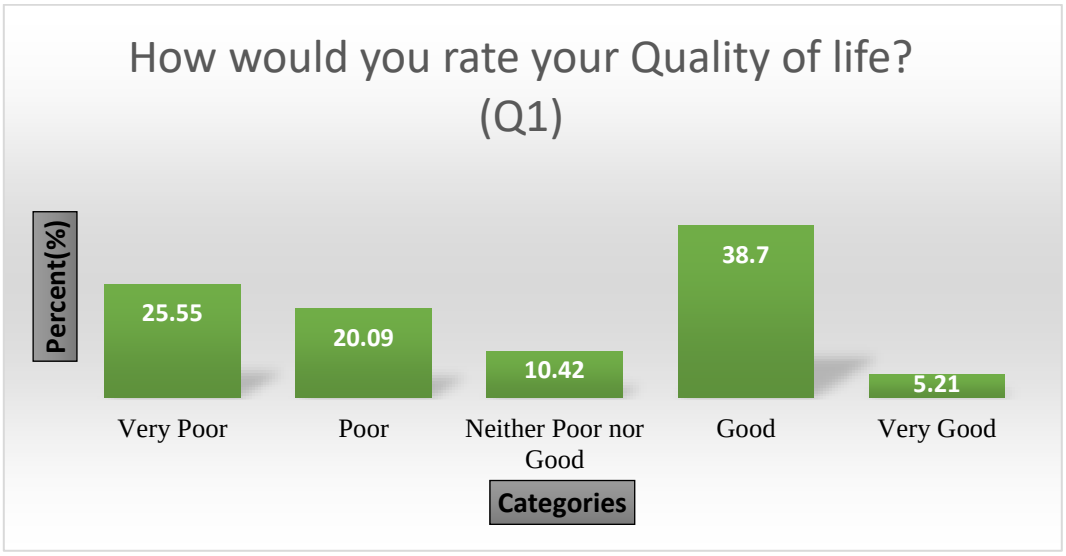
3 ±1.19, respectively, highlighting areas of concern that may affect overall quality of life. The 95% confidence intervals for all domains suggest that these scores are statistically reliable. Overall, the results underscore the necessity for targeted interventions aimed at improving HRQOL within this population.

Table 5.Health-related quality of life and its domains among adult patients with type 2 diabetes attending follow-up care at public Hospitals, Puntland, Somalia, 2024 (n = 403)

Domains	N	Mean ± SD	95% CI
Overall HRQOL	403	52.9 ± 6.90	52.2– 53.56
Physical Health	403	54.9 ± 12.43	53.65– 56.09
Psychological	403	53.9 ± 12.53	52.72– 55.17
Social relations	403	51.38 ± 16.65	49.75– 53.01
Environmental	403	50.91 ± 11.72	49.77– 52.06

Self-rating quality of life and self-reported health satisfaction of adult type 2 diabetes patients attending follow-up care at public Hospitals in Puntland, Somalia.

Based on their perceived quality of life, 156 participants (38.71%) reported that their quality of life was good, while 104 participants (25.81%) indicated it was very poor. In terms of self-perceived health satisfaction, 146 participants (36.23%) expressed dissatisfaction, compared to 128 participants (31.76%) who reported being satisfied.



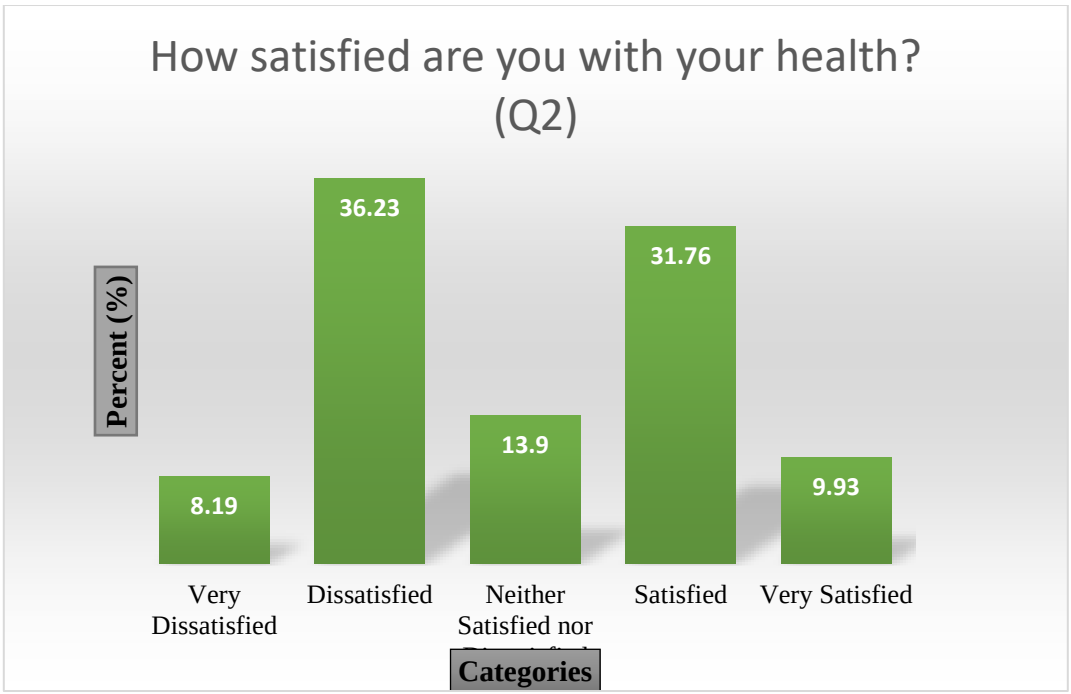


Figure 3.Self-rated perceived quality of life and health satisfaction of adult type 2 diabetes patients attending follow-up care at public Hospitals in Puntland, Somalia, 2024 (n=403)

4.5. Factors Associated with HRQOL

In the bivariable analysis, these variable Health facility, Education, income, BMI, Duration of T2DM, Complication of T2DM, Comorbidity, Perceived stigma, Travel time, Waiting time, Self-care practice, Knowledge about T2DM, Empowerment, Depression, Distress status, Social support were candidate for multivariable analysis (Table 6).

Table 6. Bivariate analysis of factors associated with Health-related quality of life, among adult type 2 diabetes patients attending follow-up care at public Hospitals, in Puntland, Somalia, 2024 (n=403)

Variable	Categories	β	95% CI		P-value	Pearson Correlation
			Lower	Upper		
Age of the Participants (year)	<40	1				
	40-60	-.813	-2.31	68	0.286	-0.0835
	>60	-1.54	-3.43	.35	0.109	-0.0835
sex	Male	-.457	-1.81	.89	0.507	-0.0331
	Female	1				
Residence	Urban	.696	-.977	2.37	0.41	0.0408
	Rural	1				
Health facility	Dalab Hospital	-2.92	-4.47	-1.37	**0.000***	**-0.0318**
	Gardo General Hospital	.33	-1.41	2.08	0.704	-0.0318
	Caafi diabetes specialty clinic	1				
Marital status	Married	.348	-1.02	1.72	0.619	0.0248
	Unmarried	1				
Education	No formal education	1				
	Primary education	.009	-1.62	1.64	0.990	0.1210
	Secondary and above	2.05	.430	3.68	**0.013***	**0.1210**
Occupation	Housewife	1				
	Employee	-.380	-2.39	1.63	0.710	-0.0575
	Merchant	.086	-2.36	2.54	0.945	-0.0575
	Other	-1.20	-3.28	.869	0.254	-0.0575
Income	<200$	1				
	200-400	.900	-.511	2.31	**0.211***	**0.0928**
	>400$	2.19	-.342	4.72	**0.090***	**0.0928**
Family size	=<7	-.279	-1.75	1.194	0.709	-0.0186
	>7	1				
BMI	Underweight	1				
	Normal weight	1.71	-.448	3.87	**0.120***	**0.1036**
	Overweight	1.24	-1.20	3.70	0.318	0.1036
	Obese	3.70	.923	6.47	**0.009***	**0.1036**
Treatment modality	Injection	1				
	Oral	.475	-1.24	2.19	0.588	-0.0045
Duration of T2DM	<5 Years	1.97	.162	3.78	**0.033***	**0.1063**
	>=5 Years	1				
Complication of T2DM	Yes	1				
	No	3.23	1.76	4.71	**0.000***	**0.2102**
Comorbidity	No	2.44	.904	3.98	**0.002***	**0.1540**
	At least one comorbidity	1				
HbA1c	Good glycemic control	.910	-.961	2.78	0.340	0.0481
	Poor glycemic control	1				

Table 6 (Continued)

Variables	Categories	β	95% CI		P-value	Pearson Correlation
			Lower	Upper		
Dyslipidemia	Optimal	1				
	Borderline	-2.17	-9.278	4.92	0.547	0.0599
	High	.368	-6.47	7.21	0.916	0.0599
	Very high	.165	-6.69	7.02	0.962	0.0599
Perceived stigma	No	1.42	-.218	3.06	**0.089***	**0.0848**
	Yes	1				
Travel time		-.081	-.130	-.032	**0.001***	**-0.1613**
Waiting time	>15 minutes per visit	-2.66	-5.23	-.101	**0.042***	**-0.1015**
	≤15 minutes per visit	1				
Self care practice	Poor	1				
	Good	2.21	.86	3.57	**0.001***	**0.1587**
Knowledge about T2DM	Poor	1				
	Good	4.79	3.47	6.10	**0.000***	**0.3377**
Empowerment	Poor	1				
	Good	4.09	2.79	5.39	**0.000***	**0.2964**
Depression	None/ mildly Depressed	1				
	Moderately/Severely depressed	-1.74	-3.09	-.40	**0.011***	**-0.1265**
Distress status	Not distressed	1				
	Distressed	-7.4	-13.47	-1.30	**0.017***	**-0.1187**
Social support	Poor	1				
	Good	1.24	-.120	2.60	**0.074***	**0.0892**

Dependent variable = Overall Health-Related Quality of Life *P-value <0.25.

4.5.1. Multivariable linear regression analysis

Multiple linear regression analysis was conducted to identify factors associated with overall HRQOL among adult with type 2 diabetes attending follow-up care at public hospitals in Puntland. The analysis revealed that several variables were significantly associated with Overall HRQOLwhich are Education, Complication of T2DM, Comorbidity, waiting time, Perceived stigma, Self care practice, Knowledge about T2DM, Empowerment, diabetes related distress and Social support.

Table 7. Multivariable analysis of factors associated with health-related quality of life in adult type 2 diabetes patients attending follow-up care at public Hospitals in Puntland, Somalia (2024, n = 403*)*

Variables	Categories	β	P-value	95% CI for β	
				Lower	Upper
Education	No formal education	1			
	Primary education	-.192	0.810	-1.761	1.376
	Secondary and above	1.75	**0.040***	.084	3.42
Complication of T2DM	yes	1			
	No	2.62	**0.000***	1.15	4.08
Comorbidity	At had least one comorbidity	1			
	No any comorbidy on admission	1.591	**0.037***	.098	3.085
Waiting time	>15 minutes per visit	-2.32	**0.049***	-4.64	-.008
	≤15 minutes per visit	1			
Perceived stigma	yes	1			
	No	1.571	**0.041***	.0660	3.077
Self care practice	Poor	1			
	Good	1.877	**0.003***	.645	3.10
Knowledge about T2DM	Poor	1			
	Good	3.620	**0.000***	2.351	4.88
Empowerment	Poor	1			
	Good	3.992	**0.000***	2.74	5.246
Distress	Not distressed	1			
	Distressed	-5.56	**0.041***	-10.90	-.220
Social support	poor	1			
	Good	1.460	**0.017***	.261	2.660

Dependent variable: Overall HRQOL, Mean VIF= 1.64

5. DISCUSSION

The current study highlights the health-related quality of life of patients with type 2 diabetes mellitus who are receiving follow-up care at public hospitals in Puntland, Somalia.

Our findings indicate a mean overall HRQOL score of **52.9 ± 6.90** among adult patients with type 2 diabetes.

This result is consistent with previous research utilizing the WHOQOL-BREF scale to assess health-related quality of life within this population. Studies conducted in various diabetes clinics, including those at the Internal Medicine Unit of Thammasat University Hospital in Thailand, Felege Hiwot Referral Hospital in Bahir Dar, Gondar Referral Hospital in the North Gondar Zone, Debre Markos Referral Hospital, Mizan Tepi-Bench Maji Zone, and Nekemte Specialized Hospital in Nekemte City, Ethiopia, have reported similar findings. The mean scores for overall quality of life (QOL) in patients with type 2 diabetes were 54.3, 52.6, 52.18, 51.9, 51.5, and 50.3, respectively (Komaratat et al., 2021, Reba et al., 2018, Aschalew et al., 2020a, Wonde et al., 2022, Gebremedhin et al., 2019b, Feyisa et al., 2020). Suggesting consistency in the challenges faced by these patients.

However, the overall health-related quality of life observed in our study was lower than that reported in studies conducted at the University of Nigeria Teaching Hospital in Southeast Nigeria, Alain City in the UAE, University College Hospital (UCH) in Ibadan, Nigeria, and a Basic Health Unit (BHU) in the Distrito Federal, Brazil. These studies reported mean HRQOL scores of 75.6, 75.2, 64.34, and 60.3, respectively (Nwatu et al., 2019, Al kaabi et al., 2021, Ababio et al., 2017, Lima et al., 2018). Possibly due to the limited availability of healthcare services in Puntland, Somalia. Many patients in our setting face challenges such as inadequate access to specialized diabetes care, limited health education, and socioeconomic barriers, which could negatively affect their quality of life.

