# UTILIZATION OF PATIENT-ACTIVATION INTERVENTION TO ENHANCE SELF-CARE PRACTICES AMONG PATIENTS NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN SELECTED HOSPITALS, KENYA

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# Utilization of Patient-activation Intervention to Enhance Self-care Practices among Patients Newly Diagnosed with Type 2 Diabetes Mellitus in Selected Hospitals, Kenya

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**A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy in Nursing (Medical-Surgical Nursing) of the Jomo Kenyatta University of Agriculture and Technology**

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## DECLARATION

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

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## DEDICATION

This work is dedicated to all healthcare professionals who remain committed to providing health education to patients diagnosed with Type 2 Diabetes Mellitus. It is also dedicated to patients newly diagnosed with T2DM who strive to adjust their lifestyle behaviors and work towards achieving effective self-care management. Furthermore, this work is dedicated to the family members who continuously support these patients during follow-up visits and their daily lives at home.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **ADA** | American Diabetes Association |
| **ADCES** | Association of Diabetes Care and Education Specialists |
| **BMI** | Body Mass Index |
| **CDC** | Centre for Disease Control and Prevention |
| **CHW** | Community Health Worker |
| **CINAHL** | Cumulative Index to Nursing and Allied Health Literature |
| **CKD** | Chronic Kidney Disease |
| **CME** | Continuous Medical Education |
| **COR** | Crude Odds Ratio |
| **COVID-19** | Coronavirus Disease 2019 |
| **CVD** | Cardiovascular Diseases |
| **DCI** | Diabetes Care Intervention |
| **DESMOND** | Diabetes Education and Self-Management for Ongoing and Newly Diagnosed |
| **DFU** | Diabetes Foot Ulcer |
| **DPP** | Diabetes Prevention Program |
| **DSC** | Diabetes Self-care |
| **DSME** | Diabetes Self-Management Education |
| **DSMQ** | Diabetes Self-Management Questionnaire |
| **DSMS** | Diabetes Self-Management Support |
| **FGD** | Focus Group Discussion |
| **HbA1c** | Glycosylated Hemoglobin |

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|---|---|
| **HBM** | Health Belief Model |
| **HCP** | Healthcare Professionals |
| **HDL** | High-Density Lipoprotein |
| **IDF** | International Diabetes Federation |
| **JKUAT** | Jomo Kenyatta University of Agriculture and Technology |
| **KDHS** | Kenya Demographic and Health Survey |
| **KDIC** | Kenya Diabetes Information Center |
| **KII** | Key Informant Interviews |
| **KNBS** | Kenya National Bureau of Statistics |
| **KU-ERC** | Kenyatta University Ethics Review Committee |
| **LDL** | Low-Density Lipoprotein |
| **MCNAP** | Muranga County Nutrition Action Plan |
| **MHCE** | Mobile Health Care Environment |
| **MOH** | Ministry of Health |
| **MPHS** | Ministry of Public Health & Sanitation |
| **NACOSTI** | National Commission for Science, Technology and Innovation |
| **NCDs** | Non-Communicable Diseases |
| **NHIF** | National Health Insurance Fund |
| **OR** | Odds Ratio |
| **PAI** | Patient Activation Intervention |
| **PAM® -13** | Patient Activation Measure tool |
| **QUAL** | Qualitative |
| **QUAN** | Quantitative |

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|---|---|
| **RN** | Registered Nurse |
| **SDSCA** | Summary of Diabetes Self-care Activities |
| **SDG** | Sustainable Development Goal |
| **SMS** | Short Message Service |
| **SPSS** | Statistical Package for the Social Sciences |
| **T2DM** | Type 2 Diabetes Mellitus |
| **UK** | United Kingdom |
| **US** | United States |
| **USA** | United States of America |
| **USD** | United States Dollar |
| **WDF** | World Diabetes Federation |
| **WHO** | World Health Organization |

