

**FACTORS ASSOCIATED WITH GLYCEMIC CONTROL AMONG PEOPLE
LIVING WITH TYPE 2 DIABETES IN DOUALA, CAMEROON**



NGENCHE COMFORT TANGANG

SHS/MPH/4959-1/2022

**A RESEARCH THESIS SUBMITTED TO THE DEPARTMENT OF
COMMUNITY HEALTH, SCHOOL OF PUBLIC HEALTH IN PARTIAL
FULFILLMENT OF REQUIREMENTS FOR THE AWARD OF THE DEGREE
OF MASTER OF PUBLIC HEALTH (APPLIED EPIDEMIOLOGY) AMREF**

INTERNATIONAL UNIVERSITY

JULY 2025

DECLARATION AND APPROVAL

Declaration by Candidate

This thesis is my original work and has not been presented for a degree in any other university or any other award.

Signature: 

Ngenche Comfort Tangang

SHS/MPH/4959-1/2022

Date: 26th June 2025

Approval by Supervisors:

This thesis is submitted for examination through our endorsement as supervisors:

Signature: 

Dr. Shiphrah Kuria Ndiritu

Department of Community Health

School of Public Health

Amref International University

Date: 26th June 2025

Signature: 

Dr. Jean Claude Katte

RSD Institute

Date: 26th June 2025

COPYRIGHT

© 2025 Ngenche Tangang Comfort and Amref International University



DEDICATION

I dedicate this thesis to all those affected by diabetes, whose experiences motivate the quest for improved comprehension of self-care management of this condition. I wish to express my heartfelt appreciation to my family for their steadfast financial and emotional support throughout this journey.



ACKNOWLEDGEMENT

I extend my deepest gratitude to Dr. Shiphrah Kuria Ndiritu, Dr. Katte Jean Claude and Dr. Nyagero Josephat for their guidance, support and encouragement they gave me throughout this journey, I sincerely appreciate the time they spent in reviewing this study and sharing their extensive expertise in the field of public health and diabetes.

I extend my sincere regards to Dr. NGO Bikia of Laquintinie Hospital and Dr. Ambe Elizabeth of Acha Hospital-Bepanda for their support during data collection. Their assistance was instrumental in facilitating the data collection process.

I would like to sincerely thank my husband and children for their endless encouragement, love, and patience throughout this journey. Your unwavering support has been my greatest source of strength and motivation. To my siblings, thank you for your constant push and belief in my potential. Your encouragement kept me going even in the most challenging times.

I am deeply grateful to Dr. Ndonwie Peter for his invaluable mentorship and guidance throughout the course of this research. Your insight and support have been instrumental in shaping my academic growth.

My heartfelt thanks also go to Dr. Fosso Simun Reine for her helpful tips and suggestions on how to approach and structure this project, which contributed meaningfully to its development.

Finally, I am thankful to Dr. Simo Louokdom Josue for his direction in data analysis. Your expertise made a great difference in the success of this research.

ABSTRACT

Background: Effective self-care management is crucial for improving glycemic control in Type 2 Diabetes Mellitus. This study explores self-care management practices and associated factors of glycemic control among type 2 diabetes patients at Laquintinie Hospital and Presbyterian Health Complex Bepanda in Douala, Cameroon.

Methodology: A cross-sectional survey was conducted using a mixed-method approach, with a systematic random sample of 230 participants. Quantitative data were collected via revised Summary of Diabetes Self-Care Activities questionnaire, and qualitative data through focus group discussions. Glycemic control was assessed using HbA1c levels. Descriptive statistics summarized data on characteristics of participants, social support and self-care practices. Associations between characteristics of participants, social support and self-care practices with glycemic control were examined using inferential analysis; chi-square, Wilcoxon rank-sum tests and logistic regression. Qualitative data were analyzed thematically.

Results: Statistically significant association was found between dietary self-care and glycemic control (AOR = 2.07, 95% CI: 1.08–4.03, $p = 0.030$). Foot care was statistically significantly with glycemic control (AOR = 1.97, 95% CI: 1.02–3.88, $p = 0.046$). Financial support emerged as a statistically significant predictor (AOR = 0.43, 95% CI: 0.20–0.85, $p = 0.020$). Qualitative data reinforced these findings by highlighting financial constraints, high food and supply costs and high cost of monitoring supplies.

Conclusion and Recommendations: Poor dietary practices, inadequate foot care, and lack of financial support were statistically significantly with poor glycemic control among individuals with type 2 diabetes. No significant associations were found for physical activity, glucose monitoring, overall self-care, or smoking. Medication adherence was poor across all participants. These findings underscore the need for strategies aimed at enhancing dietary self-care, foot care practices and financial support through the provision of affordable, culturally appropriate nutritional guidance, structured diabetic foot care education, and subsidization of diabetes supplies.

TABLE OF CONTENTS

DECLARATION AND APPROVAL.....	II
DEDICATION.....	III
ACKNOWLEDGEMENT.....	V
ABSTRACT.....	VI
TABLE OF CONTENTS	VII
LIST OF TABLES	XII
LIST OF FIGURES	XIII
LIST OF ABBREVIATIONS	XIV
DEFINITION OF TERMS.....	XV
CHAPTER 1: INTRODUCTION.....	1
1.1 Overview	1
1.2 Background of the study	1
1.3 Statement of the Problem.....	6
1.4 Research Questions.....	9
1.5 Study Objective.....	9
1.5.1 <i>Broad Objectives</i>	9
1.5.2 <i>Specific Objectives</i>	9
1.6 Justification of the Study.....	10
1.7 Significance of the Study	11
1.8 Scope of the Study.....	12
1.9 Assumptions of the Study.....	12
CHAPTER 2: LITERATURE REVIEW	13

2.1 Introduction.....	13
2.2 Theoretical Framework.....	13
2.3 Review of Related and Empirical Literature	16
2.3.1 <i>Review of Diabetes and Glycemic Control</i>	16
2.3.2 <i>Factors Influencing Self-care Management in Patients with T2DM</i>	17
2.3.3 <i>Overview of Diabetes and Self-Care Management Practices</i>	21
2.4 Identification of Knowledge Gap.....	26
2.5 Conceptual Framework.....	27
CHAPTER 3: METHODOLOGY	30
3.1 Introduction.....	30
3.2 Research Design	30
3.3 Study Area and Setting.....	31
3.4 Study Population.....	31
3.5 Sample and Sampling Procedures.....	33
3.5.1 <i>Sample Size Determination</i>	33
3.5.2 <i>Sampling Method</i>	34
3.6 Data Collection Instruments	38
3.7 Validity and Reliability.....	43
3.8 Data Collection Procedures.....	43
3.8.1 <i>Quantitative Data</i>	44
3.8.2 <i>Qualitative Data</i>	45
3.9 Data Analysis and Presentation.....	46
3.9.1 <i>Quantitative Analysis</i>	46

3.9.2 <i>Qualitative Analysis</i>	48
3.10 Ethical Considerations.....	48
3.10.1 <i>Participant Selection and Informed Consent</i>	49
3.10.2 <i>Risk Mitigation</i>	49
3.10.3 <i>Confidentiality</i>	49
3.10.4 <i>Withdrawal</i>	50
3.11.1 <i>Recall Bias</i>	50
3.11.2 <i>Social Desirability Bias</i>	50
CHAPTER 4: RESULTS	51
4.1 Introduction.....	51
4.2 Description of the Study Participants	51
4.2.1 <i>Sociodemographic and Clinical Characteristics of Participants</i>	51
4.2.2 <i>Distribution of Self-Care Practice</i>	53
4.2.3 <i>Distribution of Social Support among the Participants</i>	54
4.3 Levels of Glycemic Control among Respondents with Type 2 Diabetes.....	55
4.4 Association of Sociodemographic and Clinical Characteristics of Participants with Glycemic Control	56
4.5 Association of Self-Care Practices of Participants with Glycemic Control.....	60
4.6 Association of Social support with Glycemic Control	67
4.7 Logistic Regression of Sociodemographic and Clinical Characteristics of Respondents and Glycemic Control	69
4.8 Logistic Regression of Self-Care Management Practices and Glycemic Control	73
4.9 Logistic Regression of Social Support and Glycemic Control	75

4.10 Model of Factors Independently Associated with Glycemic Control.....	77
CHAPTER 5: DISCUSSIONS	80
5.1 Introduction.....	80
5.2 Glycemic Control was Generally Poor among Participants	80
5.3 The Association of Sociodemographic and Clinical Characteristics Glycemic Control	81
5.4 Association of Specific Self-Care Management Practices and Glycemic Control	86
5.5 Association of Social Support and Glycemic Control.....	93
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS	96
6.1 Introduction.....	96
6.2 Conclusion	96
6.3 Implications of the Findings.....	100
6.4 Recommendations.....	102
6.4.1 <i>Policy Recommendations</i>	102
Subsidization of Diabetes Medications, Monitoring Devices and Nutritional Foods	102
6.4.2 <i>Healthcare Professionals</i>	103
6.4.3 <i>Community Support Organizations</i>	103
6.4.4 <i>Research Recommendations</i>	103
REFERENCES	104
Appendix I: INFORM CONSENT	123

Appendix II: Approval to Carry out Research from Amref International University Kenya	132
Appendix III: Authorization to Carry out Research from Regional Research Ethics Committee for Human Health, Littoral.....	133
Appendix IV: Permission from Laquintinie Hospital	135
Appendix V: Permission from PCC Acha- Bepanda.....	136
Appendix VI: Research Tool (English version)	137
Appendix VII: Plagiarism checker Certificate.....	154



LIST OF TABLES

Table 1: Distribution of Study Participants and Sampling Method	36
Table 2: Sociodemographic and Clinical Characteristics of Study Participants (N = 230)	53
Table 3: Distribution of Self-Care Practices (N = 230)	54
Table 4: Distribution of Social Support (N = 230)	55
Table 5: Association of Sociodemographic Characteristics of Participants with Glycemic Control	58
Table 6: Association of Clinical Characteristics of Participants with Glycemic Control.	59
Table 7: Association of Self-Care Practices of Participants with Glycemic Control	66
Table 8: Association of Social support with Glycemic Control	69
Table 9: Logistic Regression of Sociodemographic and Clinical Characteristics of Respondents and Glycemic Control.....	72
Table 10: Logistic Regression of Self-Care Management Practices and Glycemic Control	75
Table 11: Logistic Regression of Social Support and Glycemic Control	77
Table 12: Model of Factors Independently Associated with Glycemic Control	79

LIST OF FIGURES

Figure 1: Application of the Transtheoretical Model in understanding behavior change in people living with type 2 diabetes 14

Figure 2: Conceptual framework demonstrating the association of self-care management practices, social support, and sociodemographic/clinical characteristics with glycemic control among individuals with type 2 diabetes 29

Figure 3: Distribution of Glycemic Control Status of Participants..... 55



LIST OF ABBREVIATIONS



ADA	American Diabetes Association
AOR	Adjusted Odd Ratio
CDC	Centers for Disease Control and Prevention
CSV	Comma Separated Value
DM	Diabetes Mellitus
DSMES	Diabetes Self-Management Education and Support
FGD	Focus Group Discussion
FPC	Finite Population Correction
GC	Glycemic Control
HbA1c	Glycated hemoglobin
IDF	International Diabetes Federation
PAHO	Pan American Health Organization
SDSCA	Summary of Diabetes Self-care Activities
SCP	Self-care Practice
SMBG	Self-Monitoring of Blood Glucose
SCM	Self-Care Management
SCMP	Self-Care Management Practices
T2DM	Type 2 Diabetes Mellitus
TTM	Trans theoretical Model
WHO	World Health Organization

DEFINITION OF TERMS

- Blood glucose monitoring:** Refers to the process of regularly checking and recording blood sugar levels using a blood glucose meter or other monitoring devices. In this study, blood glucose monitoring referred to adhering to the frequency of testing as recommended by a healthcare provider.
- Dietary practices:** Refers to making conscious decisions about food and beverage consumption to promote overall health and manage blood glucose levels. In this study, good dietary practice was defined as following a healthful eating plan, consuming at least five servings of fruits and vegetables, limiting the intake of high-fat foods such as red meat and full-fat dairy products, and spacing carbohydrate intake evenly throughout the day.
- Glycemic control:** Refers to the management of blood glucose levels within a target range recommended for individuals with diabetes. Good glycemic control was defined as having glycated hemoglobin (HbA1c) level $<6.5\%$, while poor glycemic control was defined as an HbA1c level $\geq 6.5\%$, based on the American College of Endocrinology (ACE) guidelines.
- Glycated hemoglobin (HbA1c):** It reflects the average blood glucose levels over the previous 2 to 3 months. In this study, good glycemic

control was defined as an HbA1c level of <6.5%, and poor glycemic control as $\geq 6.5\%$, in accordance with the American College of Endocrinology (ACE) recommendations.

Medication adherence:

Refers to the degree to which individuals adhere to their prescribed medication as directed, at the right time and in the correct dosage. In this study, medication adherence referred to the extent to which participants took their prescribed diabetes medication in the recommended dosage.

Physical activity:

This involves engaging in regular exercise and physical movements to improve overall health and manage blood glucose levels.

Self-care management practices:

Refers to the activities and behaviors individuals with type 2 diabetes undertake to manage their condition on a day-to-day basis. In this study it includes medication adherence, self-monitoring of blood glucose, dietary practices, physical activity, foot care and smoking.

Self-care:

It refers to the actions and behaviors undertaken by individuals with type 2 diabetes to manage their condition and promote their overall health.

Type 2 diabetes:

A chronic condition characterized by the body's inability to effectively use insulin or produce enough of it.

CHAPTER 1: INTRODUCTION

1.1 Overview

This chapter introduces the study on self-care management practices and associated factors of glycemic control among people living with type 2 diabetes mellitus (T2DM) in Douala, Cameroon. It presents the background of the study, a description of the problem under investigation as well as the research objectives and questions. It also states the significance, scope and assumptions of the study.

1.2 Background of the study

Diabetes is a serious long-term condition that occurs when glucose levels in a person's blood rise because the body cannot produce enough or any insulin or cannot effectively use the insulin it produces (IDF Diabetes Atlas, 2025). Insulin is a peptide hormone secreted by the beta cells in the pancreatic islets of Langerhans that is important for controlling blood glucose levels through stimulation of glucose uptake by cells (Wilcox, 2005). There are different types of diabetes, which include type 1, type 2, gestational diabetes and others; monogenic diabetes (due to gene mutation), Latent autoimmune diabetes in adults (characteristics of type 1 and type 2 diabetes) and diabetes caused by damage to the pancreas (World Health Organization [WHO], 2019). Diabetes mellitus (DM) is a condition in which the pancreas does not produce enough insulin (type 1) or when the body cannot use its insulin efficiently (type 2) (Brutsaert, 2023). Gestational diabetes occurs in pregnant women who have never had diabetes, which usually goes away after the baby is born, however, it increases the mother's risk of having type 2 diabetes later in life (Centers for Disease Control and Prevention [CDC], 2024).

Type 2 Diabetes Mellitus (T2DM) exists as a worldwide public health crisis that creates major healthcare challenges for medical institutions and local community-based care delivery systems. T2DM accounts for between 90% and 95% of diabetes, with the highest proportions in low and middle-income countries (WHO, 2019). T2DM is currently the 8th leading cause of global disease burden (Institute for Health Metrics and Evaluation, 2024) and it is estimated to become the second by 2050 (Institute for Health Metrics and Evaluation, 2024). Around 90% of diabetes cases fall under the category of T2DM (Goyal et al., 2025) and are affected by preventable risk variables such as poor eating habits, being overweight, sedentary lifestyle, and smoking habits. Various risk factors of diabetes can change through environmental and behavioral adaptation (Arya, 2023). World Health Organization, (2024) defines obesity as a condition present when body mass index (BMI) $\geq 30 \text{ kg/m}^2$, and this factor generates between 80–85% of the risk for acquiring T2DM. The risk level for those with obesity reaches 80 times higher than people with BMI values below 22, according to Watts (2022).

Worldwide data indicates 589 million adults aged 20 to 79 (equivalent to 11.1% of this age range) currently have diabetes, with around 252 million being undiagnosed, increasing health risks and results in delayed treatment acquisition. Research indicates that adult diabetes cases will increase to 852.5 million individuals, 13% of the adult world population by 2050 (IDF Diabetes Atlas, 2025). According to the United Nations High-Level Meeting in 2018, DM constitutes one of the five leading non-communicable diseases (NCDs) that have been marked as global health issues and which individually or together with cardiovascular disorder, chronic respiratory disorder, cancers, and mental health disorders, account for about two-thirds of all deaths in the world (United Nations Assembly, 2018).

Approximately 3.4million adults globally aged 20-79years are projected to have died because of diabetes or its complications in 2024 corresponding to 9.3% of worldwide deaths from all causes in this age bracket (IDF Diabetes Atlas, 2025).

Research conducted on data trends in Africa shows a significant increase in prevalence rates, equally affecting both genders throughout rural and urban zones (Mbanya et al., 2010). The following two decades will likely witness an increase in T2DM cases, predominantly in developing countries where the majority of diabetic patients belong to the 45 to 64 years' age group (Zimmet et al., 2001). African region despite having the lowest incidence estimation of 5.0% among IDF Regions, the expected increase in the number of people with diabetes by 2050 is the highest at 142%, reaching 60 million; also, the proportion of undiagnosed diabetes in Africa is highest of all the IDF Regions at 72.6% (IDF Diabetes Atlas, 2025).

Research indicates that 6-8 % of urban adults in Cameroon are diabetic, with approximately 80% being unaware of their condition and the 2002 report showed that out of the identified diabetics only a quarter of them got their blood sugar under control (World Diabetes Foundation, 2004). The diabetes health burden in Cameroon is not only significant but expanding at a rapid pace. The World Diabetes Foundation, (2004) documented a tenfold (1994 to 2004) increase in diabetic cases among Cameroonian adults through three cross-sectional surveys. Also, according to the World Bank collection of development indicators, as reported by Trading Economics (2025), diabetes prevalence among adults in Cameroon was 5.5% in 2021.

Self-care management is a comprehensive support system to provide healthcare services for people with chronic conditions and their families to boost their understanding of their daily health management roles. This approach, help in making informed decisions about their care, encourage healthy behaviors as well as access to more support (WHO, 2022). The WHO (2020) established self-care as the prospect of families and individuals alongside communities to prevent disease while maintaining health and overcoming health ailments alone or with healthcare worker assistance. However, self-care practices are a set of behavioral practices used by individuals suffering from diabetes in order to manage and control the disease on their own, these practices are found to have an association with blood glucose levels and thereby reduce the incidence of complications associated with diabetes (Ahmad & Joshi, 2023).

Self-care practices in people with T2DM are strongly related to their age, educational attainment, marital status and economic situation. Okafor et al. (2024) found in Nigeria that elderly people, individuals with little education and those in specific jobs performed self-care practices poorly. A similar investigation in South Africa noted that diabetes care could be improved by adding sociodemographic factors to the treatment plan (Hellebo et al., 2024).

Social support is very important for successful self-care practices to take place. It has been found from studies that receiving strong social support improves how well people stick to self-care practices (El-Radad et al., 2023). Moreover, low levels of social support have been associated with lower self-care management practices, and suboptimal glycemic control as well (Tang et al., 2008).

The main therapeutic goal of maintaining good glycemic control is to prevent micro and macrovascular complications (Azzam et al., 2021). However, the urban population of Cameroon struggles with T2DM management according to findings from Sobngwi et al. (2012) who located poor GC in 61.8% of participants showing a major management obstacle for T2DM in Cameroon.

Due to this rising burden in diabetes, various interventions and approaches have been made at the global, regional and national levels. In order to comprehend the centrality of self-care in the management of diabetes several interventions have been suggested and used all over the world to help improve patient outcomes and they include foot care, blood glucose monitoring, medication adherence, regular physical activity, dietary practices, and numerous educational and support programs (Almutairi et al., 2020).

This burden can be reduced through self-care practices that enables, the patients to deal with the complex nature of diabetes with or without the assistance of a health care provider (WHO, 2022) and this includes opting for a healthy diet, regular physical activity, self-monitoring of blood glucose, taking medication as prescribed, foot care and smoking cessation (Eva et al., 2018). Without these practices, suitable GC cannot be achieved, nor the adverse effects of hyperglycemia improved. For social support, the WHO Global Diabetes Compact has the vision of reducing risk of diabetes, ensuring that all people who are diagnosed with diabetes have access to equitable, comprehensive, affordable and quality treatment and care, the Compact will also support the prevention of type 2 diabetes from obesity, unhealthy diet and physical inactivity (WHO, 2025).

At the level of Africa, the WHO has been encouraging implementation of mobile health (mHealth) interventions in Africa to improve diabetes self-care through applying mobile

technology to medication reminders, health education, and remote consultations at the level of Africa. The interventions are done to increase the involvement of the patient and, finally, improve diabetes control in low- and middle-income countries (WHO, 2019). To balance the increasing burden of diabetes in Cameroon, efforts have been made to introduce a series of programs and policies in the country to enhance diabetes self-care behaviors and in that regard, both successes and obstacles have been witnessed. In Cameroon, the WHO and the International Diabetes Federation (IDF) are cooperating on diabetes programs which aim at developing and strengthening systems and increasing access to care as well as multi-sectoral collaboration (World Diabetes Foundation, 2017). This partnership also involves projects such as sponsoring the WHO diabetes education programs and offering expertise in diabetes control programs.

Even with these global, regional and national interventions to enhance diabetes management and adoption of self-care behaviors, there is still a lot to be understood in relation to the factors that influence glycemic control among the persons with type 2 diabetes in the urban setting of Cameroon, Douala. This study therefore seeks to fill this gap by investigating the factors associated with glycemic control among people living with type 2 diabetes in Douala, Cameroon.

1.3 Statement of the Problem

Self-care management practices are an essential component of managing diabetes, including frequent adherence to medications, healthy eating plans, physical exercise, blood sugar monitoring, foot care, and tobacco avoidance, as suggested by the global guidelines, (American Diabetes Association Professional Practice Committee, 2023; WHO, 2016).

The stated practices are crucial in the provision and sustenance of optimal glycemic control and the avoidance of acute and chronic complications (Powers et al., 2020).

However, in low-and middle-income countries such as Cameroon, adherence to self-care practices is often challenged by systemic barriers such as limited access to healthcare and socioeconomic obstacles. A report from the WHO shows prevalence of diabetes-related premature deaths in Africa reaches 58% compared to the standard global rate of 48%. The WHO reports that the African region currently houses 24 million diabetic adults, yet these numbers are projected to rise to 55 million by 2045, with a predicted 129% increase (WHO, 2022). This is an indication of systemic problems in the management of diabetes.

In Cameroon, where the rate of type 2 diabetes mellitus (T2DM) is 5.7%, with no significant urban-rural disparity (Bigna et al., 2018), previous research on this condition has either pointed primarily toward complications (Chia-Garba et al., 2021) or focused on knowledge levels (Nansseu et al., 2019). Studies on the association between self-care practices and glycemic control, especially in Douala, are scarce. A study in Ethiopia by Abebe et al. (2022) has pointed out that, inadequate self-care prevalence is frequently reported in resource-constrained settings in which it is likely to lead to inadequate glycemic control. However, no evidence is still available specifically connecting self-care practices to glycemic controls in Douala, the economic capital of Cameroon.

Despite international efforts by organizations like the World Health Organization (WHO), and International Diabetes Federation (IDF) to assist Cameroon in the process of improving diabetes management, there are still issues that hinder effective self-management. For instance, according to Niba et al. (2023), self-care among adults with type 2 diabetes was

also inappropriate even after the establishment of national health programs. Likewise, Sharon Negsang et al. (2023) indicated that in Limbe and Buea, there have been a significant mismatch between diabetes self-care education and subsequent patient-practices. Nonetheless, these studies did not investigate the effects of the particular factors impacting self-care management behaviors, or to focus on the connection with glycemic control outcomes. This creates a significant gap in the knowledge on the relationship between self-care behaviors, social support, and sociodemographic and clinical factors, and their interactions to determine glycemic control, especially in an urban setting like Douala. Also, self-care practices are globally recognized as critical to managing T2DM, but there is limited empirical evidence assessing their real-world application and their direct association with glycemic control in urban Cameroonian populations like Douala. Specifically, there is a knowledge gap on how sociocultural, economic, and personal factors influence the practice and effectiveness of self-care management practices among people with T2DM in Douala, a rapidly growing metropolis with unique health access and lifestyle challenges. Therefore, this study aims to address the existing research gap by investigating the factors associated with glycemic control among people living with T2DM in Douala, Cameroon. Specifically, by; - firstly assessing the levels of GC among T2DM patients, - secondly examining the association of sociodemographic and clinical characteristics such as age, gender, education, income, marital status, BMI, and duration of diabetes with GC, - thirdly, determining the association between specific self-care management practices (medication compliance, dietary practices, physical activity, blood glucose monitoring, foot care, smoking and overall self-care) with GC, and lastly evaluate the association of social support with GC.

1.4 Research Questions

This study will be answering the following questions:

1. What is the level of glycemic control among people living with type 2 diabetes in Douala, Cameroon?
2. What is the association between sociodemographic and clinical characteristics and glycemic control among people living with type 2 diabetes in Douala, Cameroon?
3. What is the association between specific self-care management practices and glycemic control among people living with type 2 diabetes in Douala, Cameroon?
4. What is the association between social support and glycemic control among people living with type 2 diabetes in Douala, Cameroon?

1.5 Study Objective

1.5.1 Broad Objectives

To investigate the factors associated with glycemic control among people living with type 2 diabetes in Douala, Cameroon.

1.5.2 Specific Objectives

1. To assess the levels of glycemic control among people living with type 2 diabetes in Douala, Cameroon.
2. To examine the association of sociodemographic and clinical characteristics with glycemic control among people living with type 2 diabetes in Douala, Cameroon.
3. To determine the association between specific self-care management practices with glycemic control among people living with type 2 diabetes in Douala, Cameroon.

4. To evaluate the association of social support with glycemic control among people living with type 2 diabetes in Douala, Cameroon.

1.6 Justification of the Study

The increasing burden of type 2 diabetes mellitus (T2DM) in sub-Saharan African urban cities, such as Douala, Cameroon requires evidence-based approaches, and strategies to alleviate the issue. With the rise of diabetes rates, little is known about the association between self-care management practices and glycemic control (GC) and how sociodemographic and clinical characteristics and social support system affect them.

This research will fill this gap by researching which self-care practice, sociodemographic and clinical characteristics and social support contribute to glycemic control in Douala. The results will have contextual information that will guide localized strategies intended to manage diabetes in resource-limited urban communities like Douala.

This research conforms to Sustainable Development Goal 3 (SDG 3), mainly target 3.4, which strives to reduce diabetes-related premature deaths in combination with other non-communicable diseases. Results from this research will support global and national efforts to improve diabetes outcomes by building on frameworks like WHO's Global Action Plan for the Prevention and Control of NCDs 2013-2020 which specifies diabetes as a leading NCD and more recent initiatives like the WHO Global Diabetes Compact. The African Union, through Agenda 2063, identifies NCDs, particularly diabetes, as significant development threats facing the African continent. This study also aligns with national priorities as self-care management directly reinforces Cameroon's Health Sector Strategy (2020-2030) and the National Health Strategy Plan (NHSP 2021-2025) whose goal is to

build on capacities in chronic disease management, to empower individuals and improve community based health interventions.

The study enables knowledge on what glycemic control practices and support systems are most effective and therefore guides practical implementation towards better outcomes of diabetes in Douala Cameroon or other similar settings.

1.7 Significance of the Study

This research holds public health importance because it will expand our current understanding by providing insights into the factors associated with glycemic control, specifically among individuals with T2DM in Douala, Cameroon. This information is currently limited in the context of this region, and the study will fill this research gap.

By identifying self-care practices, sociodemographic and clinical characteristics and social support factors associated with glycemic control, this study will encourage healthcare professionals to develop more targeted and culturally sensitive approaches to patient education and support. This personalized approach to diabetes care can enhance patient engagement and adherence to self-care practices and ultimately improve GC outcomes.

The study findings demonstrate essential information which should encourage healthcare providers to strengthen their commitment towards patient education and self-care practice follow-up sessions. The results of this study offer evidence which strengthens healthcare professionals' responsibility for supporting and monitoring patients with T2DM through effective self-care management.

1.8 Scope of the Study

This research investigated T2DM patients from Douala, Cameroon, who ranged in age from 21 years and older while including both genders and different socioeconomic levels and diabetes treatment stages. Researcher evaluated different self-care practices (through the association of medication adherence, dietary changes, exercise, SMBG, foot care and smoking), sociodemographic and clinical characteristic and social support with GC. The research analyzed participant GC by primarily using glycated hemoglobin levels (HbA1c) measurement as an objective metric. The research design included a mixed-methods cross-sectional design with quantitative and qualitative approaches for collecting information at a specific point in time. The study provided a snapshot between the factors associated with glycemic control among individuals with T2DM in Douala, Cameroon.