Conversely, our study reported a higher overall health-related quality of life compared to similar studies conducted in Bangladesh, northern Thailand, Dessie in Northeast Ethiopia, and Maharashtra, India, which reported HRQOL scores of 40.65, 49.4, 49.47, and 49.72, respectively (Amin et al., 2022, Tamornpark et al., 2022, Girma et al., 2020b, Jain et al., 2014).

This disparity may be attributed to improved follow-up care and community support for patients with type 2 diabetes in our study area.

Individuals diagnosed with type 2 diabetes mellitus who possess an educational attainment of secondary level or higher exhibit a significantly improved health-related quality of life in comparison to those with only primary education or no formal educational background.

Findings from studies conducted in Ethiopia, Saudi Arabia, Iran, and Mexico also indicate that HRQOL is significantly associated with the educational status of patients with type 2 DM (Reba et al., 2018, Alshayban and Joseph, 2020, Javanbakht et al., 2012, Gholami et al., 2013, Martínez et al., 2008). This suggests that patients with higher educational attainment are better equipped to make informed decisions regarding self-care, as well as to understand their disease, its complications, and treatment options.

Having diabetes related complications was identified as one of the contributing factors to the poor quality of life among T2DM patients in Puntland, Somalia.

This finding is supported by studies conducted in Saudi Arabia, Tikur Anbessa Specialized Hospital in Addis Ababa, and various hospitals in Northwest Ethiopia, which reported a correlation between diabetes complications and poor quality of life among diabetes patients. (Al Hayek et al., 2014, Gebremariam et al., 2022, Sendekie et al., 2023). A study in India also found that type 2 diabetes patients with complications experienced a significantly poorer quality of life compared to those without medical complications (John et al., 2019). Another study done in Northwest of Iran established that individuals with type 2 diabetes mellitus who presented with complications exhibited a significantly poorer quality of life compared to those without such complications (Didarloo and Alizadeh, 2016).

A study conducted in Saudi Arabia confirmed that individuals with type 2 diabetes mellitus who did not have complications reported a significantly better quality of life compared to those with complications (Alshayban and Joseph, 2020). Trikkalinou et al. also reported that the QOL among type 2 diabetes mellitus worsened when complications started to develop (Trikkalinou et al., 2017). Khunkaew et al.(Khunkaew et al., 2019) also reported that Thai diabetes mellitus patients with complications experienced a poorer quality of life.

Medical complications arising from diabetes can impose significant burdens and suffering on both patients and their family members, ultimately contributing to a diminished quality of life(Tamornpark et al., 2022).

This study demonstrated that patients without comorbidities upon admission exhibited higher overall health-related quality of life (HRQoL) scores compared to those presenting with at least one comorbidity. This finding is corroborated by research conducted in Ethiopia, Nigeria, and Singapore (Aschalew et al., 2020a, Adeniyi et al., 2015, Quah et al., 2011). On the other hand, studies conducted in Boston, USA, as well as in Addis Ababa and Mizan Tepi, Ethiopia, revealed that the presence of one or more comorbidities was negatively associated with quality of life (Wexler et al., 2006, Gebremariam et al., 2022, Gebremedhin et al., 2019a). This could be attributed to the impact of various chronic diseases in patients with diabetes, as well as the side effects and drug interactions associated with multiple medications, which can impair all aspects of health-related quality of life.

Waiting time was found to be a significant negative predictor of health-related quality of life among the participants in our study. This finding aligns with the results of a study conducted in Nigeria, which similarly demonstrated that prolonged waiting times adversely affected HRQOL in patients with diabetes (Bolarinwa et al., 2016). Notably, patients who experienced waiting times exceeding 15 minutes reported a lower quality of life. Such extended waiting periods are indicative of inadequate follow-up care, potentially stemming from an overwhelmed healthcare system. Additionally, the absence of an effective queuing system and suboptimal triaging strategies in diabetes clinics may further contribute to these extended waiting times.

Patients who experienced perceived social stigma demonstrated a negative impact on their psychological and social well-being, as well as their overall health-related quality of life, compared to those who did not perceive such stigma.

This finding is consistent with studies conducted at Nekemte Specialized Hospital in Ethiopia, Dessie Comprehensive Specialized Hospital in northeastern Ethiopia, and in Switzerland (Feyisa et al., 2020, Girma et al., 2020b, Gredig and Bartelsen-Raemy, 2017).

Diabetic patients often navigate multiple restrictions, which may exacerbate feelings of stigma across various aspects of their lives. They frequently encounter limitations regarding the amount, type, and timing of food intake, such as the necessity to consume specific foods at designated times and the requirement to wait for insulin to take effect before eating. These constraints can negatively influence an individual's HRQOL and their interactions in social and workplace environments.

In this study, we found that good self-care behaviors, defined as adherence to at least three dimensions of self-care, are significant predictors of quality of life in adults with diabetes. Conversely, poor self-care practices or diminished adherence to self-care are associated with a reduced quality of life. These findings align with similar studies conducted in Bangladesh and Iran (Saleh et al., 2014, Bazpour et al., 2021) which support the result of our investigation. Diabetic patients need to be knowledgeable and well-informed to achieve improved health-related quality of life (Aghamolaei et al., 2005). In our study, 61% of individuals with type 2 diabetes demonstrated adequate knowledge levels, reflecting an average understanding. This finding is consistent with other studies that report similar levels of knowledge in this population (Mujika-Zabaleta et al., 2010, Miloradović et al., 2009, Mufunda et al., 2012).

Our multiple linear regression analysis revealed that knowledge has a direct positive influence on quality of life, with a one-unit increase in knowledge corresponding to a 3.620-unit increase in QoL. This contrasts with the findings of (Menard et al., 2007), who noted no association between QoL improvements and diabetes knowledge in participants with type 2 diabetes mellitus. Similarly, (Kueh et al., 2017) found that diabetes knowledge was not a significant predictor of QoL impact. However, they concluded that diabetes knowledge could serve as an important indicator in mitigating the negative effects on QoL, suggesting that while it may not directly influence QoL, it can affect other variables, such as attitudes, which do have a direct impact. This discrepancy may stem from differences in study populations, measurement methods, or contextual factors that influence how diabetes knowledge affects QoL.

The findings of this study revealed a significant positive association between participants' empowerment and their quality of life. Specifically, an increase of one unit in patient empowerment was correlated with a direct increase of 4.09 units in QoL. Previous research conducted in Slovenia, Finland, Malaysia, Italy, and Ireland (Virtič Potočnik et al., 2024, Simonsen et al., 2021, Zhu et al., 2019, Rossi et al., 2015, Fitzgerald et al., 2015), consistently demonstrated that individuals who perceive higher levels of empowerment are more likely to achieve improved glycemic control, ultimately leading to a better quality of life for those with Type 2 diabetes.

Diabetes-related distress emerged as a significant negative predictor of health-related quality of life among the participants in our study. This finding is consistent with previous research conducted in Malaysia, which demonstrated a negative association between distress and

HRQOL (Chew et al., 2015). Furthermore, (Liu et al., 2010) indicated that the severity of emotional distress correlates inversely with quality of life; specifically, greater emotional distress is associated with a decline in HRQOL. These findings underscore the critical impact of diabetes-related distress on overall patient well-being and highlight the necessity for effective psychological support in diabetes management.

Social support has been demonstrated to exert a positive impact on the quality of life of patients with type 2 diabetes. The present study underscores the significant influence of social support on the QoL of individuals diagnosed with T2D. Specifically, the findings reveal a direct positive relationship between social support and QoL, indicating that an increase of one unit in social support is associated with an increase of 1.25 units in QoL. This result aligns with findings from a study conducted in East China (Wang et al., 2024), further corroborating the beneficial role of social support in enhancing the QoL of T2D patients.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The health-related quality of life among patients with type 2 diabetes mellitus in Puntland, Somalia is moderate highlighting the significant influence of educational, clinical, and psychosocial factors. Major barriers to improved health-related quality of life include limited access to healthcare due to increased waiting time, diabetes-related complications, and perceived stigma. In contrast, enhanced self-care practices, good knowledge about diabetes, and good social support were associated with better health-related quality of life scores.

6.2. Recommendations

For Puntland Ministry of Health

- **Policy Development:** formulate policies aimed at improving diabetes management by prioritizing early detection, comprehensive care for complications, and psychosocial support.
- **Awareness Campaigns:** launch nationwide campaigns that emphasize diabetes education, self-care practices, stigma reduction, and community engagement
- **Infrastructure Development:** Invest in the establishment of diabetes clinics staffed by multidisciplinary teams, ensuring accessibility for patients in both urban and rural areas.

For Puntland Regional Health Bureaus

- **Training Programs:** Implement regular training sessions for healthcare providers focused on diabetes management, particularly concerning complications, comorbidities, and psychosocial aspects.
- **Community Health Initiatives:** Establish community-based diabetes management programs that highlight the importance of family and community involvement in providing support.
- **Resource Allocation:** Ensure equitable distribution of essential diabetes medications, diagnostic tools, and monitoring equipment across regional healthcare facilities.

For Puntland Public Hospitals

- **Comprehensive Care Services:**Establish specialized diabetes units that provide multidisciplinary care, incorporating endocrinologists, dietitians, and mental health professionals
- **Patient Empowerment Programs:** Initiate educational workshops within hospitals that focus on diabetes self-care, knowledge enhancement, and patient empowerment.
- **Follow-Up Systems:** Enhance follow-up mechanisms to monitor patients' adherence to treatment plans and ensure consistent care.

For Health Employers

- **Workplace Wellness Programs:** Implement diabetes-friendly workplace policies, including flexible scheduling for medical appointments and on-site health screenings.
- **Employee Education:** Organize seminars aimed at enhancing knowledge about diabetes management and reducing stigma in the workplace for individuals with type 2 diabetes mellitus (T2DM).

For Researchers

- **Future Studies:** Conduct longitudinal studies to explore the causal relationships between health-related quality of life and variables such as social support, empowerment, and knowledge.
- **Cultural Context:** Examine cultural and societal influences on diabetes management and HRQoL in Puntland to inform the development of tailored interventions.
- **Intervention Trials:** Evaluate the efficacy of specific interventions, such as patient empowerment programs, in enhancing HRQoL outcomes.

6.3. Strengths and Limitation of the Study

Strength of the study

This study is notable for its use of a representative sample, ensuring that the findings are reflective of the broader population. Data were collected directly from patients through interviews, providing primary data that enhances the reliability of the results. Additionally, an internationally recognized tools were employed for data collection, further reinforcing the study's methodological rigor. The consideration of the outcome variable as continuous may also help to minimize misclassification bias, thereby enhancing the accuracy of the findings.

Limitation of the study

As a cross-sectional design, the observed associations do not imply causality. Additionally, the use of an interviewer-administered questionnaire can raises the potential for interviewee bias, which may influence the findings. Furthermore, data collection occurred at a single point in time, and fluctuations in health-related quality of life may occur if measurements are taken at multiple intervals.

7. REFERENCES

A Abdallah, M., Esmayel, E. and Moussa, M. 2019. Assessment of health related life quality in type 2 diabetic patients in Zagazig University Hospitals. *Zagazig University Medical Journal,* 25**,** 790-800.

Ababio, G., Bosomprah, S., Olumide, A., Aperkor, N., Aimakhu, C., Oteng-Yeboah, A., et al. 2017. Predictors of quality of life in patients with diabetes mellitus in two tertiary health institutions in Ghana and Nigeria. *Nigerian Postgraduate Medical Journal,* 24**,** 48-55.

Abedini, R., Bijari, B., Miri, Z., Shakhs Emampour, F. and Abbasi, A. 2020. The quality of life of the patients with diabetes type 2 using EQ-5D-5 L in Birjand. *Health and quality of life outcomes,* 18**,** 1-9.

Adeniyi, A., Ogwumike, O., Oguntola, D. a. and Adeleye, J. 2015. Interrelationship among physical activity, quality of life, clinical and sociodemographic characteristics in a sample of Nigerian patients with type 2 diabetes. *African Journal of Physiotherapy and Rehabilitation Sciences,* 7**,** 12-18.

Adom, D., Hussein, E. K. and Agyem, J. A. 2018. Theoretical and conceptual framework: Mandatory ingredients of a quality research. *International journal of scientific research,* 7**,** 438-441.

Aghamolaei, T., Eftekhar, H., Mohammad, K., Nakhjavani, M., Shojaeizadeh, D., Ghofranipour, F., et al. 2005. Effects of a health education program on behavior, HbA1c and health-related quality of life in diabetic patients. *Acta Medica Iranica***,** 89-94.

Al-Aboudi, I. S., Hassali, M. A., Shafie, A. A., Hassan, A. and Alrasheedy, A. A. 2015. A cross-sectional assessment of health-related quality of life among type 2 diabetes patients in Riyadh, Saudi Arabia. *SAGE open medicine,* 3**,** 2050312115610129.

Al Hayek, A. A., Robert, A. A., Al Saeed, A., Alzaid, A. A. and Al Sabaan, F. S. 2014. Factors associated with health-related quality of life among Saudi patients with type 2 diabetes mellitus: a cross-sectional survey. *Diabetes & metabolism journal,* 38**,** 220.

Al kaabi, K., Al Kaabi, O., Al Marzooqi, F., Al Murri, G. and BaynounaAlKetbi, M. 2021. Evaluation of Health-related Quality of Life in Patients With Diabetes in Different Care Settings a Cross Sectional Study in Alain, UAE. *medRxiv***,** 2021.06. 19.21259165.

Alshayban, D. and Joseph, R. 2020. Health-related quality of life among patients with type 2 diabetes mellitus in Eastern Province, Saudi Arabia: A cross-sectional study. *PLoS One,* 15**,** e0227573.

Amin, M. F., Bhowmik, B., Rouf, R., Khan, M. I., Tasnim, S. A., Afsana, F., et al. 2022. Assessment of quality of life and its determinants in type-2 diabetes patients using the WHOQOL-BREF instrument in Bangladesh. *BMC Endocrine Disorders,* 22**,** 162.

