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Influence of Duration of Diabetes, Presence of Comorbidities, and Medication Adherence Contributing to Poor Glycemic Control Among Clients at Kapkatet Sub-County Hospital, Kericho County Kenya

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ABSTRACT

Diabetes Mellitus (DM) remains a major public health concern, especially in low- and middle-income countries like Kenya, where poor glycemic control is highly prevalent. This study aimed to examine the influence of duration of diabetes, presence of comorbidities, and medication adherence on poor glycemic control among patients attending Kapkatet Sub-County Hospital. A hospital-based cross-sectional study was conducted among 300 adult patients diagnosed with diabetes mellitus. Data were collected through structured questionnaires and medical record reviews. Descriptive statistics were used to summarize demographic and clinical characteristics. Chi-square tests and logistic regression analysis were applied to assess associations between clinical factors and glycemic control. The study adhered to ethical guidelines including informed consent and confidentiality. Out of 250 respondents (response rate: 83.3%), 60% exhibited poor glycemic control (fasting blood glucose ≥ 7.2 mmol/L). Patients with a disease duration of over 10 years had a significantly higher likelihood of poor control ($\chi^2 = 27.12$, $p < 0.001$). Comorbidities were present in 88 patients, with 62.5% of them exhibiting poor control, though the association was not statistically significant ($p = 0.202$). Patients on insulin therapy alone had the highest rate of poor control (94.1%), while those reporting difficulty accessing medications were significantly more likely to have poor control ($\chi^2 = 9.34$, $p = 0.002$). Clinical factors particularly longer duration of diabetes and poor medication access are significantly associated with poor glycemic control. Though comorbidities were not statistically significant, their presence correlated with higher poor control rates. The findings call for targeted interventions, including structured follow-up for long-term patients, improved medication access, and strengthened patient education to enhance diabetes outcomes in rural health settings.

Keywords: Duration of Diabetes, Comorbidities, Medication Adherence, Glycemic Control, Kapkatet Sub-County Hospital

INTRODUCTION

Background of the Study

Diabetes Mellitus (DM) remains a significant global health issue, affecting an estimated 537 million adults as of 2021, with projections indicating an increase to 643 million by 2030 (International Diabetes Federation, 2021). The burden is particularly high in low- and middle-income countries (LMICs), where healthcare systems often struggle with inadequate resources, leading to poor glycemic control (World Health Organization, 2016). In Kenya, the prevalence of diabetes among adults is approximately 3.3%, yet many individuals remain undiagnosed or receive suboptimal care (Karanja et al., 2023). Poor glycemic control is a key contributor to complications such as retinopathy, nephropathy, and cardiovascular disease (Saeedi et al.,

2019). Clinical factors like duration of diabetes, presence of comorbidities, and medication adherence are well-documented determinants of glycemic outcomes (Khan et al., 2019; Wanjiku et al., 2020). Rural settings, including Kapkatet Sub-County Hospital, face distinct challenges in diabetes care, including limited access to medications, poor follow-up systems, and low levels of patient education (Omondi & Otieno, 2022). The Health Belief Model (HBM) offers a useful framework to understand how patient perceptions shape health behaviors like adherence and lifestyle modification (Rosenstock, 1974).

Problem Statement

Despite increased awareness and improvements in diabetes management protocols, poor glycemic control continues to affect a significant proportion of patients at Kapkatet Sub-County Hospital. Factors such as medication stock-outs, insufficient follow-up, and complex comorbidities have been identified in broader studies (Tadesse, 2019; Smokovski, 2020), but little is known about how these challenges play out specifically in the Kapkatet context. Without local evidence, healthcare providers risk implementing generalized interventions that may not effectively address the specific needs of this population. This study aims to fill that gap by investigating the relationship between duration of diabetes, comorbidities, and medication adherence with glycemic control outcomes.

Justification of the Study

This study is necessary for several reasons:

- It will generate localized evidence to guide diabetes care strategies.
- It incorporates a behavioral model (HBM) that accounts for individual perceptions and barriers to adherence.
- It supports policymakers and clinicians in designing contextualized interventions, particularly in resource-limited rural settings.

Findings from this study will benefit not only Kapkatet Sub-County Hospital but also inform diabetes management approaches in similar regions across Kenya and other LMICs (Manyara & Mbugua, 2024).