1.9 Assumptions of the Study

This study assumed that participants consistently reported correct self-care behaviors and glycemic control outcomes for the past week and that the study population represented the broader population of individuals with T2DM in this region.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter represents a detailed literature review of the factors related to glycemic control in people with type 2 diabetes mellitus (T2DM). It starts by providing an overview of the theoretical framework that informed the study, proceeds to provide a global and local empirical literature review, which looks at demographic, socioeconomic, and psychosocial factors associated with self-care and glycemic outcomes, identifies relevant knowledge gaps, and presents the conceptual framework.

2.2 Theoretical Framework

This study uses the behavioral change approach known as the Transtheoretical Model (TTM), formulated by Prochaska and DiClemente in 1984 and updated in 1986 to help understand how people change when it comes to addictive behavior. Prochaska et al. (1992) suggested that people go through five stages during any change process. The first three stress motivation, whereas the last two focus more on taking action. Stages are: 1-Precontemplation: Individuals demonstrate limited information regarding diabetes self-care practices and understanding of diabetes. 2-Contemplation: Individuals recognize the requirement for self-care practices modifications, although they have not made any commitment to begin execution 3-Preparation: Participants have officially decided to modify their self-care practices expected during the following month. These participants develop motivation through improved social backing, greater information awareness, and educational resources. 4-Action: Individuals actively modify their self-care practices and use acquired knowledge to manage their diabetes. 5-Maintenance: Individual who reach

the maintenance stage show that they made successful behavior changes and aim to prevent returning to their previous condition. Relapse prevention becomes their motivation since they gained personal fulfillment, social support and the integration of healthcare practices into regular activities alongside regular self-assessment, see Figure 1.

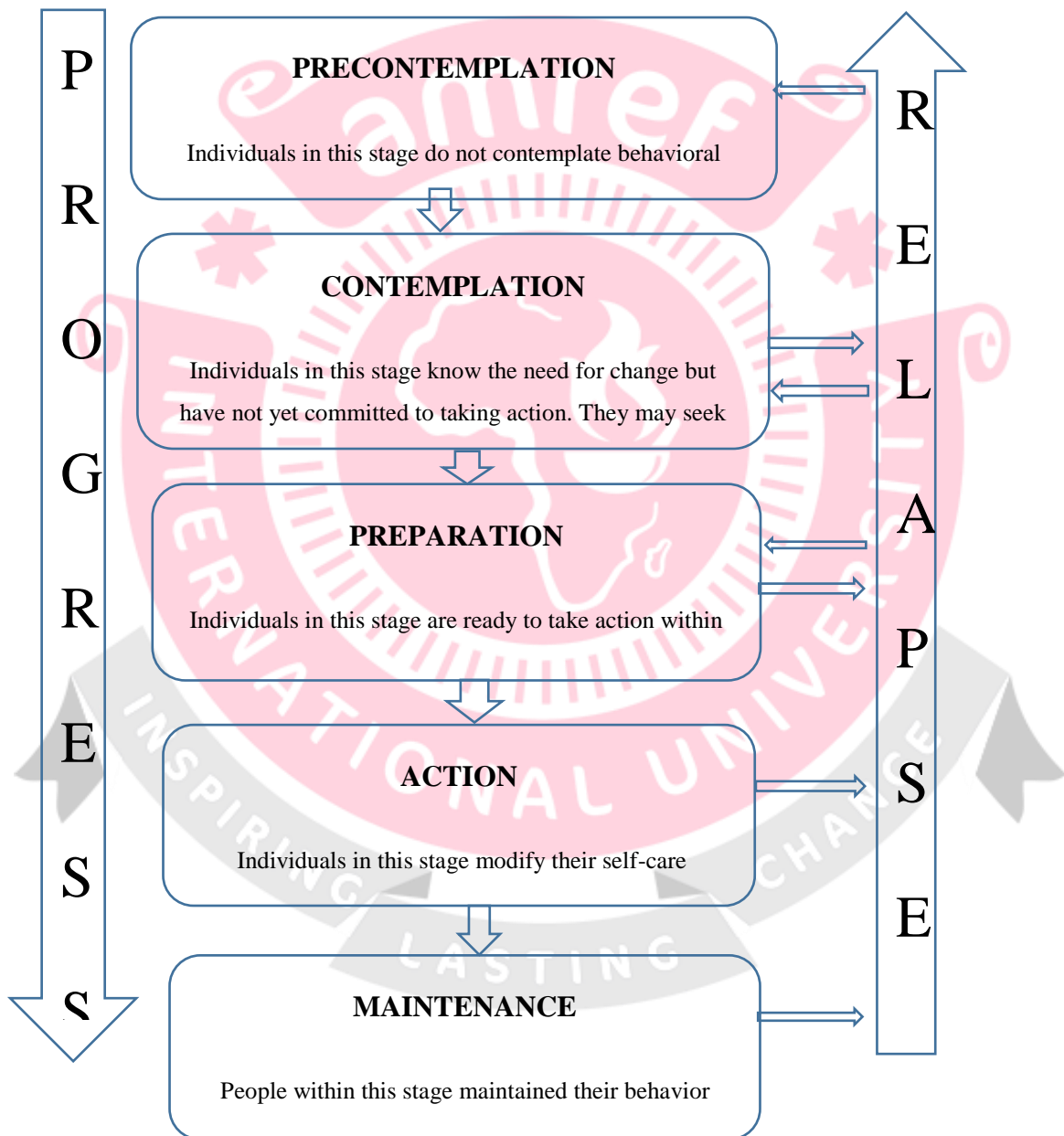


Figure 1: Application of the Transtheoretical Model in understanding behavior change in people living with type 2 diabetes

Several studies have supported the use of the Transtheoretical Model in diabetes care. Zare et al. (2020) investigated self-care among persons with type 2 diabetes in Brazil. They discovered that those in the action/maintenance phases were able to stick to self-care action/maintenance and better glycemic control in areas like diet, physical activity, and glucose monitoring. Miezah et al. (2024) used TTM to evaluate the behavior change in self-care among adults with type 2 diabetes in Pakistan. The study proved that the focus on each of the stages of decisional balance, self-efficacy and processes of change led to increased transition between the contemplation and preparation, as well as action and maintenance.

In conclusion, this study uses the Transtheoretical Model to investigate the association between self-care management practices and glycemic control (GC) among T2DM patients in Douala. This model is appropriate for this study as it gives an organized approach of grouping patients according to their self-care preparedness. It also aligns with the study objectives; the first objective which talks about documentation of glycemic control, where people in the later stages especially action and maintenance are likely to show better outcomes, the second objective on examining sociodemographic and clinical characteristics associations as external factors that may influence how people move through the stages, the third objective which is assessing the association between self-care practices which aligns with the action and maintenance stages and the fourth objective which is evaluating social support which is essential for moving people from preparedness to action and sustaining it at maintenance stage.

2.3 Review of Related and Empirical Literature

2.3.1 Review of Diabetes and Glycemic Control

Diabetes mellitus (DM) has become an expanding public health issue in Cameroon that features growing incidence rates and major medical complications (Bigna et al., 2018). Multiple lifestyle reforms combined with self-assessment methods serve at the core of effective diabetes self-care practices to achieve successful blood sugar control for diabetic individuals.

Self-care management practices in Cameroon receive ongoing research attention through several studies that reveal critical information about diabetes management in the country and its association with GC. For instance, research by Sharon Negsang et al. (2023) in Cameroon found that patients with T2DM showed inadequate practice of essential treatment and exercise self-care behaviors. This analysis demonstrated that diabetes patients require targeted interventions that will improve their adherence to clinical practices while promoting better glycemic control results. Research by Chia-Garba et al. (2021) discovered that poor self-care activities by T2DM patients in Cameroon resulted in elevated hypertension rates as well as retinal disorders. This analysis revealed that self-care management strategies need attention since they play a vital role in preventing diabetes complications while improving glycemic control.

Chugbe Nathaneal et al. (2023) highlighted specific challenges faced by individuals with T2DM in Cameroon, including the absence of SMBG at home, particularly among patients aged 40-49. Non-adherence to diet or eating plans also contributed to inadequate GC. These

findings of this study show that SMGB and dietary practices are important in diabetes management.

2.3.2 Factors Influencing Self-care Management in Patients with T2DM

Based on the categorization introduced by Abraham (2011), patient self-care behavior regarding T2DM could be discussed based on three main domains namely demographic, socioeconomic, and social support indicators. These categories remain relevant and are supported literature review below:

Sociodemographic and Clinical Factors

Age as a Contributing Factor to Self-Care among T2DM Patients

Abraham (2011) stressed a positive relationship between age and routine self-care practices among T2DM patients. A number of studies have supported the idea that older age is linked to greater adherence to self-care, although it is inconsistent with certain behaviors. Baquedano et al. (2010) found that old age was associated with good and regular T2DM self-care. Niba et al. (2023) showed that being 67 years and older with diabetes duration of more than 5 years were significantly associated with adherence to diabetes self-care behaviors. Nevertheless, certain behaviors of self-care demonstrate diverse trends depending on age. As an example, older people frequently decrease their physical activity whereas their compliance to medication and diet remains high. According to De Oliveira et al. (2022), elderly adults aged 65 years and above had a highly unchanged rate of adherence to medications, but their physical activity level decreased significantly, mainly because of mobility and health restrictions. Likewise, Al-Azayzih et al. (2023) established that older adults with T2DM exhibited strong treatment adherence and clinic follow-ups,

although they have significantly reduced physical activity, attributed to chronic comorbidities and limitations in functionality outcomes. In another study by Shigaki et al. (2010), it was found that older adults were less likely to exercise, and old age was associated with a high level of diet and medication adherence, low glycated hemoglobin level and few symptoms of diabetes-related depression.

Gender as a Contributing Factor to Self-Care Practice among T2DM Patients

Abraham (2011) highlighted that gender affects self-care behavior among patients with type 2 diabetes mellitus (T2DM). There has been various evidence of different behavior patterns of self-care between men and women. In one study, Baroni et al. (2022) found that women were observed to be more adherent to dietary recommendations and men were more inclined towards seasonal physical activity and activity that could be more or less based on lifestyle roles with cultural expectation implications. In the same measure Mathew et al. (2012) found that women were highly likely to keep close to their diet and utilize broader social mechanisms of support, and men focused more on technical measures of managing diabetes, including tracking blood glucose levels and taking medication. Baumann et al. (2010) reported that men experienced more regular physical self-care activity, and women scored more adherence to the recommended diet and also experienced more significant self-care than women. Nöthlings et al. (2010) revealed no relationship between gender-related mortality and self-care-related medication usage.

Length/ History of T2DM Diagnosis as Contributing Factor to Self-Care

Abraham (2011) also revealed that early diagnosis of T2DM and treatment positively correlate with improved self-care practices, which are developed over time and view changes from feeling ill to living like others. Similarly, Xu et al. (2010) found a positive

relationship between adherence to recommended medications and monitoring of regular blood glucose and the duration of diabetes. On the other hand, Van Puffelen et al. (2020) reported that patients with prolonged diabetes duration were less engaged in physical activities yet they were found to have higher blood glucose monitoring levels compared to shorter disease duration. Also, according to Zhu et al. (2024), higher self-efficacy and marriage were positively related to preventive behavioral efforts, whereas clinical variables like prolonged DM duration, high levels of glycosylated hemoglobin (HbA1c), and advanced age were connected to reduce attendance in diabetic follow-ups.

Education as a Contributing Factor to Self-Care among T2DM Patients

Studies have shown continually that education positively correlates with frequent self-care activities of persons with type 2 diabetes mellitus. These studies discovered that those with high educational attainment were associated with good and regular T2DM self-care. Similarly, studies carried out by Abraham (2011) and Xu et al. (2010) found that higher educational attainment was associated with less dependence on medications, more physical activity, regular SMBG, and positive support behavior. Likewise, Okafor et al. (2024) and Sayuti et al. (2024) also identified that organized diabetes education programs resulted in substantial patient knowledge, self-efficacy and self-care behavior improvements mainly in the areas of nutrition and medication regimes in the patient populations. According to Gurmu et al. (2018), the self-care scores of patients with secondary education or higher and with diabetes of more than 10 years were significantly higher, which was primarily associated with better knowledge and confidence among the patients about their disease. A cross-nation research conducted by Lamb et al. (2021) using WHO SAGE data indicated

that the higher the level of education, the more successfully people preoccupied in rural China could consume medication regularly and self-monitor blood sugar.

Financial Status as a Contributing Factor to Self-Care among T2DM Patients

A number of reports have shown that financial conditions have a great impact on self-care behavior among patients with diabetes type 2. As an example, Kumar et al. (2024) discovered that higher earning individuals were more than twice as likely to follow the dietary recommendations and actively participate in physical activity, compared to people with lesser earnings. Likewise, in the qualitative study by Semerci Çakmak et al. (2025), low-income patients also faced significant obstacles to successful self-care, including the inability to purchase healthy foods, glucometers, and regular medical visits resulting in high HbA1c levels in the end. Additionally, Dahal et al. (2024) measured the impact of healthcare expenditures on self-care actions such as blood glucose testing, foot care, physical exercise, and prescription adherents of low-asset communities to be directly linked to healthcare cost.

Social Support/Network

Social Support as a Contributing Factor to Self-Care among T2DM Patients

Abraham (2011) showed that T2DM patients experience better self-care when supported by social networks and social support. In like manner, Assah et al. (2015) found that self-care practices in low- and middle-income countries (LMICs) were substantially enhanced by peer support, particularly self-management programs guided by community health workers. Their review included a trial carried out in Cameroon, which highlighted the effectiveness of face-to-face peer support on the enhancement of self-management in adults

with T2DM especially. In line with this, Paulsamy et al. (2021) found a strong connection between the levels of perceived social support and diabetes self-care behaviors. These results were further evidenced as Hasan et al. (2024) found that social support was positively correlated with self-care activities and that family support proved the most significant influence when it came to contribute to effective diabetes self-management. In other studies, Oftedal et al. (2010) found that patients who belonged to similar social groups experienced better metabolic control results and self-care abilities.

2.3.3 Overview of Diabetes and Self-Care Management Practices

Several research studies demonstrated the relationship between T2DM patients' self-care practices and their glycemic control outcomes; according to Almomani and AL-Tawalbeh (2022), people with T2DM who followed diabetes self-care recommendations for physical exercise and medication use showed better blood sugar results. Similarly, Patient outcomes related to glycemic control among people with T2DM improved when they followed diabetes self-care practices, including regular physical activity, healthy eating, self-monitoring of blood glucose (SMBG), and medication use, according to Gao et al. (2013). Multiple studies have examined the external elements that affect self-care management practices performed by patients with T2DM while assessing their impact on glycemic control. For example, research carried out by Amer et al. (2018) determined that diabetic patients who attained a higher level of formal medical education alongside diabetes and possessed strong diabetes management self-efficacy levels demonstrated excellent self-care practices for nutrition control, exercise performance and medication use. Paulsamy et al. (2021) also found that strong social ties are related to more self-care and greater diabetes self-care efficacy in T2DM patients.

Physical inactivity and cigarette smoking, together with poor eating habits and alcohol utilization, obesity, and high blood pressure, form the risk factors for T2DM (Kamradt et al., 2014). According to Campagna et al. (2019), the risk of developing type 2 diabetes is higher among those who smoke, but women who have heavy exposure are prone to a much higher risk than men. The review also emphasized that quitting smoking leads to a gradual decrease of the risk of diabetes, and significant health benefits are achieved several years after quitting.

Older adults with Type 2 Diabetes Mellitus (T2DM) struggle with foot complications that have a great negative effect on their health and overall quality of life, Fomboh (2017) in his study conducted in Bamenda Cameroon found that poor foot care practices were closely related to low literacy, socioeconomic constraints, and lack of adequate provider education. Recent randomized controlled trials prove that self and family supported management programs can result in significant improvement of clinical outcomes. As an example, Subrata et al. (2020) have determined that self-management behaviors, family involvement, HbA1c levels, and ulcer healing significantly improved within 3 months of intervention. Likewise, Chen and Jo (2023) discovered that the digital foot care interventions based around older Taiwanese people had a significant result with regards to self-efficacy, better foot care behavior, and significant drop in HbA1c in comparison to control care. Also, according to Matricciani and Jones (2015) foot complications often affect older adults with T2DM and can decrease a person's health and overall welfare and routine foot inspection, periodical treatment from professionals, good hygiene and proper shoes help decrease the chances of suffering any foot problems. Furthermore, Brask-Thomsen et al. (2025) emphasized the importance of early diagnosis and management of

neuropathic pain to avoid the developing complications and enhance the life quality of afflicted patients.

Diabetes Self-Management Education and Support (DSMES) addresses multiple clinical aspects of disease management and educational needs, as well as psychosocial factors and behavioral elements in diabetes routines, to create foundational abilities that enable patients with diabetes to conduct daily self-care with better results. DSMES services enable diabetes patients to achieve weight loss and better glycated-hemoglobin results, to lower blood pressure and cholesterol in the body and reduce their chance of facing diabetes-related complications (Centers for Disease Control and Prevention [CDC], 2024). The CDC has outlined seven key self-care practices for diabetes management (CDC, 2024), they include healthy coping, healthy eating, being active, taking medication, monitoring, problem-solving, and reducing risks.

Healthy coping involves a practical, constructive approach promoting beneficial interpersonal relationships and overall quality of life (Powers et al., 2017). Healthy eating is consuming various high-quality nutritious foods in adequate quantities to support optimal health, according to the American Diabetes Association (2020). Patients can control their blood sugar by eating fewer highly caloric foods, reducing their sodium and sugar intake, and removing junk food from their diet (Paterson & Thorne, 2000).

Being active includes active participation in physical exercise leads to better blood glucose control. To achieve blood glucose control, T2DM patients should perform 150 minutes each week of moderate-intensity workouts, including brisk walking, cycling, and swimming. A 10-minute walk right after meals serves as an introductory exercise, but you

should work toward making your activity levels more intense. People who stay physically active benefit from their blood sugar control and overall health and well-being (CDC, 2024).

Taking medication includes following dosage instructions, using the right timing and frequency, and adhering to the recommended duration (Cramer et al., 2008). Monitoring refers to measuring blood glucose and tracking dietary elements and exercise activities using various analysis equipment for medical decision-making about diabetes control. Monitoring provides a wide range of health indicators that include blood pressure measurement, weight tracking, and cholesterol check-ups for cardiovascular health evaluation. It also assesses sleep patterns and mood levels, adherence to medications, and the status of eyes, kidneys, and feet (Association of Diabetes Care and Education Specialists & Kolb, 2021).

Problem-solving represents a learned behavior that involves the creation of multiple potential strategies to solve problems together with their strategic selection and implementation and evaluation of the results (Mulcahy et al., 2003). The skill helps people with diabetes monitor their condition on their own while it enables them to make good choices about their health behaviors (King et al., 2010; Mulcahy et al., 2003).

Lowering risk begins with identifying potential threats and applying strategies to stop complications and minimize adverse outcomes. Many diabetes-related complications exist, including hypoglycemia, hyperglycemia, diabetic ketoacidosis, hyperosmolar hyperglycemic state, retinopathy, nephropathy, neuropathy and cardiovascular problems (Association of Diabetes Care and Education Specialists & Kolb, 2021).

The reviewed literature on sociodemographic and clinical characteristics, self-care practices, and social support, together with blood glucose control in Cameroon establishes age, gender, level of education, level of income level, marital status, duration of diabetes, medication adherence, dietary practices, exercise, foot care, smoking and SMBG as essential areas of study. Studies reviewed important elements that affect the self-care management practices of people with T2DM in Douala, Cameroon. Such findings demonstrate why creating strategies for better self-care management with improved outcomes in glycemic control remains crucial for this population. Additional studies need to evaluate other factors and intervention methods that would help maximize diabetes management outcomes in Cameroon.

The reviewed literature reveals missing knowledge and information about T2DM self-management in the Douala area, thus requiring additional research. The current research builds on previous work by developing research principles that guide its methodology and data evaluation process. The literature review provided the necessary groundwork for this study by showing the importance of self-care management practices, sociodemographic and clinical characteristics and social support in delivering an extensive understanding of the relationship between self-care practices and glycemic control. Additionally, this study's findings will fill existing knowledge gaps to guide the development of interventions that will enhance self-care practices and glycemic control for Cameroonian T2DM patients in Douala. The research builds on existing studies to deliver significant contributions to diabetes self-care management knowledge, enhancing the health results of Douala's T2DM patients.

2.4 Identification of Knowledge Gap

The relationship between self-care management practices and glycemic control has been researched among diabetic individuals with diverse cultural backgrounds across different geographical locations (Abebe et al., 2022; Almomani & AL-Tawalbeh, 2022; Modarresi et al., 2020). Neighboring nations demonstrate associations between medication adherence and healthy dietary practices, regular physical activity, and SMBG with glycemic control, according to research from Nigeria (Jackson et al., 2021) and Ghana (Apini et al., 2018). Existing research provides important findings about self-care practices yet fails to address the specific associations between these practices and glycemic control in Douala, Cameroon.

Existing research in Cameroon has primarily examined general aspects of self-care management practices alongside related complications (Chia-Garba et al., 2021) and diabetes-related public knowledge (Nansseu et al., 2019). These studies fail to determine which exact behaviors under each self-care management practices category (medication adherence, dietary practices, physical activity, SMBG, foot care and smoking) lead to better glycemic control in Douala.

The existence of cultural and geographical resemblances between Douala and neighboring nations Nigeria and Ghana could justify the detection of shared self-care management practices and their outcomes on glycemic control. Differences in specific practices, along with their association, can emerge because of regional particularities. This research seeks to fill existing knowledge gaps by identifying specific components in each self-care management practices category while determining which influencing factors are associated

with proper glycemic control in Douala. This study evaluates the relationship between socioeconomic and demographic factors in Douala to determine their impact on self-care management practices and glycemic control.

Through careful investigation of these knowledge gaps this research attempts to build a fully detailed understanding regarding self-care practices and their association with suitable glycemic control in Douala's context. The acquired knowledge about this population will serve as a foundation to build strategies that enhance diabetes management and glycemic control results.

2.5 Conceptual Framework

This study utilizes Towards A as its model for analyzing diabetes self-care management. Zeng et al. (2014) implemented their 'Towards A' conceptual model to analyze diabetes self-care management of Chinese immigrants living in the United States. The conceptual model shows the connections between several independent variables and its dependent variable, see Figure 2. The model establishes that T2DM self-management is linked to sociodemographic characteristics, behavioral and psychological characteristics, social support, linguistic barriers, and cultural characteristics.

The application of this model to Douala, Cameroon required adjustments to align with factors influencing self-care management and blood sugar management results within this healthcare environment. The adapted framework shows GC as the primary health outcome which is linked to: Self-care management practices; dietary practices, physical activities, medication adherence, self-monitoring of blood glucose, foot care and smoking, Sociodemographic and clinical characteristics; Age, gender, marital status, level of income,

level of education, duration of diabetes, height, weight and BMI, Social support; Financial support, practical support, emotional support and informational support. This model also assumes that self-care management of T2DM relies on both social circumstances and family dynamics. Self-management capabilities in Cameroon are heavily affected by cultural values as well as economic constraints and family involvement. The framework considers individual behaviors and environmental factors which corresponds to the comprehensive nature of the Towards A model for predicting GC outcomes, see Figure 2.



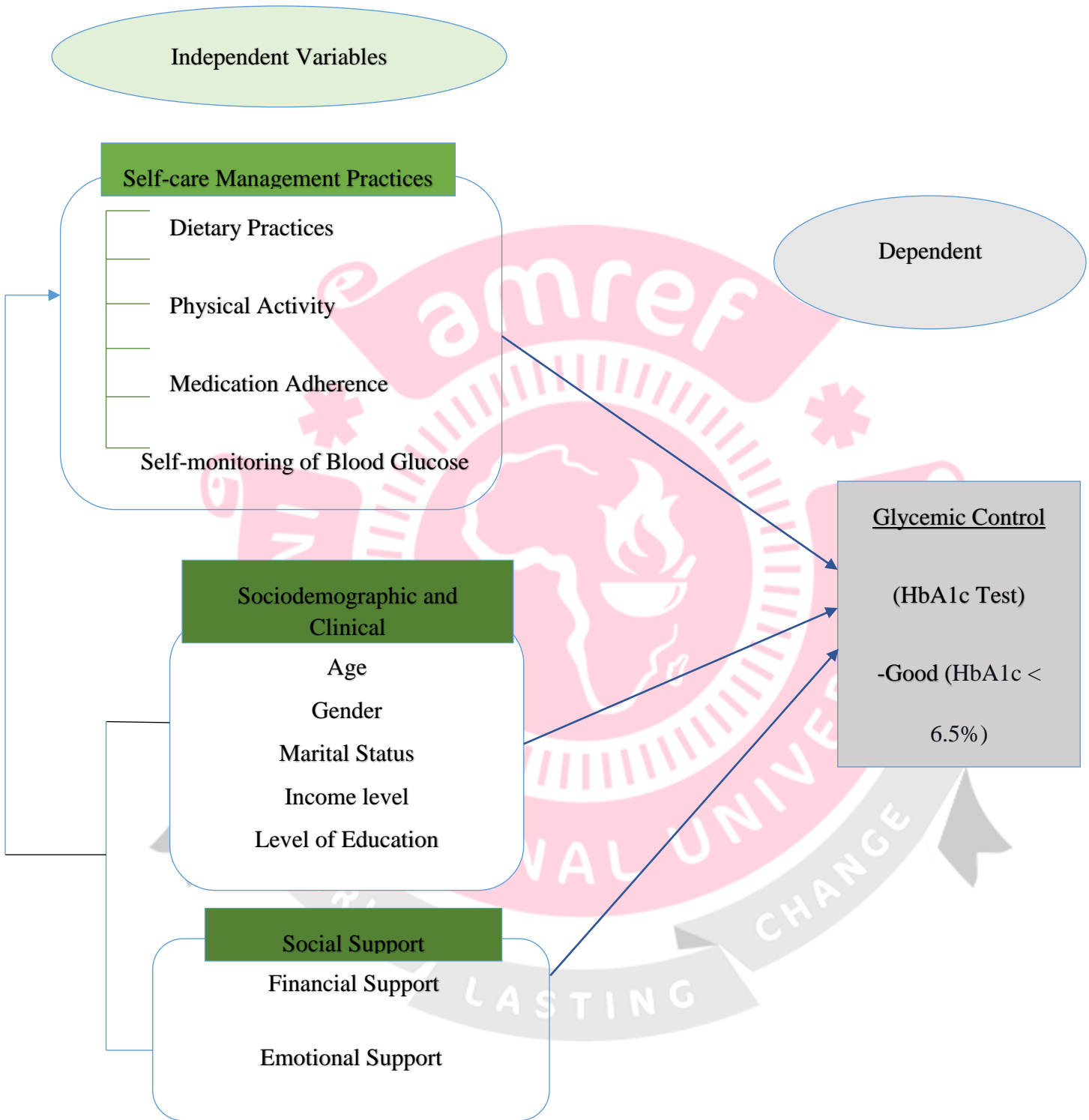


Figure 2: Conceptual framework demonstrating the association of self-care management practices, social support, and sociodemographic/clinical characteristics with glycemic control among individuals with type 2 diabetes

CHAPTER 3: METHODOLOGY

3.1 Introduction

The chapter details the research design and explains the study population and sampling method, as well as the sample size calculation, data collection procedure, and data analysis method, as well as ethical concerns.

3.2 Research Design

This study design was a cross-sectional descriptive survey that utilized mixed-methods using both quantitative and qualitative approaches. The quantitative approach was used to gather self-care practices data alongside information regarding glycemic control (GC) and self-care management elements impacting outpatients with type 2 diabetes mellitus (T2DM) at Laquintinie and Presbyterian Health Complex Bepanda. Two focus group discussions (FGD) were used to obtain qualitative data on patients' self-care practices, motivations, and challenges alongside factors affecting their self-care management practices. This study captured a single-time representation of the population through its cross-sectional setup. The chosen design enabled both rapid analysis of numerous participants and simultaneous study of numerous variables. This research measured self-care behavior such as medication adherence, dietary habits, self-monitoring of blood glucose (SMBG), foot care, smoking and physical activity, sociodemographic and clinical characteristics and social support concurrently with GC. This comprehensive approach provided a broader understanding of the relationship between self-care management practices and GC in this population.

3.3 Study Area and Setting

This study was carried out in Douala, the capital of Littoral region, it is the largest city in Cameroon, the commercial and economic capital of Cameroon and the entire CEMAC region comprising Gabon, Congo, Chad, Equatorial Guinea, Central African Republic and Cameroon. It has the largest port and a major international airport, the Douala International Airport (DIA). Consequently, it handles most of the country's major exports, such as cocoa oil and coffee, timber, metals and fruits. According to UN-based estimates (derived from United Nations agencies), the metropolitan population of Douala, Cameroon, grew from approximately 2.97 million in 2015 to around 4.20 million in 2024 (UN-Habitat, 2025). This study was carried out specifically in two hospitals in Douala, Cameroon: Laquintinie Hospital and Presbyterian Health Complex (PHC) Bepanda. These hospitals were chosen because they are well-established medical centers known for treating a high volume of patients with T2DM. Additionally, these hospitals are located in different areas of Douala, allowing the recruitment of participants from diverse socioeconomic backgrounds.