Aschalew, A. Y., Yitayal, M. and Minyihun, A. 2020a. Health-related quality of life and associated factors among patients with diabetes mellitus at the University of Gondar referral hospital. *Health Qual Life Outcomes,* 18**,** 62.

Aschalew, A. Y., Yitayal, M. and Minyihun, A. 2020b. Health-related quality of life and associated factors among patients with diabetes mellitus at the University of Gondar referral hospital. *Health and quality of life outcomes,* 18**,** 1-8.

Association, A. D. 2017. American Diabetes Association Standards of medical care in diabetes–2017. *Diabetes care,* 40**,** S1.

Association, A. P. 2024. *Depression* [Online]. Available: https://www.apa.org/topics/depression/#:~:text=Home%20%20Psychology%20topics-,Depression,-Everyone%20experiences%20sadness [Accessed May 6, 2024].

Bazpour, M., Rostampour, S. and Kamel-Khodabandeh, A. 2021. Assessment of quality of life and self-care behaviors in patients with type 2 diabetes mellitus in Mashhad, Iran. *Jundishapur Journal of Chronic Disease Care,* 10.

Bharamu Nyamagoud, S., Viswanatha Swamy, A. H. and Kangrali, B. 2023. Assessment of Health-Related Quality of Life and Associated Factors among Type 2 Diabetes Mellitus Patients Attending a Tertiary Care Hospital. *Indian Journal of Pharmaceutical Education and Research,* 58**,** 326-332.

Bolarinwa, O. A., Ameen, H. A., Sanya, E. O., Kolo, P. M., Durowade, K. A., Uthman, M.-M. B., et al. 2016. Pattern and predictive factors of health-related quality of life of patients with hypertension, diabetes and concomitant hypertension with diabetes in Ilorin, Nigeria. *Nigerian Postgraduate Medical Journal,* 23**,** 182-190.

Cai, H., Li, G., Zhang, P., Xu, D. and Chen, L. 2017. Effect of exercise on the quality of life in type 2 diabetes mellitus: a systematic review. *Quality of Life Research,* 26**,** 515-530.

Carper, M. M., Traeger, L., Gonzalez, J. S., Wexler, D. J., Psaros, C. and Safren, S. A. 2014. The differential associations of depression and diabetes distress with quality of life domains in type 2 diabetes. *Journal of behavioral medicine,* 37**,** 501-510.

Chew, B.-H., Mohd-Sidik, S. and Shariff-Ghazali, S. 2015. Negative effects of diabetes–related distress on health-related quality of life: an evaluation among the adult patients with type 2 diabetes mellitus in three primary healthcare clinics in Malaysia. *Health and quality of life outcomes,* 13**,** 1-16.

Didarloo, A. and Alizadeh, M. 2016. Health-related quality of life and its determinants among women with diabetes mellitus: a cross-sectional analysis. *Nursing and midwifery studies,* 5.

Doubova, S. V., Mino-León, D. and Pérez-Cuevas, R. 2013. Linking quality of healthcare and health-related quality of life of patients with type 2 diabetes: an evaluative study in Mexican family practice. *International journal for quality in health care,* 25**,** 664-672.

Ebrahimi, H., Sadeghi, M., Esmaeili, S.-M., Janmohammadi, F. and Bahonar, E. 2023. Effect of empowerment model-based program on quality of life in patients with type 2 diabetes: A randomized controlled trial. *Iranian Journal of Nursing and Midwifery Research,* 28**,** 99-104.

Elazhary, H., Noorwali, A., Zaidi, N., Alshamrani, R., Aljohani, M., Khan, D., et al. 2018. Knowledge about diabetes and its effect on quality of life among diabetic patients in king Abdulaziz University Hospital, Jeddah. *J Adv Med Med Res,* 26**,** 1-11.

Esin, R., Khairullin, I., Esin, O. and Abakumova, A. 2016. Quality of life in patients with type 2 diabetes mellitus. *Bionanoscience,* 6**,** 502-507.

Espuela, F. L., Cuenca, J. P., Díaz, C. L., Sánchez, J. P., Gamez-Leyva, G. and Naranjo, I. C. 2020. Sex differences in long-term quality of life after stroke: Influence of mood and functional status. *Neurología (English Edition),* 35**,** 470-478.

Esubalew, H., Belachew, A., Seid, Y., Wondmagegn, H., Temesgen, K. and Ayele, T. 2024. Health-Related Quality of Life Among Type 2 Diabetes Mellitus Patients Using the 36-Item Short Form Health Survey (SF-36) in Central Ethiopia: A Multicenter Study. *Diabetes, Metabolic Syndrome and Obesity***,** 1039-1049.

Feyisa, B. R., Yilma, M. T. and Tolessa, B. E. 2020. Predictors of health-related quality of life among patients with diabetes on follow-up at Nekemte specialised Hospital, Western Ethiopia: a cross-sectional study. *BMJ Open,* 10**,** e036106.

Fitzgerald, M., O'Tuathaigh, C. and Moran, J. 2015. Investigation of the relationship between patient empowerment and glycaemic control in patients with type 2 diabetes: a cross-sectional analysis. *BMJ open,* 5**,** e008422.

Funnell, M. M., Anderson, R. M., Arnold, M. S., Barr, P. A., Donnelly, M., Johnson, P. D., et al. 1991. Empowerment: an idea whose time has come in diabetes education. *The diabetes educator,* 17**,** 37-41.

Gebremariam, G. T., Biratu, S., Alemayehu, M., Welie, A. G., Beyene, K., Sander, B., et al. 2022. Health-related quality of life of patients with type 2 diabetes mellitus at a tertiary care hospital in Ethiopia. *PLoS One,* 17**,** e0264199.

Gebremedhin, T., Workicho, A. and Angaw, D. A. 2019a. Health-related quality of life and its associated factors among adult patients with type II diabetes attending Mizan Tepi University Teaching Hospital, Southwest Ethiopia. *BMJ Open Diabetes Research and Care,* 7**,** e000577.

Gebremedhin, T., Workicho, A. and Angaw, D. A. 2019b. Health-related quality of life and its associated factors among adult patients with type II diabetes attending Mizan Tepi University Teaching Hospital, Southwest Ethiopia. *BMJ Open Diabetes Res Care,* 7**,** e000577.

Gele, A. A., Ahmed, M. Y., Kour, P., Moallim, S. A., Salad, A. M. and Kumar, B. 2017. Beneficiaries of conflict: a qualitative study of people's trust in the private health care system in Mogadishu, Somalia. *Risk management and healthcare policy***,** 127-135.

Gholami, A., Azini, M., Borji, A., Shirazi, F., Sharafi, Z. and Zarei, E. 2013. Quality of life in patients with type 2 diabetes: application of WHOQOL-BREF scale. *Shiraz E-Medical Journal,* 14**,** 162-171.

Girma, M., Wodajo, S., Ademe, S., Edmealem, A., M, W. S. and Mesafint, G. 2020a. Health-Related Quality of Life and Associated Factors Among Type Two Diabetic Patients on Follow-Up in Dessie Comprehensive Specialized Hospital, Dessie, North East Ethiopia, 2020. *Diabetes Metab Syndr Obes,* 13**,** 4529-4541.

Girma, M., Wodajo, S., Ademe, S., Edmealem, A., W/silasie, M. and Mesafint, G. 2020b. Health-related quality of life and associated factors among type two diabetic patients on follow-up in dessie comprehensive specialized hospital, dessie, North East Ethiopia, 2020. *Diabetes, Metabolic Syndrome and Obesity***,** 4529-4541.

Gredig, D. and Bartelsen-Raemy, A. 2017. Diabetes-related stigma affects the quality of life of people living with diabetes mellitus in S witzerland: implications for healthcare providers. *Health & social care in the community,* 25**,** 1620-1633.

Group, T. W. 1998. The World Health Organization quality of life assessment (WHOQOL): development and general psychometric properties. *Social science & medicine,* 46**,** 1569-1585.

Homady, A., Albasheer, O., Bajawi, A., Hamdi, S., Awaf, A., Madkhali, T., et al. 2023. Health-related Quality of Life among Type 2 Diabetes Patients in Southern Province of Saudi Arabia using WHOQOL-BREF: A Cross-section Study. *Curr Diabetes Rev,* 19**,** e211222212099.

IDF (International Diabetes Federation) 2021. Diabetes report 2000 — 2045. International Diabetes Federation.

Imayama, I., Plotnikoff, R. C., Courneya, K. S. and Johnson, J. A. 2011. Determinants of quality of life in type 2 diabetes population: the inclusion of personality. *Quality of life research,* 20**,** 551-558.

Iqbal, Q., ul Haq, N., Bashir, S. and Bashaar, M. 2017. Profile and predictors of health related quality of life among type II diabetes mellitus patients in Quetta city, Pakistan. *Health and quality of life outcomes,* 15**,** 1-9.

Issa, B. and Baiyewu, O. 2006. Quality of Life of Patients with Diabetes Mellitus in a Nigerian Teaching Hospital. *Hong Kong Journal of Psychiatry,* 16.

Jain, V., Shivkumar, S. and Gupta, O. 2014. Health-related quality of life (hr-qol) in patients with type 2 diabetes mellitus. *North American journal of medical sciences,* 6**,** 96.

Jarab, A. S., Alefishat, E., Mukattash, T. L., Albawab, A. Q., Abu-Farha, R. K. and McElnay, J. C. 2019. Exploring variables associated with poor health-related quality of life in patients with type 2 diabetes in Jordan. *Journal of Pharmaceutical Health Services Research,* 10**,** 211-217.

Javanbakht, M., Abolhasani, F., Mashayekhi, A., Baradaran, H. R. and Jahangiri noudeh, Y. 2012. Health related quality of life in patients with type 2 diabetes mellitus in Iran: a national survey.

Jing, X., Chen, J., Dong, Y., Han, D., Zhao, H., Wang, X., et al. 2018. Related factors of quality of life of type 2 diabetes patients: a systematic review and meta-analysis. *Health and quality of life outcomes,* 16**,** 1-14.

John, R., Pise, S., Chaudhari, L. and Deshpande, P. R. 2019. Evaluation of quality of life in type 2 diabetes mellitus patients using quality of life instrument for indian diabetic patients: A cross-sectional study. *Journal of mid-life health,* 10**,** 81-88.

Kaplan, R. M., Hartwell, S. L., Wilson, D. K. and Wallace, J. P. 1987. Effects of diet and exercise interventions on control and quality of life in non-insulin-dependent diabetes mellitus. *Journal of general internal medicine,* 2**,** 220-228.

Khunkaew, S., Fernandez, R. and Sim, J. 2019. Demographic and clinical predictors of health-related quality of life among people with type 2 diabetes mellitus living in northern Thailand: A cross-sectional study. *Health and quality of life outcomes,* 17**,** 177.

Kien, N. T., Hoa, N. P., Duc, D. M. and Wens, J. 2021. Health-related quality of life and associated factors among patients with type II diabetes mellitus: A study in the family medicine center (FMC) of Agricultural General Hospital in Hanoi, Vietnam. *Health Psychology Open,* 8.

Kintzoglanakis, K., Pavlou-Skantzis, L., Themeli, T., Kyprianou, M. and Paschou, S. A. 2024. Determinants of health-related quality of life of patients with type 2 diabetes and multimorbidity: a cross-sectional study. *Hormones***,** 1-8.

Komaratat, C., Auemaneekul, N. and Kittipichai, W. 2021. Quality of life for type II diabetes mellitus patients in a suburban tertiary hospital in Thailand. *Journal of Health Research,* 35**,** 3-14.

Kueh, Y. C., Morris, T. and Ismail, A.-A.-S. 2017. The effect of diabetes knowledge and attitudes on self-management and quality of life among people with type 2 diabetes. *Psychology, health & medicine,* 22**,** 138-144.

Letta, S., Aga, F., Yadeta, T. A., Geda, B. and Dessie, Y. 2022. Poor Self-Care Practices and Being Urban Resident Strongly Predict Chronic Complications Among Patients with

Type 2 Diabetes in Eastern Ethiopia: A Hospital-Based Cross-Sectional Study. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy***,** 2095-2106.

Lima, L. R. d., Funghetto, S. S., Volpe, C. R. G., Santos, W. S., Funez, M. I. and Stival, M. M. 2018. Quality of life and time since diagnosis of Diabetes Mellitus among the elderly. *Revista Brasileira de Geriatria e Gerontologia,* 21**,** 176-185.

Liu, M.-Y., Tai, Y.-K., Hung, W.-W., Hsieh, M.-C. and Wang, R.-H. 2010. Relationships between emotional distress, empowerment perception and self-care behavior and quality of life in patients with type 2 diabetes. *Hu li za zhi The Journal of Nursing,* 57**,** 49-60.

Lloyd, A., Sawyer, W. and Hopkinson, P. 2001. Impact of long-term complications on quality of life in patients with type 2 diabetes not using insulin. *Value in Health,* 4**,** 392-400.

LoBiondo-Wood, G. and Haber, J. 2013. Methods and critical appraisal for evidence-based practice. *Nursing Research: Text and Study Guide Package,* 290.

Marte, J. L. C., Ruiz-Matuk, C., Mota, M., Pérez, S., Recio, N., Hernández, D., et al. 2019. Quality of life and metabolic control in type 2 diabetes mellitus diagnosed individuals. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews,* 13**,** 2827-2832.

Martínez, Y. V., Prado-Aguilar, C. A., Rascón-Pacheco, R. A. and Valdivia-Martínez, J. J. 2008. Quality of life associated with treatment adherence in patients with type 2 diabetes: a cross-sectional study. *BMC health services research,* 8**,** 1-10.