Objectives of the Study

General Objective

To determine the influence of duration of diabetes, presence of comorbidities, and medication adherence on poor glycemic control among diabetic patients at Kapkatet Sub-County Hospital.

Specific Objectives

1. To assess the relationship between the duration of diabetes and glycemic control among diabetic patients.
2. To examine the influence of comorbidities on glycemic control among diabetic patients.
3. To determine the effect of medication adherence on glycemic control among diabetic patients.
4. To identify the proportion of patients experiencing poor glycemic control and the clinical factors associated with it.

Research Questions

1. What is the relationship between the duration of diabetes and glycemic control?
2. How do comorbidities influence glycemic control in diabetic patients?

3. What is the effect of medication adherence on glycemic control?
4. What proportion of diabetic patients at Kapkatet Sub-County Hospital have poor glycemic control, and what clinical factors are associated?

Research Hypotheses

- Null Hypothesis (H_0): There is no significant association between clinical factors (duration of diabetes, presence of comorbidities, and medication adherence) and glycemic control among diabetic patients.
- Alternative Hypothesis (H_1): There is a significant association between clinical factors (duration of diabetes, presence of comorbidities, and medication adherence) and glycemic control among diabetic patients.

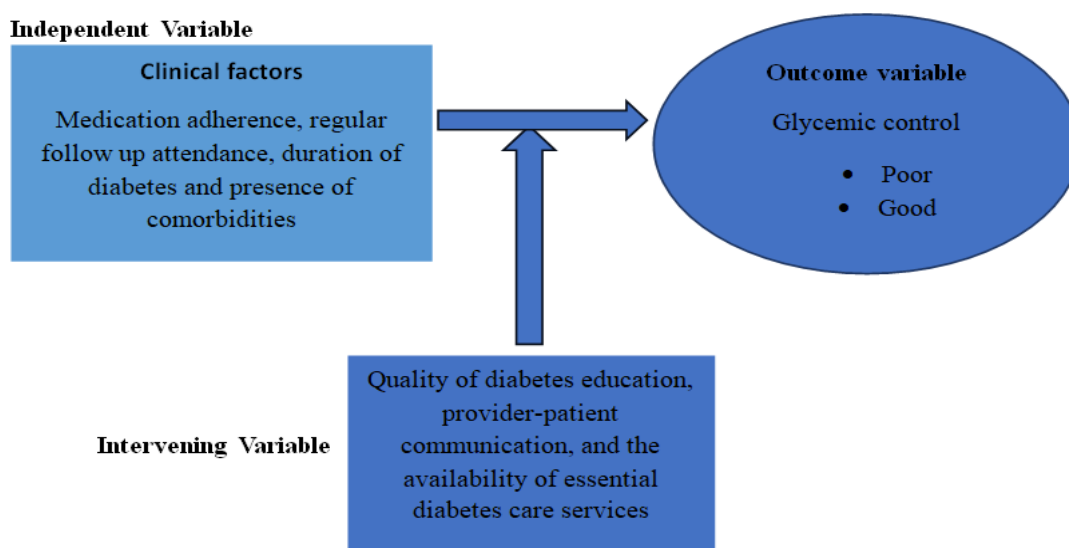
Definition of Key Terms

- Glycemic Control: The regulation of blood glucose levels in patients with diabetes, commonly assessed through fasting glucose or HbA1c levels (Powers et al., 2020).
- Comorbidity: The co-occurrence of one or more chronic conditions with diabetes, such as hypertension or cardiovascular disease (Dinavari & Saadati, 2024).
- Medication Adherence: The extent to which a patient follows the prescribed dosage, timing, and frequency of medication intake (Hailu, 2020).
- Duration of Diabetes: The time elapsed since a patient was diagnosed with diabetes mellitus.

Health Belief Model (HBM): A theoretical model explaining how individual beliefs about health conditions and outcomes influence behaviors related to prevention and treatment (Rosenstock, 1974).

Conceptual Framework

This study is grounded in the Health Belief Model (HBM), which explains how individuals' beliefs and perceptions influence their health behaviors. In the context of diabetes, the HBM suggests that patients are more likely to adhere to medication and self-care practices when they perceive themselves to be at risk (susceptibility), believe the consequences are serious (severity), and view the benefits of treatment as outweighing the barriers. The conceptual framework for this study illustrates the relationship between various factors influencing glycemic control among diabetic patients at Kapkatet Sub-County Hospital. It is based on the interaction of clinical factors, which collectively impact glycemic outcomes.