3.4 Study Population

The study population comprised individuals living in Douala, Cameroon, who had been diagnosed with T2DM and were receiving regular follow-up at Laquintinie Hospital and Presbyterian Health Complex Bepanda during the study period. This population encompassed diverse age groups, genders, educational levels, and predominant socioeconomic activities within Douala City.

According to the health facility records:

1. Laquintinie Hospital follows approximately 300 people with type 2 diabetes per month (Hospital Diabetes Registry, Laquintinie Hospital, 2025).
2. Presbyterian Health Complex Bepanda follows approximately 140 people with type 2 diabetes per month (Hospital Diabetes Registry, Presbyterian Health Complex Bepanda, 2025).

Based on these figures, the accessible study population was estimated at approximately 440 people with type 2 diabetes attending out-patient care at both health facilities.

The sampling frame of this research was the list of participants who had been diagnosed with type 2 diabetes mellitus, who received active follow-up care at Laquintinie Hospital and Presbyterian Health Complex Bepanda, Douala in Cameroon, during the study period.

3.4.1 Inclusion Criteria

Individuals were recruited for the study if they were, 21 years and above (this age requirement was informed by the notion that people at this age would have achieved some degree of independence in handling their own health and that they would be entitled full legal rights to make decisions concerning their health). Also, only individuals with type 2 diabetes mellitus who had been diagnosed at least six months prior to the time of recruitment and who had lived with the disease at least six months were allowed to join.

3.4.2 Exclusion Criteria

The study excluded the respondent in case he or she had impaired cognitive functions since this may hinder his or her capacity to give sincere responses or comprehension of study processes. Patients who were too ill to participate or needed urgent treatment during the time the data was collected were excluded as well since there were ethical and practical

issues in using acutely ill people. Also, pregnant women were not included in the research since pregnancy has alternative blood sugar control objectives because they are affected by the requirements of the growing fetus.

3.5 Sample and Sampling Procedures

3.5.1 Sample Size Determination

The sample size for this study was determined using Cochran's formula, which is suitable for calculating an ideal sample size considering the desired level of precision, confidence level, and estimated prevalence of the attribute in the population. Cochran's formula is normally used when the population is large or infinite and applies to both proportions and means (Cochran, 1977). Generally, it is calculated using the formula below:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

1. e is the desired level of precision (i.e. the margin of error),
2. n_0 is the initial sample size for large populations (before any adjustments for finite populations)
3. p is the (estimated) proportion of the population with type 2 diabetes.
4. Z is the z-value (e.g., 1.96 for 95 % confidence interval)
5. q is $1 - p$.

The proportion p was assumed to be 0.5 because the actual prevalence of type 2 diabetes mellitus (T2DM) in Douala was not known. This assumption gives the maximum

variability and stipulates the largest sample size, guaranteeing proper statistical power and accuracy in the study outcomes.

Therefore, the initial population was calculated as,

$$n_0 = ((1.96)^2 (0.5) (0.5)) / (0.05)^2 = 385.$$

But since the population we are studying was small, that is, finite, to retain precision of results without over-sampling, the sample size was adjusted by the finite population correction (FPC). This was done by:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where,

n= adjusted sample size for the finite population,

n₀ = initial sample size from Cochran's formula

N = total population size (which in this study is estimated at 800 T2DM patients on followed up at Laquintinie Hospital and PHC Bepanda, Douala-Cameroon).

The sample size (*n*) of this study was then calculated as follows;

$$n = 385 / (1 + (384 / 800)) = 260.135$$

Therefore, the sample size for this study was 261.

3.5.2 Sampling Method

A purposive sampling method was used to select the hospitals, Presbyterian Health Complex Bepanda (a private hospital with a diabetes unit) and Laquintinie Hospital (a public hospital with an endocrinology department) to ensure a diverse T2DM outpatient

population. These hospitals were selected because they served different types of patients from various socioeconomic sectors and educational levels with diverse healthcare access, thus increasing the likelihood of having T2DM outpatients in Douala. Systematic random sampling was then applied to recruit respondents from these hospitals.

In order to have fair distribution of the sample size between the two hospitals based on the number of outpatients they receive in a month; the proportional allocation was used as follows;

$$n = (N / N_{\text{total}}) \times n_{\text{sample}}$$

Where;

n= number of participants allocated to each hospital

N= monthly diabetes outpatient of the hospital

N_{total} = monthly diabetes outpatient (440)

n_{sample} = planned sample size (261)

Distribution of Study Participants and Sampling Method of the various health facility is seen on Table 1 below.

Table 1: Distribution of Study Participants and Sampling Method

Health Facility	Average Monthly T2DM Patients	Proportion of Total Patients (%)	Sample Size Allocation (n = 261)	Sampling Technique
Presbyterian Health Complex Bepanda	140	$(140/440) \times 100 = 31.8\%$	83	Systematic random sampling (quantitative) and purposive for focus group discussion
Laquintinie Hospital	300	$(300/440) \times 100 = 68.2\%$	178	Systematic random sampling (quantitative) and purposive for focus group discussion
Total	440	100%	261	

Quantitative Sampling

Systematic Random Sampling

This method was used to recruit study participants from the target population of individuals with T2DM in Douala, Cameroon. A systematic sampling approach was applied using a sampling fraction at the k^{th} interval ($k = N/n$), where N = total population size (which in this study is estimated at 800 T2DM patients on follow-up at Laquintinie Hospital and PHC Bepanda, Douala-Cameroon) and n = planned sample size (261). The interval was calculated as $k = 800/261 = 3.0 = 3$ approximately. The first respondent was selected using a lottery method, and every 3rd T2DM patient was approached during follow-up visits in diabetes clinics until the final sample size of 230.

A total of 267 patients were approached during data collection, slightly exceeding the planned sample size of 261 to account for potential non-response and exclusions. Out of these, 230 participants completed the study, resulting in a final response rate of 86.1%.

Although the calculated and planned sample size was 261, only 230 participants were successfully recruited and included in the final survey. This was due to a combination of practical field constraints such as; nineteen participants (7.1%) did not consent to perform an glycated hemoglobin (HbA1c) test, seven participants (2.6%) dropped out due to time constraints or personal reasons, six participants (2.2%) were loss to follow-up as some of the participants who promised to come back for the HbA1c test did not finally show up and five were excluded (1.9%) due to non-eligibility criteria during actual data collection, not being diagnosed with T2DM for at least six months.

Qualitative sampling

Focus Group Discussions (FGD)

Two FGDs were conducted to create participant diversity, which provided in-depth exploration of self-care management practices and factors influencing GC and GC measures for individuals with T2DM. There were six T2DM patients included in each FGD to achieve meaningful group interaction and complete participant experience sharing and effective member participation. This aligns with qualitative research practices (6-8) participants in order to have a manageable and focused discussion.

The FGD participants were selected purposefully based on the following criteria, participants who were; diagnosed with T2DM at least 6 months, ready to communicate in

a discussion language commonly understood by the other members, and also willing to discuss their experiences of self-care management practices and GC within group setting.

The 12 FGD participants were drawn from the same study population as the quantitative survey to prevent the reuse of survey information or participant fatigue across both study phases. Participation was completely voluntary, and the principal supervisor acted with the Medical officer in charge to enroll participants.

The subjects were invited to join at their outpatient appointment following an informative discussion with their doctor during consultation visit. All participants gave informed consent before their group discussion at the conclusion of their regular consultation. The FGD session occurred inside a private and neutral hospital facility, which provided both safety and confidentiality to participants.

3.6 Data Collection Instruments

3.6.1 Instrument

The revised version of the Summary of Diabetes Self-Care Activities (SDSCA) was used. It was modified to collect data for self-care management practices (dietary practices, medication adherence, physical activities, self-monitoring of blood glucose (SMBG), foot care and smoking) in this study in order to reflect the context of Douala. Precisely the subsection on exercise, “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?” was modified to “On how many of the last seven days did you participate in a specific exercise session (walking, running, dancing) other than what you do around the house or as part of your work.” This modification was

done considering the Cameroonian setting where urban population needs are less inclined towards swimming and biking because facilities and the corresponding costs make it inaccessible and also the walking, running and dancing is more within reach and of cultural relevance. The alteration was meant to provide clarity in understanding and proper feedback.

The SDSCA is a brief self-report questionnaire of diabetes self-management that includes items assessing the following aspects of diabetes regimen: diet (specific and general), exercise, blood-glucose testing, foot care, and smoking (Toobert et al., 2000). It is measured by taking respondents' reports on the frequency with which they perform various activities over the last seven days. The questionnaire was divided into six domains: diet, physical activity, SMBG, foot care, smoking, and medication adherence.

3.6.2 Measurement of Variables

Dependent variables

Glycemic control (GC)

The term GC describes blood glucose level management which helps avoid diabetes complications (Bin Rakhis et al., 2022). The ADA, together with the IDF, uses HbA1c as their preferred metric for determining long-term diabetic control (American Diabetes Association, 2018). The ADA emphasized in 2016 that monitoring HbA1c is essential in diabetes treatment control. HbA1c measures average GC throughout the past 2-3 months by combining pre-meal and post-meal blood sugar levels (American Diabetes Association, 2016). The universal application of the HbA1c test for assessing GC stems from its ability

to be measured without requiring patient fasting (The International Expert Committee, 2009).

The ADA supports a less than 7% (53 mmol/mol) HbA1c target for non-pregnant adults who remain free of severe hypoglycemic episodes (ElSayed et al., 2022), and the American College of Endocrinology (ACE) recommends less than 6.5% as their target (Bin Rakhis et al., 2022). The research employed an HbA1c cut-off value $<6.5\%$, which also matched the Finecare rapid quantitative test specifications. Study participants were divided into two groups based on their HbA1c results, with good GC, defined as $\text{HbA1c} < 6.5\%$, and poor GC, defined as $\text{HbA1c} \geq 6.5\%$.

Independent Variable

Self-Care Management Practices

The set of self-care management behaviors were measured using Revised SDSCA questionnaire. This include; medication adherence, self-monitoring of blood glucose, dietary practices, physical activity, foot care and smoking.

Medication Adherence

Participants' compliance with their prescribed medication was measured in terms of how regularly they have taken the medication over the last 7 days.

Self-Monitoring of Blood Glucose (SMBG)

Questions were asked on the self-monitoring of blood glucose during the previous week (frequency).

Dietary Practices

Questions were asked on creating the habit of following a healthy eating plan, that is, portion control and balanced food selection while avoiding sugary or fatty food.

Physical Activity

Questions were asked on getting involved in exercises, including walking, running, or dancing, taking into account their duration and intensity.

Foot Care

Questions included how regularly they examined their feet for sores, kept their feet clean, stayed away from soaking their feet and picked suitable foot wear.

Smoking

Questions included the smoking status of the subject, the number of cigarettes smoked per day.

These practices were examined individually to determine if they were associated with glycemic control (good vs poor control).

Overall Self-Care Practices

An overall self-care total score was calculated to provide information regarding the collective association of several self-care measures, including dietary practice, medication adherence, SMBG, physical activity, foot care, and smoking with glycemic control. Using this approach accounts that, the diabetes self-care behaviors are not separate, but rather they are intimately interrelated. For instance, people who are active physically typically monitor their blood glucose more frequently as well. A composite score takes into account those relationships between the domains and gives a wider indicator of self-care management.

Sociodemographic and Clinical Characteristics

Sociodemographic characteristics included; gender, age, marital status, level of income and level of education while clinical characteristics included; BMI given by weight (kg)/Height (m)² and duration of diabetes.

Social Support

Forms of support from family, friends, loved ones and the community in supporting diabetes self-care was explored in this study, which included: financial support, emotional support, practical help (e.g. reminders, aide in taking medication or eating meals), informational support (e.g. advice, shared knowledge) and other forms of support which were self-reported support by participants through open ended questions and included spiritual support, appraisal support, companionship support and advocacy support

3.6.3 Scoring of the Questionnaire (Revised SDSCA)

Each survey participant selected their weekly participation frequency for diabetes self-care activities from a scale of “0 (no weekly engagement) to 7 (daily participation every week).” They specified their involvement in dietary practices, physical activity, SMBG, medication adherence, foot care, and smoking throughout the week. The potential scores on the instrument extended from 0 to 7 to reflect the number of times participants performed each self-care practices throughout the previous seven days. A reverse scoring approach was implemented for items 4 in the diet 14 in the foot care category and 16 in the smoking section (Toobert et al., 2000). Items 4 and 14 received the following scoring scale: 0=7, 1=6, 2=5, 3=4, 4=3, 5=2, 6=1, 7=0. A positive response for item 16 received a numerical score of 1, indicating good behavior, yet responding with a negative answer earned a score

of 0. The total scores (overall self-care practice) from self-care practice assessments led to the following categorizations;

Scores below the 25th percentile: Poor self-care practice

Scores between the 25th and 75th percentile: Fair self-care practice.

Scores above the 75th percentile: Good self-care practice.

The research classified self-care practice into good and poor categories based on respondents who reached above or below the 50th percentile for each domain specifically diet, medication adherence, SMBG, and physical activity.

3.7 Validity and Reliability

The SDSCA demonstrates strong psychometric qualities through its acceptable inner-item correlations (mean 0.47) together with moderate test-retest reliability (mean 0.40) and minimal correlation between its five dimensions (mean $r = 0.23$) according to Toobert et al., (2000). The SDSCA demonstrates solid validity and reliable performance as a patient-reported measure which evaluates diabetes self-care management including dietary behavior and medication use along with blood glucose tracking and physical activity habits according to (Toobert et al., 2000). The SDSCA's proven validity in research studies across different African nations demonstrates its applicability as presented through the diagnostic work of Chali et al. (2018) in Ethiopia, Afaya et al. (2023) in Ghana, and Sharon Neksang et al. (2023) in Cameroon supports its applicability in the present context.

3.8 Data Collection Procedures

This section details the two data collection methods that were used in this study.

Quantitative and qualitative data were collected simultaneously.

3.8.1 Quantitative Data

The survey questionnaire was translated from English to French for Francophone patients, and its consistency was validated through reverse translation procedures. The developed questionnaire was divided into three sections, the first part was made up of socio-demographics and clinical characteristics and social support, the second part were self-care practices (dietary habits, physical exercises, SMBG testing, medication adherence, smoking, and foot care), and the last part was HbA1c test results. The main supervisor conducted data collection at Laquintinie Hospital, while a trained nurse collected data at Presbyterian Health Complex. The nurse obtained training regarding study protocol implementation, data collection procedures, and standard data collection methods for participant consistency. T2DM patients were approached during routine visits to explain the study, followed by eligibility screening procedures. Voluntary and eligible patients obtained an extensive consent document that outlined the research's aims as well as the procedures along with risk information, privacy protocols, withdrawal choices, and researcher contacts. Research participants received sufficient time to examine the document and received additional explanations where necessary. Patients who understood the research terms willingly signed up to participate but anyone who refused received polite acknowledgment.

A unique identification system was applied at the start of data collection using the KoBo Toolbox within a private environment. A trained nurse collected venous blood through venipuncture from consenting participants by placing it in k3-EDTA tubes in different hospitals' blood collection unit. An insulated cooler with ice packs transported the samples

to the laboratory, maintaining the temperature between 2-8°C, and reached the laboratory within 5 minutes of sample collection. Upon arriving at the laboratory, the laboratory technician in charge of carrying out the test for HbA1c, evaluated the samples using direct visual observation to check for clots and hemolysis prior to testing. The HbA1c test was done according to established protocols. The analysis utilized the Finecare™ rapid quantitative test, which operates through fluorescence immunoassay technology to examine samples. The test was carried out by ensuring that the lot number of the test cartridge matched the lot number of the identification (ID) chip and the buffer. The ID chip was inserted in to the Finecare™ meters to ensure accuracy by allowing the device to automatically recognize and adjust for variations between different test batches. The tube was then securely closed and mixed thoroughly by shaking for one minute. Next, 75 µL of the sample mixture was loaded into the sample well of the test cartridge. Immediately after adding the sample, the test cartridge was inserted into the Finecare™ analyzer's cartridge holder for analysis. The results were displayed on the screen after five minutes, expressed as percentage and distributed to all participants. Data were exported from KoBo Toolbox in CSV format and analyzed using R statistics.

3.8.2 Qualitative Data

FGDs took place at Laquintinie Hospital and PHC Bepanda over a period of 45 minutes to 1 hour, where participants could feel comfortable in a neutral environment to reduce distractions. The main researcher (moderator) directed the FGDs while the note-taker recorded critical observations, non-verbal signals, and audio recorded the discussion, seeking consent from all participants. The research used semi-structured topic guide to maintain essential theme coverage through structured questioning and by exploring new

topics that came up. During the discussions, participants explored self-care management strategies, which included medication adherence, dietary practices, physical activity, and SMBG. The sessions also addressed factors influencing self-care practices and patients' GC levels. The moderator started each discussion segment before guiding participants toward equal contributions through deep probing of their answers for comprehension. The note-taker documented direct and indirect communication patterns between participants, together with essential key points from the discussion. The note taker also provided clarification when needed. Consent from participants enabled investigators to record the FGDs, the discussion continued until the point where data saturation was achieved.

3.9 Data Analysis and Presentation

Quantitative and qualitative findings were analyzed separately before their triangulation in the result presentation. The methodological triangulation for the result integration was employed through a convergent parallel mixed-methods design. This approach investigated each dataset in its methodological context, and through triangulation of results, discussed them both in parallel in order to provide a stronger, more valid and credible investigation toward the raised research question across both approaches.

3.9.1 Quantitative Analysis

R statistical software version 4.4.3, available through the Comprehensive R Archive Network (CRAN), was used to analyze data in order to understand the factors associated with GC among this population. The data cleaning procedure included checking for missing information and inconsistent measures alongside outliers, and the subsequent corrections followed data structure guidelines and research objectives. Patients were

partitioned into two separate groups according to their HbA1c values: those with good GC presented HbA1c values $< 6.5\%$, while those with poor GC had HbA1c values $\geq 6.5\%$.

To summarize, participants' socio-demographic, clinical, self-care practices and social support data, descriptive statistics were used. All categorical variables, such as gender, marital status, dietary practices, were presented as frequencies and percentages, but the continuous variables such as age, BMI were described by presenting the mean, standard deviation, median and interquartile range.

Bivariate analysis was carried out to examine the association between GC and the different independent variables. Pearson's Chi-square test or Fisher's exact test (when suitable) were both used to check for association between GC and categorical data. The Wilcoxon rank-sum test was run instead of the independent t-test for age and BMI test results because the data were not normally distributed, and the groups had unequal variation.

Strength of the relationship between glycemic controls with categorical and continuous variables was shown by calculating crude odd ratio (ORs) and their 95% confidence interval (CI). At the univariate logistic regression level, only variables with $p < 0.05$ were considered for multivariable logistic regression analysis. This allowed impactful predictors to be prioritize.

A multivariable logistic regression model calculated the adjusted effect of self-care practices indicators on GC after adjusting for potential confounders from the bivariate level. The analysis included independent variables which showed statistical significance at $p < 0.05$ during the univariate logistic regression.

The study presented results as adjusted odds ratios (AORs) with 95% confidence intervals and p-values. A p-value < 0.05 indicated statistical significance for detecting a meaningful association between independent variables and GC.

3.9.2 Qualitative Analysis

The recorded FGD sessions underwent verbatim transcription to develop an authentic depiction of participant responses. The transcript data were compared to the audio recordings to verify accuracy and document complete information before starting the analysis. Thematic analysis was conducted on data obtained from the FGDs.

The analysis generated unique codes, which revealed twenty-three distinct codes when examining the first transcripts. The collected codes led to cluster formation that resulted in seven distinct themes. The analyzed themes combined various original codes into broader descriptions that showcased vital dissimilarities and commonalities among focus group participants in managing their diabetes along with the challenges they faced in self-care practices.

3.10 Ethical Considerations

Amref International University approved starting the study, and the Regional Research Ethics Committee for Human Health, Littoral, granted ethical clearance before the research initiation. The Synod Clerk of the Presbyterian Church and the Director of Laquintinie Hospital authorized the study at the hospital level. Study participants freely joined with written consent from each participant. Confidentiality and anonymity was maintained throughout the research protocol and the final results were communicated with the hospital

administrators. The research complied with all ethical regulations established at by the Regional Research Ethics Committee for Human Health, Littoral.

3.10.1 Participant Selection and Informed Consent

This study included individuals diagnosed with T2DM receiving treatment at the Presbyterian Health Complex Bepanda and Laquintinie Hospital, based on established inclusion criteria. Participants were given comprehensive information regarding the study's aims, procedures, potential risks, and benefits. Informed consent was obtained from each participant before their inclusion in the study, and they were informed of their right to withdraw at any point without facing any penalty.

3.10.2 Risk Mitigation

This study posed minimal risk to participants, as the survey was nonintrusive and caused no harm. While the HbA1c test involved slight discomfort from blood collection, trained healthcare professionals used proper techniques to minimize it. Participants were fully informed about the procedure and their right to withdraw, and the researcher covered the test costs. Contact information was provided for any concerns during or after the study.

3.10.3 Confidentiality

Participants' identities were protected by assigning a unique code during interviews conducted via the KoBo Toolbox on Android devices. Audio recordings, transcripts, and electronic data were securely stored on a password-protected device, with access limited to the principal researcher and a trained nurse.

3.10.4 Withdrawal

The research team emphasized participants' rights during the informed consent process, assuring them that withdrawing from the study would not affect their medical treatment or relationship with healthcare professionals.

3.11 Study Constraints and Limitations

Though this research has valuable outcomes it is important to consider the following limitations;

3.11.1 Recall Bias

Because the data was self-reported, participants might have inaccurately remembered their self-care practice adherence, leading to recall bias.

3.11.2 Social Desirability Bias

The participants in focus group discussions could have felt compelled to deliver standard responses, which may have created incorrect assessments regarding their self-care practice commitment and the obstacles they experienced.

CHAPTER 4: RESULTS

4.1 Introduction

Research findings factors associated with glycemic control among people living with T2DM patients in Douala, Cameroon are presented in this chapter. The research analysis follows the study objectives while incorporating both quantitative and qualitative findings. The quantitative section provides descriptive statistics that analyzes the study population by examining their self-care management practices which include; medication adherence, dietary habits, exercise frequency, SMBG, foot care, and smoking, sociodemographic and clinical characteristics, social support and glycemic control (glycated hemoglobin levels). The qualitative data examines findings from focus group discussion (FGD) and explored self-care practices, interpreting factors influencing self-care practices and glycemic control (GC) outcomes. Triangulation of the quantitative results with qualitative insights was done in this chapter to offer a deeper, more human-centered understanding of the results.

4.2 Description of the Study Participants

This section presents descriptive analysis of participants' sociodemographic and clinical characteristics, self-care practices, social support and glycated hemoglobin (HbA1c).

4.2.1 Sociodemographic and Clinical Characteristics of Participants

Of 230 participants in the study, 154(67.0%) females and 76(33.0%) males. The median age of study participants was 62.0 years (interquartile range [IQR] 47.0 to 68.0 years). When it comes to marital status, 128(55.7%) were married, 33(14.3%) were single, and the rest were either widowed or divorced. Regarding education level, 67(29.1%) participants

had completed primary education, 108(47.0%) had completed secondary education, 44(19.1%) had tertiary education, while 11(4.78%) had informal education. Employment status showed that 41(17.8%) participants were unemployed, 52(22.6%) were employed, and 137(59.6%) were self-employed or were into informal jobs. Among respondents, 63.5% (146) earned average monthly income of <100,000 CFA (approximately 167USD), 29.6% (68) earned between 101,000-200,000 CFA (approximately 168USD-133USD), 3.91%(9) earned between 201,000 - 300,000 CFA (approximately 335USD-500USD), 3.04%(7) earned > 300,000 CFA (approximately 500USD). The median BMI was 29.0 kg/m² with an IQR of 25.4 to 33.6 kg/m², which showed that majority of the participants were in overweight to the obese range. Diabetes duration was <1 year in 11.3% of patients; 1-2 years in 17.4% and 3-5plus years in 23.9%. Also, 23.0% of participants had diabetes for 6-10 years, whereas, 24.3%, had diabetes over 10 years, see Table 2.

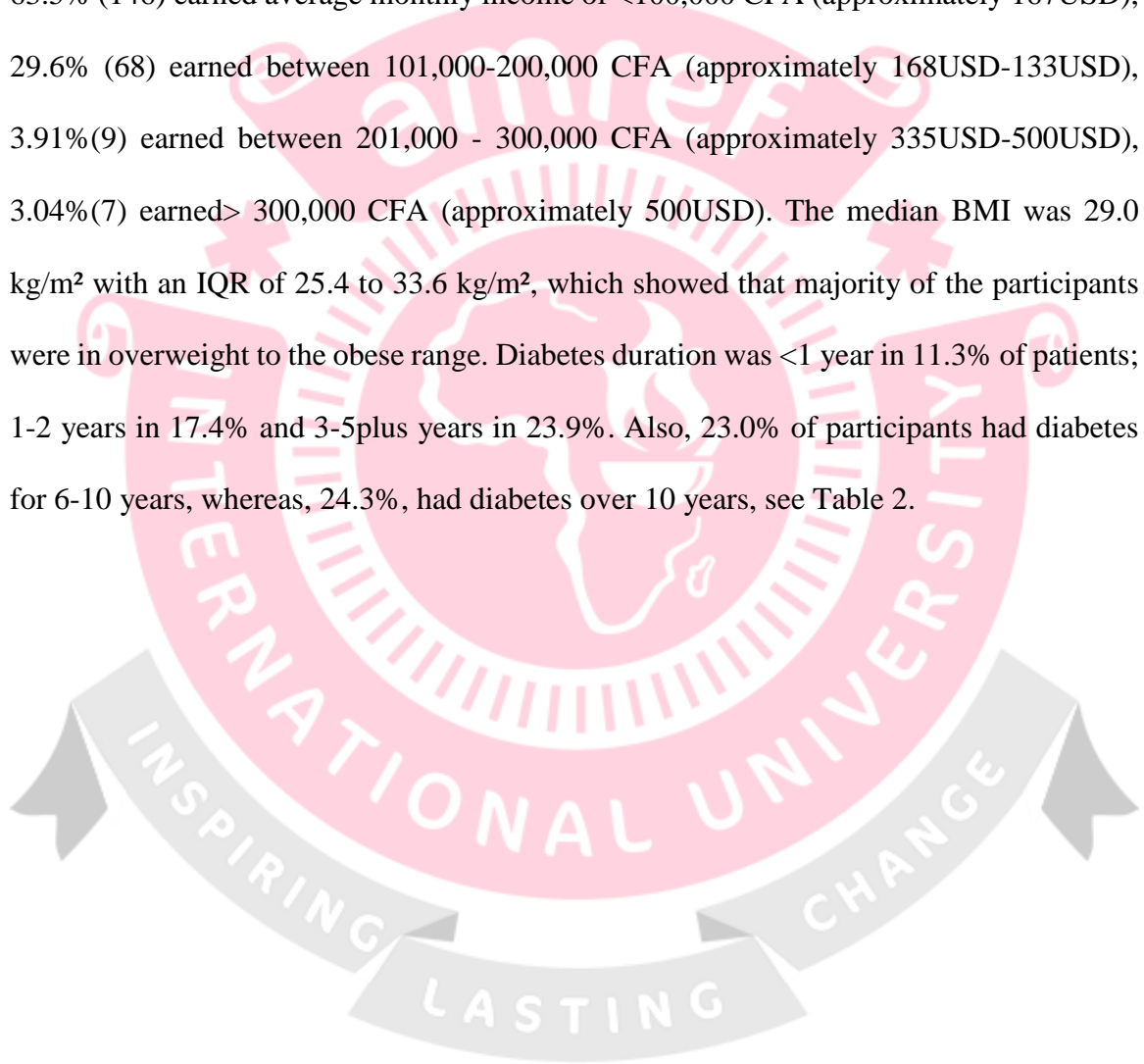


Table 2: Sociodemographic and Clinical Characteristics of Study Participants (N = 230)

Variable	Category	n (%)
Sociodemographic Characteristics		
Gender	Female	154 (67.0%)
	Male	76 (33.0%)
Age (years)	Median [IQR]	62.0 [47.0–68.0]
Marital Status	Single	33 (14.3%)
	Married	128 (55.7%)
	Widowed/Divorced	69 (30.0%)
Level of Education	Informal	11 (4.78%)
	Primary	67 (29.1%)
	Secondary	108 (47.0%)
	Tertiary	44 (19.1%)
Employment Status	Employed	52 (22.6%)
	Self-employed/Informal	137 (59.6%)
Average Monthly Income (CFA)	<100,000	146 (63.5%)
	101,000–200,000	68 (29.6%)
	201,000–300,000	9 (3.91%)
	>300,000	7 (3.04%)
Clinical Characteristics		
BMI (kg/m ²)	Median [IQR]	29.0 [25.4–33.6]
Duration of Diabetes	<1 year	26 (11.3%)
	1-2 years	40 (17.4%)
	3-5 years	55 (23.9%)
	6-10 years	53 (23.0%)
	>10 years	56 (24.3%)

Note. n = Number of participants; % = Percentage; BMI = Body Mass Index (weight (kg)/height(m)²); IQR = Interquartile Range; 1FCFA is approximately 0.00172USD.