## DEFINITION OF OPERATIONAL TERMS

| | |
|---|---|
| **Adult** | An individual above 18 years of age. |
| **Awareness** | Being well informed on the recommended self-management for T2DM. |
| **Clinical outcome** | Measurable changes in a patient's health as result of the clinical care received. |
| **Complications** | Presence of a secondary condition that aggravates an already existing condition. |
| **Empower** | Make patient more confident and knowledgeable in taking care of their health. |
| **Follow-up** | Healthcare given to a patient overtime after the initial management for a disease. |
| **Glycemic control** | Maintenance of blood glucose levels constantly between 3 mmol/L to 10mmol/L and having HbA1c below 6.5 |
| **Good Adherence** | Compliance to the recommended management for T2DM |
| **Health literacy** | Degree to which a person is able to process and understand health information that they need to make certain health decision provided to them by the healthcare profession. |
| **Health seeking behaviors** | Action undertaken by a person who perceives themselves to have a certain health problem. |
| **Healthcare professional** | An individual who is trained and licensed to offer medical care. |

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|---|---|
| **Lifestyle habits** | An individual's living behavior or habits that they have chosen. |
| **mHealth** | The use of text messaging (SMS) delivered via the patient's personal mobile device to deliver personalized educational and behavioral prompts to support patient's attainment of self-care efficacy following initial diagnosis. |
| **Newly diagnosed patient** | A patient who has been diagnosed with T2DM for the first time, has a new prescription for anti-diabetic agents. |
| **Nutrition therapy** | Prescribed diet plan that a patient is advised to adhere to consistently. |
| **Outcome** | Measure of effect of diabetes management on patients. |
| **Patient Activation** | Empowering patients on their knowledge, skills and confidence for them to initiate active self-management. |
| **Patient Activation Intervention** | Structured strategies/ interventions designed to increase an individuals level of knowledge, skills, and confidence to actively participate in managing their health. |
| **Patient Activation Level** | The degree of a patient's knowledge, skills, and confidence in managing their health and healthcare. |

**Patient Activation Measure®-13 (PAM®-13)** A 13-item validated questionnaire used to assess a patients knowledge, skills, and confidence in managing their health and healthcare.

**Patient empowerment** Enabling a patient believe that they have an active role to play in managing their health.

**Patient engagement** Steps that patients take to make use of accessible health-care services.

**Patient-tailored-activation Intervention** When healthcare professionals engage patients in their self-care by promoting an increase in their knowledge, skills and confidence.

**Perception** Patients understanding of the recommended self-management for T2DM.

**Poor adherence** Not complying with the recommended management for T2DM

**Problem solving skills** Patients ability to resolve issue affecting their health.

**Quality of Life** Perception that a patient is able to enjoy their normal daily life activities.

**Self-awareness** Patient's ability to recognize their diabetes status, symptoms, and understand the impact of their self-care practices on blood glucose control.

**Self-care practices** Routine activities performed by an individual diagnosed with T2DM to manage their

| | |
|---|---|
| | condition, as measured by participants' responses on Diabetes Self-Management Questionnaire with higher responses indicating better self-care practices. |
| **Self-efficacy** | Patient's level of confidence in their ability to successfully perform recommended self-management |
| **Self-management behaviors** | Patient's ability to modify their behaviors into the recommended practices for T2DM. |
| **Telemedicine** | Use of technology such as phone calls to offer healthcare services. |