LITERATURE REVIEW

Introduction

This chapter reviews global, regional, and local literature relevant to glycemic control among diabetic patients. It explores the influence of clinical and behavioral factors specifically duration of diabetes, presence of comorbidities, and medication adherence on glycemic outcomes. The Health Belief Model (HBM) and socio-ecological model are also discussed as conceptual tools for understanding patient behavior.

Global Epidemiology of Diabetes and Glycemic Control

Globally, diabetes mellitus remains a significant public health concern, with the International Diabetes Federation (2021) estimating that over 10% of the adult population is affected. Despite advancements in treatment, many patients struggle to maintain optimal glycemic control. In low- and middle-income countries, this is compounded by weak health systems, poor health literacy, and limited access to medications (WHO, 2016). Studies conducted in countries like Pakistan and Ethiopia have shown that a substantial proportion of patients have HbA1c levels above 8%, placing them at risk of complications (Khan et al., 2019; Dinavari & Saadati, 2024). Barriers such as medication costs, inadequate patient education, and overburdened healthcare providers are common (Garbutt, 2022).

Duration of Diabetes and Glycemic Control

The duration of diabetes is a well-documented factor in glycemic outcomes. As the disease progresses, pancreatic β -cell function declines, leading to worsening glucose regulation (Wanjiku et al., 2020). Research by Khan et al. (2019) found that patients living with diabetes for more than 10 years were more likely to experience poor glycemic control due to increased treatment complexity and reduced insulin sensitivity. In Kenya, similar findings were reported by Abebe (2023), who noted that patients with longer disease duration were significantly less likely to achieve target fasting blood glucose levels. Long-term patients may also develop treatment fatigue, further compromising control (Smokovski, 2020).

Comorbidities and Glycemic Control

The presence of comorbid conditions, such as hypertension, cardiovascular disease, and kidney dysfunction, increases the complexity of diabetes management. Studies have shown that comorbidities lead to polypharmacy and treatment burden, which can interfere with adherence and glycemic monitoring (Mbui et al., 2021; Tadesse, 2019). Globally, patients with diabetes and comorbid conditions are more likely to experience hospitalization and diabetic complications (Essien, 2022). However, the strength of this association varies depending on the setting and availability of integrated care services.

Medication Adherence and Glycemic Control

Medication adherence is a major determinant of diabetes outcomes. Inconsistent or incorrect use of medication can result in uncontrolled blood glucose levels, even when effective treatments are prescribed. Research from Ethiopia (Alemayehu, 2023) and Nigeria (Bello-Ovosi et al., 2019) has demonstrated that non-adherence due to medication cost and side effects is highly prevalent. In Kisumu County, Kenya, Omondi and Otieno (2022) found that over 60% of diabetic patients missed doses due to stock-outs and financial hardship. This is consistent with international findings by Powers et al. (2020), who emphasized the need for patient support and affordable drug access.

Behavioral and Psychological Determinants: The Health Belief Model

The Health Belief Model (HBM) offers a framework for understanding how psychological and perceptual factors influence diabetes self-management. The HBM includes six key constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Rosenstock, 1974). Application of the HBM in diabetes research has shown that patients with high perceived severity and benefits

are more likely to adhere to medications and lifestyle changes (Amedu, 2023). In the rural Kenyan context, barriers such as poor health literacy and low self-efficacy remain critical (Manyara & Mbugua, 2024).

The Socio-Ecological Model in Diabetes Management

The socio-ecological model complements the HBM by incorporating multiple levels of influence individual, interpersonal, community, organizational, and policy. According to Asfaw and Dube (2022), effective diabetes management requires support not only from healthcare providers but also from families, communities, and national policies. In LMICs, weak health infrastructure and social stigma around chronic illness are significant ecological barriers to diabetes control (WHO, 2023). Addressing these determinants is essential for achieving sustained improvements in glycemic outcomes. In summary, the reviewed literature confirms that duration of diabetes, comorbidities, and medication adherence are key determinants of glycemic control. However, few studies have applied these insights in rural Kenyan settings, particularly using models like the HBM or socio-ecological model. This study aims to bridge this gap by generating context-specific evidence from Kapkatet Sub-County Hospital.

METHODOLOGY

Research Design

This study adopted a cross-sectional descriptive research design. The design was appropriate for assessing the relationship between clinical factors and glycemic control at a single point in time. A cross-sectional approach is widely used in epidemiological studies to estimate the prevalence of outcomes and explore associations between variables (Creswell & Creswell, 2018).