McQueen, R. B., Ellis, S. L., Maahs, D. M., Anderson, H. D., Nair, K. V., Libby, A. M., et al. 2014. Association between glycated hemoglobin and health utility for type 1 diabetes. *The Patient-Patient-Centered Outcomes Research,* 7**,** 197-205.

Mehta, R., Subedi, S. and Bohora, S. 2014. Health related quality of life of diabetic patients visited in Koshi Zonal Hospital, Biratnanar. *Journal of Chitwan Medical College,* 4**,** 13-16.

Menard, J., Payette, H., Dubuc, N., Baillargeon, J., Maheux, P. and Ardilouze, J. 2007. Quality of life in type 2 diabetes patients under intensive multitherapy. *Diabetes & metabolism,* 33**,** 54-60.

Mikailiūkštienė, A., Juozulynas, A., Narkauskaitė, L., Žagminas, K., Sąlyga, J. and Stukas, R. 2013. Quality of life in relation to social and disease factors in patients with type 2

diabetes in Lithuania. *Medical science monitor: international medical journal of experimental and clinical research,* 19**,** 165.

Miloradović, D., Nikolić, M., Dimić, D., Bačanin, B., Abramović, Z. and Petrović, V. 2009. KNOWLEDGE, ATTITUDE AND BEHAVIOUR TOWARD OWN DISEASE AMONG PATIENTS WITH TYPE 2 DIABETES. *Acta Facultatis Medicae Naissensis,* 26.

Mishra, S. R., Sharma, A., Bhandari, P. M., Bhochhibhoya, S. and Thapa, K. 2015. Depression and health-related quality of life among patients with type 2 diabetes mellitus: a cross-sectional study in Nepal. *PloS one,* 10**,** e0141385.

Mufunda, E., Wikby, K., Björn, A. and Hjelm, K. 2012. Level and determinants of diabetes knowledge in patients with diabetes in Zimbabwe: a cross-sectional study. *The Pan African Medical Journal,* 13.

Mujika-Zabaleta, A., Forbes, A., While, A., Mold, F. and Canga, N. 2010. Relationship between diabetes knowledge, glycaemic control and quality of life: pilot study. *Diabetes Prim Care,* 12**,** 374-81.

Muze, M., Hailu, E., Woldemichael, K. and Fekecha, B. 2017a. Health Related Quality of Life And its Associated Factors Among Diabetic Patients Attending Diabetes Clinic in Jimma University Teaching Hospital, Ethiopia,2014. *Journal of Diabetes & Metabolism,* 08.

Muze, M., Hailu, E., Woldemichael, K. and Fekecha, B. 2017b. Health related quality of life and its associated factors among diabetic patients attending diabetes clinic in Jimma university teaching hospital, Ethiopia, 2014. *J Diabetes Metab,* 8**,** 2.

Nwatu, C., Onyekonwu, C., Unaogu, N., Ijeoma, U., Onyeka, T., Onwuekwe, I., et al. 2019. Health related quality of life in nigerians with complicated diabetes mellitus–a study from Enugu, South East Nigeria. *Nigerian Journal of Medicine,* 28**,** 138-147.

Nyanzi, R., Wamala, R. and Atuhaire, L. K. 2014. Diabetes and quality of life: a Ugandan perspective. *Journal of diabetes research,* 2014.

Oguzturk, O. 2008. Differences in quality of life in rural and urban populations. *Clinical and Investigative Medicine,* 31**,** E346-E350.

Olukotun, O., Akinboboye, O., Williams, J. S., Ozieh, M. and Egede, L. E. 2022. Influences of demographic, social determinants, clinical, knowledge, and self-care factors on quality

of life in adults with type 2 diabetes: black-white differences. *Journal of Racial and Ethnic Health Disparities,* 9**,** 1172-1183.

Pandey, S., Kumar, P., Singh, C., Ranjan, A., Bhar, D. and Agrawal, N. 2020. Quality of life using WHOQOL-BREF of Patients with Type 2 Diabetes mellitus attending a Primary Health Centre of Patna, India. *Indian Journal of Preventive & Social Medicine,* 51**,** 151-157.

Pascal, I. G., Ofoedu, J. N., Uchenna, N. P., Nkwa, A. A. and Uchamma, G.-U. E. 2012. Blood glucose control and medication adherence among adult type 2 diabetic Nigerians attending a primary care clinic in under-resourced environment of eastern Nigeria. *North American Journal of Medical Sciences,* 4**,** 310.

Peyrot, M., Rubin, R. R., Chen, X. and Frias, J. P. 2011. Associations between improved glucose control and patient-reported outcomes after initiation of insulin pump therapy in patients with type 2 diabetes mellitus. *Diabetes Technology & Therapeutics,* 13**,** 471-476.

Pham, T., Nguyen, N. T. T., ChieuTo, S. B., Pham, T. L., Nguyen, T. X., Nguyen, H. T. T., et al. 2019. Gender differences in quality of life and health services utilization among elderly people in rural Vietnam. *International journal of environmental research and public health,* 16**,** 69.

Pham, T. B., Nguyen, T. T., Truong, H. T., Trinh, C. H., Du, H. N. T., Ngo, T. T., et al. 2020. Effects of diabetic complications on health-related quality of life impairment in Vietnamese patients with type 2 diabetes. *Journal of diabetes research,* 2020.

Pichon-Riviere, A., Irazola, V., Beratarrechea, A., Alcaraz, A. and Carrara, C. 2015. Quality of life in type 2 diabetes mellitus patients requiring insulin treatment in Buenos Aires, Argentina: a cross-sectional study. *International journal of health policy and management,* 4**,** 475.

PSS (Puntland State of Somalia). 2020. *BACKGROUND TO PUNTLAND GOVERNMENT OF SOMALIA* [Online]. Available: Five Year Puntland Development Plan - 3 (2020-2024) [Accessed May 15, 2024].

Quah, J. H., Luo, N., Ng, W. Y., How, C. H. and Tay, E. G. 2011. Health-related quality of life is associated with diabetic complications, but not with short-term diabetic control in primary care. *Annals of the Academy of Medicine-Singapore,* 40**,** 276.

Rajgadhi, H., Patel, V., Sabu, B. and Malhotra, S. 2018. Medication adherence and health related quality of life in adult patients suffering from diabetes mellitus type 2 and its association with glycosylated hemoglobin and lipids-a prospective study at tertiary care hospital. *International journal of pharmaceutical sciences and research,* 9**,** 3347-3354.

Reba, K., Argaw, Z., Walle, B. and Gutema, H. 2018. Health-related quality of life of patients with diagnosed type 2 diabetes in Felege Hiwot Referral Hospital, North West Ethiopia: a cross-sectional study. *BMC research notes,* 11**,** 1-6.

Redekop, W. K., Koopmanschap, M. A., Stolk, R. P., Rutten, G. E., Wolffenbuttel, B. H. and Niessen, L. W. 2002. Health-related quality of life and treatment satisfaction in Dutch patients with type 2 diabetes. *Diabetes care,* 25**,** 458-463.

Ridderstråle, M., Evans, L. M., Jensen, H. H., Bøgelund, M., Jensen, M. M., Ericsson, Å., et al. 2016. Estimating the impact of changes in HbA 1c, body weight and insulin injection regimen on health related quality-of-life: a time trade off study. *Health and quality of life outcomes,* 14**,** 1-10.

Rossi, M. C., Lucisano, G., Funnell, M., Pintaudi, B., Bulotta, A., Gentile, S., et al. 2015. Interplay among patient empowerment and clinical and person-centered outcomes in type 2 diabetes. The BENCH-D study. *Patient education and counseling,* 98**,** 1142-1149.

Saeedi, P., Salpea, P., Karuranga, S., Petersohn, I., Malanda, B., Gregg, E. W., et al. 2020. Mortality attributable to diabetes in 20–79 years old adults, 2019 estimates: Results from the International Diabetes Federation Diabetes Atlas. *Diabetes research and clinical practice,* 162**,** 108086.

Safita, N., Islam, S., Chow, C. K., Niessen, L., Lechner, A., Holle, R., et al. 2016. The impact of type 2 diabetes on health related quality of life in Bangladesh: results from a matched study comparing treated cases with non-diabetic controls. *Health and quality of life outcomes,* 14**,** 1-9.

Saleh, F., Mumu, S. J., Ara, F., Hafez, M. A. and Ali, L. 2014. Non-adherence to self-care practices & medication and health related quality of life among patients with type 2 diabetes: a cross-sectional study. *BMC public health,* 14**,** 1-8.

Sendekie, A. K., Dagnew, E. M., Tefera, B. B. and Belachew, E. A. 2023. Health-related quality of life and its determinants among patients with diabetes mellitus: a multicentre cross-sectional study in Northwest Ethiopia. *BMJ open,* 13**,** e068518.

Simonsen, N., Koponen, A. M. and Suominen, S. 2021. Empowerment among adult patients with type 2 diabetes: age differentials in relation to person-centred primary care, community resources, social support and other life-contextual circumstances. *BMC Public Health,* 21**,** 844.

Sorato, M. M., Tesfahun, C. and Lamessa, D. 2016. Levels and predictors of adherence to self-care behaviour among adult type 2 diabetics at Arba Minch general hospital, Southern Ethiopia. *J Diabetes Metab,* 7**,** 11.

Spasić, A., Veličković, R. R., Catić, Đ. A., Stefanović, N. and Cvetković, T. 2014. Quality of life in type 2 diabetic patients. *Acta Facultatis Medicae Naissensis,* 31**,** 193-200.

Svenningsson, I., Marklund, B., Attvall, S. and Gedda, B. 2011. Type 2 diabetes: perceptions of quality of life and attitudes towards diabetes from a gender perspective. *Scandinavian journal of caring sciences,* 25**,** 688-695.

Tamornpark, R., Utsaha, S., Apidechkul, T., Panklang, D., Yeemard, F. and Srichan, P. 2022. Quality of life and factors associated with a good quality of life among diabetes mellitus patients in northern Thailand. *Health and Quality of Life Outcomes,* 20**,** 81.

Thapa, S., Pyakurel, P., Baral, D. D. and Jha, N. 2019. Health-related quality of life among people living with type 2 diabetes: a community based cross-sectional study in rural Nepal. *BMC Public Health,* 19**,** 1171.

Tran Kien, N., Phuong Hoa, N., Minh Duc, D. and Wens, J. 2021. Health-related quality of life and associated factors among patients with type II diabetes mellitus: A study in the family medicine center (FMC) of Agricultural General Hospital in Hanoi, Vietnam. *Health Psychol Open,* 8**,** 2055102921996172.

Trikkalinou, A., Papazafiropoulou, A. K. and Melidonis, A. 2017. Type 2 diabetes and quality of life. *World journal of diabetes,* 8**,** 120.

Tusa, B. S., Geremew, B. M. and Tefera, M. A. 2020. Heath related quality of life and associated factors among adults with and without diabetes in Adama city East Shewa, Ethiopia 2019; using generalized structural equation modeling. *Health and quality of life outcomes,* 18**,** 1-13.

Virtič Potočnik, T., Ružić Gorenjec, N., Mihevc, M., Zavrnik, Č., Mori Lukančič, M., Poplas Susič, A., et al. Person-Centred Diabetes Care: Examining Patient Empowerment and Diabetes-Specific Quality of Life in Slovenian Adults with Type 2 Diabetes. Healthcare, 2024. MDPI, 899.

Wang, L., Li, L., Qiu, Y., Li, S. and Wang, Z. 2024. Examining the Relationship Between Social Support, Self-Efficacy, Diabetes Self-Management, and Quality of Life Among Rural Individuals With Type 2 Diabetes in Eastern China: Path Analytical Approach. *JMIR Public Health and Surveillance,* 10**,** e54402.

Ware, J. E. 1993. SF-36 health survey. Manual and interpretation guide. *The health institute***,** 6: 1-6: 22.

Weeks, W. B., Kazis, L. E., Shen, Y., Cong, Z., Ren, X. S., Miller, D., et al. 2004. Differences in health-related quality of life in rural and urban veterans. *American Journal of Public Health,* 94**,** 1762-1767.

Wexler, D., Grant, R., Wittenberg, E., Bosch, J., Cagliero, E., Delahanty, L., et al. 2006. Correlates of health-related quality of life in type 2 diabetes. *Diabetologia,* 49**,** 1489-1497.

WHO (World Health Organization). 2024. *Health topics/Diabetes* [Online]. World Health Organization [Accessed April 2, 2024].

Wonde, T. E., Ayene, T. R., Moges, N. A. and Bazezew, Y. 2022. Health-related quality of life and associated factors among type 2 diabetic adult patients in Debre Markos Referral Hospital, Northwest Ethiopia. *Heliyon,* 8**,** e10182.

Woyesa, S., Mamo, A., Mekonnen, Z., Abebe, G., Gudina, E. K. and Milkesa, T. 2021. Lipid and lipoprotein profile in HIV-infected and non-infected diabetic patients: a comparative cross-sectional study design, Southwest Ethiopia. *HIV/AIDS-Research and Palliative Care***,** 1119-1126.

Wube, T. B., Begashaw, T. A. and Hirigo, A. T. 2020. Prevalence of dyslipidemia and its correlation with anthropometric and blood pressure variables among type-2 diabetic patients. *Journal of Diabetes and Endocrinology,* 11**,** 10-17.

Zan, H., Meng, Z., Li, J., Zhang, X. and Liu, T. 2024. Factors associated with quality of life among elderly patients with type 2 diabetes mellitus: the role of family caregivers. *BMC Public Health,* 24**,** 539.

Zhu, T. H., Mooi, C. S. and Shamsuddin, N. H. 2019. Diabetes empowerment scores among type 2 diabetes mellitus patients and its correlated factors: A cross-sectional study in a primary care setting in Malaysia. *World journal of diabetes,* 10**,** 403.