## ABSTRACT

Globally, the prevalence of Type 2 Diabetes Mellitus (T2DM) is increasing, corresponding to a rise in diabetes related complications in Kenya. This study aimed to enhance self-care practices among patients newly diagnosed with T2DM through a patient-tailored activation intervention. An embedded mixed methods study using a sequential explanatory design was conducted involving 124 newly diagnosed patients recruited from two level 5 hospitals in Kenya. Purposive sampling method was used to select the study areas; Muranga Level 5 hospital as the study group and Kiambu Level 5 hospital as the control group. The study was conducted over one year in three phases: a baseline survey, an implementation phase, and a post-intervention evaluation phase. Quantitative data were collected using the Patient Activation Measure®-13 (PAM®-13), and a modified Diabetes Self-Management Questionnaire (DSMQ) and analyzed using Statistical Package for the Social Sciences (SPSS) version 26. Qualitative data were collected through Focus Group Discussions (FGDs), and Key Informant Interviews (KIIs), and analyzed using NVivo 13. Quantitative data were analyzed using descriptive statistics, chi-square tests, binary logistic regression, and paired sample *t*-tests, while qualitative data were thematically analyzed and triangulated. Ethical approval was sought from Kenyatta University Ethics Review Committee (KU-ERC). At baseline, low patient activation was observed in 46 (74.2%) participants in the control group and 43 (69.4%) in the study group, while poor self-care practices were recorded in 30 (48.4%) participants in the control group and 39 (62.9%) in the study group, respectively. Four themes emerged from the FGDs on patient-related factors influencing self-care practices. Institution-related factors were significantly associated with self-care practices, including health education sessions (OR = 1.887; 95% CI: 1.591–2.238), and scheduled follow-up visits (OR = 0.379; 95% CI: 0.183–0.786). In addition, two main thematic categories emerged from the FGDs and KIIs: enablers and inhibitors. Findings from the baseline survey informed the development and implementation of the patient-tailored activation intervention in Phase II. Participants in the study group were then followed for three months. Following the intervention, the study group registered a (9.74-fold) significant increase in the mean activation scores from 54.05 (±7.866) at baseline to 63.79 (±15.51) at post-intervention ($t$ (61) = 4.474, $p < .001$), representing a large effect size (Cohen's $d$ = 0.80) while participants in the control group recorded a decrease in their mean activation scores from 52.50 (±6.62) at baseline to 47.41(±47.41) at post-intervention ($t$ (61) = -2.559, $p$=0.013), with a moderate negative effect size ($d$ = −0.46). Regarding, self-care practices the control group registered no significant change at post-intervention 5.28 (SD±1.77) from baseline 5.08 (SD±1.22) ($t$ (61) = -0.798, $p$ = 0.428), with a small effect size ($d$ = 0.13) while the study group registered a statistically significant change at post-intervention 6.77 (SD±1.67) compared to the baseline scores 4.77 (SD±0.96) ($t$ (61) = -8.229, $p < .001$), corresponding to a very large effect size ($d$ = 1.47). The findings demonstrate that early patient-tailored activation significantly improves patient activation levels and self-care practices among individuals newly diagnosed with T2DM. The study therefore recommends that healthcare professionals adopt early patient empowerment strategies to identify the needs of newly diagnosed patients and to strengthen their confidence and skills in self-managing their condition.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of Study

Globally, the population of adults newly diagnosed with Type 2 Diabetes Mellitus (T2DM) has been rising drastically. The World Health Organization (WHO, 2021) reported that 422 million individuals had been diagnosed with diabetes mellitus by the year 2014, with 1.5 million of them having been diagnosed with T2DM. In addition, by 2040, the number of individuals newly diagnosed with T2DM is estimated to rise by 141%. Similarly, according to the Centers for Disease Control and Prevention (CDC, 2020), diabetes mellitus has a crude rate of 31 per 100,000 population, making it one of the leading causes of death globally. Likewise, a rise in the morbidity and mortality rates due to T2DM has been reported. Jalilian et al. (2023) reported that 76.1% of patients living with T2DM in Iran had developed at least one complication. Some of the complications reported were retinopathy 15.4% and cardiovascular disease, 15.9 %. Additionally, according to the WHO (2021), by the year 2019, diabetes mellitus had caused 1.5 million deaths.