Study Area

The research was conducted at Kapkatet Sub-County Hospital, a government facility located in Kericho County, Kenya. The hospital offers both inpatient and outpatient services and operates a diabetes clinic that serves a large number of patients from rural and peri-urban settings. It was selected due to its high diabetic patient load, accessibility, and the need for localized data on diabetes management.

Study Population

The study targeted all adult diabetic patients receiving care at the diabetes clinic in Kapkatet Sub-County Hospital. These included both Type 1 and Type 2 diabetes patients attending routine follow-ups.

Inclusion and Exclusion Criteria

- Inclusion Criteria:
 - Adult patients (aged ≥ 18 years) diagnosed with diabetes mellitus.
 - Patients who had been on treatment for at least six months.
 - Patients who consented to participate in the study.
- Exclusion Criteria:
 - Critically ill patients who could not respond to interviews.
 - Pregnant women with gestational diabetes.

Sample Size Determination

The sample size was calculated using Yamane's formula for finite populations:

$$n=N1+N(e2)$$

Where:

- n = sample size
- N = estimated population size of diabetic patients at the clinic
- e = margin of error (0.05)

Substituting the values:

$$n=10001+1000(0.05)^2=10001+2.5=286$$

$$n=1+1000(0.05)^2=1+2.5=286$$

The sample was rounded to 300 to increase reliability.

Sampling Technique

A systematic sampling technique was employed. From a list of diabetic patients attending the clinic, every 3rd patient was selected after a random starting point was determined. This method ensured a representative and unbiased sample from the clinic's diabetic population.

Data Collection Methods

Data were collected using:

- Structured interviewer-administered questionnaires: Included socio-demographic characteristics, disease duration, medication adherence, comorbidities, and follow-up behaviors.
- Medical record reviews: Provided information on diagnosis type, glycemic status (e.g., FBG or HbA1c levels), and clinical complications.

Data Collection Procedure

- Ethical clearance was obtained from the Institutional Ethics Review Committee (IERC).
- Permission was sought from Kapkatet Sub-County Hospital administration.
- Trained research assistants administered the tools.
- Confidentiality and anonymity were ensured throughout data collection.

Study Instruments

- Questionnaire: Developed based on previous validated tools and reviewed by experts. It consisted of both open and closed-ended questions.
- Checklist: Used to extract clinical information from patient records (e.g., medication regimen, laboratory results).

Validity and Reliability

- Content validity was ensured through expert review by public health professionals and clinical nurses.

- A pilot study involving 10 diabetic patients from a neighboring facility was conducted to test clarity and consistency.
- Reliability was assessed using Cronbach's alpha, with a threshold of 0.70 considered acceptable.

Data Analysis

Data were entered into SPSS version 26 for cleaning and analysis. The analysis was conducted in the following steps:

- Descriptive statistics: Frequencies, means, and percentages.
- Inferential statistics: Chi-square tests for associations; logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs).
- The significance level was set at $p < 0.05$.

A hypothesis-driven analysis was conducted to test the association between clinical factors and glycemic control outcomes.

Ethical Considerations

- Ethical approval was obtained from the University of Kabianga IERC.
- Informed consent was obtained from all participants.
- Participant anonymity and data confidentiality were strictly maintained.
- Data were stored securely and used exclusively for research purposes.

RESULTS

Introduction

This chapter presents the study findings on the influence of duration of diabetes, presence of comorbidities, and medication adherence on glycemic control among diabetic patients at Kapkatet Sub-County Hospital. A total of 250 participants completed the study, yielding a response rate of 83.3%. Results are organized according to the study objectives and hypotheses.