Zhuang, Y., Ma, Q.-H., Pan, C.-W. and Lu, J. 2020. Health-related quality of life in older Chinese patients with diabetes. *PloS one,* 15**,** e0229652.

8. ANNEXES

8.1. Information Sheet and Informed Voluntary Consent Form for the Head of the Health Facility (English version).

My name is Bashir Khalif, I am studying my Master's degree at Haramaya University, College of Health and Medical sciences. I kindly request you to lend me your attention to explain you about the study and your institution being selected as study setting.

The study title: Health related quality of life and associated factors among adult type 2 diabetes mellitus patients attending follow-up care at public hospitals in Puntland, Somalia, 2024.

Purpose of the study: to assess Health-Related Quality of Life and Associated Factors among Adult Type 2 Diabetes Patients Attending Follow-up Care at Public Hospitals in Puntland, Somalia 2024.Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of master's degree in Epidemiology for principal investigator.

Procedure and duration: I will be interviewing the patient using aquestionnaire supported by ODK toprovide me with pertinent data that is helpful for the study. There are **9** parts of **139** questions to answer, where the Data collector will fill the questionnaire by interviewing the patient.The interview on each patient will take about 40 minutes.

Risks and benefits: the risk of being participant in this study is minimal, but only taking few minutes from the participant's time.There would not be any direct payment for participating in this study. But the findings from this research may reveal important information which will benef it you and other diabetes mellitus patient in the future by identifying factors associated with health-related quality of life.

Confidentiality: the information that will be provided will be kept confidential.There will be no information that will identify the participants in particular.The finding of this study will be general for the study community and will not reflect anything particular of individual person. The questionnaires will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: participation for this study is fully voluntary.The participants as well as hospitals have the right to declare to participate or not in this study. If they decided to participate, they have the right to withdrawn from the study at any time and this will not lebel them for any loss of benefit which

They otherwise are entitled.They do not have to answer any question that they do not want to answer.

Contact address: if there are any questions or enquires any time about the study or procedures, please contact in this address.

The principal investigator: Bashir Khalif

Mobile phone: +252-907-061206

E-mail address: bashirfarah013@gmail.com

Institutional health research ethics review committee (IHRERC), Haramaya University, College of health Sciences:

Office phone: +251254662011, P.O.Box: 235, Harar.

Declaration of informed voluntary consent:

I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures. The risks and benefits, issues of confidentiality, the rights of participating and the contact address for any quires. I have been given the opportunity to ask questions for things that may have been unclear. Iwas informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the Hospital have the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the hospital's premises. Therefore, I declare my voluntary consent on behalf of Hospital management to allow this study to be conducted in the Hospitalwith my initials (signature).

Name and signature of Head of the Hospital: _____Date ___

Name and signature of the principal investigator: _____Date___

Thank you for your cooperation!

8.2. Participant Information Sheet and Informed Voluntary Consent Form (for competent adult >= 18 years), (English version).

My name is _____I am working as data collector for the study being conducted in this hospital with Bashir Khalif w h o is studying his Master's degree at Haramaya University college of Health and Medical Sciences. I kindly request you to lend me attention to explain you about the study.

The study title: Health related quality of life and associated factors among adult type 2 diabetes mellitus patients attending follow-up care at public hospitals in Puntland, Somalia, 2024.

Purpose of the study: to assess Health-Related Quality of Life and Associated Factors among Adult Type 2 Diabetes Patients Attending Follow-up Care at Public Hospitals in Puntland, Somalia, from July 28 to August 28, 2024. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of Master's degree in Epidemiology for principal investigator.

Procedure and duration: I will be interviewing you using a questionnaire to provide me with pertinent data that is helpful for the study. There are **9** parts of **139** questions to answer, where the Data collector will fill the questionnaire by interviewing the patient.The interview on each patient will take about 40 minutes, so I kindly request you to spare me this time for the interview.

Risks and benefits: the risk of being participant in this study is minimal, but only taking few minutes from the participant's time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.

Confidentiality: the information that will be provided will be kept confidential.There will be no information that will identify the participants in particular.The finding of this study will be general for the study community and will not reflect anything particular of individual person. The questionnaires will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights: participation for this study is fully voluntary.The participants have the right to declare to participate or not in this study. If they decided to participate, they have the right to withdrawn From the study at any time and this will not label them for any loss of benefit which they otherwise

Are entitled. They do not have to answer any question that they do not want to answer.

Contact address: if there are any questions or enquires any time about the study or procedures, please contact in this address.

The principal investigator: Bashir Khalif

Mobilphone: +251-909-79-10-50

Emailaddress: bashirfarah03@gmail.com.

Institutional health research ethics review committee (IHRERC), Haramaya University, College of health Sciences:

Office phone: +251254662011, P.O.B:235, Harar.

Declaration of informed voluntary consent:

I have read/was read to me the participant information sheet.I have clearly understood the purpose of the research, the procedures. The risks and benefits, issues of confidentiality, the rights of participating and the contact address for any inquire.I have been given the opportunity to ask questions for things that may have been unclear.I was informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want.Therefore, I declare my voluntary consent to participate in this study with my initials (signature).

Name and signature of participant: _____Date ___

Name and signature of data collector:_____Date ___

Thank you for your cooperation!

8.3. Participant Information Sheet and Informed Voluntary Consent Form (for competent adult ≥ 18 years), (Somali version)

Hordhaca:

Magaceygu waa Bashir Khalif waxaan ahay arday waxbarashada heerka labaad ka barta jaamacadda Haramaaya, faraceeda caafimaadka ee kuyaal magaalada Harar, Ethiopia.waxaan si xurmo leh kaaga codsanayaa in aad I amaahiso maqalkaaga si aan kuugu faaahfaahiyo macluumaadka ku saabsan daraasaadda laguu xushay in aad ka qayb qaadato.

Cinwaanka daraasadda:

Qiimaynta Tayada nololeeed ee la xidhiidha caafimaadka dadka la nool cudurka macaanka nooca 2aad, iyo arrimaha saameeya bukaanadaas ku xiran xarumaha daryeelka caafimaad ee puntland Somalia, 2024.

Hadafka/ujeedada daraasadda:

In la qiimeeyo Tayada nololeeed ee la xidhiidha caafimaadka dadka la nool cudurka macaanka nooca 2aad iyo arrimaha saameeya bukaanada taga cisbitaallada guud ee Puntland, Soomaaliya, Luulyo 28 ilaa Ogosto 28, 2024.

Xogaha daraasaadkan lagu helidoono waxay faa'ido u noqon doontaa waddanka, sidoo kale waxaa isticmaali doona xafiisyada Caafimadka iyo daneeyayaasha kala duwan ee ay khusayso si ay u diyaariyaan Qorshaha fog una ballaadhiyaan adeegyada ku saabsan gudbinta macluumaadka caafimaadka.

Habka iyo mudada:

Waxaan kula yeelan doona waraysi aniga oo adeegsanaya su'aalo qoraal ah oo ku diyaarsan application-ka loo isticmaalo xog ururinta ee loo yaqaano ODK. Si aad ii siiso xogtan muhiimka ah ee waxtarka u leh daraasadda, waxaan kaa codsanayaa in aad i siiso qiyaastii 40 daqiiqo oo waqtigaaga ka mid ah. Weydiimuhu waa 9 qaybood oo ka kooban 139 su'aalood oo u baahan in laga jawaabo, waxa aan ku buuxinayaa su'aal walba mobile kayga aniga oo ku wareysanaya.

Khasaaraha iyo faa'idada:

Kasoo qeybgalka aad kasoo qeybgaleysaan wax khasaaraa ood kala kulmeysaan ma jirto, laakiin xoogaa waxa uu idinka qaadanayaa Daqiiqado yar oo ka mida wakhtigiina .ka qeybgalaha daraasaaddan wax lacaga oo la siinayo malahan xiliga wareysiga.laakiin waxay wax badan ka caawineysaa xubnaha u qaabilsan dhanka diyaarinta qorshaha Caafimaadka.

Kalsooni ku qabid:

Xogta aad nasiineysaa waa in ay noqotaa mid aad ku kalsoon tahay. Wax xoga oo adiga si gaar ahaaneed laguugu takoorayo ma jirto, xogta daraasadan kazoo baxda waxay noqon doontaa mid si guud ahaaneed bulshada loogu dabbaqayo, ee ma ahaaneyso mid shaqsiyaad iyo qoys lagu saleynayo .su‟aaluhuna waa mid CODE /tiro lagu kala saarayo, wax magac oo lagu qorayo majirto. Sidoo kale wax summad ah oo hadalada iyo warbixinada ka qaybgalaha lagu lifaaqayo majirto.

Xuquuqaha ka qeyb galaha:

Ka qeybgalaha daraasadani waxuu leeyahay doorasho madaxbanaan .waxaad xor u tahay in aad go'aansato inaad ka qayb gasho iyo inaadan ka qayb gelin. Haddaad go'aansato inaad ka qayb gasho waxaad xaq u leedahay inaad kabaxdo daraasadda wakhti kasta. Taasi wax saamayn ah kuguma yeelan doonto. Sidoo kale kuma khasbanid inaad ka jawaabto su'aal kasta oo lagu weydiiyo.

Ciwaanka lagala xiriirayo:

Haddii ay jiraan wax su'aalo ah oo u baahaan in la cadeeyo, Fadlan la soo xiriir:

- ✓ Mudane. Bashir Khalif Farah telofoonka: +251-909791050,
- ✓ Iimaylka: bashirfarh013@gmail.com,
- ✓ Guddiga Dib-u-eegista Anshaxa Cilmi-baarista Caafimaadka ee jaamacada Haramaya (Institutional Health Research Ethics Review Committee (IHRERC):
- ✓ Lambarka xafiiska: - 0254662011, P.O.Box 235, Harar, Ethiopia.

Bayaanka ogolaanshaha ikhtiyaariga ah ee la isku wargeliyay:

Waan akhriyay / waa la ii aqriyay xaashida macluumaadka kaqeybgalaha. Waxaan si cad u fahansanahay ujeedada cilmi baaristaan, nidaamka, khatarta iyo faa'iidooyinka, arrimaha qarsoodiga, xuquuqda kaqeybgalka iyo cinwaanka wixii weydiin ah. Waxaa la i siiyay fursad aan ku waydiiyo su'aalo waxyaabaha aan caddayn. Waxaa la ii sheegay in aan xaq u leeyahay in aan ka noqdo ama diidikaro daraasadda waqti kasta ama in aanan ka jawaabin su'aal kasta oo aanan rabin. Sidaa darteed, waxaan cadeynayaa ogolaanshahayga ikhtiyaariga ah ee ah in aan kaqaybqaato daraasaddan iyada oo ay weheliso saxeexyada (saxeexay) sida hoos lagu tilmaamay.

Magaca iyo saxiixa kaqeyb galaha daraasadda: taariikhda_____

Magaca iyo saxeexa xog ururiyaha: taariikhda____

8.4. Data Collection Instruments (English Version)

I. Socio-demographic related factors (Please Circle your possible answer in the response box)		
No	**Questions**	**Response**
100	Date of interview in DD/MM/YYYY (G.C)	_____
101	Region/Zone/District	_____
102	Name of Hospital/Health Facility	1. Caafi diabetes specialty clinic 2. Dalab Hospital 3.Gardo General Hospital
103	Current residency area	1. Urban 2. Rural
104	Age of respondent (in complete years)	_____years
105	Sex of respondent	1. Male 2. Female
106	What is your current marital status?	1.Unmarried 2. Married
107	What is your highest educational level?	1. No formal education 2.Primary education 3.Secondary and above
108	What is your main occupation?	1. Housewife 2. Government employee 3. Private employee 4. Merchant/trade 5. Other(specify)------
109	How much is your average monthly income in USD?	----------USD
110	Total family size/person living in household in number	----------
111	Weight of the respondent in Kg	----------kg
112	Height of respondent in cm	---------- cm

II. Clinical and service related conditions of the patient's questionnaire (Please Circle your possible answer in the response box).			
No	Question	Response	Remarks
201	When were you first diagnosed with diabetes mellitus (DM)?	Dd/mm/yyyy …….	
202	Have you ever felt that your diabetes has been stigmatized, or have you experienced people treating you differently or negatively because of your condition?	1.Yes 2.No	
203	Which treatment modality are you taking?	1. Oral anti DM medication only 2. Combined (oral anti diabetes and insulin) 3. Insulin injection only	
204	What is the level of HbA1C?	----------%	Retrieve from the patient's cards
205	What is your total cholesterol level? 1. HDL 2. LDL 3. Triglycerides	----------mg/dl ---------- mg/dl ---------- mg/dl	Retrieve from the patient's cards
206	Does the patient had any Non-T2DM Illness on admission?	1.Yes 2.No	
207	Have the patients developed any Complication due to diabetes?	1.Yes 2.No	
208	If the answer is yes, which of the following complication did the patient experience? Please select all that apply:	1. Cardiovascular Disease 2. Diabetic Neuropathy 3. Diabetic Nephropathy 4. Diabetic Retinopathy 5. Depression 6. Foot Damage 7. Skin and Mouth Conditions 8. Other (please specify): ____	
209	What is the total time you have to travel, either on foot or by car, to access the nearest public health facility in a single trip?	---------- Minutes	
210	For how long you wait to get a service after you reach the health-service Centre?	---------- Minutes	

III. Health-Related Quality of Life Questionnaire: WHOQOL-BREF

Instructions

This assessment asks how you feel about your quality of life, health, or other areas of your life. Please answer all the questions. If you are unsure about which response to give to a question, please choose the one that appears most appropriate. This can often be your first response. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life in the last two week.

		Very poor=**1**	Poor=**2**	Neither poor nor good=**3**	Good=**4**	Very good=**5**
1(G1)	How would you rate your quality of life?					