In Africa, studies have reported a rise in the prevalence of diabetes related complications. A study done in Morocco reported that 43.5% of adults living with T2DM had developed at least one complication. Further, the study reported that retinopathy was the most common complication affecting approximately 18.5% of patients (Mohammi et al., 2026). In Ethiopia, studies have reported a high prevalence of complications whereby nearly half, 45.5% of patients living with T2DM had been diagnosed with at least one microvascular complication (Amsalu et al., 2024). In the East African region, T2DM ranks among the leading Non-Communicable Diseases (NCDs), with an estimated 19.5 cases per 1,000 person-years, and is associated with high morbidity and mortality (WHO, 2024). In Tanzania, for instance, by the year 2024, the prevalence of T2DM was estimated at 11.9 % in the urban setting, with 44.5% of the individuals having developed diabetes-related complications. This was significantly associated with low awareness

of the recommended management for diabetes mellitus, which was estimated at 21.7% (Yustus et al., 2024).

In Kenya, the prevalence of T2DM is significantly higher in urban areas (3.4%) than in rural areas (1.9%) (International Diabetes Federation [IDF], 2021). The prevalence rates are reported to be even higher within specific low-income urban settlements in Nairobi, ranging from 4.1% to 5.3% (Karugu et al., 2024). As the prevalence of diabetes mellitus rises in Kenya, a rise in diabetes related complications has also been reported. A study conducted in the Central region of Kenya observed an increased risk of developing Chronic Kidney Disease (CKD) and Cardiovascular Diseases (CVD) among individuals who had lived with T2DM for more than 5 years (Otieno et al., 2020). Similarly, the mortality rate due to Diabetes Foot Ulcer (DFU) in Central Kenya is approximated to be at 11% (Mutonga et al., 2019). This high mortality rate in the region could be associated with the high prevalence of DFU, estimated at 9.04% (Maingi et al., 2020).

The rising prevalence of diabetes related complications has been significantly associated with poor self-care practices. Likewise, poor adherence to the recommended self-care practices has been reported in people newly diagnosed with diabetes mellitus. In Ethiopia, for instance, 54% of patients newly diagnosed with T2DM were found to have poor self-care practices (Bekele et al., 2024). A similar study found that most 61.1% of patients living with T2DM in Ethiopia demonstrated inadequate adherence to self-care practices (Endale et al., 2025). This highlights the need to initiate active self-management among individuals newly diagnosed with T2DM in order to delay or prevent the development of diabetes related complications.

When a person is newly diagnosed with T2DM, they are required to adjust their lifestyle habits, adopt health-seeking behaviors, and acquire problem-solving skills in order to achieve normoglycemia (IDF, 2025). Self-care practices, such as dietary management, medication adherence, physical activity, foot care, stress management, and periodic health reviews, determine patients' glycemic control (Matpady et al., 2020). For a patient to carry out these practices, they require knowledge of the

recommended management, the skills to perform them, and the confidence to do so independently (Salem et al., 2025). Patient Activation Intervention (PAI) is a potential strategy for empowering individuals diagnosed with chronic diseases and improving self-care practices (Lu et al., 2025). Central to this approach is the Patient Activation Measure®-13 (PAM®-13),a validated 13-item instrument that assesses an individual's readiness to self-manage based on their awareness, skill, and confidence (Ng et al., 2024).

Patient activation is a behavioral concept that describes the degree to which a person understands their role in managing their health and feels confident in doing that role (Endale et al., 2025). It incorporates the knowledge, skills, and confidence necessary for an individual to actively self-manage their health daily (Almutairi et al., 2024). Therefore, patient activation is viewed as a developmental process in which an individual moves from being a passive recipient of healthcare to becoming proactive and maintaining healthy behaviors even under stress (Achury-Saldaña et al., 2025). Recent studies demonstrate that using PAM®-13 to tailor patient care results in significant improvements in their health status and reductions in acute care utilization, such as emergency department visits (Ng et al., 2024). Consequently, current 2025 clinical performance standards recommend that healthcare professionals utilize the PAM®-13 as a baseline assessment tool at the first point of contact to identify a patient's specific activation level and guide personalized intervention strategies (Provenzano et al., 2025).