4.2.2 Distribution of Self-Care Practice

Self-care practices were measured using the Revised version of Summary Diabetes Self-Care Activities questionnaire. Participants in this study showed different self-care behaviors. About 43.5% of them had healthy eating habits, while about 56.5% did not. All

participants were found to have poor medication adherence, as only 35.7% practiced SMBG, whereas the rest did not. Regarding exercise, 59.1% of the population did not practice good self-care and only 40.9% did. For foot care, 49.1% were doing it well and 50.9% were not. Out of all the participants, just 1.74% showed poor practices for smoking self-care, whereas 98.3% demonstrated good self-care. Most individuals had good self-care, some fair and a few poor, see Table 3.

Table 3: Distribution of Self-Care Practices (N = 230)

Self-Care Practice	Category	n (%)
Diet	Good	100 (43.5%)
	Poor	130 (56.5%)
Medication Adherence SMBG	Poor	230 (100%)
	Good	82 (35.7%)
Physical Activity	Poor	148 (64.3%)
	Good	94 (40.9%)
Foot-Care	Poor	136 (59.1%)
	Good	113 (49.1%)
Smoking	Poor	117 (50.9%)
	Good	226 (98.3%)
Overall Self-Care Practice	Poor	4 (1.74%)
	Good SCP	118 (51.3%)
	Fair SCP	58 (25.2%)
	Poor SCP	54 (23.5%)

Note. n = Number of participants; % = Percentage, SCP= Self-care Practice

4.2.3 Distribution of Social Support among the Participants

For social support given by friends, family, or loved ones, 40.9% (94) of the participants received financial support, while 59.1% (136) did not. Emotional support was reported by 55.7% (128), with 44.3% (102) receiving none. For practical support with diabetes-related tasks, 64.8% (149) received help, whereas 35.2% (81) did not. Informational support was available to 80.0% (184) but lacking for 20.0% (46). Nearly all participants 94.3% (217)

reported receiving other forms of support (these were self-reported by participants through open ended questions and included spiritual support, appraisal support, companionship support and advocacy support), while 5.65% (13) did not, see Table 4.

Table 4: Distribution of Social Support (N = 230)

Forms of Support	Category	n (%)
Financial Support	Yes	94 (40.9%)
	No	136 (59.1%)
Emotional Support	Yes	128 (55.7%)
	No	102 (44.3%)
Practical Support	Yes	149 (64.8%)
	No	81 (35.2%)
Informational Support	Yes	184 (80.0%)
	No	46 (20.0%)
Others	Yes	217 (94.3%)
	No	13 (5.65%)

Note. n = Number of participants; % = Percentage

4.3 Levels of Glycemic Control among Respondents with Type 2 Diabetes

According to the HbA1c test carried out, results were documented, and participants were categorized based on their HbA1c levels as either good (HbA1c < 6.5%) or poor (HbA1c ≥ 6.5%) GC, see Figure 3.

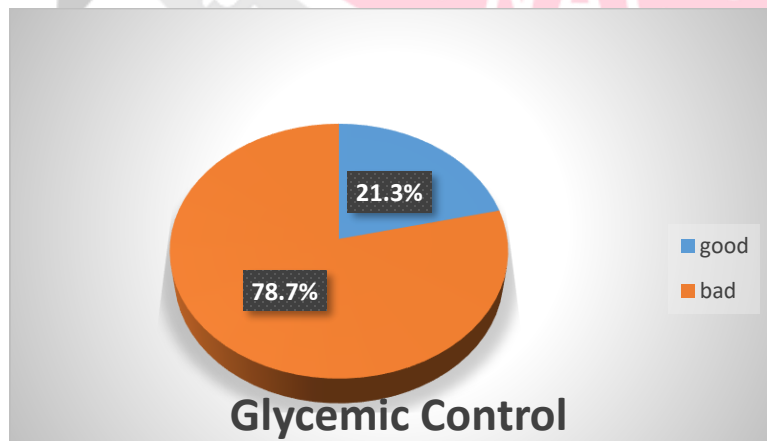


Figure 3: Distribution of Glycemic Control Status of Participants.

Note. n = 230 participants; HbA1c = Glycated hemoglobin; Percentage represents participants with HbA1c <6.5% (Good control) and HbA1c ≥6.5% (poor control).

4.4 Association of Sociodemographic and Clinical Characteristics of Participants with Glycemic Control

4.4.1 Association of Sociodemographic Characteristics of Participants with Glycemic Control

The association between sociodemographic characteristics and glycemic control was analyzed using Fisher's exact test for categorical variables such as average monthly income, level of education and marital status, while gender was analyzed using chi-squared test. Continuous variable, age, was analyzed using Wilcoxon's rank sum test. Participant characteristics by HbA1c levels (HbA1c <6.5%, n = 49; HbA1c ≥6.5%, n = 181) are shown on Table 5.

Females were more prevalent in both those with poor or good GC. Among those with good GC, 69% were female, while 66% of those with poor GC were female. Males made up 31% and 34% in the respective groups. There was no statistically significant association with GC ($p = 0.72$).

Younger people had better GC, on average aged 56 years (SD ±15), compared to 60 years (SD ±13) in those with poor GC. For individuals with good GC, the median age was 59 years [IQR 44–67], while those with poor GC were 62 years of age [IQR 48–69]. While there was a difference in participants' ages, there was no statistically significant association of age with GC ($p = 0.133$).

The majority of participants with good or poor GC were married: 49% of those with good GC and 57% of those with poor GC. Single participants had a higher proportion of good GC (22%) compared to those with poor GC (12%). Widowed and divorced participants were similarly distributed across both good and poor GC. The differences were not statistically significantly associated with GC ($p = 0.34$).

Secondary education was the most common across those who had good or poor GC, particularly among those with good GC (59%) compared to those with poor GC (44%). Primary education was more prevalent among participants with poor GC (31% vs. 20%). Levels of informal and tertiary education did not differ much between those with good or poor GC. There was not a statistically significant association between education and GC ($p = 0.24$).

Most participants made less than 100,000 CFA francs (~USD 172), a month and 59% had good GC while 65% had poor GC. The distribution of income in other categories was low. Income level showed no statistical significant association with GC ($p = 0.74$), see Table 5.

Table 5: Association of Sociodemographic Characteristics of Participants with Glycemic Control

Characteristics	<6,5, N = 49 ¹	≥6.5, N = 181 ¹	Test Statistics	p-value
Gender			$\chi^2(1, N = 230) = 0.16$	0.7 ²
Female	34 (69%)	120 (66%)		
Male	15 (31%)	61 (34%)		
Age			U=3802	0.13 ³
Mean ±SD	56 ±15	60 ±13		
Median [25% - 75%]	59 [44 - 67]	62 [48 - 69]		
Minimum - Maximum	26 - 81	27 - 87		
Marital Status				0.3 ⁴
Single	11 (22%)	22 (12%)		
Married	24 (49%)	104(57%)		
Divorced	2 (4.1%)	8 (4.4%)		
Widowed	12 (24%)	47 (26%)		
Level of Education				0.2 ⁴
Primary	10 (20%)	57 (31%)		
Secondary	29 (59%)	79 (44%)		
Tertiary	9 (18%)	35 (19%)		
Informal Education	1 (2.0%)	10 (5.5%)		
Average monthly Income				0.7 ⁴
< 100.000 CFA	29 (59%)	117 (65%)		
>300. 000 FCFA	2 (4.1%)	5 (2.8%)		
101.000 – 200.000 FCFA	17 (35%)	51 (28%)		
201.000 – 300. 000 FCFA	1 (2.0%)	8 (4.4%)		

Note. n = Number of participants; Mean ± SD = Mean and Standard Deviation, % = Percentage, ¹n (%), ²Pearson's Chi-squared test, χ^2 = Chi-square test of association, df = degree of freedom, ³Wilcoxon rank sum test, ⁴Fisher's exact test, 1FCFA is approximately 0.00172USD, U = Mann–Whitney U test statistic

4.4.2 Association of Clinical Characteristics of Participants with Glycemic Control

The association between clinical characteristics and glycemic control was analyzed using Chi-squared test for duration of diabetes and Wilcoxon rank sum test for BMI. The mean BMI was slightly higher in those with poor GC (30 kg/m²) compared to those with good

GC (29 kg/m²). Median BMI values were 29 [IQR 25–34] and 28 [IQR 25–31] respectively. Although higher BMI appeared more common in those with poor GC, the difference was not statistically significantly associated with GC (p = 0.23).

A longer duration of diabetes appeared to be associated with poorer GC. For instance, 26% of participants with poor GC had been managing diabetes for over 10 years, compared to 18% to those with good GC. Conversely, those with a duration of ≤5 years showed better GC. Still, this did not reach statistical significance association with GC (p = 0.52), see Table 6.

Table 6: Association of Clinical Characteristics of Participants with Glycemic Control

Characteristics	<6,5, N = 49 ¹	≥6,5, N = 181 ¹	Test Statistics	p-value
BMI (Weight-kg/Height-m ²)			U=3900.5	0.2 ³
Mean ±SD	29 ±5	30 ±7		
Median [25% - 75%]	28 [25 - 31]	29 [25 - 34]		
Minimum - Maximum	20 - 45	18 - 61		
Duration of T2DM			χ ² (4, N = 230) = 3.46	0.5 ²
>1year	8 (16%)	18 (9.9%)		
1-2years	11 (22%)	29 (16%)		
3-5years	11 (22%)	44 (24%)		
6-10years	10 (20%)	43 (24%)		
>10years	9 (18%)	47 (26%)		

Note. n = Number of participants; % = Percentage, ¹n (%), ²Pearson's Chi-squared test, χ²= Chi-square test of association, ³Wilcoxon rank sum test, Mean ± SD = Mean and Standard Deviation, U = Mann–Whitney U test statistic

4.5 Association of Self-Care Practices of Participants with Glycemic Control

This study used statistical and qualitative analyses to examine how self-care practices: diet, medication adherence, SMBG, physical activity, foot care, and smoking are related to GC (HbA1c). These variables were measured via the Revised Summary of Diabetes Self-Care Activities questionnaire, assessing the number of days (0–7) participants engaged in each practice during the prior week. Scores were classified as poor or good for each category, and total self-care was grouped into poor, fair, or good based on percentiles, as detailed in Chapter 3. This classification enabled analysis of GC (good/poor) as the dependent variable across self-care categories, clarifying how self-care practices relate to GC. The association between these self-care practices with glycemic control was analyzed using Chi-squared for dietary practices, medication adherence, self-monitoring of blood glucose, physical activity, foot care and overall self-care practice, and Fishers test for smoking.

4.5.1 Association of Dietary Practices with Glycemic Control

Participants with better glycemic control (HbA1c <6.5%) were more likely to practice good dietary habits (57%) compared to those with poor control (40%). This difference was statistically significant with GC ($p = 0.0302$).

During the FGDs, the challenges faced in implanting self-care practices were expressed by the participants. The first theme that emerged was, “Food Choices, Traditions, and Restrictions,” Participants expressed numerous challenges with adhering to recommended diets, with high cost of “diabetic” foods being singled out as a major problem hindering their continued use. Indeed, one FGD participant clearly stated that: “most times, because of the problem of money, you find yourself eating what is affordable, and after 2-3 days,

you try to make up for the disorder you have caused". Additionally, cultural reliance on available starchy staples was singled out with a participant explaining, "all common foods here are sweet, for example; cassava, ripe plantains etc. When they tell us not to eat these, we ask ourselves what we really have to eat". During the FGDs issue of feelings of restriction and discontentment regarding dietary issues was mentioned where a participant said; "If you look at our nutrition here, what do we see? They restrict almost everything, and there are times we ask ourselves, what will we eat then to live?"

4.5.2 Association of Medication Adherence with Glycemic Control

Medication adherence was found poor across all participants (100%). All participants (49 with HbA1c < 6.5% and 181 with HbA1c ≥ 6.5%) reported poor medication adherence, with no variation in adherence categories.

The FGDs explained the second Theme 2 was, 'Medication Dilemmas in Daily Life,' the participants detailed the challenges they face with regards to affording medications, taking medicines with complex dosing regimens, and managing side effects. A key issue was affordability, as one participant responded, "At home, I have a packet of medication. In addition, I am on retirement, and you know that we are in a very poor country. If you take your retirement benefits, you are unable to live and buy your medication". Adherence was further complicated by confusion about medication timing, one pointed out, "At 7am is morning, 10am is morning, 11am is morning. I don't know which one is actually morning". Some even confessed to consciously choosing to skip some doses to ensure that their medication lasts long, "My medication is 8500FCFA (14.09USD), I manipulate it, skip morning dose, just to economize," and "We try to play around with the dosage to save money, but it seems we are causing more harm". In addition, observers noted the physical

burden of polypharmacy, “I have to take about ten pills in the morning and another ten in the evening. It’s too much! I told my doctor I might stop taking them all because it’s unbearable”. To address these challenges, a number of participants responded by using traditional or herbal remedies including folere (hibiscus leaves), mango leaves and other indigenous practices. One participant explained, “To help your blood sugar go down, you can boil some ‘folere’ leaves and drink,” while another added, “Some people take natural herbs because traditional medicine does not impose as many restrictions on what we eat.”

4.5.3 Association of Self-Monitoring of Blood Glucose with Glycemic Control

39% practiced good SMBG in those with good GC and 35% in those with poor GC. Poor practices were more common overall, and the difference were not statistically significantly associated with GC ($p = 0.62$).

In the FGDs a third theme emerged; “Struggles and Realities of Blood Sugar Monitoring,” as participants shared their experiences with blood glucose monitoring. The lived experiences related to frequent testing, understanding of glucose targets, and systemic barriers to testing, including cost and supply shortages. In addition, some participants reported following a habitual and rigorous testing practice, “I check it every day, I monitor my blood sugar every day at 6 am before I brush my mouth because I can be forced to drink water.” Some even showed proactive use of monitoring to guide dietary choices, “I check my sugar every morning, and when it’s above 120, I adjust my meals.” Yet, one of the main challenges that persisted was the unavailability or high cost of test strips, leading to an irregular SMBG. As one participant put it, “The problem is the strip. You can have the machine, but the strip is difficult to find.” Also participants were generally uncertain about normal glucose values, one participant said, “I was told the normal value is between 0.80

- 1.10.” Furthermore, the constant high readings generated emotional responses from some individuals to the point where they stopped monitoring at all, “I stopped checking my sugar because it was always high, and it discouraged me.”

4.5.4 Association of Physical Activity with Glycemic Control

Nearly half (49%) of the participants with good GC reported good physical activity practices, compared to 39% those with poor GC. This difference was not statistically significantly associated with GC ($p = 0.22$).

The fourth theme in the FGDs was 'The Burden of Exercise' on how the participants' experience in regard to physical activity. Although most acknowledged physical activity is important in managing diabetes, several challenges were reported that limited their ability to remain active. Barriers included age related limitations, coexisting health conditions, and physical discomfort. Participants raised fears about the possible harmful effects of some types of exercise, “I realized when I do brutal sport, I have the impression my heart will stop, so I prefer to walk.” Another added, “My doctor forbade me to run at a certain age. He told me I have to walk at my own pace.” Some participants questioned if physical activity could really help manage their condition, with one saying, “Even when I was young, I was part of the national athletics team, and I still exercise, but it did not prevent me from developing diabetes. Does sports really have an impact on diabetes?” Some described their problems as ongoing, always on issue, like chronic pain and fatigue, “Even with the sports I am doing, I still have complications, especially at the level of my knees. I feel sharp pain behind my back.”

4.5.5 Foot Care Self-Care and Glycemic Control

Foot self-care was notably better among those with good GC, 63% reported good practices versus 45% for those with poor GC. This difference was statistically significantly associated with GC ($p = 0.0262$).

Foot self-care practices importance was explained in FGDs. Theme 7: ‘Hidden Dangers’ showed how participants frequently had peripheral neuropathy, which hid early symptom of foot injury, putting them at risk of complications such as ulcers. One participant shared, “There are times people say, you wear your flip-flops, and you walk, and it goes out and you don’t realize it, it’s only after you have gone for distance and people start asking, Madame where is your shoe, then you go back to look for it. They say it’s when the feet are already without sensation.” But several other people reported symptoms related to nerve damage, like numbness, burning sensations, and strange sensations in the feet, “The soles of my feet feel like they are burning with pepper. I was advised to soak them in warm water, dry them, and apply Vaseline before sleeping. It helps, but the problem persists.” Another added, “I sometimes feel vibrations in my feet, sometimes it is very hot.”

4.5.6 Association of Smoking with Glycemic Control

The majority of participants with poor or good GC practiced good smoking self-care, with 98% with good GC and poor GC classified as having good practices. Only a small proportion fell into the poor smoking self-care (2.0% and 1.7%, respectively). There was no statistically significant association with GC ($p > 0.94$).

4.5.7 Association of Overall Self-Care Practices with Glycemic Control

For those with good GC, 47% of participants demonstrated fair self-care practices, 37% had good practices, and 16% fell into the poor self-care practices. For those with poor GC, 52% had fair self-care, 22% had good practices, and 25% had poor practices. These differences were not statistically significantly associated with GC ($p = 0.0882$), see Table 7.



Table 7: Association of Self-Care Practices of Participants with Glycemic Control

Characteristics	<6.5, N = 49 ¹	≥6.5, N = 181 ¹	χ^2 (df, N = 230)	p-value
Diet Category			$\chi^2(1, N = 230)$ =4.73	0.030 ²
Good	28 (57%)	72 (40%)		
Poor	21 (43%)	109 (60%)		
Medication Category			$\chi^2(1, N = 230)$ =75.75	<0.0001 ²
Poor	49 (100%)	181 (100%)		
SMBG Category			$\chi^2(1, N = 230)$ =0.26	0.6 ²
Good	19 (39%)	63 (35%)		
Poor	30 (61%)	118 (65%)		
Physical Activity Category			$\chi^2(1, N = 230)$ =1.69	0.2 ²
Good	24 (49%)	70 (39%)		
Poor	25 (51%)	111 (61%)		
Foot Category			$\chi^2(1, N = 230)$ =4.97	0.026 ²
Good	31 (63%)	82 (45%)		
Poor	18 (37%)	99 (55%)		
Smoking Category				>0.9 ⁴
Good	178 (98.3%)	48 (98%)		
Poor	1 (2.0%)	3 (1.7%)		
Overall Self-Care Practices Category			$\chi^2(2, N = 230)$ =4.86	0.088 ²
Fair Self-Care Practices	23 (47%)	95 (52%)		
Good Self-Care Practices	18 (37%)	40 (22%)		
Poor Self-Care Practices	8 (16%)	46 (25%)		

Note. n = Number of participants; % = Percentage, ¹n (%), ²Pearson's Chi-squared test,

³Wilcoxon rank sum test, ⁴Fisher's exact test, χ^2 = Chi-square test of association, df = degree of freedom

4.6 Association of Social support with Glycemic Control

The association between the various forms of support with glycemic control was analyzed using Chi-squared for financial, emotional, practical, and informational support, while other forms of support was analyzed using Fishers exact test. Financial support was statistically significantly associated with GC ($p = 0.0212$), reported by 45% of those with poor GC and 27% with good GC. Discussions from the FGDs highlighted these findings. In the FGDs the fifth theme was 'Living with Diabetes in Douala'. The participants repeatedly emphasized the financial burdens of diabetes care and how lack of support undermines their self-care efforts. One participant described the complete absence of structural support, "At my level, there is no support for my diabetes, if at the state level there is no sensitization, no subsidies on diabetes medication, then there is no support." Others shared how financial constraints influenced their ability to adhere to dietary recommendations, "There are times you find yourself with almost empty pockets. You eat what you can afford," and another added, "Most times, it's a problem of money. Sometimes, you find yourself eating what is affordable, and after 2–3 days, you try to make up for the disorder you have caused."

Emotional support was reported at similar rates across those with poor or good GC, 55% in those with good GC and 56% in those with poor GC. No statistically meaningful relationship was detected with GC ($p > 0.92$), meaning participants received similar support no matter their GC. Nonetheless, in the FGDs, the participants highlighted the emotional toll of living with diabetes and the limited availability of psychosocial support. Under Theme 5, participants described feeling abandoned by loved ones, "Your own sister won't even ask how you are managing. The whole family can abandon you." Theme 6:

Diabetes and Mental Health further illuminated how psychological stress, relationship strain, and feelings of isolation can interfere with self-care practices, “Diabetes causes sexual weakness, which can lead to relationship problems, even infidelity.” another participant added, “With this illness, you can be fine, but immediately you are stressed, you are gone, everything goes out of normal.”

Practical, informational, and other forms of support were similarly distributed across participants with poor or good GC. About 63% of participants with good GC and 65% with poor GC reported receiving practical support. Informational support was slightly more common among those with poor GC (81%) compared to those with good GC (76%). Other forms of support were widely reported among participants with poor or good GC, with 96% good GC and 94% with poor GC. None of these differences were statistically significantly associated with GC; practical support ($p = 0.82$), informational support ($p = 0.42$) and other forms of support ($p = 0.74$), see Table 8.

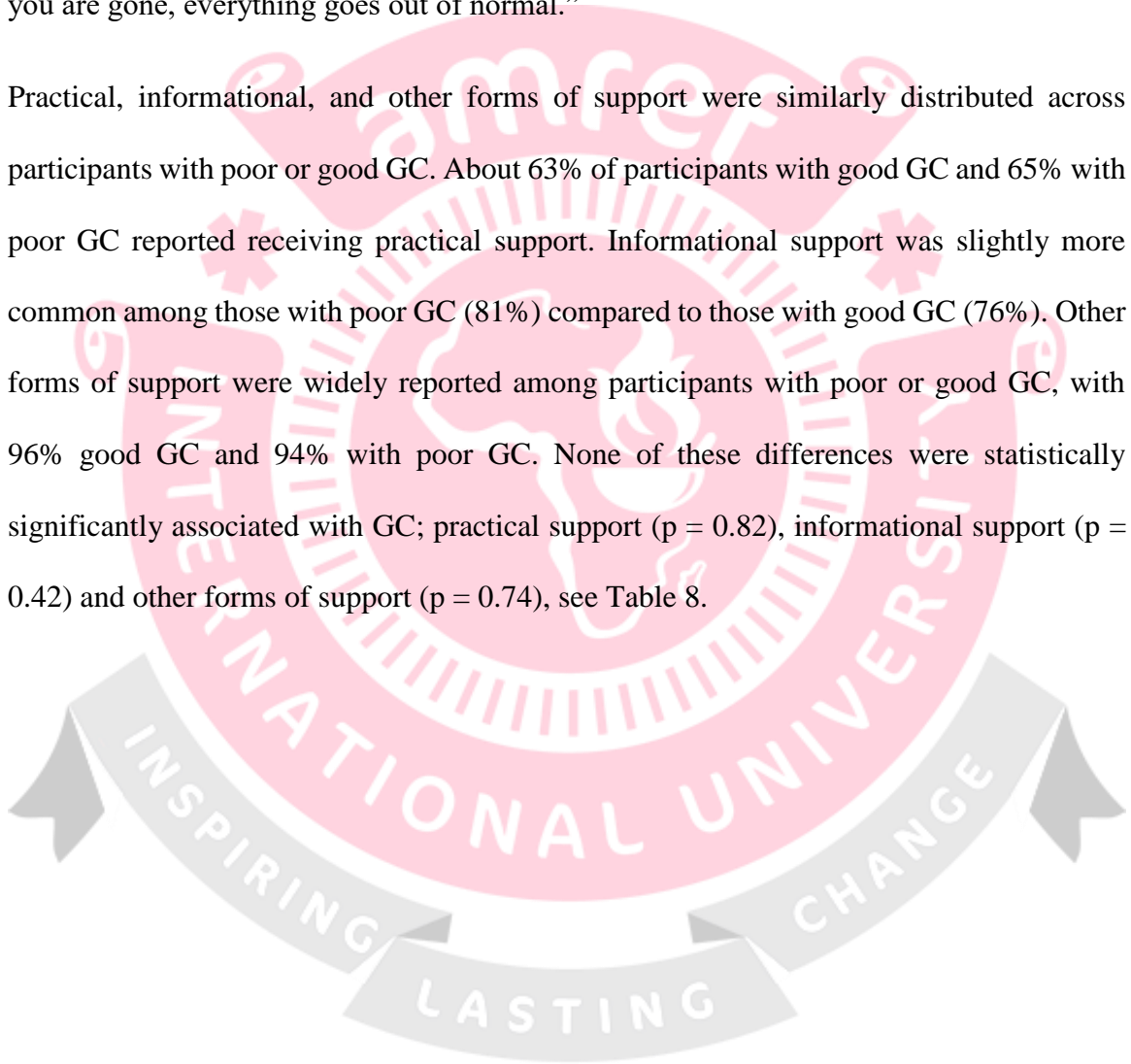


Table 8: Association of Social support with Glycemic Control

Characteristics	<6.5, N = 49 ¹	≥6.5, N = 181 ¹	χ^2 (df, N = p-value 230)
Forms of Support			
Financial Support			
			$\chi^2(1, N = 0.021^2$ 230) =5.29
Yes	13 (27%)	81 (45%)	
No	36 (73%)	100 (55%)	
Emotional Support			
			$\chi^2(1, N = >0.9^2$ 230) =0.01
Yes	27 (55%)	101 (56%)	
No	22 (45%)	80 (44%)	
Practical Support			
			$\chi^2(1, N = 0.8^2$ 230) =0.06
Yes	31 (63%)	118 (65%)	
No	18 (37%)	63 (35%)	
Informational Support			
			$\chi^2(1, N = 0.4^2$ 230) =0.78
Yes	37 (76%)	147 (81%)	
No	12 (24%)	34 (19%)	
Others			
			0.7 ⁴
Yes	47 (96%)	170 (94%)	
No	2 (4.1%)	11 (6.1%)	

Note. n = Number of participants; % = Percentage, ¹n (%), ²Pearson's Chi-squared test,

⁴Fisher's exact test, χ^2 = Chi-square test of association, df = degree of freedom

4.7 Logistic Regression of Sociodemographic and Clinical Characteristics of Respondents and Glycemic Control

4.7.1 Gender and Glycemic Control

Among participants with good GC (HbA1c < 6.5%), 34 were female (22.1%) and 15 were male (19.7%). Among those with poor GC (HbA1c ≥ 6.5%), 120 were female (77.9%) and

61 were male (80.3%). Gender was not statistically significant (OR = 1.15; 95% CI: 0.58; 2.28; $p = 0.695$).

4.7.2 Age and Glycemic Control

The median age of participants with good GC was 59.0 years [IQR: 44.0–67.0], while for those with poor GC, it was 62.0 years [IQR: 48.0–69.0]. Older age had higher odds of poor GC (OR = 1.02; 95% CI: 1.00–1.05). Age was not statistically significant ($p = 0.067$).

4.7.3 Marital Status and Glycemic Control

Single participants had the highest proportion of good GC (33.3%), followed by married (18.8%), divorced (20.0%), and widowed (20.3%). Compared to single individuals, married participants had higher odds of poor GC (OR = 2.17; 95% CI: 0.93–5.06), though this was not statistically significant ($p = 0.085$).

4.7.4 Education level and Glycemic Control

Among participants with good GC (HbA1c < 6.5%), 14.9% had primary, 26.9% secondary, 20.5% tertiary, and 9.1% informal education. Those with poor GC (HbA1c \geq 6.5%) included 85.1% primary, 73.1% secondary, 79.5% tertiary, and 90.9% informal education. Compared with primary education, secondary education is linked to a decrease in poor GC results, though this is not significant (OR=0.48; 95% CI: 0.22–1.06; $p = 0.066$). Individuals with tertiary education had a reduced likelihood of having good GC, but there was no statistical significance to these findings.

4.7.5 Income level and Glycemic Control

The distribution of average monthly income showed varying glycemic control (GC) rates. Among those earning <100,000 CFA (~USD 172), 19.9% had good GC and 80.1% poor

GC. For 101,000–200,000 CFA (~USD 174–344), 25.0% had good GC; for 201,000–300,000 CFA (~USD 346–517), 11.1% had good GC; and for >300,000 CFA (>USD 517), 28.6% had good GC. This analysis found no statistical significance, with ORs of 0.74 (p=0.400), 1.98 (p=0.586), and 0.62 (p=0.580) for the respective income groups versus <100,000 CFA.

4.7.6 BMI and Glycemic Control

Participants with good GC had a median BMI of 27.9 kg/m² (IQR: 25.2–30.9) versus 29.4 kg/m² (IQR: 25.5–34.1) for those with poor GC. Each one-unit BMI increase was linked to a non-significant 4% higher odds of poor GC (OR=1.04; 95% CI: 0.98–1.10; p=0.167), showing a possible but non-statistical significant trend.