		Very dissatisfied=**1**	Dissatisfied=**2**	Neither satisfied nor dissatisfied=**3**	Satisfied=**4**	**Very** satisfied=**5**
2(G4)	How satisfied are you with your health?					

The following questions ask about how much you have experienced certain things in the last two weeks.

		Not at all=**1**	A little=**2**	A moderate amount=**3**	Very much=**4**	An extreme amount=**5**
3(F1.4)	To what extent do you feel that (physical) pain prevents you from doing what you need to do?					
4(F11.3)	How much do you need any medical treatment to function in your daily life?					
5 (F4.1)	How much do you enjoy life?					
6(F24.2)	To what extent do you feel your life to be meaningful?					
7 (F5.3)	How well are you able to concentrate?					
8(F16.1)	How safe do you feel in your daily life?					
9(F22.1)	How healthy is your physical environment?					

Table III. Health-Related Quality of Life Questionnaire: WHOQOL-BREF (Continued)

The following questions ask about how completely you experienced or were able to do certain things in the last two weeks.

		Not at all=**1**	A little=**2**	Moderately=**3**	Mostly=**4**	Completely=**5**
10(F2.1)	Do you have enough energy for everyday life?					
11(F7.1)	Are you able to accept your bodily appearance?					
12(F18.1)	Have you enough money to meet your needs?					
13(F20.1)	How available to you is the information that you need in your day-to-day life?					
14(F21.1)	To what extent do you have the opportunity for leisure activities?					

		Very poor=**1**	Poor=**2**	Neither poor nor good=**3**	Good=**4**	Very good=**5**
15 (F9.1)	How well are you able to get around?					

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied=**1**	Dissatisfied=**2**	Neither satisfied nor dissatisfied=**3**	Satisfied=**4**	Very satisfied=**5**
16 (F3.3)	How satisfied are you with your sleep?					
17 (F10.3)	How satisfied are you with your ability to perform your daily living activities?					
18 (F12.4)	How satisfied are you with your capacity for work?					
19 (F6.3)	How satisfied are you with yourself?					
20 (F13.3)	How satisfied are you with your personal relationships?					
21 (F15.3)	How satisfied are you with your sex life?					

Table III. Health-Related Quality of Life Questionnaire: WHOQOL-BREF (Continued)

		Very dissatisfied=1	Dissatisfied=2	Neither satisfied nor dissatisfied=3	Satisfied=4	Very satisfied=5
22 (F14.4)	How satisfied are you with the support you get from your friends?					
23 (F17.3)	How satisfied are you with the conditions of your living place?					
24 (F19.3)	How satisfied are you with your access to health services?					
25 (F23.3)	How satisfied are you with your transport?					

The following question refers to how often you have felt or experienced certain things in the last two weeks.

		Never=**1**	Seldom=**2**	Quite often=**3**	Very often=**4**	Always=**5**
26 (F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?					

IV. Diabetes Self-Care Activities Questionnaire

The questions below ask you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

Diet

1. How many of the last SEVEN DAYS have you followed a healthful eating plan?

0 1 2 3 4 5 6 7

2. On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?

0 1 2 3 4 5 6 7

3. On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?

0 1 2 3 4 5 6 7

4. On how many of the last SEVEN DAYS did you eat high fat foods such as red meat or full-fat dairy products?

0 1 2 3 4 5 6 7

Exercise

5. On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? (Total minutes of continuous activity, including walking?

0 1 2 3 4 5 6 7

6. On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?

0 1 2 3 4 5 6 7

Blood Sugar Testing

7. On how many of the last SEVEN DAYS did you test your blood sugar?

0 1 2 3 4 5 6 7

8. On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?

0 1 2 3 4 5 6 7

Foot Care

9. On how many of the last SEVEN DAYS did you check your feet?

0 1 2 3 4 5 6 7

10. On how many of the last SEVEN DAYS did you inspect the inside of your shoes?

0 1 2 3 4 5 6 7

Smoking

11. Have you smoked a cigarette—even one puff—during the past SEVEN DAYS?

0. No 1. Yes

If yes, how many cigarettes did you smoke on average day? Number of cigarettes:

Medication

6A. On how many of the last SEVEN DAYS, did you take your recommended diabetes medication?

0 1 2 3 4 5 6 7

OR

7A. On how many of the last SEVEN DAYS did you take your recommended insulin injections?

0 1 2 3 4 5 6 7

V. Diabetes Knowledge Scale: Here are 20 statements about diabetes, some are true statements and some are false. Please read each statement and then indicate whether you think it is true or false by putting a circle around either TRUE or FALSE. If you do not know the answer please put a circle around DON'T KNOW.			
1. The diabetes diet is a healthy diet for most people	true=1	false=2	don't know=3
2. Glycosylated hemoglobin (HbA1c) is a test that measures your average blood glucose level in the past week	true	false	don't know
3. A pound of chicken has more carbohydrate in it than a pound of potatoes	true	false	don't know
4. Orange juice has more fat in it than low fat milk.	true	false	don't know
5. Urine testing and blood testing are both equally as good for testing the level of blood glucose.	true	false	don't know
6. Unsweetened fruit juice raises blood glucose levels	true	false	don't know
7. A can of diet soft drink can be used for treating low blood glucose levels.	true	false	don't know
8. Using olive oil in cooking can help lower the cholesterol in your blood.	true	false	don't know
9. Exercising regularly can help reduce high blood pressure.	true	false	don't know
10. For a person in good control, exercising has no effect on blood sugar levels.	true	false	don't know
11. Infection is likely to cause an increase in blood sugar levels.	true	false	don't know
12. Wearing shoes a size bigger than usual helps prevent foot ulcers.	true	false	don't know
13. Eating foods lower in fat decreases your risk for heart disease.	true	false	don't know
14. Numbness and tingling may be symptoms of nerve disease.	true	false	don't know
15. Lung problems are usually associated with having diabetes.	true	false	don't know
16. When you are sick with the flu you should test for glucose more often.	true	false	don't know
SKIP TO QUESTION 19 IF YOU DON'T TAKE INSULIN			
17. High blood glucose levels may be caused by too much insulin.	true	false	don't know
18. If you take your morning insulin but skip breakfast your blood glucose level will usually decrease	true	false	don't know
19. Having regular check-ups with your doctor can help spot the early signs of diabetes complications	true	false	don't know
20. Attending your diabetes appointments will stop you getting diabetes complications.	true	false	don't know

VI. DIABETES EMPOWERMENT SCALE
PLEASE ANSWER THE FOLLOWING QUESTIONS

		Strongly Agree=5	Agree=4	Neutral=3	Disagree=2	Strongly Disagree=1
In general, I believe that I:						
1	...know what part(s) of taking care of my diabetes that I am satisfied with.					
2	...know what part(s) of taking care of my diabetes that I am dissatisfied with.					
3	...know what part(s) of taking care of my diabetes that I am ready to change.					
4	...know what part(s) of taking care of my diabetes that I am not ready to change.					
5	...can choose realistic diabetes goals.					
6	...know which of my diabetes goals are most important to me.					
7	...know the things about myself that either help or prevent me from reaching my diabetes goals.					
8	...can come up with good ideas to help me reach my goals.					
9	...am able to turn my diabetes goals into a workable plan.					
10	...can reach my diabetes goals once I make up my mind.					
11	...know which barriers make reaching my diabetes goals more difficult.					
12	...can think of different ways to overcome barriers to my diabetes goals.					
13	...can try out different ways of overcoming barriers to my diabetes goals.					
14	...am able to decide which way of overcoming barriers to my diabetes goals works best for me					
15	...can tell how I'm feeling about having diabetes.					
16	...can tell how I'm feeling about caring for my diabetes					
17	...know the ways that having diabetes causes stress in my life.					

Table VI. DIABETES EMPOWERMENT SCALE (**Continued)**

		Strongly Agree=5	Agree=4	Neutral=3	Disagree=2	Strongly Disagree=1
In general, I believe that I:						
18	...know the positive ways I cope with diabetes-related stress					
19	...know the negative ways I cope with diabetes-related stress					
20	...can cope well with diabetes- related stress.					
21	...know where I can get support for having and caring for my diabetes.					
22	...can ask for support for having and caring for my diabetes when I need it.					
23	...can support myself in dealing with my diabetes.					
24	...know what helps me stay motivated to care for my diabetes.					
25	..Can motivate myself to care for my diabetes.					
26	...know enough about diabetes to make self-care choices that are right for me.					
27	...know enough about my- self as a person to make diabetes care choices that are right for me.					
28	...am able to figure out if it is worth my while to change how I take care of my diabetes.					

.

VII. PHQ-9 QUESTIONNAIRE: PLEASE ANSWER THE FOLLOWING QUESTIONS						
Over the last 2 weeks, how often have you been bothered by any of the following problems? (use "✓" to indicate your answer)		Not at all= 0	Several days= 1	More than half the days= 2	Nearly every day=3	
1	Little interest or pleasure in doing things					
2	Feeling down, depressed, or hopeless					
3	Trouble falling or staying asleep, or sleeping too much					
4	Feeling tired or having little energy					
5	Poor appetite or overeating					
6	Feeling bad about yourself or that you are a failure or have let yourself or your family down					
7	Trouble concentrating on things, such as reading the newspaper or watching television					
8	Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual					
9	Thoughts that you would be better off dead, or of hurting yourself					
10	If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	Not difficult at all =**0**		_____		
		Somewhat difficult =**1**		_____		
		Very difficult =**2**		_____		
		Extremely difficult =**3**		_____		

VIII. Diabetes-related Distress 17 Items Scale (DDS-17) Questionnaire: Please answer the following questions							
		Not a Problem=1	A Slight Problem=2	A Moderate Problem=3	Somewhat Serious Problem=4	A Serious Problem=5	A Very Serious Problem=6
1	Feeling that my doctor doesn't know enough about diabetes and diabetes care						
2	Feeling that diabetes is taking up too much of my mental and physical energy every day						
3	Not feeling confident in my day-to-day ability to manage diabetes						
4	Feeling angry, scared and/or depressed when I think about living with diabetes.						
5	Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes.						
6	Feeling that I am not testing my blood sugars frequently enough.						
7	Feeling that I will end up with serious long-term complications, no matter what I do.						
8	Feeling that I am often failing with my diabetes routine.						
9	Feeling that friends or family are not supportive enough of self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods).						
10	Feeling that diabetes controls my life.						
11	Feeling that my doctor doesn't take my concerns seriously enough						
12	Feeling that I am not sticking closely enough to a good meal plan.						
13	Feeling that friends or family don't appreciate how difficult living with diabetes can be.						

Table VIII. Diabetes-related Distress 17 Items Scale (DDS-17) Questionnaire (Continued)

		Not a Problem=1	A Slight Problem=2	A Moderate Problem=3	Somewhat Serious Problem=4	A Serious Problem=5	A Very Serious Problem=6
14	Feeling overwhelmed by the demands of living with diabetes.						
15	Feeling that I don't have a doctor who I can see regularly enough about my diabetes.						
16	Not feeling motivated to keep up my diabetes self-management.						
17	Feeling that friends or family don't give me the emotional support that I would like.						

IX. Oslo Social Support Scale (OSSS-3) Questionnaire: Please answer the following questions				
Oslo 1: How many people are so close to you that you can count on them if you have great personal problems?				
1 None	**2** 1-2	**3** 3-5	**4** 5+	
Oslo 2: How much interest and concern do people show in what you do?				
1 None	**2** Little	**3** Uncertain	**4** Some	**5** A lot
Oslo 3: How easy is it to get practical help from neighbors if you should need it?				
1 Very difficult	**2** Difficult	**3** Possible	**4** Easy	**5** Very easy

8.5. Data Collection Instruments (Somali Version)

I. Su'aalaha la xiriira arrimaha dhaqan-bilsho (Socio-demographic related factors) Fadlan ka jawaab su'aalaha soo socda		
Tirada	**Su'aasha**	**Jawaabta**
100	Taariikhda waraysiga	----------
101	Gobolka/Aaga/Degmada	----------
102	Magaca Isbitaalka/Xarunta Caafimaadka	1. xarunta daryeelka sonkorowga ee Caafi 2. Cisbitaalka Dalab 3. Cisbitalka guud ee Qardho
103	Xaggee hadda degantahay	1. magaaalada 2. miyiga
104	Da'da jawaab-celiyaha (sanadaha oo dhamaystiran)	----------Sano
105	Jinsiga jawaab-celiyaha	1. lab 2. dhedig
106	Waa maxay xaaladaada guur ee hadda?	1. aan guursan 2. Guursaday
107	Waa maxay heerkaaga waxbarasho ee ugu sarreeya?	1. Aan lahayn waxbarasho rasmi ah 2.Waxbarashada aasaasiga ah 3. Waxbarashada dugsiga sare iyo wixii ka sarreeya
108	Waa maxay shaqadaada ugu weyn ee aad qabato?	1. xaas gurijoog ah 2. Shaqaale dawladeed 3. iskii u shaqaysta 4. Ganacsato/ganacsi 5. shaqo kale (cadey)------
109	Waa imisa doollar celceliska dakhligaaga billaha ah?	-----Doollar
110	Wadarta tirada qoyska/ inta qof ee ku nool guriga tiro ahaan?	----------
111	Miisaanka jawaab bixiyaha kiilo ahaan ----------	kg ----------
112	Dhererka jawaab bixiyaha ee cm ahaan----	cm ----------