Socio-Demographic Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–35	38	15.2
	36–55	103	41.2
	56 and above	109	43.6
Gender	Male	106	42.4
	Female	144	57.6
Education Level	None	49	19.6
	Primary	94	37.6

	Secondary	67	26.8
	Tertiary	40	16.0
Type of Diabetes	Type 1	28	11.2
	Type 2	222	88.8

Clinical Characteristics and Glycemic Control Status

Variable	Category	Poor Control (n, %)	Good Control (n, %)	Total (n)
Duration of Diabetes	<5 years	33 (30.3%)	76 (69.7%)	109
	6–10 years	59 (64.1%)	33 (35.9%)	92
	>10 years	58 (92.1%)	5 (7.9%)	63
Comorbidities Present	Yes	55 (62.5%)	33 (37.5%)	88
	No	92 (54.9%)	75 (45.1%)	167
Medication Use	Oral only	96 (56.8%)	73 (43.2%)	169
	Insulin only	48 (94.1%)	3 (5.9%)	51
	Combination therapy	11 (47.8%)	12 (52.2%)	23
Medication Access Difficulty	Yes	95 (68.3%)	44 (31.7%)	139
	No	55 (49.5%)	56 (50.5%)	111

Glycemic Control Status

Glycemic Status	Fasting Blood Glucose (FBG)	Frequency (n)	Percentage (%)
Good Control	<7.2 mmol/L	100	40.0
Poor Control	≥7.2 mmol/L	150	60.0

Hypothesis Testing and Association Analysis

Hypothesis 1: Duration of Diabetes and Glycemic Control

Chi-square test: $\chi^2 = 27.12$, $df = 2$, $p < 0.001$ There is a statistically significant association between duration of diabetes and glycemic control.

Hypothesis 2: Presence of Comorbidities and Glycemic Control

Chi-square test: $\chi^2 = 1.63$, $df = 1$, $p = 0.202$ No statistically significant association was found between comorbidities and glycemic control.

Hypothesis 3: Medication Adherence (Access) and Glycemic Control

Chi-square test: $\chi^2 = 9.34$, $df = 1$, $p = 0.002$ There is a significant association between medication access and glycemic control.

DISCUSSION

Introduction

This chapter interprets the study findings in relation to the existing body of literature. The discussion is structured according to the research objectives and hypotheses. Key factors examined include duration of diabetes, presence of comorbidities, and medication adherence as they relate to glycemic control among diabetic patients at Kapkatet Sub-County Hospital.

Duration of Diabetes and Glycemic Control

This study revealed a strong association between longer duration of diabetes and poor glycemic control ($p < 0.001$). Notably, 92.1% of patients who had lived with diabetes for more than 10 years had poor glycemic control. This finding aligns with research by Khan et al. (2019) and Wanjiku et al. (2020), who reported that patients with longer disease duration often exhibit worsening glycemic trends due to declining pancreatic β -cell function and increased insulin resistance. A similar trend was observed in Ethiopia, where Dinavari and Saadati (2024) found a progressive decline in glycemic control beyond five years of diagnosis. The deterioration is often attributed to treatment fatigue, increased comorbidity burden, and complex medication regimens (Smokovski, 2020). These findings highlight the need for personalized treatment reviews and enhanced follow-up for long-term patients.

Comorbidities and Glycemic Control

Although 62.5% of patients with comorbidities exhibited poor control, the association was not statistically significant ($p = 0.202$). This contrasts with the work of Mbui et al. (2021), who found that patients with diabetic complications like nephropathy and neuropathy had significantly higher HbA1c levels. One possible explanation is the cross-sectional nature of this study, which may not fully capture the time-lag between glycemic fluctuations and the onset of complications. Alternatively, patients with comorbidities may be receiving more frequent care, potentially buffering the negative effects on glycemic outcomes. A longitudinal design may be more appropriate to assess these delayed associations.

Medication Adherence (Access) and Glycemic Control

The study established a significant association between difficulty in accessing medication and poor glycemic control ($p = 0.002$). Patients who reported access issues had a 68.3% rate of poor glycemic control, compared to 49.5% among those with consistent access. These findings align with studies from Kenya (Omondi & Otieno, 2022), Nigeria (Bello-Ovosi et al., 2019), and globally (Powers et al., 2020), all of which underscore the central role of medication availability in achieving therapeutic targets. In low-resource settings, barriers such as drug stock-outs, out-of-pocket payments, and long travel distances to clinics often result in missed doses and treatment interruptions (Alemayehu, 2023). These findings support the need for policy reforms focused on ensuring steady medication supply chains and subsidized care in rural health facilities.

Glycemic Control Status in the Study Population

Overall, 60% of participants had poor glycemic control, consistent with previous reports from Kenya (Abebe, 2023; Wanjiku et al., 2020). This high prevalence is reflective of broader trends in sub-Saharan Africa, where under-resourced health systems, inadequate education, and economic constraints hinder effective diabetes management (WHO, 2023; Tadesse, 2019). Interestingly, patients on insulin-only regimens had the worst glycemic outcomes (94.1% poor control), which may indicate advanced disease requiring more intensive

therapy. This supports findings from Gosmanov et al. (2018), who emphasized the importance of structured education and frequent monitoring for insulin-treated patients.