4.7.7 Duration of Diabetes and Glycemic Control

For analysis purpose, diabetes duration was grouped as ≤5 years (including <1, 1–2, 3–5 years) and >5 years (6–10 and >10 years). Participants with >5 years had lower odds of good GC than those with ≤5 years (OR=0.64; 95% CI: 0.34–1.22), but this was not statistically significant (p=0.178), suggesting a possible but unclear link between longer duration and poorer GC, see Table 9.

Table 9: Logistic Regression of Sociodemographic and Clinical Characteristics of Respondents and Glycemic Control

	HbA1c < 6.5% (n=49)	HbA1c ≥ 6.5% (n=181)	Total N=230	OR [95% CI]	P-value
Sociodemographic Characteristics and Glycemic Control					
Gender					
Female	34 (22.1%)	120 (77.9%)	154 (67.0%)	Ref.	Ref.
Male	15 (19.7%)	61 (80.3%)	76 (33.0%)	1.15 [0.58;2.28]	0.695
Age, Med[IQR]	59.0 [44.0-67.0]	62.0 [48.0-69.0]	62.0 [47.0-68.0]	1.02 [1.00;1.05]	0.067
Marital Status					
Single	11 (33.3%)	22 (66.7%)	33 (14.3%)	Ref.	Ref.
Married	24 (18.8%)	104 (81.2%)	128 (55.7%)	2.17 [0.93;5.06]	0.085
Divorced	2 (20.0%)	8 (80.0%)	10 (4.35%)	2.00 [0.36;11.1]	0.463
Widowed	12 (20.3%)	47 (79.7%)	59 (25.7%)	0.96 [0.75;5.13]	0.183
Level of Education					
Primary	10 (14.9%)	57 (85.1%)	67 (29.1%)	Ref.	Ref.
Secondary	29 (26.9%)	79 (73.1%)	108 (47.0%)	0.48 [0.22;1.06]	0.066
Tertiary	9 (20.5%)	35 (79.5%)	44 (19.1%)	0.68 [0.25;1.84]	0.461
Informal Education	1 (9.1%)	10 (90.9%)	11 (4.78%)	1.75 [0.20;15.3]	0.681
Average Monthly Income					
< 100,000 CFA	29 (19.9%)	117 (80.1%)	146 (63.5%)	Ref.	Ref.
>300,000 CFA	2 (28.6%)	5 (71.4%)	7 (3.04%)	0.62 [0.11;3.36]	0.58
101,000 – 200,000 CFA	17 (25.0%)	51 (75.0%)	68 (29.6%)	0.74 [0.38;1.47]	0.4
201,000 – 300,000 CFA	1 (11.1%)	8 (88.9%)	9 (3.91%)	0.98 [0.24;16.5]	0.586
Clinical Characteristics and Glycemic Control					
BMI Med[IQR]	27.9 [25.2-30.9]	29.4 [25.5-34.1]	29.0 [25.4-33.6]	1.04 [0.98;1.10]	0.167
Duration of Diabetes					
≤5 years	30 (24.8%)	91 (75.2%)	121 (52.6%)	Reference	Ref.
>5 years	19 (17.4%)	90 (82.6%)	109 (47.4%)	0.64 [0.34–1.22]	0.178

Note. n = Number of participants; % = Percentage; HbA1c = Glycated hemoglobin; OR = Odds Ratio; 95% CI = 95% Confidence

Interval; 1FCFA is approximately 0.00172USD

4.8 Logistic Regression of Self-Care Management Practices and Glycemic Control

4.8.1 Dietary Self-Care and Glycemic Control

For diet, 28.0% of participants with good dietary self-care had good GC (HbA1c <6.5%), compared to 16.2% among those with poor dietary self-care. The difference was statistically significant ($p = 0.032$). Participants with bad dietary self-care had more than twice the odds of poor GC as those with good dietary practice (OR = 2.02).

4.8.2 Medication Adherence and Glycemic Control

Medication adherence was found poor across all participants (100%). All participants (49 with HbA1c < 6.5% and 181 with HbA1c \geq 6.5%) reported poor medication adherence, with no variation in adherence categories. Therefore, medication adherence showed no difference in GC distribution.

4.8.3 Self- Monitoring of Blood Glucose and Glycemic Control

23.2% of participants with good SMBG had good GC (HbA1c < 6.5%) versus 20.3% with poor SMBG. Although good SMBG showed a slightly higher rate of good GC, no statistically meaningful difference was detected ($p=0.608$). Poor SMBG was linked to slightly higher odds of poor GC (OR=1.19), though not statistically significant ($p=0.608$).

4.8.4 Physical Activity and Glycemic Control

For Physical activity, 25.5% with good physical activity had good GC (HbA1c <6.5%) versus 18.4% with poor GC. Though good GC was higher among active participants, no statistically meaningful difference was detected ($p=0.20$). Poor physical activity was linked to 1.52 times higher odds of poor GC (OR=1.52; 95% CI: 0.81–2.87).

4.8.5 Foot Care Practices and Glycemic Control

Among participants, 27.4% with good GC practiced good foot care, while 72.6% had poor GC. Conversely, 15.4% with good GC and 84.6% with poor GC reported poor foot care. Bivariate analysis showed poor foot care was associated with 2.08 times higher odds of poor GC (OR=2.08; 95% CI: 1.10–4.05), indicating a statistical significance ($p=0.027$).

4.8.6 Smoking Self-Care Practice and Glycemic Control

For smoking, 25.0% of participants who reported not smoking (good self-care) had good GC (HbA1c <6.5%), compared to 21.2% among those who reported smoking (poor self-care). The difference was not statistically significant ($p = 0.819$), and participants who smoked had slightly higher odds of poor GC (OR = 1.24).

4.8.7 Overall Self-Care Practices and Glycemic Control

31.0% with good overall self-care had good GC (HbA1c <6.5%), versus 19.5% with fair and 14.8% with poor self-care. Although good self-care showed the highest good GC, differences were not statistically significant ($p=0.097$ for good vs. fair; $p=0.474$ for poor vs. fair). Good self-care was linked to lower odds of poor GC (OR=0.54; 95% CI: 0.26–1.10), while poor self-care showed higher odds (OR=1.39; 95% CI: 0.58–3.35), compared to fair self-care, see Table 10.

Table 10: Logistic Regression of Self-Care Management Practices and Glycemic Control

Self-Care Management Practice	Category	HbA1c < 6.5% (n=49)	HbA1c ≥ 6.5% (n=181)	OR [95% CI]	P-value
Dietary Practices	Good	28 (28.0%)	72 (72.0%)	Ref.	Ref.
	Poor	21 (16.2%)	109 (83.8%)	2.02 [1.07;3.83]	0.032
Medication Adherence SMBG	Poor Adherence(All)	49 (21.3%)	181 (78.7%)	Ref.	Ref.
	Good	19 (23.2%)	63 (76.8%)	Ref.	Ref.
Physical Activity	Poor	30 (20.3%)	118 (79.7%)	1.19 [0.62;2.27]	0.608
	Good	24 (25.5%)	70 (74.5%)	Ref.	Ref.
Foot-care	Poor	25 (18.4%)	111 (81.6%)	1.52 [0.81;2.87]	0.200
	Good	31 (27.4%)	82 (72.6%)	Ref.	Ref.
Smoking	Poor	18 (15.4%)	99 (84.6%)	2.08 [1.09;3.98]	0.027
	Good	1 (25.0%)	3 (75.0%)	Ref.	Ref.
Overall Self-care	Poor	48 (21.2%)	178 (78.8%)	1.24 [0.13;12.2]	0.819
	Fair SCP	23 (19.5%)	95 (80.5%)	Ref.	Ref.
	Good SCP	18 (31.0%)	95 (80.5%)	0.54 [0.26;1.10]	0.097
	Poor SCP	8 (14.8%)	46 (85.2%)	1.39 [0.58;3.35]	0.474

Note. n = Number of participants, % = Percentage of participants in each category, OR = Odds Ratio, 95% CI = 95% Confidence Interval, SCP= Self-Care Practices, SMBG= Self-monitoring of Blood Glucose.

4.9 Logistic Regression of Social Support and Glycemic Control

Among participants with good GC (HbA1c < 6.5%), 13 (13.8%) lacked financial support, while 36 (26.5%) received it. For those with poor GC (HbA1c ≥ 6.5%), 81 (86.2%) had no

support, and 100 (73.5%) did. Financial support was statistically significant, reducing the odds of poor GC by 55% (OR = 0.45; 95% CI: 0.22–0.90; p = 0.021).

Among those with good GC, 27 (21.1%) did not receive emotional support, whereas 22 (21.6%) did. Among those with poor GC, 101 (78.9%) did not receive emotional support, while 80 (78.4%) did. The odds ratio (OR = 0.97 [95% CI: 0.52;1.83]) and the p-value was (0.929) showing no statistically significant.

For practical support, 20.8% with good GC did not receive it, while 22.2% did; among poor GC, 79.2% lacked support and 77.8% received it. Practical support was not statistically significant (OR=0.92; 95% CI: 0.48–1.77; p=0.798).

For informational support, 20.1% with good GC did not receive it, 26.1% did; among poor GC, 79.9% lacked and 73.9% received it. Informational support showed no statistical significance (OR=0.71; 95% CI: 0.34–1.51; p=0.382).

For other support types, 21.7% with good GC did not receive it, 15.4% did; among poor GC, 78.3% lacked and 84.6% received it. Other forms of support showed no statistical significance (OR=1.52; 95% CI: 0.33–7.10; p=0.642), see Table 11.

Table 11: Logistic Regression of Social Support and Glycemic Control

Form of Support	HbA1c <6.5% (n=49)	HbA1c ≥6.5% (n=181)	OR [95% CI]	P-value
Financial Support				
No	13 (13.8%)	81 (86.2%)	Ref.	Ref.
Yes	36 (26.5%)	100 (73.5%)	0.45 [0.22;0.90]	0.021
Emotional Support				
No	27 (21.1%)	101 (78.9%)	Ref.	Ref.
Yes	22 (21.6%)	80 (78.4%)	0.97 [0.52;1.83]	0.929
Practical Support				
No	31 (20.8%)	118 (79.2%)	Ref.	Ref.
Yes	18 (22.2%)	63 (77.8%)	0.92 [0.48;1.77]	0.798
Informational Support				
No	37 (20.1%)	147 (79.9%)	Ref.	Ref.
Yes	12 (26.1%)	34 (73.9%)	0.71 [0.34;1.51]	0.382
Other Support				
No	47 (21.7%)	170 (78.3%)	Ref.	Ref.
Yes	2 (15.4%)	11 (84.6%)	1.52 [0.33;7.10]	0.642

Note. n = Number of participants; % = Percentage; HbA1c = Glycated hemoglobin; OR = Odds Ratio; 95% CI = 95% Confidence Interval.

4.10 Model of Factors Independently Associated with Glycemic Control

The independent effect of self-care practices and their association with GC was determined via multivariate logistic regression using the enter method where all the variables were introduced all at ones. This method allowed for the assessment of the adjusted effect of the different self-care practices, sociodemographic and clinical characteristics and social support on GC while controlling for the effect of the others. The multivariate logistic regression was developed using self-care practices and forms of social support that were

statistically significant (foot-care, dietary practices and financial support) at the univariate logistic regression level at ($p < 0.05$). Table 12 shows the result of the univariate and multivariate logistic regression.

Among the participants, 28.0% with good GC ($HbA1c < 6.5\%$) reported good dietary self-care, compared to 16.2% with poor dietary self-care. Those with poor dietary self-care had significantly higher odds of poor GC (OR = 2.02, 95% CI: 1.07–3.83, $p = 0.032$), which remained statistically significant after adjustment (AOR = 2.07, 95% CI: 1.08–4.03, $p = 0.030$).

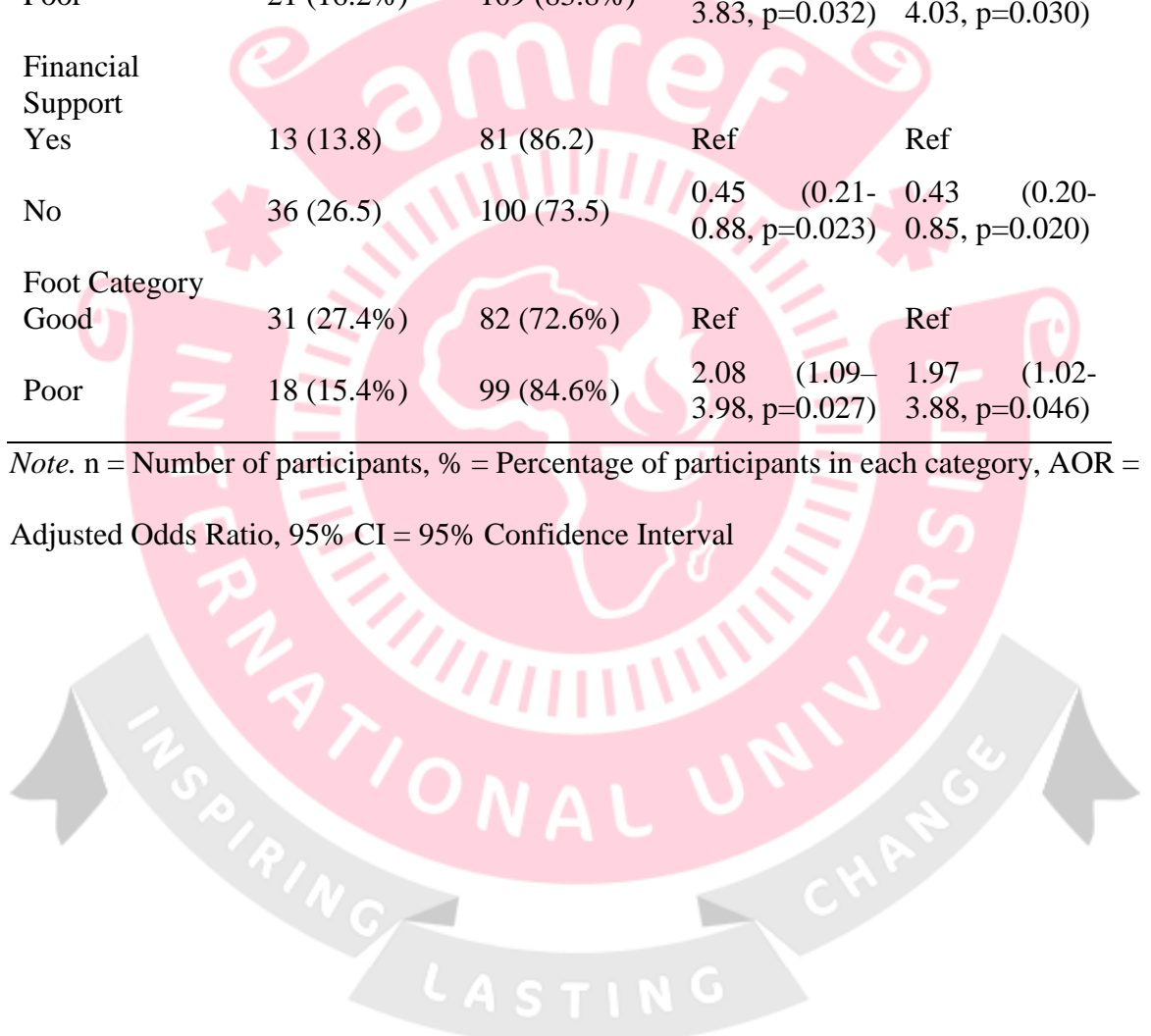
Regarding financial support, 13.8% of participants with good GC received support, while 26.5% without financial support achieved good GC. Lack of financial support was associated with reduced odds of poor GC (OR = 0.45, 95% CI: 0.21–0.88, $p = 0.023$) and remained statistically significant after adjustment (AOR = 0.43, 95% CI: 0.20–0.85, $p = 0.020$).

For foot care, 27.4% with good GC practiced good foot care compared to 15.4% with poor foot care. Poor foot care was associated with increased odds of poor GC (OR = 2.08, 95% CI: 1.09–3.98, $p = 0.027$), which was also statistically significant in the adjusted model (AOR = 1.97, 95% CI: 1.02–3.88, $p = 0.046$), see Table 12.

Table 12: Model of Factors Independently Associated with Glycemic Control

Self-care Domain	HbA1c < 6.5% (n=49)	HbA1c ≥ 6.5% (n=181)	OR (Univariate) [95% CI]	AOR (Multivariable) [95% CI]
Dietary Category				
Good	28 (28.0%)	72 (72.0%)	Ref	Ref
Poor	21 (16.2%)	109 (83.8%)	2.02 (1.07–3.83, p=0.032)	2.07 (1.08–4.03, p=0.030)
Financial Support				
Yes	13 (13.8)	81 (86.2)	Ref	Ref
No	36 (26.5)	100 (73.5)	0.45 (0.21–0.88, p=0.023)	0.43 (0.20–0.85, p=0.020)
Foot Category				
Good	31 (27.4%)	82 (72.6%)	Ref	Ref
Poor	18 (15.4%)	99 (84.6%)	2.08 (1.09–3.98, p=0.027)	1.97 (1.02–3.88, p=0.046)

Note. n = Number of participants, % = Percentage of participants in each category, AOR = Adjusted Odds Ratio, 95% CI = 95% Confidence Interval



CHAPTER 5: DISCUSSIONS

5.1 Introduction

This section covers findings from mixed method, cross-sectional study, which assessed the factors associated with glycemic control among people living with type 2 diabetes mellitus (T2DM) in Douala, Cameroon. This discussion involves the quantitative statistical analysis from the survey and the glycated hemoglobin (HbA1c) test and the qualitative insight from the focus group discussion (FGDs). This chapter highlights self-care practices, sociodemographic and clinical characteristics and social support, and their association with glycemic control (GC) through quantitative statistical data, coupled with the participant's experiences, which adds depth to the understanding of self-care practices, contributing towards refined understanding.

5.2 Glycemic Control was Generally Poor among Participants

This study revealed diverse levels of GC while demonstrating that numerous T2DM patients in this community demonstrated poor GC due to multiple challenges in diabetes management. This result of poor GC aligns with global findings of the International Diabetes Federation (IDF), which documented that more than 50% of diabetes patients do not reach glycemic targets (IDF Diabetes Atlas, 2025).

In the African region, research conducted in Nigeria by Jackson et al. (2021) and Ghana by Apini et al. (2018) illustrates that social status, educational attainment, and traditional customs prevent successful diabetes management. These results highlight ongoing diabetes

management barriers for persons with diabetes who struggle to achieve good GC while underscoring the need for specific interventions to enhance self-care practices.

This research also supports previous research by Sharon Negsang et al. (2023) and Chia-Garba et al. (2021) regarding high rates of suboptimal GC among T2DM patients in Cameroon. In this context, the underlying factors of poor glycemetic control are tied to limitations found in the system of health care, socioeconomic disadvantages, and individual challenges that limit patients to actively practice effective self-care behaviors.

5.3 The Association of Sociodemographic and Clinical Characteristics Glycemic Control

5.3.1 Association of Gender and Glycemic Control

Although, no gender difference was observed in GC in this study, the gender-based differences in self-care practices have always been reported in the previous research. In contrast, Abraham (2011) in Sweden pointed out that gender plays a major role in influencing self-care behavior of persons living with T2DM. To support this, Baroni et al. (2022) in Italy noted the tendency towards women following the eating recommendations more and men being physically active and determined by seasonality and cultural norms. Similarly, Mathew et al. (2012) in Canada observed that women preferred to use social support systems and practice dietary discipline whilst men were more inclined to technical issues on diabetes management including blood glucose testing and the use of medication.

Notwithstanding these findings, no gender difference in GC was evident in this study. It may be explained by the potential exposure to the same socioeconomic and cultural factors

in this urban environment that might help to diminish conventional differences in self-care behaviors between both genders.

5.3.2 Association of Age and Glycemic Control

In this study, getting older increases the risk of having poor glycemic control, although no statistically significant difference was detected in this study. In contrast, earlier reports, including that of Abraham (2011) in Sweden, have emphasized a positive association between age and self-care routine in patients with T2DM. Specifically, an example is the research by Baquedano et al. (2010) in Mexico, who found that older adults had better and more consistent self-care behaviors. Similar to this, Niba et al. (2023) in Cameroon found that persons who are aged 67 years and older, and those with a more extended diagnosis of diabetes, are significantly more responsive to following self-care routines.

Nevertheless, self-care may have age-related differences that are inconsistent. For example, De Oliveira et al. (2022) in Brazil demonstrated that although older adults usually possess high rates of medication adherence, their rates of physical activity considerably decrease, primarily because of mobility and health constraints. In line with this, Al-Azayzih et al. (2023) in Jordan identified that the elderly people secured adequate clinic visitation and medication compliance, yet physical activity remained significantly low, and was usually affected by long-standing comorbidities.

In spite of these results, the relationship between glycemic control and age was not significant in our study. It might possibly be because of overlapping variables in our population, for example, long standing diabetes, less physical activity or other age-related

complications that may have dulled down the effects of high medication, or dietary adherence alone.

5.3.3 Association of Income Level and Glycemic Control

The present study did not find a significant relationship between income level and glycemic control among the participants with type 2 diabetes. The finding differs with the opinion of Kumar et al. (2024) in Fiji, which demonstrated that individuals with higher income were over twice as likely to follow dietary recommendations and engage in physical activity than lower-income individuals. Equally, Dahal et al. (2024) and Semerci Çakmak et al. (2025) in Nepal and Turkiye respectively, found that financial limitation was one of the direct constraints to self-care practice, which resulted in poor glycemic outcomes among low-income communities.

Nevertheless, no significant association was found in our analysis, which may indicate the extent to which patients with T2DM in Douala economy are struggling to attain stable self-care and neutralize the impact of diabetes among all-income brackets.

5.3.4 Association of Education Level and Glycemic Control

Education level did not demonstrate the significant association with glycemic control in this study, but people having secondary education or higher had more chances to receive better glycemic results than those having primary education only. The finding is partly in line with other researches like Abraham (2011) in Sweden and Xu et al. (2010) among Chinese Americans who were able to determine that patients with better education have higher likelihood of regular self-care, exercising more, and less use of medications.

Similarly, Okafor et al. (2024) in Nigeria and Sayuti et al. (2024) in Indonesia documented the fact that structured diabetes education led to significant self-care improvement especially in the areas of nutrition and medication adherence. Also, Lamb et al. (2021), with the data of WHO SAGE, observed a strong association between higher education level and self-monitoring of diabetes and the effective use of medications in rural China.

Nevertheless, the relation between the educational level and glycemetic control was not statistically significant in our study. This might be because systemic issues in Douala health care system, even educated patients might not be able to access quality care, information or resources to enable them to consistently meet self-care goals.

5.3.5 Association of Marital Status and Glycemic Control

In this study, single participants reported the most positive GC, while married individuals, who are usually thought to get more help, were more likely to report low GC. Though these results were not statistically meaningful, they contradict typical thinking about the role of marriage in diabetes, since they do not agree with studies by Tang et al. (2008) among African Americans and Xu et al. (2010) among Chinese Americans. These studies found that getting married can increase social support which leads to patients taking care of themselves better and sticking more to their treatment. The global trend believes that support from a spouse improves managing chronic illnesses.

Still, this research finds that being married doesn't necessarily explain GC. Personal drive, what a person is dealing with or easy access to healthcare might matter more than a person's marital status.

5.3.6 Association of Body Mass Index and Glycemic Control

While participants with poor GC had a BMI which was higher than those with good GC, this difference was not statistically significant. The results here match those from Kamradt et al. (2014) in Germany, showing that obesity, combined with reduced exercise and poor diet, greatly increases type 2 diabetes risks. Thus, while statistical significance was not reached, the observed trend in BMI support the established understanding that excess body weight contributes to poor glycemic outcomes.

5.3.7 Association of Duration of Diabetes and Glycemic Control

The length of diabetes was also not significantly related to glycemic control, though patients with a diabetes history of five-year or longer showed poorer glycemic results. This result does not concur with multiple previous studies which proposed longer diabetes duration to be linked to better self-care practice. As an example, Abraham (2011) in Sweden pointed out that illness-flow behavior changes gradually to normalized and consistent self-care regimens with time among patients.

In a similar manner, Xu et al. (2010) discovered that the longer the duration of diabetes, the higher the medication adherence and frequent use of blood glucose monitoring. Nevertheless, a more detailed picture was given by van Puffelen et al. (2020) in Netherlands, stating that patients with more diabetes history were less physically active, but used the blood sugar surveillance more frequently. Similarly, Zhu et al. (2024) in Singapore found that a longer duration of diabetes, high levels of HbA1c, and an older age, negatively correlate with the frequency of follow-up care and participation in prevention.

The absence of statistical significance in our research could be a response to psychological fatigue, diminished motivation, and structural obstructions that patients in Douala undergo with time, despite these contrasting findings.

5.4 Association of Specific Self-Care Management Practices and Glycemic Control

5.4.1 Association of Dietary Self-Care and Glycemic Control

The study revealed a statistically meaningful relationship between dietary self-care and GC after controlling for foot care and financial support, with adherence to healthy diets over twice as likely of achieving optimal GC. This finding emphasizes the significance of dietary practices for the control of T2DM and complements the findings by Gao et al. (2013) in China, stating that dietary adherence plays a crucial role in influencing glycemic results. Also, according to CDC (2024), Diabetes Self-Management Education and Support (DSMES) standards, healthy eating is one of the seven self-care practices that are essential for good GC.

The findings from the FGDs demonstrating daily social and economic pressures that affect people's choice of food. Participants frequently identified the challenge of paying for diabetes-friendly foods and locating culturally appropriate substitutes for commonly consumed high-carb foods such as cassava. This data is parallel to the views presented by Wen et al. (2004) among Mexican Americans and Baumann et al. (2010) in Uganda who noted that there is a need for considerations of both local food systems and cultural food practices when it comes to engaging in proper dietary self-care. Participants spoke frankly about the significant emotional cost of feeling deprived, which they expressed in terms of

frustration and restriction, and made it clear that dietary guidelines that fail to take local circumstances into account are more likely to be experienced as a burden than as a benefit.

The study carried out by Aikens et al. (2005) in the United States is a further justification of the importance of family and community in influencing diet, the same way as participants utilize communal meals and shared food decisions. Statistical analysis reveals that dietary intake alone has an effect on the GC, although FGD narratives emphasize educational support and systemic support, affordability, and cultural adaption.

5.4.2 Association of Medication adherence and Glycemic Control

The results revealed an unexpected pattern in terms of patients' compliance to the prescribed medicines. Participants had the same medication adherence rate regardless if they had good or poor GC. This consistency means that systemic impediments not individual decisions are the predominant impediments to the use of appropriate medication in this context.

While international research carried out by CDC (2024) and Gao et al. (2013) identifies medication adherence as a key variable in managing T2DM, our study shows that affordability, complicated dosing, and medical literacy deficit were significant challenges. Data from the FGDs explains this bringing out that cost, confusion regarding when to take doses and daily fatigue among others had been the cause for not adhering to medications. Such findings imply that the problem is more than a lack of personal motivation, but a larger adaptive challenge.

In divergence to the results of Xu et al. (2010) among Chinese Americans who found greater adherence as disease duration increased, this study did not report this trend and

underscores the necessity for continued education and support for the patients. There was no significant relationship between medication adherence and glycemic control observed in this analysis, which could thus be a result of the dominance of these systemic and contextual factors, which discourage the effectiveness of the adherence to medication in isolation to achieve glycemic goals.

5.4.3 Association of Self-Monitoring of blood glucose and Glycemic Control

The research showed no statistically meaningful relationship amid the usage of SMBG and glycemic outcomes of the participants. This is in contrast to a great amount of research globally that emphasizes the critical role of frequent glucose monitoring on diabetes illness management, CDC, (2024), Gao et al. (2013) in China and Tengblad et al. (2007) in Sweden.

Xu et al. (2010) on Chinese Americans and Tengblad et al. (2007) in Sweden revealed a close relationship between frequent monitoring and better patient compliance, better medication regimens, and longer-term stable blood glucose levels. Limited access to SMBG tools is a recurrent challenge in the Cameroonian context, especially in middle-aged patients Chugbe Nathaneal et al. (2023), these findings resonates with the explanations given during the FGDs. The FGDs participants identified the key barriers to SMBG as the high cost and unavailability of test strips and not glucometers, thus interfering with self-monitoring for good GC.

Some participants in the FGDs demonstrated lack of understanding of glucose targets and the interpretation of the test results despite reporting daily monitoring. Others took initiative in changing their diet according to results from SMBG, while others appeared

unaware of what the ideal blood sugar values were. The discrepancy between what participants do and what they know could have contributed to the lack of statistically significant differences in glycemetic outcome for SMBG in this study.

Experience of emotional fatigue and disappointment made it more difficult for participants to continue being committed. Several participants reported ending their monitoring because they kept recording high readings of blood glucose, indicating how prolonged high values can weaken the motivation necessary for consistent monitoring. The discrepancy between findings might be accounted for by the difficulties of SMBG in resource-limited settings, as seen in both numerical outcomes and FGDs.