II. su'aalaha la xiriira xaaladaha bukaan-socodka iyo adeeg bixinta (Clinical and service related conditions of the patient's)		
	Ka jawaab su'aalaha soo socda	
Tirada	**Su'aasha**	**jawaabta**
201	Goorma ayey ahayd Markii ugu horeysay ee lagugu sheegay xanuunka macaanka (DM)?	Maalinta/bisha/sanadka…….
202	Weligaa ma dareentay in cudurka macaanka lagugu dhaleeceeyay, amase dad si xun kuula dhaqmeen xaaladaada awgeed?	1. haa 2.maya
203	Intee bilood ayaad la nooshahay macaanka tan iyo markii lagugu sheegay?	……. Bilood
204	daawo noocee ah ayaad qaadataa	1. Daawooyinka afka laga qaato ee macaanka oo kaliya 2. Irbadda Insuliinka oo kaliya
205	Goorma ayey ahayd markii ugu horeysay oo aad bilowday in aad qaadato daawada sonkorowga?	Maalinta/bisha/sanadka…….
206	Intee yahay heerka HbA1C ee la baaray?	----------%
207	Waa maxay wadarta heerka kolestaroolkaaga? 1. HDL (lipoprotein-ka cufnaanta sare leh) 2. LDL (lipoprotein-ka cufnaanta hoose leh) 3. TG (Triglycerides)	 ----------mg/dl ----------mg/dl ----------mg/dl
208	Bukaanku miyuu horay u qabey xanuuno kale macaanka ka hor?	1. Haa 2. Maya
209	Bukaanku hadda miyuu leeyahay wax xanuuno ah oo ka dhashay cudurka macaanka?	1. Haa 2.Maya
210	Hadday jawaabtu haa tahay, waa kuwee kuwa ka mid ah xanuunadaan soo socda ee bukaanku la kulmay? Fadlan dooro dhammaan kuwa khuseeya:	1. Cudurka Wadnaha 2. Sonkorow neeerfaha saameeyey 3. Sonkorow kelyaha saameeyey 4. sonkorow indhaha saameeyey 5. Niyad-jab 6. Dhaawac cagaha ah 7. cuduro kale (fadlan sheeg): ____
211	Waa imisa wakhtiga uu kugu qaato halkii safar, lug ama baabuur, si aad u gaarto goobta caafimaadka guud ee kuugu dhow?	Daqiiqadood ____
212	Intee ayaad sugtaa si aad u hesho adeegga caafimaadka Ka dib markaad gaarto Xarunta?	Daqiiqadood ____

III. WHOQOL-BREF

Hor dhac: Qiimayntani waxay ku weydiinaysaa sida aad u aragto tayada noloshaada, caafimaadkaaga, ama qaybaha kale ee noloshaada. Fadlan ka jawaab su'aalaha oo dhan. Haddii aadan hubin jawaabta aad ka bixinayso su'aasha, fadlan dooro midka ugu habboon. Tani waxay badanaa noqon kartaa jawaabtaada koowaad. Fadlan maskaxda ku hay heerarkaaga, rajadaada, raaxaysigaaga iyo welwelkaaga. Waxaan ku waydiisanayaa inaad ka fikirto noloshaada labadii toddobaad ee u dambeeyay.

		Aad u liidata=1	Liidata=2	Ma liidato mana wanaagsana=3	Wanaagsan=4	Aad u wanaagsan=5
1(G1)	Sidee baad u qiyaasilahaayd heerka noloshaada?					

		Aad uguma qanacsani=1	**Kuma qanacsani=2**	**kuma qanacsani kamana qanacsani=3**	**Waan Ku Qanacsanahy=4**	**Aad uguma qanacsani=5**
2 (G4)	Sideebaad caafimaadkaaga ugu qanacsantahay?					
16(F3.3)	Sidee baad hurdaada ugu qanacsantahay?					
17(F10.3)	Sideed ugu qanacsantahay awooddaada waxqabad ee dhaqdhaqaaqa noloshaada maalinlaha?					
18(F12.4)	Sideed ugu qanacsantahay awooddaada shaqo?					
19 (F6.3)	Sidee adigu isugu qanacsantahay?					
20(F13.3)	Sideed ugu qanacsantahay xiriirradaada gaar ahaaneed?					
21(F15.3)	Sideed ugu qanacsantahay xiriirkaaga galmada?					
22(F14.4)	Side ed ugu qanacsantahay taageerada aad ka hesho saaxiibbadaa?					
23(F17.3)	Sided ugu qanacsantahay xaaladda meesha aad ku nooshahay?					
24(F19.3)	Sideed ugu qanacsantahay helidda adeegyada caafimaadka?					
25(F23.3)	Sided ugu qanacsantahay gaadiidka aad isticmaasho?					

Su’aalaha soo socda wexeey ku weeydinayaan khibradda aad leedahay inta aay qiyaastii le’ekeeyd siiba waxyaabaha khaaska (gaarka ah) ah ee affartii usbuuc ee Ina soo dhaaftay

		Haba yaraatee innaba=1	Wax yar=2	Qadar dhexdhexaad ah=3	Aad u badan=4	Qiyaas aan xaddidneeyn=5
3(F1.4)	Ilaa xadkee baad dareemeeysaa in xanuunka korka kaa hayaa uu kaa hor istaagey wixii aad u baahneeyd inaad qabsato?					
4(F11.3)	Ilaa intee ayaad ku tiirsan tahay daawooyinka, si aad u qabsato hawlahaaga maalinlaha?					
5 (F4.1)	Intee in le’eg ayaad ku raaxeeysataa nolosha?					
6(F24.2)	Ilaa xadkee baad dareemeeysaa ineey noloshaadu qiime leedahay?					
7 (F5.3)	Qiyaastee baad awooddaada iyo fahamkaaga qof’ahaaneed ugu dhug yeelankartaa shaqada aad hayso adigoo aan feker kaa mashquulinayn?					
8(F16.1)	Intee in le'eg baad ammaan ku dareemeysaa nolol maalmeedkaaga?					
9(F22.1)	Caafimaad ahaan inteey le’egtahay saameeynta beey’adda dabiiciga ee aad ku nooshahay?					

Su’aalaha soo socda wexeey ku weeydinayaan dhammaan khibradda aad leedahay intey le’ekeeyd siiba waxyaabaha khaaska (gaarka ah) ah ee affartii usbuuc ee ina soo dhaaftay.

		Haba yaraatee innaba=1	**Wax yar=2**	**Dhexdhexaad=3**	**Inta badan=4**	**Si buuxda=5**
10(F2.1)	Firfircooni kugu filaan ma u leedahay (ama ma u haysaa himad) nolol maalmeedkaaga?					
11(F7.1)	Ma ku qanacsantahay muuqaalka jirkaaga?					
12(F18.1)	Lacag kugu filan ma haaysataa si aad u kaafido baahidaada?					
13(F20.1)	Sidee kuugu sahlantahay inaad hesho xogta aad u baahantahay maalinwalba?					

14(F21.1)	Intee in le'eg ayaa fursad u leedahay inaad qabato hawlo madadaalo, ama nasasho ah wakhtigaaga firaaqada ah?"					

Su'aashaan soo socota wexeey tixraaceeysaa inta jeer ee aad dareentay ama aad khibrad u yeelatay waxyaabaha qaarkood affartii usbuuc ee la soo dhaafay.

		Marna=1	Dhif ah=2	Marar badan=3	Marar badan=4	Mar walba=5
26 (F8.1)	Intee jeer baad dareentay rajo xumo sida: rajo beel, walaac, murugo ama niyad jab?					

IV. xog-ururinta Hawlaha Is-daryeelka Sonkorowga (Diabetes Self-Care Activities Questionnaire)

Su'aalaha hoose waxay ku weydiinayaan hawlahaaga is-daryeelka sonkorowga 7dii maalmood ee la soo dhaafay. Hadii aad buktey 7dii maalmood ee la soo dhaafay, fadlan dib uga fikir 7dii maalmood ee u dambeeyay ee aad roonayd

Cuntada

1. Immisa ka mid ah todobadii maalmood ee u dambeeyay ayaad raacday qorshe cunto caafimaad leh oo si gaar ah laguugu sameeyey?

0 1 2 3 4 5 6 7

2. Celcelis ahaan, bishii la soo dhaafay, imisa MAALMOOD Isbuucii ayaad raacday Qorshe cunto?

0 1 2 3 4 5 6 7

3. 7dii maalmood ee la soo dhaafay, imisa maalmood ayaad cuntay ugu yaraan 5 qaybood oo khudaar ah?

0 1 2 3 4 5 6 7

4. Immisa ka mid ah todobadii maalmood ee u dambeeyay ayaad cuntay cuntooyinka dufanku ku badan yahay sida hilibka cas ama caanaha dufanka leh?

0 1 2 3 4 5 6 7

Jimicsiga

5. Immisa ka mid ah toddobadii maalmood ee u dambeeyay ayaad ka qayb qaadatay ugu yaraan 30 daqiiqo oo ah dhaqdhaqaaqa jirka? (Isugeynta daqiiqadaha dhaqdhaqaaqa joogtada ah, oo ay ku jiraan socodka?

0 1 2 3 4 5 6 7

6. Immisa ka mid ah todobadii maalmood ee u dambeeyay ayaad samaysay jimicsi gaar ah (sida dabaasha, socodka, baaskiilka I.W.M) oo aan ka ahayn waxa aad ku qabato guriga dhexdiisa ama qayb ka ah shaqadaada?

0 1 2 3 4 5 6 7

Cabbiraadda Sonkorta

7. Immisa ka mid ah todobadii maalmood ee u dambeeyay ayaad iska cabbirtay sonkorta?

0 1 2 3 4 5 6 7

8. Immisa ka mid ah todobadii maalmood ee u dambeeyay ayaad iska cabirtay sonkorta adigoo iska cabiray tirada inta jeer ee uu horay kuugula taliyay dhakhtarku?

0 1 2 3 4 5 6 7

Daryeelka cagaha

9. Immisa ka mid ah toddobadii maalmood ee u dambeeyay ayaad cagahaaga ka eegtay wax nabaro ah?

0 1 2 3 4 5 6 7

10. Immisa ka mid ah toddobadii maalmood ee u dambeeyay ayaad kormeertay oo ka dhugatey gudaha kabahaaga wax qodax, dhagax, bir IWM ah? 0 1 2 3 4 5 6 7
Sigaar cabid
11. Miyaad cabtay wax sigaar ah, xitaa hal mar oo aad jiidey allaha ka dhigee intii lagu jiray todobadii maalmood ee la soo dhaafay? 0. Maya 1. Haa Hadday haa tahay, imisa sigaar ah ayaad cabtay celcelis ahaan maalintii? Tirada sigaarka**: …….**
Daawooyinka
6A. Immisa ka mid ah todobadii maalmood ee u dambeeyay ayaad qaadatay irbadda insuliinta ee dhakhtarku kuu qoray? 0 1 2 3 4 5 6 7
7A. Immisa ka mid ah todobadii maalmood ee u dambeeyay, ayaad qaadatay kiniiniyada laguu qoray ee sonkorta? 0 1 2 3 4 5 6 7

V. **Xog-ururinta aqoonta sonkorowga (Diabetes Knowledge Scale**)

Halkan waxaa ah 20 oraahood oo ku saabsan cudurka macaanka, Fadlan dooro jawaabta Adiga oo oranaya waa run ama waa been Haddii aanad garanayn jawaabta fadlan dheh Ma garanayo.

		Run=1	Been=2	Magaranayo=3
1	Cuntada lagu taliyay dadka macaanka qaba guud ahaan waa cunto caafimaad leh balse aan ka duwanayn cunada dadka caafimaadka qaba ay cunaan			
2	Glycosylated hemoglobin (HbA1c) waa baaritaan lagu cabbiro celceliska heerka gulukooska dhiiggaaga ku jira ee usbuucii tagay			
3	Hal rodol oo digaag ah ayaa ka karbohaydrayt badan hal rodol baradho ah			
4	Cabitaanka liin macaanta ayaa ka dufan badan caanaha xoolaha			
5	Baaritaanka kaadida iyo baaritaanka dhiigga labadaba si isku mid ah ayaa looga ogaan karaa heerka gulukoosta ee dhiigga			
6	Cabitaanka khudradda ee aan la macaanayn wuxuu kor u qaadaa heerka sonkorta dhiiga ku jirta			
7	hal daasad oo cabitaanka wershadaysan ah baa kor loogusoo qaaadi karaa marka qofka sonkortiisu dhacdo			
8	Saliidda saytuunka oo loo isticmaalo cunno karinta waxay kaa caawin kartaa inay yarayso kolestaroolka dhiiggaaga.			
9	Jimicsiga joogtada ah wuxuu kaa caawin karaa dejinta dhiigkarka			
10	qofku in uu sonkortiisa la socdo, jimicsina sameeyo waxba kama tarto heerka sonkorta			
11	Infection-ka ayaa laga yaabaa inuu kiciyo heerka sonkorta ee qofka sonkorta qaba			
12	Xirashada kabo cabbir ahaan kaa badan waxay kaa caawinayaan ka hortagga boogaha cagaha			
13	cuntooyinka dufanku ku yar yahay oo la cunaa waxay hoos u dhigaan khatarta wadne xanuunka			
14	Kabuubyo iyo jidhidhico laga dareemo addimada ama gacmaha ayaa noqon kara calaamado muujinaya cudurka neerfaha ee macaanku keeno			
15	Xanuunada sambabada ayaa badanaa lala xiriiriyaa sonkorowga.			
16	Marka hargab kugu dhaco waa inaad tijaabisaa gulukoosta marar badan			
17	Heerarka gulukooska dhiigga oo sarreeya waxaa sababi kara insulinta oo badan			

18	Haddii aad qaadato insulinta subaxdii laakiin aad quraacda ka boodo heerka gulukoosta dhiiggaaga ama sonkortu waa ku dhaceysaa			
19	In aad si joogto ah ugu xirnaato dhakhtarka waxay Caawintaa in horay loo ogaado calaamadaha muujinaya dhibaatooyinka uu keeno sonkorowgu			
20	Imaanshaha ballamaha uu dhakhtarku kuu qabtay waxay ka saacideysaa in laga hortago dhibaatooyinka sonkorowga			