In Kenya, studies have predicted a rapid rise in new cases of T2DM. This highlights the need for healthcare stakeholders to implement measures to curb the projected upsurge. Moreover, despite the availability of diabetes management guidelines globally and in Kenya, the number of T2DM-related complications has been on the rise. Hence, T2DM is a growing health concern, and if no effective interventions are put in place, it will become an economic burden on patients, their families, and the country's healthcare system. According to the American Diabetes Association (ADA, 2025), patient empowerment is the most important initiative in diabetes management. Similarly, the WHO stated that to prevent the early development of diabetes-related complications, healthcare providers need to initiate and implement early

empowerment programs for people newly diagnosed with T2DM to achieve good clinical outcomes (WHO, 2021).

Therefore, the objective of this study was to develop a structured diabetes education module, a patient-activation-tailored intervention, aimed at empowering adult patients newly diagnosed with T2DM in order to activate and continuously engage them during their initial and follow-up visits. The goal was to enable patients to acquire knowledge of the recommended management for T2DM and to develop the skills and confidence needed to execute the recommended self-care practices.

### 1.2 Statement of the Problem

Despite the ongoing prevention and management efforts, T2DM continues to pose a major public health problem in Kenya, characterized by high morbidity, premature mortality, and a substantial burden on the health system. In Kenya, NCDs, including diabetes, account for more than 50% of inpatient hospital admissions and approximately 39% of all deaths, indicating a significant contribution to avoidable morbidity and mortality (Ministry of Health [MOH], 2021; WHO, 2023).

Recent estimates from the International Diabetes Federation (IDF) attribute approximately 9,377 deaths among adults aged 20–79 years in Kenya to diabetes mellitus, accounting for about 3.4% of all deaths in this age group and contributing significantly to years of life lost and disability-adjusted life years (IDF, 2025). In addition, nearly 35% of individuals living with T2DM experience at least one major diabetes related complication, further amplifying the morbidity burden and underscoring the urgent need for effective prevention and management strategies in Kenya (MOH, 2018; IDF, 2025).

Notwithstanding the current strategic efforts to improve clinical care in Kenya, a critical functional gap exists at the patient level, leading to persistently poor diabetes-related outcomes and a high prevalence of complications. A study conducted in Machakos County, Kenya, found that 66.9% of individuals with T2DM did not practice recommended self-care management, resulting in a high proportion of patients with poor glycemic control (Kiarie et al., 2023). Furthermore, a cross-

sectional study conducted in Nyeri County found a significant association between suboptimal self-care practices and high prevalence of microvascular complications ($p < 0.001$) (Ireri et al., 2024). Similarly, a study by Otieno et al. (2020) observed that 39% of patients diagnosed with diabetes mellitus in Central Kenya had developed CKD. At Kenyatta National Hospital, the largest referral hospital in Kenya, CKD accounted for the highest proportion of hospital admissions due to diabetes-related complications at 38.6% (Mwenda et al., 2019).

The rising incidence of T2DM complications in Kenya has imposed a significant economic burden on the patients and their families, often subjecting them to catastrophic health expenditure. According to a report by Adamjee and de Harerimana (2022) the direct cost of diabetes care in Kenya is estimated at USD 413 per patient supplemented by USD 213 in indirect costs. This burden is particularly acute in Central Kenya, where the disease has been rapidly accelerating in incidence. For instance, statistics from Murang'a County reveal that new T2DM diagnoses nearly doubled over a two-year period, rising from 14,950 cases in 2017 to 28,447 by 2019, underscoring a profound and rapidly escalating local disease burden (MCNAP, 2020). Therefore, failing to implement measures to promote adherence to recommended self-care practices creates a severe financial burden for patients and worsens their health outcomes. In addition, targeting newly diagnosed patients for early empowerment can effectively mitigate Kenya's rising morbidity and mortality rates.