Application of the Health Belief Model

This study's results support the theoretical framework of the Health Belief Model (HBM). For example, poor medication adherence among those facing access barriers may reflect perceived barriers, while the high poor control rate among long-term diabetics suggests reduced self-efficacy and perceived benefit from ongoing treatment. Studies by Amedu (2023) and Manyara and Mbugua (2024) similarly report that patients with low perceived severity and low self-efficacy tend to under prioritize medication adherence and lifestyle changes. These insights underscore the need to integrate behavior change communication and self-efficacy reinforcement into diabetes care programs. The findings of this study therefore confirm the significant role of duration of diabetes and medication access in influencing glycemic control. While comorbidities were not significantly associated, they remain clinically relevant. The results underscore the importance of patient-centered interventions, particularly in resource-constrained settings.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study examined the influence of clinical factors specifically duration of diabetes, presence of comorbidities, and medication adherence on glycemic control among diabetic patients at Kapkatet Sub-County Hospital. The following conclusions can be drawn: A longer duration of diabetes was significantly associated with poor glycemic control. Patients living with diabetes for more than 10 years had the highest prevalence of poor control, emphasizing the progressive nature of the disease and the need for tailored interventions. While a higher percentage of participants with comorbidities exhibited poor glycemic control, the association was not statistically significant. However, comorbidities remain clinically important due to their potential to complicate diabetes management. Medication access, as a proxy for adherence, was strongly associated with glycemic outcomes. Patients facing difficulty in obtaining medications were more likely to have poor control, highlighting systemic barriers to effective diabetes care. Overall, the study underscores the need for long-term management strategies, improved access to medications, and patient empowerment initiatives to address the burden of poor glycemic control in rural settings.

Recommendations

Recommendations for Practice

1. Enhance Patient Follow-Up for Long-Term Diabetics-Establish structured treatment reviews and follow-up plans for patients with over five years since diagnosis, to optimize therapies and reduce complications.
2. Ensure Continuous and Affordable Access to Medications-Strengthen supply chain systems and subsidize diabetes medication at public health facilities to minimize treatment interruptions.
3. Implement Community-Based Diabetes Education Programs-Educate patients on disease severity, benefits of adherence, and self-monitoring using models like the Health Belief Model to promote behavior change.
4. Adopt Type-Specific Management Protocols-Design distinct clinical pathways for Type 1 and Type 2 diabetes patients, accounting for different adherence challenges and treatment needs.

Recommendations for Policy

1. Integrate Diabetes Services into Universal Health Coverage (UHC)-Advocate for inclusion of diabetes management in national insurance schemes to reduce out-of-pocket costs for vulnerable populations.

2. Support Decentralization of Diabetes Care-Train lower-level health facilities and community health workers to manage stable diabetic cases, easing pressure on referral centers like Kapkatet.

Recommendations for Further Research

1. Conduct Longitudinal Studies-To better understand the causal relationships between comorbidities, disease progression, and glycemic control over time.
2. Explore Psychosocial and Behavioral Determinants-Using qualitative methods to capture patient beliefs, cultural attitudes, and barriers influencing adherence in rural populations.

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APPENDIX I

Appendix I: Data Collection Tool – Structured Questionnaire

SECTION A: Socio-Demographic Information

1. Age: _____ years
2. Sex: 1. Male 2. Female
3. Education Level: 1. No formal education 2. Primary 3. Secondary 4. Tertiary
4. Occupation: _____
5. Marital Status: 1. Single 2. Married 3. Divorced 4. Widowed

SECTION B: Clinical Characteristics

6. Type of Diabetes: 1. Type 1 2. Type 2
7. Duration since diagnosis: 1. Less than 5 years 2. 6–10 years 3. More than 10 years
8. Current medications used: 1. Oral drugs only 2. Insulin only 3. Both oral and insulin (Combination therapy)
9. Do you have any diagnosed comorbidities? 1. Yes 2. No

If Yes, specify: ____ 1. Hypertension 2. Cardiovascular disease 3. Renal disease 4. Other: _