VI. xog ururin ku saabsan awoodsiinta qofka macaanka qaba (Diabetes Empowerment Scale)						
		Waan kugu raacsanahay weliba si xoogan=**5**	Waan kugu raacsanahay=**4**	Dhexdhexaadbaan ka ahay=**3**	Kuguma Raacsani=**2**	Kuguma raacsani, weliba si xoogan=**1**
Guud ahaan, waxa aan aaminsanahay in aan:						
1	…….garanayo tabta aan u maaraynayo xanuunka macaanka, waana tab aan ku faraxsanahay					
2	…… garanayo qaybaha daryeelka xanuunka macaanka ee aanan ku faraxsanayn ama aan dhayalsado					
3	……garanayo qaybta(qaybaha) daryeelka xanuunka macaanka ee aan diyaarka u ahay in aan wax ka bedelo					
4	……garanayo qaybta(qaybaha) daryeelka xanuunka macaanka ee aanan diyaarka u ahayn in aan wax ka bedelo					
5	……dooran karo yoolal dhab ah oo aan ka yeelan karo xanuunka macaanka					
6	dooran karo yoolal dhab ah oo aan ka leeyahay xanuunka macaanka kuwooda ugu mudan					
7	….. garanayo arrimaha naftayda ku saabsan oo iga caawinkara ama caqabad ku noqon kara in aan gaaro yoolalka dhab ah oo aan ka leeyahay xanuunka macaanka					
8	……la imaan karo fikrado wanaagsan oo iga caawiya inaan gaaro yoolalkayga macaanka.					
9	….Waxaan awoodaa inaan u beddelo yoolalkayga sonkorowga qorshe shaqayn kara.					
10	...gaari karo yoolalkayga sonkorowga marka aan ka go'aansado maskaxdayda					
11	…..aqaan caqabadaha ka dhigaya gaaritaanka yoolalkayga sonkorowga mid aad u adag					

12	...ka fikiri karo habab kala duwan oo aan kaga gudbi karo caqabadaha hortaagan yoolalkayga xanuunka macaanka					
13	... Isku dayi karo habab kala duwan oo aan kaga gudbo caqabadaha hortaagan yoolalkayga sonkorowga.					
14	... awoodo in aan go'aansado habka aan uga gudbi karo caqabadaha hortaagan yoolalkayga xanuunka macaanka kuwaas oo sida ugu fiican iigu shaqayn kara					
15	Sheegi karo sida aan ku dareemayo xanuunka macaanka.					

Jadwalka VI. Xog ururin ku saabsan awoodsiinta qofka macaanka qaba ayaa weli socda

		Waan kugu raacsanahay weliba si xoogan=**5**	Waan kugu raacsanahay=**4**	Dhexdhexaad baan ka ahay=**3**	Kuguma Raacsani**=2**	Kuguma raacsani, weliba si xoogan=**1**
Guud ahaan, waxa aan aaminsanahay in aan:						
16	... sheegi karo sida uu yahy dareenkayga ku aadan daryeelka xanuunka macaanka					
17	... Ogahay siyaabaha uu xanuunka macaanku ugu keenikaro diiqad noloshayda.					
18	... ogahay siyaabaha togan ee aan ula tacaali karo walbahaarka la xiriira sonkorowga					
19	... ogahay siyaabaha xun ee aan ula tacaalo walbahaarka la xiriira sonkorowga					
20	... Si fiican ula tacaali karo walbahaarka la xiriira sonkorowga.					
21	... Ogahay meesha aan ka heli karo taageerada la xiriirta daryeelka xanuunkayga macaanka.					
22	... codsan karo taageero la xariirta daryeelka xanuunkayga macaanka marka aan u baahdo					
23	... Naftayda ku taageeri karo la tacaalida cudurka macaanka.					
24	... Ogahay waxa igu caawiya inaan ku dhiirado daryeelka xanuunkayga macaanka.					
25	..Naftayda ku dhiirigelin karo in aan daryeelo cudurkayga macaanka.					
26	...in igu filan ka aqaano cudurka macaanka si aan u sameeyo doorashooyin is-daryeel nafeed ah oo aniga igu habboon.					
27	... wax igu filan nafteyda ka aqaano si aan u sameeyo doorashooyinka daryeelka sonkorowga ee igu habboon					

28	... Waxaan awoodaa inaan ogaado inay mudan tahay markii aan muddo joogoba inaan bedelo sida aan u daryeelayo xanuunkayga macaanka.					

VII. xogwareysiga caafimaadka bukaanka (PHQ-9) **Fadlan ka jawaab su'aalahan soo socda**					
Labadii toddobaad ee u dambeeyay, immisa jeer ayuu ku dhibay mid ka mid ah dhibaatooyinkan soo socda?		haba yaraatee innaba=**0**	Dhowr maalmood=**1**	In ka badan kala badh maalmahaas=**2**	Ku dhawaad maalin kasta=**3**
1	xiisa yari iyo danayn la'aan wax qabad				
2	Niyad-jab, diiqad, ama rajo-la'aan				
3	hurdada oo aan kugu soo dhacayn ama hurdo yaraan , amase hurdo badan				
4	in aad Dareento daal ama tamar darro				
5	abiteed yari ama cunitaan badni				
6	In aad naftaada ka qabto dareen xun ama aad isu aragto in aad tahay qof guuldaraystay ama aad naftaada ama qoyskaaga hoos u dhigtay				
7	Dhibaato makaa haysataa u fiirsashada ama u dhugyeelashada ficilada qaar, sida akhrinta wargeysyada ama daawashada telefishanka				
8	In aad u soconeysey ama u hadleysey si tartiib ah oo ay dadka kale ogaan karaan. Ama caksigeed oo aad si qallafsanaan ama nasasho la'aan ah aad u wareegaysay in ka badan sidii caadiga ahayd				
9	in aad dareentay Fikirka ah inaad ku fiicnaan lahayd inaad iska dhimato, ama inaad naftaada dhaawac u geysato				
10	Haddii aad iska hubisay wax dhibaato ah, intee in le'eg ayay dhibaatooyinkani kugu adkeeyeen in aad shaqadaada qabsato, in aad wax ku daryeesho guriga, ama aad la dhaqanto dadka kale?	Ma adka gebi ahaan ba =**0**		_____	
		Xoogaa wey adagtahay =**1**		_____	
		Aad bey u adagtahay =**2**		_____	
		Wax ka adagba ma arkin=**3**		_____	

VIII: Walaaca la xariira sonkorowga, 17 su'aalod (Diabetes-related Distress 17 Items Scale (DDS-17) Questionnaire)						
	Wax dbib ah ma leh=1	Dhib aan badnayn=2	Dhibaato dhexdhexaad ah=3	dhibaato xoogaa xoogan=4	Dhibaato Halis ah=5	Dhib aad u daran=6
1. waxaan dareemaya in dhakhtarkaygu aanu aqoon ku filan u lahayn xanuunka macaanka iyo daryeelkiisa						
2. waxaan dareemayaa in sonkorowgu qaato wax badan oo ah tamarta maskaxdayda iyo jidhkayga maalin kasta						
3. kuma dareemayo kalsooni buuxda awooddayda maalinlaha ah ee aan ku maareeyo xanuunka macaanka						
4. waxaan dareemaa xanaaq, baqdin iyo niyad-jab markaan ka fekero in aan la noolahay sonkorow						
5. Waxaan dareemayaa in takhtarkaygu iga siin tilmaamo cad oo ku filan sida loo maareeyo cudurka macaanka.						
6. Waxaan dareemayaa inta badan inaanan iska cabirin sonkorta dhiigayga in igu filan.						
7. Waxaan dareemayaa in aan ku dambayn doono dhibaatooyin waqti dheer oo halis ah, wax macne ahna samayn mayo dadaal walba oo aan la imaado.						
8. Waxaan dareemayaa in aan inta badan ku guuldareysto habka isdaryeelka joogtada ah ee xanuunka macaanka.						
9. waxaan dareemayaa in saaxiibada ama qoysku aaysan iga siin taageero igu filan dadaallada is-daryeelka (tusaale waxa ay qorsheyaan in aan sameeyo ficilo ka hor imaanaya jadwalkayga, sida in ay igu dhiirigeliyaan inaan cuno cuntooyink "qaldan" oo aan sonkorowga u fiicnayn)						
10. Waxaan dareemayaa in sonkorowgu uu xakameeyey ama dabray noloshayda.						
11. waxaan dareemayaa in takhtarkaygu aanu si dhab ah oo ku filan u qaadan welwelkayga						
12. Waxaan dareemayaa inaanan si joogto ah u lahayn qorshe cunto oo wanaagsan.						
13. waxaan dareemayaa in asxaabta ama qoysku aysan igu qadarin ilana dareemayn sida ay u tahay la noolaanshaha cudurka macaanku arrin adag tahay						
14. Waxaan ka dareemayaa culays inaan la qabsado baahida la noolaanshaha maalinlaha ee xanuunka macaanka						

Jadwalka: VIII Walaaca la xariira sonkorowga, 17 su'aalod (Diabetes-related Distress 17 Items Scale (DDS-17) Questionnaire) ayaa weli socda

	Wax dbib ah ma leh=1	Dhib aan badnayn=2	Dhibaato dhexdhexaad ah=3	dhibaato xoogaa xoogan=4	Dhibaato Halis ah=5	Dhib aad u daran=6
15. Waxaan dareemaya inaanan haysan dhakhtar si igu filan oo joogto ah iiga eegikara cudurkayga macaanka.						
16. Ma dareemayo dhiirigelin si aan u sii wado is-maamulidayda sonkorowga.						
17. Waxaan dareemayaa in asxaabta ama qoysku aysan i siin taageeradii niyadeed ee aan jeclaan lahaa.						

IX: Xog-ururinta ku saabsan halbeegidda Taageerada Bulsho ee Oslo (OSSS-3): Fadlan ka jawaab su'aalahan soo socda				
Oslo 1: Immisa qof ayaa kugu dhow oo aad ku kalsoonaan kartaa haddii aad la kulanto dhibaato nafeed oo weyn?				
1 Waxba ba	2 Hal ilaa laba qof	3 Sadex ilaa shan qof	4 Shan qof iyo kabadn	
Oslo 2: Intee in le'eg ayay dadka kugu xeeran (qoyska, asxaabta, iwm.) u muujiyaan xiisaha iyo daryeelka waxa aad qabato?				
1 Waxba ba	2 Wax yar	3 Lama hubo	4 xoogaa	5 Wax badan
Oslo 3: sidee bay kuugu fududahay in aad caawimo wax ku ool ah uga hesho deriska haddii aad u baahato?				
1 Aad bey u adag	2 Wey yare adagtahay	3 Waa arrin macquul ah	4 yare Fudud	5 Aad u fudud

8.6. Curriculum Vitae (CV)

CURRICULUM VITAE

BASHIR KHALIF FARAH

Tell +251909791050 E-mail:bashirfarah013@gmail.com

PERSONAL INFORMATION

Full Name: Bashir Khalif Farah

Birth Date: January 15, 1994, GC

Place of Birth: Gardo, Puntland, Somalia

Marital Status: Single

Nationality: Somali

EDUCATIONAL BACKGROUND

2022-2024: MPH Candidate at Haramaya University, Ethiopia.

2015-2019: BSc in Public health at Haramaya University, Ethiopia.

2009-2015: Almuntada Secondary school, Gardo, Somalia.

2004-2009: Shafici Primary and elementary school, Gardo, Somalia.

WORK EXPERIENCES

September 2018 - July 2019: Internship of Clinical Officer at Chiro General Hospital, Hararge, and Health Centers (Goro, Diredawa and Kurfachele Garamul'ata), Ethiopia.

September 2020-january 2021: Covid-19 And case search DFA daily Reporting And case search DFA daily reporting

March2021-Nov 2022: Clinical consultant for Mobile clinics at the Somali Red Crescent Society (SRCS).

COMPUTER SKILLS AND COMPETENCES

Proficient in MS Windows, Word, Excel, Access, etc. In addition to the aforementioned skills, I possess a Strong knowledge and proficiency in Epi Data, Epi info, Stata, and SPSS.

SHORT TERM TRAINING WITH CERTIFICATE AWARD

2015- 2019: award certificate, I was a member of Haramaya University
Student's union in the Campus. This actively involved in many academic And non-academic activities.

May 01-02 -2019: Certificate of training participation on 'employability
Skills' organized by career development service directorate of Haramaya University.

May2019-June 2019: Award Certificate for successful completion of team
Training program and implementation of Water storage construction and
Extra activities at Kurfachele Town, Ethiopia.

1st July - 31st July, 2020: Completion certificate of research Methods & Application skills, using SPSS at University of Bosaso, Somalia

REFERENCES

Mr. Moti Tolera (BSc, MPH): former Head, Public health and healthy Policy unit, Haramaya University, College of health and
Medical Science. TEL: +251256661883,
Mobile number: +251922381559
Email: Motitolera@gmail.com.

Mr. Mustafa Yusuf Osman: SRCS, Bosaso branch Coordinator,
Phone No: +252907739546.

Mr. Mohammed Salah Osman: District Polio Officer of Gardo district,
Phone No: +252 907716077

LANGUAGE SKILLS

Languages	Listening	Speaking	Reading	Writing
Somali	Excellent	Excellent	Excellent	Excellent
Arabic	V. good	V. good	Excellent	Excellent
English	V. good	V. good	Excellent	Excellent
Amharic	Good	Good	Unable to read	Unable to write
Afan Oromo	Good	Good	Good	Good

HOBBIES

To become a dedicated researcher, leader, and educator who actively Contributes to the advancement of knowledge in the sciences, while also Striving to be a devout servant of Allah by imparting the teachings and

Spreading the message of Islam to people from all corners of the globe.