Amid the growing burden of T2DM in Kenya, there is a paucity of local studies implementing evidence-based interventions in high-prevalence areas such as Central Kenya. Hence, this study sought to develop a structured educational module, the patient-activation-intervention, in Muranga County to deliver targeted health education to individuals newly diagnosed with T2DM. The module was designed to empower patients and promote sustained engagement in the recommended self-care practices for T2DM, which are essential for achieving optimal glycemic control.

## 1.3 Justification

Several studies have recommended that integrating interventions tailored to patients' activation levels into routine diabetes care improve clinical outcomes and quality of life for individuals with chronic conditions. Taking into consideration the high prevalence of diabetes related complications in Kenya, there is a need for evidence-based intervention approaches that will aid in reinforcing knowledge, skills, and confidence among individuals newly diagnosed with T2DM. Moreover, implementing an early empowerment intervention study among patients living with T2DM aligns with Kenya Vision 2030's focus on strengthening and promotive health strategies within the health sector. Type 2 diabetes mellitus poses a significant threat to these goals due to its chronic nature, long-term complications, and adverse impact on patients' quality of life. Additionally, early empowerment is important because initial diagnosis presents a critical window for preventing disease progression, complications, premature mortality, and increased healthcare costs (WHO, 2023; IDF, 2025).

Studies conducted in Kenya have found that adherence to recommended diabetes management is poor among people living with T2DM, which has been associated with adverse clinical outcomes. Furthermore, T2DM is a chronic condition that demands lifelong self-care management and is therefore associated with a substantial financial burden on patients, their families, and the wider community. This burden may also contribute to increased strain on the national healthcare system. Therefore, empowering individuals at this point of diagnosis is essential to mitigate these burdens and improve long-term health outcomes. Moreover, integrating an evidence-based care approach into the management of T2DM aligns with Sustainable Development Goal (SDG) on good health and well-being, which aims to reduce premature mortality from NCDs through prevention, treatment, and health promotion (United Nations, 2015). In addition, empowering patients living with T2DM to engage in effective self-care practices has been shown to significantly reduce diabetes-related complications and premature deaths (MOH, 2021).

## 1.4 Research Questions

1. What is the patient-activation level among patients newly diagnosed with T2DM in selected hospitals, Kenya?
2. What are the self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya?
3. What are the patient factors influencing self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya?
4. What are the institutional factors influencing self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya?
5. What are the patient-tailored activation interventions used in empowering patients newly diagnosed with T2DM in selected hospitals, Kenya?
6. What is the effect of the patient-tailored activation intervention on patient-activation levels among patients newly diagnosed with T2DM in selected hospitals, Kenya?
7. What is the effect of the patient tailored-activation intervention on self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya?

## 1.5 Objectives

### 1.5.1 Broad Objective

To enhance self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

### 1.5.2 Specific Objectives

1. To establish patient-activation levels among patients newly diagnosed with T2DM in selected hospitals, Kenya.
2. To determine self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.
3. To determine patient factors influencing self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

4. To determine institutional factors influencing self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.
5. To develop a patient-tailored activation intervention for patients newly diagnosed with T2DM in selected hospitals, Kenya.
6. To determine the effect of the patient-tailored activation intervention on patient-activation levels among patients newly diagnosed with T2DM in selected hospitals, Kenya.
7. To determine the effect of patient-tailored activation intervention on self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

### 1.6 Research Hypothesis

***$H_0$*1:** There is no significant relationship between patient factors and self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_1$*1:** There is a significant relationship between patient factors and self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_0$*2:** There is no significant relationship between institutional factors and self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_1$*2:** There is a significant relationship between institutional factors and self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_0$*3:** Patient-tailored-activation intervention is not effective in enhancing patient-activation levels among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_1$*3:** Patient-tailored activation intervention is effective in enhancing patient activation levels among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_0$*4:** Patient tailored-activation intervention is not effective in enhancing self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

***$H_1$*4:** Patient-tailored activation intervention is effective in enhancing self-care practices among patients newly diagnosed with T2DM in selected hospitals, Kenya.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter discusses literature on the concept of the Patient Activation Measure® tool, research findings on the utilization of patient activation-tailored interventions in managing patients diagnosed with T2DM, and their effectiveness. This chapter will also discuss relevant literature on self-care practices among patients diagnosed with T2DM. Additionally, the literature on factors influencing self-care practices will be discussed, including institutional and patient factors that influence patients' adaptation to the recommended management for T2DM. The theoretical framework and conceptual framework that drive the study's literature review will also be presented. Lastly, the chapter summary and the research gaps the researcher addressed in the study will be discussed.