5.4.4 Association of Physical Activity with Glycemic Control

The participants who took part in physical activity regularly were more likely to control their blood sugar successfully, despite the change not reaching statistical significance. These results are supported globally by CDC (2024) guidelines that advocate for a minimum of 150 minutes of moderate-intensity exercise weekly that include walking, swimming and cycling which further display impact of exercise on regulation of glycemetic levels in the body. However, the lack of statistical significance in this research means that while physical activity is of great importance, its impact when isolated may not be sufficient in significantly altering glycemetic outcomes when other factors such as diet and foot care in the multivariate model also come into play.

The results of the research also resonate with the findings of Gao et al. (2013) in China which show that observing regular exercise routine has a positive effect on GC. While it is true that regular physical activity was related to more favorable glycemetic outcomes, the

lack of statistical significance also means that the interrelations of different self-care behaviors may lead to difficulties of managing diabetes.

Based on the qualitative findings, many participants understood the importance of physical activities in controlling diabetes but also explained significant barriers to achieving sustained engagement. Physical deterioration caused by age, coexisting health conditions, discomfort, a greater leaning towards walks and other less vigorous exercise than energy burning exercise were common barriers cited. This is in agreement with the report by Barrett et al. (2007) in Canada that mentions that, variation in economic conditions such as income and availability of leisure time are a major determinant of physical activity engagement. These discrepancies could limit the participation of some individuals in interventions that are most effective in managing their glycemic outcomes.

In addition, participants expressed their anxieties about the dangers of strenuous activity, having the concerns about receiving the complications of the heart or coping with the physical pain. This is consistent with the concerns raised by Amer et al. (2018) in their study carried out in Sudan where they identified that individuals, who feel more confident to deal with the diabetes, are more likely to practice regular self-care including physical activity. Doubts about whether one's body can cope with exercise riskily quite often undermines the willingness to take up physical activity. Furthermore, some participants complained of not only fatigue but also chronic pain, leading to the loss of faith in themselves, and their tendency to perceive regular exercise as a threat rather than an incentive, in contradiction to its well-known significance in glycemic control.

Thus, the absence of significant relationship between physical activity and glycemic control in the current study probably represents these multidimensional physical, psychological, and socioeconomic hindrances that blur the separation of the exercise effect on glycemic control.

5.4.5 Foot Care and Glycemic Control

Foot care and glycemic control were significantly related to this research. Individuals with good foot care had a better control of their blood sugar level as compared to individuals who did not, and the difference remained statistically significant even after controlling the other variables. This research indicates that foot-care prevents ulcers, infection and is significant in diabetes management.

The FGD participants reported symptoms that were in line with diabetic peripheral neuropathy such as numbness, numbness, and warmth or vibration in their feet. These lived experiences of neuropathic pain are significant signs of some underlying nerve damages, which when not addressed may result into severe conditions like ulcers and amputations. This resonates with global evidence by Matricciani and Jones, (2015) Australia, where they indicated that frequent foot examination and proper foot hygiene go a long way to prevent such risks. In addition, recent studies by Brask-Thomsen et al. (2025) emphasize the importance of prompt diagnosing and proper control of neuropathic pain to eliminate the development of the disease and increase the quality of life of patients. Also, Subrata et al. (2020) in Thailand, identified that foot ulcers significantly improved within three months of intervention, including self-management behaviors, family involvement, HbA1c levels, and ulcer healing.

A study conducted in Africa by Suglo et al. (2024) in Ghana revealed that educating the family members on diabetic foot care contributes the instilling value in the process of taking care of the patient.

According to Fomboh (2017) in studies done in Cameroon, it was shown that patients lack knowledge about proper foot care as they are not well educated by healthcare workers in addition to the economic hardship and illiteracy among the population.

5.4.6 Association of Smoking and Glycemic Control

This study showed no connection between smoking and GC, unlike studies by Kamradt et al. (2014) from Germany in their study which showed that smoking form the risk factors for T2DM and Campagna et al. (2019), who also talk about the risk of developing diabetes due to smoking. This study recorded low smoking rates among participants despite known links between smoking and diabetes development and complications. The small number of individuals who smoked may be the reason we found no connection because smoking habits depend on factors specific to communities.

5.4.7 Association between Overall Self-Care Practices and Glycemic Control

The findings of the study observed a positive trend associated with good overall self-care practices and improved GC, although not statistically significant. This trend is consistent with findings from Almomani and AL-Tawalbeh, (2022) in Northern Jordan and Gao et al. (2013) in China, where adherence to dietary guidelines, regular physical activity, and medication adherence was associated with better metabolic outcomes.

This study results are in line with global recommendations established by the Centers for Disease Control and Prevention (CDC, 2024), that present seven self-care behaviors

required for successful diabetes management based on healthy eating and physical activity with medication compliance and SMBG. Participants in this study who engaged in these practices were more prone to achieve good GC, reinforcing the applicability of the CDC's framework even in lower-resource settings.

Meanwhile, in this current research, there are also significant context-specific barriers that the CDC framework does not explicitly consider; for instance, the main challenges to adherence were financial barriers, limited access to medications and glucose monitoring supplies, and culturally rooted dietary practices. Numerous participants could not keep to medication schedules, not because of a lack of knowledge but because of economic distress. Cultural food preferences also often went against prescribed dietary plans, complicating their self-care endeavors. These findings highlight the importance of adapting these global guidelines by the CDC to reflect social, cultural, and economic aspects of resource-limited populations, as in this study.

Similar challenges are seen in Sub-Saharan Africa. The research carried out in Ethiopia by Abebe et al. (2022) and Jackson et al. (2021) in Nigeria detected self-care awareness and economic struggles that inhibit execution. According to Chugbe Nathaneal et al. (2023) in Cameroon's South West region, non-dietary practices combined with SMBG non-compliance proved to be the main reasons for poor diabetes control yet again validating the current findings from Douala.

5.5 Association of Social Support and Glycemic Control

Among the types of social support studied, only financial support established a significant relationship with glycemic control whereas other types of social support did not. The

evidence presented in this finding aligns with the recent evidence, including the research conducted by Kumar et al. (2024) in Fiji, showing that people who had higher earnings were more likely to act in accordance with dietary guidelines and regularly perform physical activity than people with lower incomes. Similarly, Semerci Çakmak et al. (2025) in Türkiye, recorded that low-income patients also experienced difficulties buying healthy food, glucometers, and getting regular medical check-ups that accumulatively led to higher levels of HbA1c. Consistent with that, Dahal et al. (2024) in Nepal, showed that in low-asset communities, healthcare costs directly affected important self-care processes, including blood glucose testing, taking medications, foot, and physical exercise.

Although financial support was shown to be significant, other types of support did not statistically correlate with glycemic control in the study. This can be due to the fact that financial ability directly facilitates the provision of material resources needed to maintain diabetes and that emotional, informational, and practical support impact may be more indirect or long-lasting and not reflected immediately in the glycosylated levels.

The FGD on the other hand suggested an indirect influence. People reported feeling social indifference, mental stress and relationship problems that are likely to interfere with continued self-care practices although not directly interfering with blood sugar management. The difference between the quantitative and qualitative findings suggests that the emotional and psychological aspects of support may not show up in the measures of single-time glycemic readings, but they may actually play considerable roles in implicating patterns of behavior overtime.

In addition, although improved metabolic control was reported in patients belonging to socially cohesive groups by Oftedal et al. (2010) in Norway, the current study did not support this pattern as overall social support was not significantly associated to glycemic control. These differences may result from cultural or situational differences like the fact that an individual might claim to have close social networks, but in real, they may not receive much support. The descriptions of experiences by the participants suggest that social connections exist but sometimes are not translated into effective support, hence the need for the distinction of perceived, potential and actual support in diabetes care studies.



CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In this chapter, the key findings are summarized, followed by practical recommendations. The current study sought to assess the factors associated with glycemic control (GC) among people living with type 2 diabetes mellitus (T2DM) in Douala, Cameroon. The mixed-methods approach of this study combined a quantitative survey including glycated hemoglobin test and qualitative insights-focus group discussions (FGDs). This study explored the association of self-care practices, sociodemographic and clinical characteristics, and social support with glycemic control. The study results present the difficulties of diabetes management in insufficient resource areas while showing critical target areas for improvement.

6.2 Conclusion

6.2.1 Glycemic Control Remains Poor

Majority of the participants (79%) demonstrated poor glycemic control based on their glycated hemoglobin (HbA1c) results ($HbA1c < 6.5\%$). Although some improved their control, a significant proportion were unable to reach optimal blood glucose markers, which places them at risk for long-term health complications. The current situation demands improved personalized diabetes management approaches that aim to break down barriers that prevent proper GC in this affected community.

6.2.2 Sociodemographic and Clinical Characteristics were not associated with Glycemic Control

In this study, there were no statistically significant relationships between glycemic control and sociodemographic characteristics and clinical characteristics as assessed, such as gender, age, income, educational level, marital status, BMI, and diabetes duration. Although trends were in favor of higher education, longer diabetes duration, and younger age being associated with better glycemic outcomes, they were not strong to achieve significance.

6.2.3 The Role of Self-Care Practices in Glycemic Control

Dietary Practice was Significantly Associated with Glycemic Control

Among the self-care practices, dietary practices emerged as one of the predictor of glycemic control. Patients with type 2 diabetes who followed unhealthy dietary habits were nearly twice as likely to experience poor glycemic control matched up to those with good dietary practices (AOR=2.07; $p = 0.030$), this proves the value of nutritional education and assistance. However, FGDs pointed out that these nutritional behaviors were frequently undermined by culturally preferred foods, mental stress, and high prices of proposed foods. Therefore, successful dietary self-care interventions are needed to address cultural barriers and ensure food is affordable.

Foot Care was Significantly Associated with Glycemic Control

The analysis indicated that foot care plays a significant role in determining glycemic control. Participants' who had poor foot care were almost twice as likely to have poor glycemic control than those who practiced good foot care (AOR = 1.97; $p = 0.046$). As a

result, foot care is shown to be essential for managing diabetes. The qualitative results from FGDs found that women and older people are much more concerned about fear of getting hurt and feeling discomfort when trying to exercise. Foot care knowledge was lacking among participants and some of them reported symptoms of peripheral neuropathy that limited their ability to look after themselves. Such situations call for T2DM patients to be taught about proper foot care and for regular community screening to take place. Early detection and better education for feet may benefit people who have diabetes.

Medication Adherence was Generally Poor

The research revealed troubling poor medication compliance problems affecting every participant in the study. This demand coordinated approaches from patient and medical institutions to address this critical challenge in achieving improved glycemic control by carrying out reinforced medication adherence support system.

Self-Monitoring of Blood Glucose was not Routinely Practiced

SMBG and glycemic outcomes did not exhibit a significant association in this study ($p = 0.608$). From the findings by FGDs, most respondents faced obstacles largely due to scarcity of test strips and inadequate knowledge in result interpretation, and not a major challenge in accessing glucometers. Some persons decided to end the monitoring as they had high glucose levels constantly stating that, they felt a lot of emotional exhaustion, and lost the motivation to proceed with testing. Such an issue shows the need for educational programs to take care of technical and psychological aspects of patients.

Good Overall Self-care Practices showed Promising Association with Improved Glycemic Control

Although there was a trend indicating improvement of the glycemic outcomes as evidenced by an overall self-care practice, this a relationship was not statistically significant ($p = 0.097$). This reinforces the seven key self-care behaviors established by CDC in harmonizing diabetes management across the globe. However, the research shows that the global recommendations would have to be altered to meet different challenges of the local community of Douala, including affordability, health education and eating culturally established habits. Physical activity and smoking showed no significant relationship with glycemic control.

6.2.4 Financial Support was Significantly Associated with Glycemic Control

From the different social supports researched, financial support was found to strongly predict GC. Among the participants, financial support made a significant difference, with those lacking support more than twice as likely to experience poor GC compared to those with support (AOR = 0.43; $p = 0.020$). This means that being financially stable is key for allowing people with T2DM to manage their health on their own. FGDs found that financial difficulties made it difficult for participants to stick to a healthy diet, purchase necessary drugs and keep a regular eye on their blood glucose. Although emotional and social support played no direct role, they were noticed to improve self-care by motivating and encouraging patients to follow their plans. The results show that providing subsidies, free test kits and affordable food can help reduce the difficulties faced by those with diabetes.

6.3 Implications of the Findings

This study highlights various practical points that healthcare professionals, policymakers and community organizations can use in supporting diabetes care.

6.3.1 Urgent Need to Address Poor Glycemic Outcome

Due to the high rate of poor glycemic control in this study, it is imperative to implement the policy interventions to fix the social determinants of health concerning the cost of accessing the medication, healthy food, and monitoring supplies to support and facilitate better glycemic outcomes.

6.3.2 Behavior Focused Strategies over Demographic Predictors

Individual factors such as age, level of education, income, and the duration of diabetes were not statistically significant in their prediction of glycemic control, this could mean that these markers are only mediated through complicated behavioral and environmental mechanisms rather than on their own. Thus, enhanced coordination of care and contextual education could assist patients to go through the Transtheoretical Model: contemplation to action and maintenance stages in the process of changing their behaviors.

6.3.3 Targeted Support Needed for Dietary and Foot Care Practices

Results reaffirm that self-care practices in particular diet and foot care are mandatory to glycemic control. They are, however, undermined by systemic barriers due to cultural food preferences and the inability to adhere due to costs. Individualized support and education should be implemented to increase sustenance of these practices by patients.

6.3.4 Community Support as Vital Booster

Statistically, general social support was not significant; however, in the qualitative analysis, community-based health promotion and peer support have been found to be significant in supporting self-care maintenance. These support systems are motivational and resilient in patients, though they may not be directly connected to the short-term glycemic outcomes.

6.3.5 Theoretical Implications

The study results support the Transtheoretical Model (TTM) of the behavior change framework composed of precontemplation, Contemplation, Preparation, Action, and Maintenance stages. Various participants demonstrated precontemplation stage traits which resulted in their limited comprehension of diabetes self-care management practices and their outcomes on GC since they struggled with dietary choices, medication compliance, and SMBG procedures. Individuals who recognized the importance of developing new behaviors continued to stay within the Contemplation stage. However, financial constraints, cultural norms, and societal factors prevented them from advancing to the next stage. Some participants were willing to change their behaviors by aligning with the Preparation stage while participating in self-care practices with sufficient social support and educational services about health. People who followed healthcare recommendation for self-care practices were at the Action stage but monetary limits for healthy eating and test strip expenses alongside stress levels became external barriers against ongoing self-care commitment. Several study participants incorporated self-care practices into their daily routine, demonstrating that their personal motivation and social relations enabled them to move forward to the Maintenance stage. Financial challenges, stress, and

healthcare service barriers frequently prompt patients to relapse, as also seen in the FGDs demonstrating the need for ongoing support. Through the TTM framework we understand what factors prevent some individuals from keeping self-care practices. The research indicates that certain participants show improved self-care advancement, yet environmental factors, including restricted access to budget-friendly nutritious foods, financial constraint, difficulties with caring for their feet and expensive testing supplies, as the FGDs revealed, lead other participants to maintain earlier stages of behavior. According to this finding, medical providers should adopt individualized adherence strategies based on patient preparedness levels.

6.4 Recommendations

6.4.1 Policy Recommendations

Subsidization of Diabetes Medications, Monitoring Devices and Nutritional Foods

Considering the importance of financial aid in glycemic control, the government is encouraged to introduce national or regional subsidies specific to diabetes medicines, glucose-monitoring materials, and diabetes-compatible foods, especially among the economically marginalized groups in Douala. The elimination of cost barriers will improve the compliance of patients with treatment and eating plans.

Government can carry out culturally sensitive campaign through schools, churches, markets and radio to ensure that people are aware of diabetes, how to eat, take care of their feet and monitor their glucose.

6.4.2 Healthcare Professionals

The healthcare professionals are invited to be proactive in assisting the patients to better manage their self-care provisions by; making regular follow ups appointments aimed at educating the patients on self-medication processes, conducting thorough foot care orientations to enable the patients to correctly identify and manage diabetic neuropathies and the associated effects, offering culturally specific nutritional counseling which is sensitive to the local food traditions but addresses the financial limitations of the patients, and facilitating the participation of the patients on the diabetes support networks that will provide financial assistance on medication, monitoring appliances, and nutritive foods.

6.4.3 Community Support Organizations

Community based organizations are invited to collaborate with healthcare providers and government bodies to; create culturally-appropriate programs and strategies around having a healthy diet and foot-care and promote and execute financial support programs that can be used to subsidize diabetic drugs, inexpensive glucose monitoring materials and diabetes-friendly foods.

6.4.4 Research Recommendations

Longitudinal Studies on Self-care Practices

Research involving cohort studies incorporating assessments of T2DM self-care practice consequences on patient health outcomes to understand their combined effects on extended glycemic control fully.

REFERENCES

- Abebe, A., Wobie, Y., Kebede, B., Wale, A., Destaw, A., & Ambaye, A. S. (2022). Self-care practice and glycemic control among type 2 diabetes patients on follow up in a developing country: A prospective observational study. *Journal of Diabetes & Metabolic Disorders*, 21(1), 455–461. <https://doi.org/10.1007/s40200-022-00995-4>
- Abraham, M. (2011). *Self-care in type 2 diabetes: A systematic literature review on factors contributing to self-care among type 2 diabetes mellitus patients* [Bachelor's thesis, Linnaeus University]. DiVA Portal. <https://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-17705>
- Afaya, R. A., Bam, V., Lomotey, A. Y., & Afaya, A. (2023). Clinical factors influencing knowledge and self-care practice among adults with type 2 diabetes mellitus. *Nursing Open*, 10(4), 2492–2500. <https://doi.org/10.1002/nop2.1506>
- Ahmad, F., & Joshi, S. H. (2023). Self-care practices and their role in the control of diabetes: A Narrative Review. *Cureus*, 15(7), Article e41409. <https://doi.org/10.7759/cureus.41409>
- Aikens, J. E., Bingham, R., & Piette, J. D. (2005). Patient-provider communication and self-care behavior among type 2 diabetes patients. *The Diabetes Educator*, 31(5), 681–690. <https://doi.org/10.1177/0145721705280829>
- Al-Azayzih, A., Kanaan, R., Altawalbeh, S., Al-Qerem, W., & Smadi, S. (2023). Medication adherence and its associated determinants in older adults with type 2

diabetes and cardiovascular comorbidities. *Patient Preference and Adherence*, *17*, 3107–3118. <https://doi.org/10.2147/PPA.S437013>

Almomani, M. H., & AL-Tawalbeh, S. (2022). Glycemic control and its relationship with diabetes self-care behaviors among patients with type 2 diabetes in Northern Jordan: A cross-sectional study. *Patient Preference and Adherence*, *16*, 449–465. <https://doi.org/10.2147/PPA.S343214>

Almutairi, N., Hosseinzadeh, H., & Gopaldasani, V. (2020). The effectiveness of patient activation intervention on type 2 diabetes mellitus glycemic control and self-management behaviors: A systematic review of RCTs. *Primary Care Diabetes*, *14*(1), 1-10. <https://doi.org/10.1016/j.pcd.2019.08.009>

Amer, F. A., Mohamed, M. S., Elbur, A. I., Abdelaziz, S. I., & Elrayah, Z. A. (2018). Influence of self-efficacy management on adherence to self-care activities and treatment outcome among diabetes mellitus type 2 Sudanese patients. *Pharmacy Practice*, *16*(4), Article 1274. <https://doi.org/10.18549/PharmPract.2018.04.1274>

American Diabetes Association. (2016). Standards of medical care in diabetes—2016 abridged for primary care providers. *Clinical Diabetes*, *34*(1), 3–21. <https://doi.org/10.2337/diaclin.34.1.3>

American Diabetes Association. (2018). Classification and diagnosis of diabetes: Standards of medical care in diabetes—2018. *Diabetes Care*, *41*(Supplement_1), S13–S27. <https://doi.org/10.2337/dc18-S002>

- American Diabetes Association. (2020). Facilitating behavior change and well-being to improve health outcomes: Standards of medical care in diabetes—2020. *Diabetes Care*, 43(Supplement_1), S48–S65. <https://doi.org/10.2337/dc20-S005>
- American Diabetes Association Professional Practice Committee. (2023). Introduction and methodology: Standards of care in diabetes—2024. *Diabetes Care*, 47(Supplement_1), S1–S4. <https://doi.org/10.2337/dc24-SINT>
- Apini, R., Annan, R., Apprey, C., & Asamoah-Boakyé, O. (2018). Predictors of glycaemic control among Ghanaian type 2 diabetic patients using diabetes self-management approach. *International Journal of Biochemistry Research & Review*, 23(2), 1–18. <https://doi.org/10.9734/IJBCRR/2018/42976>
- Arya, P. (2023). Risk Factors of Diabetes. *Journal of Diabetes Medication & Care*, 6(3), 61–66. [https://doi.org/10.37532/jdmc.2023.6\(3\).61-66](https://doi.org/10.37532/jdmc.2023.6(3).61-66)
- Assah, F. K., Atanga, E. N., Enoru, S., Sobngwi, E., & Mbanya, J. C. (2015). Community-based peer support significantly improves metabolic control in people with Type 2 diabetes in Yaoundé, Cameroon. *Diabetic Medicine*, 32(7), 886–889. <https://doi.org/10.1111/dme.12720>
- Association of Diabetes Care and Education Specialists, & Kolb, L. (2021). An effective model of diabetes care and education: The ADCES7 self-care behaviors™. *The Science of Diabetes Self-Management and Care*, 47(1), 30–53. <https://doi.org/10.1177/0145721720978154>

- Azzam, M. M., Ibrahim, A. A., & Abd El-Ghany, M. I. (2021). Factors affecting glycemic control among Egyptian people with diabetes attending primary health care facilities in Mansoura District. *The Egyptian Journal of Internal Medicine*, 33(1), 33. <https://doi.org/10.1186/s43162-021-00065-w>
- Baquedano, I. R., Santos, M. A. D., Martins, T. A., & Zanetti, M. L. (2010). Self-care of patients with diabetes mellitus cared for at an emergency service in Mexico. *Revista Latino-Americana de Enfermagem*, 18(6), 1195–1202. <https://doi.org/10.1590/S0104-11692010000600021>
- Baroni, I., Caruso, R., Dellafiore, F., Ausili, D., Barello, S., Vangone, I., Russo, S., Magon, A., Conte, G., Guardamagna, L., & Arrigoni, C. (2022). Self-care and type 2 diabetes mellitus (T2DM): A literature review in sex-related differences. *Acta Biomedica Atenei Parmensis*, 93(4), e2022277. <https://doi.org/10.23750/abm.v93i4.13324>
- Barrett, J. E., Plotnikoff, R. C., Courneya, K. S., & Raine, K. D. (2007). Physical activity and type 2 diabetes. *The Diabetes Educator*, 33(1), 128–143. <https://doi.org/10.1177/0145721706297453>
- Baumann, L. C., Kenneth Opio, C., Otim, M., Olson, L., & Ellison, S. (2010). Self-care beliefs and behaviors in Ugandan adults with type 2 diabetes. *The Diabetes Educator*, 36(2), 293–300. <https://doi.org/10.1177/0145721709358460>
- Bigna, J. J., Nansseu, J. R., Katte, J.-C., & Noubiap, J. J. (2018). Prevalence of prediabetes and diabetes mellitus among adults residing in Cameroon: A systematic review and

meta-analysis. *Diabetes Research and Clinical Practice*, 137, 109–118.
<https://doi.org/10.1016/j.diabres.2017.12.005>

Bin Rakhis, S. A., AlDuwayhis, N. M., Aleid, N., AlBarrak, A. N., & Aloraini, A. A. (2022). Glycemic control for type 2 diabetes mellitus patients: A systematic review. *Cureus*, 14(11), e26180. <https://doi.org/10.7759/cureus.26180>

Brask-Thomsen, P. K., Itani, M., Karlsson, P., Kristensen, A. G., Krøigård, T., Jensen, T. S., Tankisi, H., Sindrup, S. H., Finnerup, N. B., & Gylfadottir, S. S. (2025). Neuropathic pain in diabetic polyneuropathy: A 5-year prospective study. *Pain*. Advance online publication. <https://doi.org/10.1097/j.pain.0000000000003649>

Brutsaert, E. F. (2023). *Diabetes Mellitus (DM)—Hormonal and metabolic disorders*. MSD Manual Consumer Version. <https://www.msdmanuals.com/home/hormonal-and-metabolic-disorders/diabetes-mellitus-dm-and-disorders-of-blood-sugar-metabolism/diabetes-mellitus-dm>

Campagna, D., Alamo, A., Di Pino, A., Russo, C., Calogero, A. E., Purrello, F., & Polosa, R. (2019). Smoking and diabetes: Dangerous liaisons and confusing relationships. *Diabetology & Metabolic Syndrome*, 11, Article 85. <https://doi.org/10.1186/s13098-019-0482-2>

Centers for Disease Control and Prevention (CDC). (2024, May 21). *Background and benefits of DSMES*. Diabetes Self-Management Education and Support (DSMES) Toolkit. <https://www.cdc.gov/diabetes-toolkit/php/about-dsmes/background-dsmes.html>

Centers for Disease Control and Prevention (CDC). (2024, June 4). *Diabetes risk factors*.
<https://www.cdc.gov/diabetes/risk-factors/index.html>

Chali, S. W., Salih, M. H., & Abate, A. T. (2018). Self-care practice and associated factors among diabetes mellitus patients on follow up in Benishangul Gumuz Regional State public hospitals, western Ethiopia: A cross-sectional study. *BMC Research Notes*, *11*(1), 833. <https://doi.org/10.1186/s13104-018-3939-8>

Chen, S.-M., & Wu, C.-J. (2023). Investigating the effects of digital foot self-management program on enhancing self-efficacy and self-care behavior among community-dwelling older adults with type 2 diabetes: A randomized controlled trial. *Digital Health*, *9*, 20552076231220791. <https://doi.org/10.1177/20552076231220791>

Chia-Garba, M., Ajonina, M. U., Etengeneng, A. E., & Padeline, M. (2021). Self-care practices and complications among type 2 diabetic patients in Bamenda Health District, Northwest Region of Cameroon. *American Scientific Research Journal for Engineering, Technology, and Sciences*, *80*(1), 107–117. https://asrjetsjournal.org/index.php/American_Scientific_Journal/article/view/6918

Chugbe Nathaneal, S., Ojong, E. W., & Moses Ngemenya, N. (2023). Glycemic control and its determinants among type 2 diabetes mellitus patients at the Limbe Regional Hospital, Limbe, Southwestern Cameroon. *Qeios*.
<https://doi.org/10.32388/X0I9MV>

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

- Cramer, J. A., Roy, A., Burrell, A., Fairchild, C. J., Fuldeore, M. J., Ollendorf, D. A., & Wong, P. K. (2008). Medication compliance and persistence: Terminology and definitions. *Value in Health, 11*(1), 44–47. <https://doi.org/10.1111/j.1524-4733.2007.00213.x>
- Dahal, P. K., Rawal, L., Ademi, Z., Mahumud, R. A., Paudel, G., & Vandelanotte, C. (2024). Distribution and determinants of healthcare costs for self-care behaviours among patients with type 2 diabetes across low-resource communities in Nepal. *Discover Health Systems, 3*(1), 55. <https://doi.org/10.1007/s44250-024-00117-2>
- De Oliveira, R. E. M., Ueta, J. M., & Franco, L. J. (2022). Variables associated with adherence to the treatment of type 2 diabetes mellitus among elderly people. *Diabetology International, 13*(1), 160–168. <https://doi.org/10.1007/s13340-021-00518-1>
- El-Radad, H. M., Sayed Ahmed, H. A., & Eldahshan, N. A. (2023). The relationship between self-care activities, social support, and glycemic control in primary healthcare patients with type 2 diabetes. *Diabetology International, 14*(1), 65–75. <https://doi.org/10.1007/s13340-022-00598-7>
- ElSayed, N. A., Aleppo, G., Aroda, V. R., Bannuru, R. R., Brown, F. M., Bruemmer, D., Collins, B. S., Hilliard, M. E., Isaacs, D., Johnson, E. L., Kahan, S., Khunti, K., Leon, J., Lyons, S. K., Perry, M. L., Prahalad, P., Pratley, R. E., Seley, J. J., Stanton, R. C., ... on behalf of the American Diabetes Association. (2022). 6. Glycemic targets: Standards of care in diabetes—2023. *Diabetes Care, 46*(Suppl.1), S97–S110. <https://doi.org/10.2337/dc23-S006>