10. Have you experienced any diabetes-related complications? 1. Yes 2. No

If Yes, specify: _____

11. How often do you attend diabetes clinic reviews? 1. Monthly 2. Every 2–3 months 3. Irregular/when unwell

SECTION C: Medication Adherence

12. Do you take your medication as prescribed? 1. Always 2. Sometimes 3. Rarely 4. Never
13. Have you ever missed a dose in the past 7 days? 1. Yes 2. No
14. If yes, what were the reasons? (tick all that apply) 1. Medication was out of stock 2. Forgot 3. Could not afford it 4. Side effects 5. Felt better and stopped 6. Other: _____
15. Do you have difficulty accessing your prescribed medication regularly? 1. Yes 2. No

SECTION D: Glycemic Control (to be filled by clinician/researcher)

16. Most recent fasting blood glucose (FBG) level (mmol/L): _____
17. Date of most recent FBG reading: _____
18. Glycemic status based on FBG: 1. Good control (<7.2 mmol/L) 2. Poor control (≥ 7.2 mmol/L)

Appendix II: Medical Record Review Checklist

Patient ID/Code: _____
Date of Review: _____

Variable	Data Extracted
1. Type of Diabetes	1. Type 1 2.Type 2
2. Date of Diabetes Diagnosis	_____
3. Duration Since Diagnosis	_____ years
4. Latest Fasting Blood Glucose (FBG)	_____ mmol/L Not recorded
5. Date of FBG Test	_____
6. Glycemic Control Status	1. Good (<7.2 mmol/L)
	2.Poor ($\geq$ 7.2 mmol/L)
7. Latest HbA1c Level (if available)	_____ % Not available
8. Comorbidities Present	1. Hypertension
	2. Cardiovascular Disease
	3. Kidney Disease
	4. Eye Disease (Retinopathy)
	5. Neuropathy
	6. None
9. Treatment Modality	1. Oral Hypoglycemic Agents (OHA)
	2. Insulin only
	3. OHA + Insulin
10. Adherence Notes (if recorded)	_____
11. Clinic Visit Frequency	1. Monthly
	2. Bi-monthly
	3. Irregular/Defaulted
12. Additional Notes (complications, hospitalizations, etc.)	_____

Appendix III-Ierc Approval



**UNIVERSITY OF KABIANGA
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Date: 12th March, 2025

Peter Ngugi et al.,
C/o University of Kabianga,
Kericho, Kenya.

Dear Sir/Madam,

RE: Determinants Associated with Poor Glycemic Control in Diabetic Patients At Kapkaret Sub-County Hospital, Kenya

This is to inform you that University of Kabianga Institutional Scientific and Ethical Review Committee has reviewed and approved your above research proposal. Your approval number is **ISERC/2024/0060**. The approval period is **12nd March, 2025 – 11th September, 2025**.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by University of Kabianga Institutional Ethics Review Committee.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to University of Kabianga Institutional Ethics Review Committee within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to University of Kabianga Institutional Ethics Review Committee within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.

Appendix IV-Kapkatet Sub-County Hospital Approval

UNIVERSITY OF KABIANGA
SCHOOL OF HEALTH SCIENCES
DEPARTMENT OF NURSING
P.O BOX 2030- 20200, KERICHIO
muckhnn72021@gmail.com

24/8/2025

KAPKATET DISTRICT HOSPITAL
MEDICAL SUPERINTENDENT
P.O BOX 65 KAPKATET

Dear Sir/Madam,

RE: REQUEST TO CONDUCT A RESEARCH PROJECT

Following approval by the University of Kabianga Institutional Scientific and Ethical Review Committee (ISERC), we are writing to request for permission to conduct a research project on determinants associated with poor glyceimic control in diabetic patients attending Kapkatet Sub-County Hospital. As year four nursing students, we are eager to pursue a research project that aligns with the goals and objectives of your institution.

The objectives of the study are as follows:

- To investigate the demographic factors (such as age, gender, socioeconomic status, and educational level) that are associated with poor glyceimic control in diabetic patients attending Kapkatet Sub-County Hospital
- To evaluate the clinical factors (duration of diabetes, presence of comorbidities, and medication adherence) that contribute to poor glyceimic control among patients attending Kapkatet Sub-County Hospital
- To identify lifestyle factors influencing glyceimic control among diabetic patients at Kapkatet Sub-County Hospital.
- To evaluate the healthcare access and utilization patterns among diabetic patients in relation to glyceimic control at Kapkatet Sub-County Hospital.

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