This chapter is informed by a structured review of existing literature. Electronic searches were conducted using PubMed, Google Scholar, CINAHL, and Scopus, as these databases provide comprehensive coverage of peer-reviewed literature on diabetes management. The search terms used included T2DM, self-care practices, T2DM self-care practices, patient empowerment, and patient activation.

The initial search yielded 450 articles. Studies were included if they addressed adherence to the recommended diabetes management and the factors influencing it among patients with T2DM. The review also included studies that addressed programs that aimed to empower individuals diagnosed with T2DM and were published in English. Studies were excluded if they lacked full-text availability, focused on other types of diabetes, involved pediatric populations, or were not published in English. 179 were excluded for not meeting the inclusion criteria, while 171 were included in the final review. To ensure relevance and currency, the review focused on peer-reviewed literature published between 2020 and 2025, with a limited number of earlier seminal studies included where necessary. The selected literature informed the thematic organization of this chapter.

## 2.2 Patient-Activation Among Patients Diagnosed with T2DM

The PAM®-13 tool has been widely used globally to assess activation levels among patients with chronic conditions. It categorizes patients into one of four activation levels based on their confidence, knowledge, and skills. When the PAM®-13 tool is used to manage patients diagnosed with chronic conditions, the goal is for them to progress through the four levels of activation to attain effective self-care behaviors (Kearns et al., 2020). According to Magadi et al. (2022), PAM®-13 describes an individual's level of knowledge, confidence in managing their health through self-management, and skills to perform the recommended self-care. Additionally, it assesses several important concepts in chronic care management, including self-efficacy for positive health behaviors. Lightfoot et al. (2022) recommended that clinicians use PAM®-13 as a guide when assessing patients' knowledge, confidence, and skills, as it evaluates the extent to which an individual is actively involved in their health care.

Several studies have reported low activation among patients diagnosed with T2DM. A cross-sectional study among adults living with T2DM in Amazonas, Brazil, reported that most participants demonstrated low patient activation: 33% scored PAM®-13 Level 1 and 27.5% scored PAM®-13 Level 2, indicating low engagement in recommended diabetes self-management practices (de Leon et al., 2024).

In the Netherlands, the diabetes federation developed a four-step person-centered consultation model among people living with T2DM, in which, at baseline, the mean activation level was 58.9 (±11.7), corresponding to a low activation level 1(Rutten et al., 2020). Likewise, Almutairi et al. (2024) reported that the mean baseline activation score among patients with T2DM in Saudi Arabia was low at 55.9 (±13.5). In Korea, among patients who had lived with T2DM for a duration of 0 to 6 years, registered low activation levels at baseline, and this was associated with a lack of exposure to health education (Kim, 2021).

According to Keriakos et al. (2024), when clinicians adopt the PAM®-13 tool in the management of patients diagnosed with chronic conditions, they empower them with skills, knowledge, and confidence, and, as a result, they become more informed and active in caring for their own health. Wilkinson et al. (2021) observed that adopting the PAM®-13 helped determine the level of activation among patients with multi-morbidity. Similarly, a study by Yao et al. (2021) observed that highly activated patients had better health outcomes. The study also observed that the majority of patients had low activation levels, which were associated with lower knowledge levels and comorbidities. Additionally, Lin et al. (2021) stated that patient-activation-tailored interventions are effective in improving patients' quality of life.