- Eva, J. J., Kassab, Y. W., Neoh, C. F., Ming, L. C., Wong, Y. Y., Abdul Hameed, M., Hong, Y. H., & Sarker, M. M. R. (2018). Self-care and self-management among adolescent T2DM patients: A review. *Frontiers in Endocrinology*, *9*, 489. <https://doi.org/10.3389/fendo.2018.00489>
- Fomboh, R. N. (2017). Knowledge and practice on diabetic foot prevention and self-care by patients at the Bamenda Regional Hospital, Cameroon. *Journal of Public Health in Developing Countries*, *3*(2), 426–431. https://www.researchgate.net/publication/319311760_Knowledge_and_Practice_on_Diabetic_Foot_Prevention_and_Self-care_by_Patients_at_the_Bamenda_Regional_Hospital_Cameroon
- Gao, J., Wang, J., Zheng, P., Haardörfer, R., Kegler, M. C., Zhu, Y., & Fu, H. (2013). Effects of self-care, self-efficacy, social support on glycemic control in adults with type 2 diabetes. *BMC Family Practice*, *14*(1), 66. <https://doi.org/10.1186/1471-2296-14-66>
- Goyal, R., Singhal, M., & Jialal, I. (2025). *Type 2 diabetes*. In StatPearls. StatPearls Publishing. <http://www.ncbi.nlm.nih.gov/books/NBK513253/>
- Gurmu, Y., Gela, D., & Aga, F. (2018). Factors associated with self-care practice among adult diabetes patients in West Shoa Zone, Oromia Regional State, Ethiopia. *BMC Health Services Research*, *18*(1), 732. <https://doi.org/10.1186/s12913-018-3448-4>

- Hasan, A. A., Ismail, A., & Noor, H. (2024). The influence of social support on self-care behavior among T2DM patients. *SAGE Open Nursing, 10*, 23779608231219137. <https://doi.org/10.1177/23779608231219137>
- Hellebo, A., Kengne, A. P., Obse, A., Levitt, N., Myers, B., Cleary, S., & Alaba, O. (2024). Social determinants of health and diabetes self-care management in South Africa. *BMC Public Health, 24*(1), Article 20200. <https://doi.org/10.1186/s12889-024-20200-w>
- International Diabetes Federation (IDF). (2025). *IDF diabetes atlas 2025*. <https://diabetesatlas.org/resources/idf-diabetes-atlas-2025/>
- Institute for Health Metrics and Evaluation. (2024). *GBD compare*. <https://www.healthdata.org/data-tools-practices/interactive-visuals/gbd-compare>
- Institute for Health Metrics and Evaluation. (2024). *GBD foresight visualization*. <https://www.healthdata.org/data-tools-practices/interactive-visuals/gbd-foresight-visualization>
- Jackson, I. L., Onung, S. I., & Oiwoh, E. P. (2021). Self-care activities, glycaemic control and health-related quality of life of patients with type 2 diabetes in a tertiary hospital in Nigeria. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 15*(1), 137–143. <https://doi.org/10.1016/j.dsx.2020.12.027>
- Kamradt, M., Bozorgmehr, K., Krisam, J., Freund, T., Kiel, M., Qreini, M., Flum, E., Berger, S., Besier, W., Szecsenyi, J., & Ose, D. (2014). Assessing self-management in patients with diabetes mellitus type 2 in Germany: Validation of a German

version of the Summary of Diabetes Self-Care Activities measure (SDSCA-G). *Health and Quality of Life Outcomes*, 12(1), 185. <https://doi.org/10.1186/s12955-014-0185-1>

King, D. K., Glasgow, R. E., Toobert, D. J., Strycker, L. A., Estabrooks, P. A., Osuna, D., & Faber, A. J. (2010). Self-efficacy, problem solving, and social-environmental support are associated with diabetes self-management behaviors. *Diabetes Care*, 33(4), 751–753. <https://doi.org/10.2337/dc09-1746>

Kumar, R., Mohammadnezhad, M., & Khan, S. (2024). Perception of Type 2 Diabetes mellitus (T2DM) patients on diabetes self-care management in Fiji. *PLOS ONE*, 19(5), e0304708. <https://doi.org/10.1371/journal.pone.0304708>

Lamb, K. E., Crawford, D., Thornton, L. E., Shariful Islam, S. M., Maddison, R., & Ball, K. (2021). Educational differences in diabetes and diabetes self-management behaviours in WHO SAGE countries. *BMC Public Health*, 21(1), 2108. <https://doi.org/10.1186/s12889-021-12131-7>

Mathew, R., Gucciardi, E., De Melo, M., & Barata, P. (2012). Self-management experiences among men and women with type 2 diabetes mellitus: A qualitative analysis. *BMC Family Practice*, 13(1), 122. <https://doi.org/10.1186/1471-2296-13-122>

Matricciani, L., & Jones, S. (2015). Who Cares About Foot Care? Barriers and enablers of foot self-care practices among non-institutionalized older adults diagnosed with

diabetes: An integrative review. *The Diabetes Educator*, 41(1), 106–117.
<https://doi.org/10.1177/0145721714560441>

Mbanya, J. C. N., Motala, A. A., Sobngwi, E., Assah, F. K., & Enoru, S. T. (2010). Diabetes in sub-Saharan Africa. *The Lancet*, 375(9733), 2254–2266.
[https://doi.org/10.1016/S0140-6736\(10\)60550-8](https://doi.org/10.1016/S0140-6736(10)60550-8)

Miezah, D., Amoadu, M., Opoku, P. N., Junior, E. M., Zutah, J., Obeng, P., & Sarfo, J. O. (2024). Transtheoretical-based model of intervention for diabetes and prediabetes: A scoping review. *Journal of Diabetes Research*, 2024, 2935795.
<https://doi.org/10.1155/2024/2935795>

Modarresi, M., Gholami, S., Habibi, P., & Ghadiri-Anari, A. (2020). Relationship between self-care management with glycemic control in type 2 diabetic patients. *International Journal of Preventive Medicine*, 11, 127.
https://doi.org/10.4103/ijpvm.IJPVM_207_19

Mulcahy, K., Maryniuk, M., Peebles, M., Peyrot, M., Tomky, D., Weaver, T., & Yarborough, P. (2003). Diabetes self-management education core outcomes measures. *The Diabetes Educator*, 29(5), 768–803.
<https://doi.org/10.1177/014572170302900509>

Nansseu, J. R., Petnga, S.-J. N., Atangana, C. P., Ossa, A. S., Sangong, S. N. N., Ebendeng, P., & Noubiap, J. J. (2019). The general public's knowledge of diabetes mellitus: A cross-sectional study in Cameroon. *Primary Care Diabetes*, 13(2), 97–105.
<https://doi.org/10.1016/j.pcd.2018.10.003>

- Niba, L. L., Lytisia, A., & Navti, L. (2023). Adherence to diabetes self-care behaviours and associated factors amongst adults with type 2 diabetes in an urban setting in Cameroon. *International Journal of Research*, 10(9), 25-47
<https://doi.org/10.5281/zenodo.8311460>
- Nöthlings, U., Ford, E. S., Kröger, J., & Boeing, H. (2010). Lifestyle factors and mortality among adults with diabetes: Findings from the European Prospective Investigation into Cancer and Nutrition–Potsdam study. *Journal of Diabetes*, 2(2), 112–117.
<https://doi.org/10.1111/j.1753-0407.2010.00069.x>
- Oftedal, B., Karlsen, B., & Bru, E. (2010). Life values and self-regulation behaviours among adults with type 2 diabetes. *Journal of Clinical Nursing*, 19(17–18), 2548–2556. <https://doi.org/10.1111/j.1365-2702.2010.03243.x>
- Okafor, C. N., Okonkwo, U. P., Ani, K. U., Onuora, E. O., Nwokike, M., Byabagambi, J. T., JohnBosco, M. T., Mfitumukiza, V., Nwankwo, M. C., & Tumusiime, A. (2024). Self-care practices and the associated socio-demographic variables of persons with type 2 diabetes mellitus (T2DM) in Southeast, Nigeria. *Nutrition and Metabolic Insights*, 17, 11786388241233534.
<https://doi.org/10.1177/11786388241233534>
- Paterson, B., & Thorne, S. (2000). Developmental evolution of expertise in diabetes self-management. *Clinical Nursing Research*, 9(4), 402–419.
<https://doi.org/10.1177/10547730022158663>

- Paulsamy, P., Ashraf, R., Alshahrani, S. H., Periannan, K., Qureshi, A. A., Venkatesan, K., Manoharan, V., Govindasamy, N., Prabakar, K., Arumugam, T., Venkatesan, K., Chidambaram, K., Kandasamy, G., Vasudevan, R., & Krishnaraju, K. (2021b). Social support, self-care behaviour and self-efficacy in patients with type 2 diabetes during the COVID-19 pandemic: A cross-sectional study. *Healthcare*, 9(11), Article 1607. <https://doi.org/10.3390/healthcare9111607>
- Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Fischl, A. H., Maryniuk, M. D., Siminerio, L., & Vivian, E. (2017). Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *The Diabetes Educator*, 43(1), 40–53. <https://doi.org/10.1177/0145721716689694>
- Powers, M. A., Bardsley, J. K., Cypress, M., Funnell, M. M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E. D., Maryniuk, M. D., Norton, A., Rinker, J., Siminerio, L. M., & Uelman, S. (2020). Diabetes self-management education and support in adults with type 2 diabetes: A consensus report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association. *Diabetes Care*, 43(7), 1636–1649. <https://doi.org/10.2337/dci20-0023>

- Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist*, *47*(9), 1102–1114. <https://doi.org/10.1037/0003-066X.47.9.1102>
- Sayuti, E., Malini, H., & Lenggogeni, D. P. (2024). The impact of structured education on knowledge and self-efficacy in type 2 diabetes mellitus patients. *Healthcare in Low-Resource Settings*, *12*(1). <https://doi.org/10.4081/hls.2024.11918>
- Semerci Çakmak, V., Sönmez Sari, E., & Çetinkaya Özdemir, S. (2025). Experiences of adults with type 2 diabetes mellitus with low socioeconomic status: A qualitative study. *BMC Public Health*, *25*(1), 381. <https://doi.org/10.1186/s12889-025-21582-1>
- Sharon Negsang, A., Nicholas, T., Nguedia Assob, J. C., Nji, K. E., & Omer, N. (2023). Knowledge, practices and experiences of type ii diabetic patients on self-care management at the Limbe and Buea treatment centers. *Journal of Environmental Science and Public Health*, *7*(3), Article e96120192. <https://doi.org/10.26502/jesph.96120192>
- Shigaki, C., Kruse, R. L., Mehr, D., Sheldon, K. M., Ge, B., Moore, C., & Lemaster, J. (2010). Motivation and diabetes self-management. *Chronic Illness*, *6*(3), 202–214. <https://doi.org/10.1177/1742395310375630>
- Sobngwi, E., Ndour-Mbaye, M., Boateng, K. A., Ramaiya, K. L., Njenga, E. W., Diop, S. N., Mbanya, J.-C., & Ohwovoriole, A. E. (2012). Type 2 diabetes control and complications in specialised diabetes care centres of six sub-Saharan African

countries: The Diabcare Africa study. *Diabetes Research and Clinical Practice*, 95(1), 30–36. <https://doi.org/10.1016/j.diabres.2011.10.018>

Subrata, S. A., Phuphaibul, R., Grey, M., Siripitayakunkit, A., & Piaseu, N. (2020). Improving clinical outcomes of diabetic foot ulcers by the 3-month self- and family management support programs in Indonesia: A randomized controlled trial study. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(5), 857–863. <https://doi.org/10.1016/j.dsx.2020.05.028>

Suglo, J. N., Winkley, K., & Sturt, J. (2024). Improving foot self-care in people with diabetes in Ghana: A development and feasibility randomised trial of a context appropriate, family-orientated diabetic footcare intervention. *Plos ONE*, 19(5), e0302385. <https://doi.org/10.1371/journal.pone.0302385>

Tang, T. S., Brown, M. B., Funnell, M. M., & Anderson, R. M. (2008). Social support, quality of life, and self-care behaviors among African Americans with type 2 diabetes. *The Diabetes Educator*, 34(2), 266–276. <https://doi.org/10.1177/0145721708315680>

Tengblad, A., Grodzinsky, E., Lindström, K., Mölsted, S., Borgquist, L., & Johan Östgren, C. (2007). Self-monitoring of blood glucose and glycaemic control in type 2 diabetes. *Scandinavian Journal of Primary Health Care*, 25(3), 140–146. <https://doi.org/10.1080/02813430701267413>

- The International Expert Committee. (2009). International Expert Committee report on the role of the A1C assay in the diagnosis of diabetes. *Diabetes Care*, 32(7), 1327–1334. <https://doi.org/10.2337/dc09-9033>
- Toobert, D. J., Hampson, S. E., & Glasgow, R. E. (2000). The summary of diabetes self-care activities measures: Results from 7 studies and a revised scale. *Diabetes Care*, 23(7), 943–950. <https://doi.org/10.2337/diacare.23.7.943>
- Trading Economics. (2025). *Cameroon—Diabetes prevalence (% of population ages 20 to 79)—2025 data 2026 forecast 2000-2021 historical*. <https://tradingeconomics.com/cameroon/diabetes-prevalence-percent-of-population-ages-20-to-79-wb-data.html>
- United Nations General Assembly. (2018). *Political declaration of the 3rd high-level meeting of the General Assembly on the prevention and control of non-communicable diseases: Resolution adopted by the General Assembly*. <https://digitallibrary.un.org/record/1648984>
- United Nations-Habitat. (2025). *Douala, Cameroon: Vision and area planning* [Technical Report]. United Nations Human Settlements Programme. https://unhabitat.org/sites/default/files/2025/01/250126_upimc_cameroon_vision_and_area_planning_final_for_publishing.pdf
- Van Puffelen, A., Kasteleyn, M., de Vries, L., Rijken, M., Heijmans, M., Nijpels, G., Schellevis, F., & Diacourse study group. (2020). Self-care of patients with type 2 diabetes mellitus over the course of illness: Implications for tailoring support.

Journal of Diabetes and Metabolic Disorders, 19(1), 81–89.
<https://doi.org/10.1007/s40200-019-00479-y>

Watts, M. (2022, September 8). *Diabetes and obesity*. Diabetes.co.uk.
<https://www.diabetes.co.uk/diabetes-and-obesity.html>

Wen, L. K., Shepherd, M. D., & Parchman, M. L. (2004). Family support, diet, and exercise among older Mexican Americans with type 2 diabetes. *The Diabetes Educator*, 30(6), 980–993. <https://doi.org/10.1177/014572170403000619>

Wilcox, G. (2005). Insulin and insulin resistance. *The Clinical Biochemist. Reviews*, 26(2), 19–39.

World Diabetes Foundation. (2004). *Implementation of Cameroon national diabetes programme, Cameroon*. <https://www.worlddiabetesfoundation.org/what-we-do/projects/wdf16-1429/>

World Health Organization. (2019). *Classification of Diabetes Mellitus*. Geneva, Switzerland: World Health Organization. <https://iris.who.int/handle/10665/325182>

World Health Organization. (2016, April 21). *Global report on diabetes*. <https://www.who.int/publications/i/item/9789241565257>

World Health Organization. (2019, October 10). *Digital health*. <https://www.who.int/westernpacific/health-topics/digital-health>

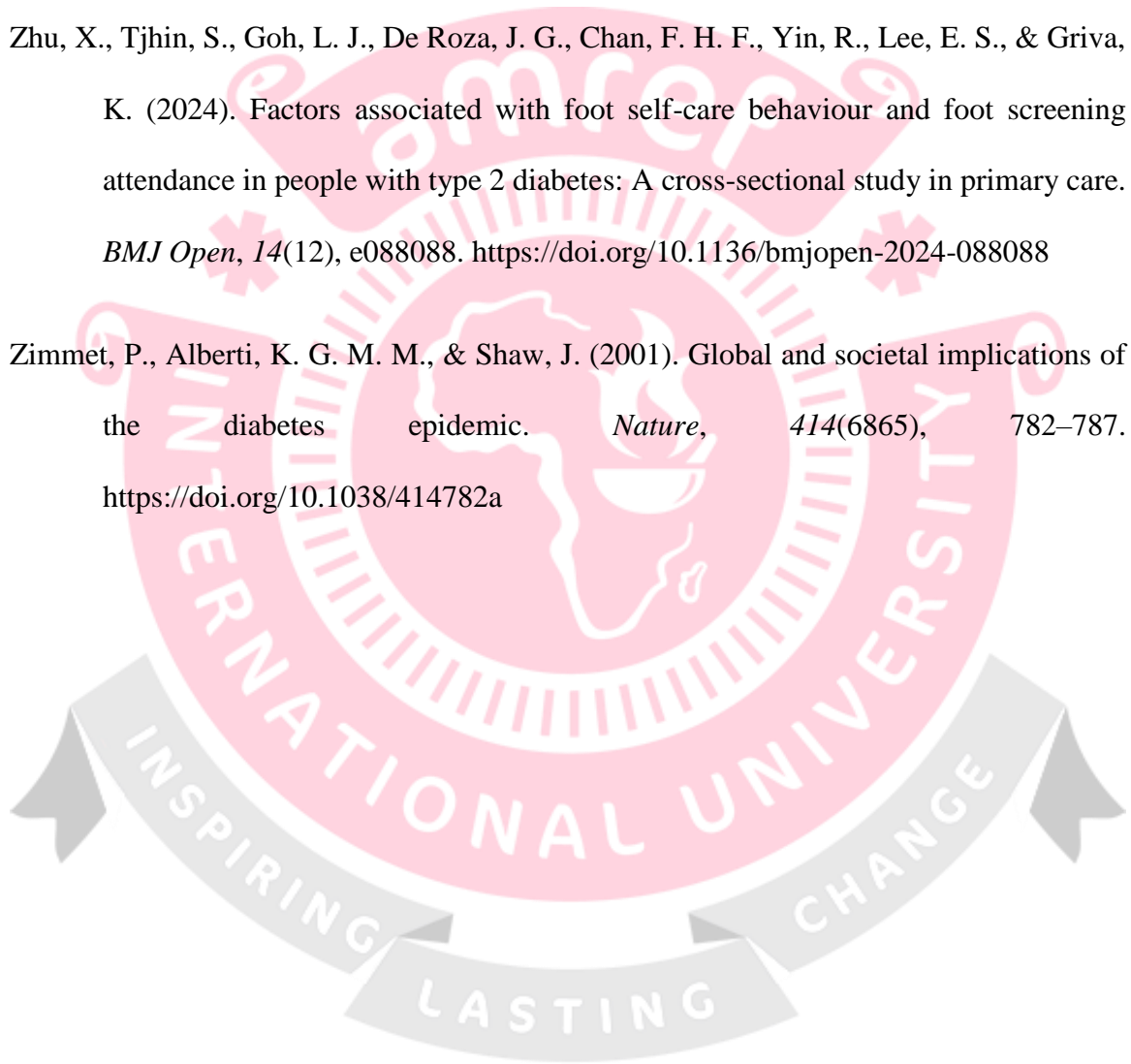
World Health Organization. (2020). *Self-care for health and well-being*. <https://www.who.int/health-topics/self-care>

- World Health Organization. (2022). *WHO guideline on self-care interventions for health and well-being* (2022 revision). World Health Organization. <https://wkc.who.int/resources/publications/i/item/WHO-RHR-19-14>
- World Health Organization. (2022). *WHO guideline on self-care interventions for health and well-being, 2022 revision*. <https://www.who.int/publications/i/item/9789240052192>
- World Health Organization. (2022, November 14). *African region tops world in undiagnosed diabetes: WHO analysis*. <https://www.afro.who.int/news/african-region-tops-world-undiagnosed-diabetes-who-analysis>
- World Health Organization. (2024). *Noncommunicable diseases*. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- World Health Organization. (2025). *The WHO Global Diabetes Compact*. <https://www.who.int/initiatives/the-who-global-diabetes-compact>
- Xu, Y., Pan, W., & Liu, H. (2010). Self-management practices of Chinese Americans with type 2 diabetes. *Nursing & Health Sciences*, *12*(2), 228–234. <https://doi.org/10.1111/j.1442-2018.2010.00524.x>
- Zare, M., Tarighat-Esfanjani, A., Rafrat, M., Shaghaghi, A., Asghari-Jafarabadi, M., & Shamshiri, M. (2020). The barriers and facilitators of self-management among adults with type 2 diabetes mellitus: A trans theoretical model (TTM)-based mixed method study in Iran. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, *13*, 2687–2699. <https://doi.org/10.2147/DMSO.S230083>

Zeng, B., Sun, W., Gary, R., Li, C., & Liu, T. (2014). Towards a conceptual model of diabetes self-management among Chinese immigrants in the United States. *International Journal of Environmental Research and Public Health*, *11*(7), 6727–6742. <https://doi.org/10.3390/ijerph110706727>

Zhu, X., Tjhin, S., Goh, L. J., De Roza, J. G., Chan, F. H. F., Yin, R., Lee, E. S., & Griva, K. (2024). Factors associated with foot self-care behaviour and foot screening attendance in people with type 2 diabetes: A cross-sectional study in primary care. *BMJ Open*, *14*(12), e088088. <https://doi.org/10.1136/bmjopen-2024-088088>

Zimmet, P., Alberti, K. G. M. M., & Shaw, J. (2001). Global and societal implications of the diabetes epidemic. *Nature*, *414*(6865), 782–787. <https://doi.org/10.1038/414782a>



APPENDICES

Appendix I: INFORM CONSENT

a. English Version

Informed Consent

Study Title	Self-care management practices and glycemic control among people living with type 2 diabetes in Douala-Cameroon.
Investigator(s)	PI: Ngenche Comfort, Contact; 676091720 Email: ladycommy003@yahoo.com CoPI: Dr. Shiphrah Kuria, Contacts; Shiphrah.kuria@amref.org CoPI: Dr. Jean Claude Katte, Jckatte@rsd-institute.org
Collaborators	Amref International University

Brief description of the purpose of the study.

You are invited to participate in a research study investigating self-care management practices and their relationship to glycemic control (GC) among individuals living with type 2 diabetes in Douala, Cameroon.

Important information to consider before you join.

Purpose of this research: This study aims to;- documenting the levels of GC among T2DM patients, - examining the association of sociodemographic and clinical characteristics such as

age, sex, education, income, marital status, BMI, and duration of diabetes with GC,- determining the association between specific self-care management practices (medication compliance, dietary practices, physical activity, blood glucose monitoring, foot care, smoking and overall self-care) with GC, and -evaluate the association of social support with GC.

Who can participate? You may participate in the study, if you are an outpatients aged 21 years and older, diagnosed with T2DM at least 6 months prior to recruitment for the study or have been living with T2DM in Douala Cameroon.

Voluntary consent: Your participation is entirely voluntary. You have the right to choose not to participate or withdraw at any time without penalty or affecting your medical care.

How long will the project last? This project is expected to last approximately 2-3 months.

What are the risks? The risks or hazards to you as you take part in this study is a breach of privacy, although measures will be taken to protect your confidentiality

What are the benefits? There may not be direct benefits to you for participating in this study. However, your participation can contribute to the following: -The information you provide will help researchers gain a better understanding of how individuals with type 2 diabetes in Douala manage their condition and how these practices impact their blood sugar control. -The findings from this study can be used to develop and improve educational programs, support groups, or other interventions to help individuals with type 2 diabetes in Douala better manage their condition. Ultimately, this could lead to improved glycemic control and overall well-being for this population. -By participating, you may gain a better understanding of your own self-care management practices and how they impact your glycemic control. This knowledge can empower you to make informed decisions about managing your diabetes.

How will we protect your information and maintain confidentiality? Your name and other identifying information (e.g., address) will be removed from the survey data before analysis. Any data that could potentially identify you will be assigned a unique code, and only the research team will have access to a linking key that connects the code to your information. All electronic data will be stored on password-protected servers with limited access.

What will happen with the results? Your data will only be used for the purposes of this research study. We will not share your information with any third party without your explicit written consent. Results will be presented in reports and publications but will not contain any information that could identify you.

Can I refuse to participate or withdraw from the study? You have the right to refuse to participate or withdraw at any time without explanation.

Compensation: There will be no monetary compensation for participation in this study.

Procedures: You will be face interviewed to complete a brief survey on a mobile phone. The survey will ask questions about your socio-demographics and self-care management practices (medication adherence, dietary practices, physical activity, and self-monitoring of blood glucose). Completing the survey expected to take approximately 40 minutes. However, the actual time may vary depending on your individual circumstances.

Why do we want to conduct the study? We are conducting this study to understand how individuals with type 2 diabetes in Douala manage their condition (SCMP) and how these practices affect their blood sugar control (GC). By examining SCMP and GC, we aim to gain insights into daily diabetes management and how practices influence blood sugar control. This study will explore potential factors influencing SCMP practices, such as access to healthcare resources, social support and financial constraints. This information can help identify areas

where support can be targeted to improve self-management. The findings from this study can be used to develop and improve interventions tailored to the specific needs and challenges faced by individuals with type 2 diabetes in Douala. This can ultimately contribute to better diabetes management and improved health outcomes in this population.

Questions about research: If you have any questions, you can ask anyone from our team now or later. If you have questions later, you may contact Mrs. Fungwa Ngenche Comfort, 676091720, ladyommy003@yahoo.com or Dr. Shiphrah Kuria, Shiphrah.kuria@amref.org or Dr. Jean Claude Katte, Jckatte@rsd-institute.org. This study has been reviewed and approved by the Ministry of Health Douala Cameroon. In case of ethical concerns, contact a member of the ethical committee in the Ministry of Health Douala, Cameroon.

STATEMENT OF CONSENT

I (respondent's Name) _____ agree that the benefits, risks and my rights regarding this study have been explained to me.

I understand that my decision to participate in this study will not change my usual medical care. In the use of my information, my identity will be concealed. I am aware that I may withdraw anytime. I understand that by signing this form I do not waive any legal rights but indicate that I have been informed about the study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

Name.....Signature/ thumb print of the participant.....Date.....

or Witness..... Signature/ thumb print of the

Witness.....Date.....

Name.....Signature of the interviewer/ Person obtaining the informed consent..... Date.....

a. French Version

Consentement éclairé

Titre de l'étude	Pratiques d'auto-prise en charge et contrôle glycémique chez les personnes vivant avec le diabète de type 2 à Douala-Cameroun.
Enquêteur(s)	PI : Ngenche Confort, Contact ; 676091720 Courriel : ladycommy003@yahoo.com CoPI : Dr Shiphrah Kuria, Contacts ; Shiphrah.kuria@amref.org CoPI : Dr Jean Claude Katte, Jckatte@rsd-institute.org
Collaborateurs	Université internationale Amref

Brève description de l'objectif de l'étude.

Vous êtes invités à participer à une étude de recherche portant sur les pratiques d'autogestion de la santé (SCMP) et leur relation avec le contrôle glycémique (GC) chez les personnes vivant avec le diabète de type 2 à Douala, au Cameroun.

Informations importantes à prendre en compte avant de vous inscrire.

Objectif de cette recherche : Cette étude vise à documenter les niveaux de contrôle glycémique (CG) chez les patients atteints de diabète de type 2 (DT2), à examiner l'association entre les caractéristiques sociodémographiques et cliniques telles que l'âge, le sexe, le niveau d'éducation, le revenu, le statut matrimonial, l'indice de masse corporelle (IMC) et la durée du diabète avec le contrôle glycémique. Elle a également pour objectif de déterminer l'association entre des pratiques spécifiques d'autogestion, notamment l'observance médicamenteuse, les habitudes alimentaires, l'activité physique, la surveillance de la glycémie, les soins des pieds, le tabagisme et l'auto-prise en charge globale, avec le contrôle glycémique. Enfin, l'étude évalue l'association du soutien social avec le contrôle glycémique.

Qui peut participer ? Vous pouvez participer à l'étude si vous êtes un patient ambulatoire âgé de 18 ans et plus, diagnostiqué avec le DT2 au moins 6 mois avant le recrutement pour l'étude ou si vous vivez avec le DT2 à Douala, au Cameroun.

Consentement volontaire : Votre participation est entièrement volontaire. Vous avez le droit de choisir de ne pas participer ou de vous retirer à tout moment sans pénalité ni affecter vos soins médicaux.

Combien de temps durera le projet ? Ce projet devrait durer environ 2 à 3 mois.

Quels sont les risques ? Les risques ou les dangers pour vous lorsque vous participez à cette étude constituent une violation de la vie privée, bien que des mesures soient prises pour protéger votre confidentialité

Quels sont les avantages ? Il se peut qu'il n'y ait pas d'avantages directs pour vous à participer à cette étude. Cependant, votre participation peut contribuer à ce qui suit : -Les informations que vous fournissez aideront les chercheurs à mieux comprendre comment les personnes atteintes de diabète de type 2 à Douala gèrent leur maladie et comment ces pratiques influencent

leur contrôle de la glycémie. -Les résultats de cette étude peuvent être utilisés pour développer et améliorer des programmes éducatifs, des groupes de soutien ou d'autres interventions pour aider les personnes atteintes de diabète de type 2 à Douala à mieux gérer leur maladie. En fin de compte, cela pourrait conduire à un meilleur contrôle de la glycémie et au bien-être général de cette population. -En participant, vous pouvez mieux comprendre vos propres SCMP et leur impact sur votre contrôle glycémique. Ces connaissances peuvent vous permettre de prendre des décisions éclairées sur la gestion de votre diabète.

Comment protégerons-nous vos informations et préserverons-nous la confidentialité ?

Votre nom et d'autres informations d'identification (par exemple, votre adresse) seront supprimés des données de l'enquête avant l'analyse. Toutes les données susceptibles de vous identifier se verront attribuer un code unique, et seule l'équipe de recherche aura accès à une clé de liaison qui relie le code à vos informations. Toutes les données électroniques seront stockées sur des serveurs protégés par mot de passe avec un accès limité.

Que va-t-il se passer avec les résultats ? Vos données ne seront utilisées qu'aux fins de cette étude. Nous ne partagerons pas vos informations avec des tiers sans votre consentement écrit explicite. Les résultats seront présentés dans des rapports et des publications, mais ne contiendront aucune information qui pourrait vous identifier.

Puis-je refuser de participer ou me retirer de l'étude ? Vous avez le droit de refuser de participer ou de vous retirer à tout moment sans explication.

Rémunération : Il n'y aura pas de compensation monétaire pour la participation à cette étude.

Procédures : Vous serez interrogé en face à face pour répondre à une brève enquête sur un téléphone portable. Le sondage posera des questions sur vos caractéristiques sociodémographiques et vos pratiques de gestion de l'autogestion de la santé (observance

médicamenteuse, habitudes alimentaires, activité physique et autosurveillance de la glycémie). Il fallait environ 40 minutes pour répondre au sondage. Cependant, le temps réel peut varier en fonction de votre situation personnelle.

Pourquoi voulons-nous mener cette étude ? Nous menons cette étude pour comprendre comment les personnes atteintes de diabète de type 2 à Douala gèrent leur maladie (SCMP) et comment ces pratiques affectent leur contrôle de la glycémie (GC). En examinant la SCMP et la GC, nous visons à mieux comprendre la gestion quotidienne du diabète et la façon dont les pratiques influencent le contrôle de la glycémie. Cette étude explorera les facteurs potentiels influençant les pratiques de SCMP, tels que l'accès aux ressources de santé, le soutien social et les contraintes financières. Cette information peut aider à identifier les domaines où un soutien peut être ciblé pour améliorer l'autogestion. Les résultats de cette étude peuvent être utilisés pour développer et améliorer des interventions adaptées aux besoins et aux défis spécifiques auxquels sont confrontées les personnes atteintes de diabète de type 2 à Douala. Cela peut contribuer à une meilleure gestion du diabète et à de meilleurs résultats de santé dans cette population.

Questions sur la recherche : Si vous avez des questions, vous pouvez les poser à n'importe quel membre de notre équipe maintenant ou plus tard. Si vous avez des questions plus tard, vous pouvez contacter Mme Fungwa Ngenche Comfort, 676091720, ladyommy003@yahoo.com ou le Dr Shiphrah Kuria, Shiphrah.kuria@amref.org ou le Dr Jean Claude Katte, Jckatte@rsd-institute.org. Cette étude a été examinée et approuvée par le Ministère de la Santé, Douala, Cameroun. En cas de problèmes éthiques, contactez un membre du comité d'éthique au ministère de la Santé Douala, Cameroun.

DÉCLARATION DE CONSENTEMENT

Je (nom du répondant) _____ d'accord que les avantages, les risques et mes droits concernant cette étude m'ont été expliqués.

Je comprends que ma décision de participer à cette étude ne changera pas mes soins médicaux habituels. Lors de l'utilisation de mes informations, mon identité sera dissimulée. Je suis conscient que je peux me retirer à tout moment. Je comprends qu'en signant ce formulaire, je ne renonce à aucun droit légal, mais j'indique que j'ai été informé de l'étude à laquelle j'accepte volontairement de participer. Une copie de ce formulaire me sera remise.

Nom.....

Signature/empreinte du pouce du participant..... Date.....

ou Témoin..... Signature du Témoin..... Date.....

Nom.....

Signature de l'enquêteur/Personne qui obtient l'information
consentement..... Date.....

Appendix II: Approval to Carry out Research from Amref International University
Kenya



AMREF INTERNATIONAL UNIVERSITY
GRADUATE SCHOOL

Email: amiu_deangraduatestudies@amref.ac.ke

P.O Box 27691-00506
Nairobi, Kenya
Tel. 0206993236

Website: <https://amref.ac.ke/>

FROM: Dean, Graduate School

DATE: 16th September 2024

TO: Ngenche Comfort Tangang

REF: AMIU/ARP/4959-1/2022

RE: APPROVAL OF RESEARCH PROPOSAL

Following your full proposal presentation on 27th October 2023, and subsequent review of your revised proposal, Graduate School Board has approved your research work entitled, "Self-Care Management Practices and Glycemic Control Among People Living with Type 2 Diabetes in Douala Cameroon."

You may now proceed with data collection subject to clearance with the Institutional Research Board (IRB) from your country. Please note that ethical approval is a mandatory requirement for all research process.

Additionally, you are required to update Graduate School of your progress after every three months by submitting progress reports using the forms attached.

Sincerely,

Dr. Duncan Irungu
Dean, Graduate School & Director Health Entrepreneurship
CC: HOD Community Health

Appendix III: Authorization to Carry out Research from Regional Research Ethics Committee for Human Health, Littoral.

REPUBLIQUE DU CAMEROUN	REPUBLIC OF CAMEROON
Paix -Travail- Patrie	Peace -Work- Fatherland
-----	-----
MINISTERE DE LA SANTE PUBLIQUE	MINISTRY OF PUBLIC HEALTH
-----	-----
DELEGATION REGIONALE DE LA SANTE PUBLIQUE DU LITTORAL	LITTORAL REGIONAL DELEGATION FOR PUBLIC HEALTH
-----	-----
COMITE REGIONAL D'ETHIQUE DE LA RECHERCHE POUR LA SANTE HUMAINE DU LITTORAL	REGIONAL HUMAN HEALTH RESEARCH ETHICS COMMITTEE FOR THE LITTORAL
-----	-----

**COMITE REGIONAL D'ETHIQUE DE LA RECHERCHE
POUR LA SANTE HUMAINE DU LITTORAL**

Arrêté N° 0977/A/MINSANTE/SESP/SG/DROS/ du 18 avril 2012 portant création, organisation et fonctionnement des comités d'éthique de la recherche pour la santé humaine au sein des structures relevant du Ministère en charge de la santé publique

N° 2024/ ¹³²/CE/CRERSH-LITTORAL Douala, le 13 novembre 2024


crersh littoral@gmail.com

CLAIRANCE ETHIQUE

Le Comité Régional d'Ethique de la Recherche pour la Santé Humaine (CRERSH -Littoral), en sa session ordinaire du 13 novembre 2024, a examiné le projet de recherche intitulé : « **SELF-CARE MANAGEMENT PRACTICES AND GLYCEMIC CONTROL AMONG PEOPLE LIVING WITH TYPE 2 DIABETES IN DOUALA CAMEROON** » soumis par Mme NGENCHE COMFORT TANGANG, Investigateur Principal.

Le projet est d'un grand intérêt scientifique et social. La procédure de l'étude est bien documentée et claire. Les risques liés à l'étude sont précisés ainsi que les mesures pour les éviter et les minimiser. La notice d'information et le formulaire de consentement éclairé, en français et en anglais, sont bien élaborés et simples à comprendre. Les mesures prises pour garantir la confidentialité des données collectées sont présentes dans le document. Les CVs des Investigateurs les décrivent comme des personnes compétentes, capables de mener à bien cette étude. Pour toutes ces raisons, le Comité Régional d'Ethique approuve pour une durée d'un an, la mise en œuvre de la présente version du protocole.

Les investigateurs sont responsables du respect scrupuleux du protocole approuvé et ne devraient y apporter aucun amendement aussi mineur soit-il, sans avis favorable du CRERSH. Les



investigateurs sont appelés à collaborer pour toute descente du CRERSH pour le suivi de la mise en œuvre du protocole approuvé. Le rapport final du projet devra être soumis au CRERSH et aux autorités sanitaires du Cameroun.

La présente clairance peut être retirée en cas de non-respect de la réglementation en vigueur et des recommandations susmentionnées.

En foi de quoi, la présente clairance éthique est délivrée pour servir et valoir ce que de droit.

Ampliations

- CNERSH
- MINSANTE



Le Président

Dr. Gérémié Solle

N.B : cette clairance éthique ne vous dispense pas de l'autorisation administrative de recherche (AAR), exigée pour mener cette étude sur le territoire camerounais. Cette dernière vous sera délivrée par le Ministère de la Santé Publique.



Appendix IV: Permission from Laquintinie Hospital

REPUBLIQUE DU CAMEROUN
PAIX – TRAVAIL – PATRIE
MINISTERE DE LA SANTE PUBLIQUE
DIRECTION HOPITAL LAQUINTINIE

BP 4035 – DOUALA CAMEROUN
TEL/FAX : (237) 33 42 15 40
Email : hospital_laquintinie@yahoo.fr



REPUBLIC OF CAMEROON
PEACE – WORK – FATHERLAND
MINISTRY OF PUBLIC HEALTH
HEAD OFFICE OF THE
LAQUINTINIE HOSPITAL

BOX 4035 – DOUALA CAMEROON
TEL/FAX : (237) 33 42 15 40
Email : hospital_laquintinie@yahoo.fr

N° 514/AR/MINSANTE/DHL

AUTORISATION DE RECHERCHE

Mme **NGENCHE Comfort TATANG**, Etudiante en Master de Santé Publique à AMREF International University Kenya, est autorisé(e) à effectuer une recherche de (02) mois du **02 janvier au 28 février 2024** au sein de l'Hôpital Laquintinie de Douala, sur le thème : « **Self-care management practices and glycemc control among people living with type 2 diabetes in Douala-cameroon** ».

Les travaux s'effectueront sous la supervision du **Dr NGO BIKAI Vanessa Marie**, Médecin Endocrinologue-Diabétologue, dans le respect du code d'éthique et de déontologie en vigueur à l'Hôpital Laquintinie de Douala.

Toute publication de ce travail devra préserver les intérêts de l'Hôpital et des personnels y ayant participé. Une copie sera transmise au Centre de Documentation pour archivage.

En foi de quoi la présente Autorisation de Recherche est délivrée pour servir et valoir ce que de droit.

Ampliation :

- DHL

Copie :

- SG/Coordo Secteur
- CSP
- C. DPT/Chef Sce
- SUPERVISEUR(S)
- INTERESSE(E)
- CHRONO/ARCHIVES

Fait à Douala, le **27 DEC 2024**
Le **Directeur de l'Hôpital Laquintinie de Douala,**
et par délégation le **Conseiller Médical**


Dr Marie Solange NDOM-EBONGUE

Appendix V: Permission from PCC Acha- Bepanda

PRESBYTERIAN CHURCH IN CAMEROON (PCC)

OFFICE OF THE SYNOD CLERK
Our Ref. (a) – 13/01/25



Your Ref.

P. O. Box 19 Buea
South West Region
Republic of Cameroon
Tel: +237 3332 25 06
Fax: + 237 3332 27 54
E-mail:
pcc_synodclerk@yahoo.co.uk

14th January, 2025

Mme. Ngenche Comfort Tangang
AMREF INTERNATIONAL UNIVERSITY
KENYA

Dear Madam,

Permission to Carry- Out Research

We write to you following your request to our office for permission to conduct two months research at two of our Institutions precisely – PHC Douala – General Section and PHC Douala – Eye Section. Your request has hereby been granted. Your period of research will run from the 27th of January, 2025 to the 27th of March, 2025.

Your proposed research is titled “Self- care management practices and glyemic control among people living with type 2 diabetes in Douala – Cameroon”. We expect that throughout your period of research you will adhere and respect the rules and regulations of the Health Services Department and by extension the Presbyterian Church in Cameroon. Kindly contact the Administrator for PHC Bepanda- Douala for any concerns.

We wish you God's blessings as you spend time with the PCC.

Yours for the service of the Lord,

Rev. Ayuk Solomon
Synod Clerk, PCC

Cc
The Moderator, PCC
The Financial Secretary, PCC
The Health Services Secretary, PCC.
The Human Resources Manager, PCC
The MOI/Admin/Accntnt/NIC PHC Dla
The MOI/Admin/Accntnt/NIC PHC Dla

Appendix VI: Research Tool (English version)

Questionnaire

Thank you for participating in this study. This study aims to investigate the association between self-care management practices and glycemic control among individuals with type 2 diabetes in Douala Cameroon. The information you provide will be instrumental in gaining valuable insights into the relationship between self-care behaviors and diabetes management.

A- Socio-Demographic Characteristics

General Information

1. Date of interview: _____
2. Name of health facility: _____
3. Unique ID: _____
4. Gender; MALE FEMALE
5. Age: _____
6. Weight: Kg
7. Height: Cm

Socioeconomic/ Support System

1. Marital status: " Single " Married " Divorced " Widowed
2. What is your level of education? : Primary Secondary Tertiary
 Informal education
3. What is your average monthly income(FCFA)? < 100.000 101.000 – 200.000 201.000 – 300. 000 >300. 000

4. How long have you lived with type two diabetes? Less than 1 year 1-2 years 3-5 years 6-10 years More than 10 years
5. What forms of support do your friends, family, or loved ones offer to facilitate your diabetes self-care? Financial support Emotional support Practical support Informational support others (specify).

B. Summary of Diabetes Self-Care Activities (SDSCA)

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. (Please circle **O** the correct answer)

Diet

1. How many of the last SEVEN DAYS have you followed a healthful eating plan (that is a meal plan that helps manage your blood sugar levels, promotes overall health, and supports diabetes management?)
- 0 1 2 3 4 5 6 7
2. On average, over the past month, how many DAYS PER WEEK have you followed a healthful 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 foods such as red meat or full-fat dairy products?

0 1 2 3 4 5 6 7

5. On how many of the last SEVEN DAYS did you space carbohydrates evenly (that is distributing your carbohydrate intake across your meals and snacks in a consistent manner) through the day?

0 1 2 3 4 5 6 7

Exercise

6. 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

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

0 1 2 3 4 5 6 7

Self-monitoring of blood glucose

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

0 1 2 3 4 5 6 7

9. 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

Medications adherence

10. On how many of the last SEVEN DAYS did you take your recommended number of diabetes pills?

0 1 2 3 4 5 6 7

Foot Care

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

0 1 2 3 4 5 6 7

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

0 1 2 3 4 5 6 7

13. On how many of the last SEVEN DAYS did you wash your feet?

0 1 2 3 4 5 6 7

14. On how many of the last SEVEN DAYS did you soak your feet?

0 1 2 3 4 5 6 7

15. On how many of the last SEVEN DAYS did you dry between your toes after washing?

0 1 2 3 4 5 6 7

Smoking

16. 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 an average day? Number of cigarettes: _____

C- Glycemic Control

Dear participant,

As part of this study, we aim to investigate the association between self-care management practices and glycemic control in individuals with type 2 diabetes residing in Douala,

Cameroon. **Glycemic control** refers to the effective management of blood sugar levels within a target range recommended for individuals with diabetes. In order to evaluate your glycemic control, we kindly request your participation in a laboratory test to measure your HbA1c levels. This test will be performed **free of charge**. This test will involve the measurement of your HbA1c levels, which will provide us with an indication of your average blood glucose levels **over the past 2-3 months**. Knowing your HbA1c level can be helpful for understanding your diabetes management and discussing treatment options with your doctor. Your involvement in this test will provide valuable insights for our research and enable us to gain a deeper comprehension of the impact of self-care practices on glycemic control. Rest assured that your privacy and confidentiality will be strictly upheld throughout the duration of this study.

We sincerely appreciate your cooperation.

HbA1c Results:



**FOCUS GROUP DISCUSSION QUESTION GUIDE ON SELF-CARE
MANAGEMENT PRACTICES AND GLYCEMIC CONTROL AMONG PEOPLE
LIVING WITH TYPE 2 DIABETES IN DOUALA-CAMEROON.**

Date and time: _____

Location: _____

Name of facilitator: _____

Name of note taker: _____

Focus group composition target group: Adult with type 2 diabetes.

Age group: 18 years and above.

Group composition by sex; Number of women: _____ Number of men: : _____

Total number of participants: _____

Were community leaders present during discussion? Yes / No

Did every participant contribute during focus group discussion equally? Yes / No

Aim of focus group discussion: To gain a deeper understanding of the factors influencing self-care management practices and glyceemic control among individuals with type 2 diabetes in Douala, Cameroon. By exploring participants' experiences, challenges, and motivations, this FGD will provide valuable insights into the contextual factors that shape diabetes self-care behaviors and outcomes.

SECTION	TIME	DISCUSSION GUIDE	NOTES
INTRODUCTION	5-10minutes	<p>1-Welcoming of participants and thanking them for participating.</p> <p>-Brief introduction of facilitator, note taker and recorder.</p> <p>2-Brief explanation of the purpose of the FGD; to discuss self-care management practices and glycemic control among people with type 2 diabetes.</p> <p>3-Brief explanation of ground rules for the FDG, (Encouraging open and honest discussion, respecting all opinions and experiences, one person speaking at a time and focusing on sharing experiences, not judging).</p> <p>4-Obtaining verbal consent from participants.</p> <p>-Introductory rounds among the participants.</p>	
<p>SELF-CARE MANAGEMENT PRACTICES (Diet, Physical activity, SMBG, Medication adherence, Foot care)</p>	20minutes	<p>1-What is self-care management practice (SCMP)?</p> <p>2-How important do you believe it is in managing diabetes?</p> <p>3-What are some of the SCMP that you are aware of?</p> <p>4- What are some of the SCMP carried out by diabetes patients in Douala?</p> <p>5-How often do they engage in these practices?</p>	

		<p>6-What are the challenges people in this community face in adhering to their self-care routine?</p> <p>7- What are some of the factors that influence people in this community to follow self-care practices consistently?</p>	
Factors influencing self-care practices (socioeconomic status, social support)	10minutes	<p>1-How important is social support from family, friends or healthcare providers in the Douala community in helping people with diabetes manage their condition?</p> <p>2-How do economic factors, such as the cost of medications or healthy foods, impact the ability of people with diabetes in the Douala community to follow self-care practices?</p>	
GLYCEMIC CONTROL	10minutes	<p>1-What do you think are the challenges that people with diabetes in the Douala community face in achieving and maintaining good glycemic control?</p> <p>2-How can we work together to create a supportive environment for people with diabetes to achieve better glycemic control in Douala?</p>	
WRAP-UP	10minutes	<p>-Summarizing key points discussed.</p> <p>-Asking participants if they have any additional comments or questions.</p> <p>-Thanking participants for their participation.</p>	

		-Providing information on how participants can access further resources or support services.	
--	--	--	--

END

B. Research Tool (French Version)

Outil de recherche

Questionnaire

Merci de participer à cette étude. Cette étude vise à étudier l'association entre les pratiques d'autogestion et le contrôle glycémique chez les personnes atteintes de diabète de type 2 à Douala, au Cameroun. Les informations que vous fournirez seront essentielles pour obtenir des informations précieuses sur la relation entre les comportements d'autogestion de la santé et la gestion du diabète.

A- Caractéristiques sociodémographiques

Informations générales

1. Date de l'entretien : _____
2. Nom de l'établissement de santé : _____
3. Identifiant unique : _____
4. Sexe ; MÂLE FEMELLE
5. Âge: _____
6. Poids: Kg
7. Hauteur: Cm

Système socio-économique/de soutien

1. Situation matrimoniale : "Célibataire "Marié "Divorcé "Veuf
2. Quel est votre niveau d'éducation ? Primaire Secondaire Tertiaire
Éducation diffuse
3. Quel est votre revenu mensuel moyen ? < 100.000 CFA 101.000 – 200.000 201.000 – 300.000 >300.000
4. Depuis combien de temps vivez-vous avec le diabète de type 2 ? Moins de 1 an 1-2 ans 3-5 ans 6-10 ans Plus de 10 ans
5. Quelles formes de soutien vos amis, votre famille ou vos proches offrent-ils pour faciliter votre autogestion du diabète ? Soutien financier Soutien émotionnel Soutien pratique Soutien informationnel Autres personnes (préciser).

B. Résumé des activités d'autogestion de la lutte contre le diabète (SDSCA)

Le questionnaire ci-dessous vise à nous renseigner sur vos activités d'autogestion du diabète au cours des 7 derniers jours. Si vous avez été malade au cours des 7 derniers jours, veuillez repenser aux 7 derniers jours où vous n'étiez pas malade. (Veuillez encercler **O** la bonne réponse)

Diète

1. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous suivi un régime alimentaire sain (c'est-à-dire un plan de repas qui aide à gérer votre taux de sucre dans le sang, favorise la santé globale et soutient la gestion du diabète?)
0 1 2 3 4 5 6 7
2. En moyenne, au cours du dernier mois, combien de JOURS PAR SEMAINE avez-vous suivi un régime alimentaire sain ?

0 1 2 3 4 5 6 7

3. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous mangé cinq portions ou plus de fruits et de légumes ?

0 1 2 3 4 5 6 7

4. Au cours des SEPT DERNIERS JOURS, combien d'aliments avez-vous mangé des aliments tels que de la viande rouge ou des produits laitiers entiers ?

0 1 2 3 4 5 6 7

5. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous réparti les glucides uniformément (c'est-à-dire répartir votre apport en glucides entre vos repas et collations de manière cohérente) tout au long de la journée ?

0 1 2 3 4 5 6 7

Exercice

6. Au cours des sept derniers jours, combien avez-vous participé à au moins 30 minutes d'activité physique ? (Nombre total de minutes d'activité continue, y compris la marche).

0 1 2 3 4 5 6 7

7. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous participé à une séance d'exercice spécifique (marche, course, danse) autre que ce que vous faites à la maison ou dans le cadre de votre travail ?

0 1 2 3 4 5 6 7

Autosurveillance de la glycémie

8. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous testé votre glycémie ?

0 1 2 3 4 5 6 7

9. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous testé votre glycémie, le nombre de fois recommandé par votre fournisseur de soins de santé ?

0 1 2 3 4 5 6 7

Observance médicamenteuse

10. Au cours des SEPT DERNIERS JOURS, combien de fois avez-vous pris le nombre recommandé de pilules contre le diabète ?

0 1 2 3 4 5 6 7

Soins des pieds

11. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous vérifié vos pieds?

0 1 2 3 4 5 6 7

12. Au cours des SEPT DERNIERS JOURS, combien de fois avez-vous inspecté l'intérieur de vos chaussures ?

0 1 2 3 4 5 6 7

13. Combien de fois au cours des SEPT DERNIERS JOURS vous êtes-vous lavé les pieds ?

0 1 2 3 4 5 6 7

14. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous trempé vos pieds?

0 1 2 3 4 5 6 7

15. Combien de fois au cours des SEPT DERNIERS JOURS avez-vous séché entre vos orteils après le lavage ?

0 1 2 3 4 5 6 7

Tabagisme

16. Avez-vous fumé une cigarette, même une bouffée, au cours des SEPT DERNIERS JOURS ?

0. Non

1. Oui. Si oui, combien de cigarettes avez-vous fumé en moyenne par jour ? Nombre de cigarettes :

C- Contrôle glycémique

Cher participant,

Dans le cadre de cette étude, nous visons à étudier l'association entre les pratiques d'autogestion des soins et le contrôle glycémique chez les personnes atteintes de diabète de type 2 résidant à Douala, au Cameroun. Le contrôle glycémique fait référence à la gestion efficace de la glycémie dans une fourchette cible recommandée pour les personnes atteintes de diabète. Afin d'évaluer votre contrôle glycémique, nous vous demandons de bien vouloir participer à un test de laboratoire pour mesurer votre taux d'HbA1c. Ce test impliquera la mesure de votre taux d'HbA1c, ce qui nous fournira une indication de votre glycémie moyenne au cours des 2-3 derniers mois. Connaître votre taux d'HbA1c peut être utile pour comprendre votre gestion du diabète et discuter des options de traitement avec votre médecin. Votre participation à ce test nous fournira des informations précieuses pour notre recherche et nous permettra de mieux comprendre l'impact des pratiques d'autosoins sur le contrôle de la glycémie. Soyez assurés que votre vie privée et votre confidentialité seront strictement respectées pendant toute la durée de cette étude.

Nous apprécions sincèrement votre coopération.

Résultats de l'HbA1c : _____

**GUIDE DE QUESTIONS SUR LES PRATIQUES D'AUTOGESTION DE
L'AUTOGESTION ET LE CONTRÔLE DE LA GLYCÉMIE CHEZ LES
PERSONNES VIVANT AVEC LE DIABÈTE DE TYPE 2 À DOUALA, AU
CAMEROUN.**

Date et heure : _____

Emplacement: _____

Nom de l'animateur : _____

Nom du preneur de notes : _____

Composition du groupe cible : Adulte atteint de diabète de type 2.

Tranche d'âge : 18 ans et plus.

Composition des groupes par sexe ; Nombre de femmes : _____ Nombre d'hommes : _____

Nombre total de participants : _____

Les leaders communautaires étaient-ils présents lors de la discussion ? Oui / Non

Tous les participants ont-ils contribué de la même manière lors des discussions de groupe?

Oui / Non

Objectif de la discussion de groupe : Approfondir la compréhension des facteurs influençant les pratiques d'autogestion de la santé et le contrôle de la glycémie chez les personnes atteintes de diabète de type 2 à Douala, au Cameroun. En explorant les expériences, les défis et les motivations des participants, ce FGD fournira des informations précieuses sur les facteurs contextuels qui façonnent les comportements et les résultats des soins du diabète.

SECTION	HEURE	DISCUSSION GUIDE	NOTES
INTRODUCTION	5 à 10 minutes	<p>1-Accueil des participants et remerciements pour leur participation.</p> <p>-Brève présentation de l'animateur, du preneur de notes et de l'enregistreur.</p> <p>2-Brève explication de l'objectif de la FGD ; Discuter des pratiques d'autogestion de la santé et du contrôle de la glycémie chez les personnes atteintes de diabète de type 2.</p> <p>3-Brève explication des règles de base pour le FDG, (Encourager une discussion ouverte et honnête, respecter toutes les opinions et expériences, une personne à la fois et se concentrer sur le partage d'expériences, pas sur le jugement).</p> <p>4-Obtention du consentement verbal des participants.</p> <p>-Rondes d'introduction entre les participants.</p>	
PRATIQUES D'AUTOGESTION DES SOINS (Régime alimentaire, Activité physique, ASG, Observance médicamenteuse, Soins des pieds)	20 minutes	<p>1-Qu'est-ce que la pratique d'autogestion des soins (SCMP) ?</p> <p>2-Quelle est l'importance selon vous dans la gestion du diabète ?</p> <p>3-Quels sont les SCMP que vous connaissez ?</p> <p>4- Quelles sont les SCMP réalisées par les patients diabétiques à Douala ?</p>	

		<p>5-À quelle fréquence s'adonnent-ils à ces pratiques ?</p> <p>6-Quels sont les défis auxquels les gens de cette communauté sont confrontés pour respecter leur routine de soins personnels ?</p> <p>7- Quels sont les facteurs qui influencent les membres de cette communauté à adopter régulièrement des pratiques d'autosoins ?</p>
Facteurs influençant les pratiques d'autogestion de la santé (statut socioéconomique, soutien social)	10 minutes	<p>1-Quelle est l'importance du soutien social de la famille, des amis ou des prestataires de soins de santé dans la communauté de Douala pour aider les personnes atteintes de diabète à gérer leur maladie ?</p> <p>2-Comment les facteurs économiques, tels que le coût des médicaments ou des aliments sains, influencent-ils la capacité des personnes atteintes de diabète dans la communauté de Douala à suivre des pratiques d'autogestion de la santé ?</p>
CONTRÔLE GLYCÉMIQUE	10 minutes	<p>1-Selon vous, quels sont les défis auxquels sont confrontées les personnes atteintes de diabète dans la communauté de Douala pour atteindre et maintenir un bon contrôle glycémique ?</p> <p>2-Comment pouvons-nous travailler ensemble pour créer un environnement favorable aux</p>

		personnes atteintes de diabète afin d'obtenir un meilleur contrôle de la glycémie à Douala ?	
CONCLUSION	10 minutes	<ul style="list-style-type: none"> -Résumer les points clés abordés. -Demander aux participants s'ils ont des commentaires ou des questions supplémentaires. -Remercier les participants pour leur participation. -Fournir des informations sur la façon dont les participants peuvent accéder à d'autres ressources ou services de soutien. 	

-RAFRAÎCHISSEMENTS

FIN



Appendix VII: Plagiarism checker Certificate

NGENCHE COMFORT MPH THESIS FOR TURNITIN.pdf



MPH Proposals Checks

MPH Thesis

Amref International University (AMIU)

Document Details

Submission ID **trn:oid:::1:3287993761**

Submission Date

Jun 30, 2025, 8:31 PM GMT+3

Download Date

Jun 30, 2025, 9:32 PM GMT+3

File Name

NGENCHE_COMFORT_MPH_THESIS_FOR_TURNITIN.pdf

File Size

973.6 KB

98 Pages

24,194 Words

134,894 Characters

15 % Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

Filtered from the Report

- ▶ Bibliography
- ▶ Quoted Text

Match Groups

- 259** Not Cited or Quoted 10%
Matches with neither in-text citation nor quotation marks
- 84** Missing Quotations 4%
Matches that are still very similar to source material
- 0** Missing Citation 0%
Matches that have quotation marks, but no in-text citation
- 0** Cited and Quoted 0%
Matches with in-text citation present, but no quotation marks

Top Sources

- 12% Internet sources
- 10% Publications
- 4% Submitted works (Student Papers)