### 2.3 Self-Care Practices Among Patients Diagnosed with T2DM

Diabetes mellitus is a chronic condition and requires continuous healthcare engagement between the patient and their healthcare provider. The goal of diabetes management is for the patient to achieve optimal control of their blood glucose levels and to prevent the development of diabetes related complications (IDF, 2021). According to the American Diabetes Association, for a patient to achieve effective control of their blood glucose levels, they must attain efficacy in certain aspects of diabetes management. Essential self-care practices for a patient diagnosed with T2DM include a healthy diet, regular physical activity, monitoring blood sugar levels, adherence to prescribed treatment, developing problem-solving skills, adopting healthy coping strategies, and engaging in risk-reduction behaviors (ADA, 2025).

Tan et al. (2020) stated that self-care practices refer to personalized care whereby the patient plays a significant role in the daily management of their own health. In addition, the patient receives support from their healthcare provider to develop confidence and skills to adopt and maintain a healthy lifestyle and to know when to seek medical help. Therefore, self-care practices are activities and behaviors a patient undertakes to promote good health and cope with illness, thereby fostering positive health-seeking behaviors and effectively utilizing available health resources (WHO, 2023). When a person is newly diagnosed with T2DM, they are required to acquire

knowledge of recommended diabetes management, skills to carry out their self-care practices, and motivation and confidence to engage in them. These key concepts are described as prerequisites for self-care practices (Rutten et al., 2020). Similarly, Mueller et al. (2022) stated that self-care practices involve the patient acquiring knowledge and skills to self-manage their health condition.

Several studies have reported poor adherence to self-care practices among patients diagnosed with T2DM. A study conducted in Kitui County, Kenya, found that only half (50.9%) of patients diagnosed with T2DM had adhered to the recommended dietary plan (Musembi et al., 2023). A similar study was done in Thika, Kenya, where the mean self-care score among patients diagnosed with T2DM was 7.6 out of 14 (Wamucii et al., 2020). Poor self-care practices have also been reported in Saudi Arabia among patients living with T2DM, whereby the mean self-care practices were poor with a score of 5.04 out of 10 (Al-Qahtani, 2020). Likewise, a study conducted in Ethiopia found that only 49% (95% CI: 43, 56%) of patients diagnosed with T2DM engaged in optimal self-care practices (Ketema et al., 2020).

Studies have reported that when a patient is newly diagnosed with diabetes mellitus, they frequently present with emotional reactions and struggle to implement the recommended lifestyle changes. A qualitative study done in the USA found that when an individual is newly diagnosed with T2DM, they experience emotional and psychological challenges, and this leads to them making very minimal changes to their lifestyle habits. The study further reported that these difficulties were associated with inadequate guidance and support at the time of diagnosis, which hindered the adoption of recommended self-care practices (Boakye et al., 2023). These findings explain the poor adherence to recommended self-care practices among patients who have lived with diabetes mellitus for a short duration.

For a patient to perform the recommended self-care practices, they need to be empowered or activated by the healthcare provider. Miller et al. (2020) stated that when an individual is newly diagnosed with T2DM, they need to be activated through continuous engagement to adhere to recommended self-management. Mueller et al. (2022) stated that there is a need to empower patients newly diagnosed

with a condition to adjust their lifestyle behaviors and acquire skills to navigate the complex self-management of the disease. It is therefore recommended that clinicians consider activating patients diagnosed with T2DM, as this is a transformative process.

## 2.4 Factors Influencing Self-Care Practices Among Patients Diagnosed with T2DM

Once an individual has been diagnosed with T2DM, they are required to adjust their lifestyle habits and adopt health-seeking behaviors. In addition, they are expected to adjust their diet, cease smoking and drinking alcohol, adopt psychological self-care, and initiate exercise to achieve a normal Body Mass Index (BMI) (WHO, 2021). Moreover, they are expected to adhere to the recommended self-care management regime and have adequate control of their blood sugar levels (D'Souza et al., 2017). A study by Simegn et al. (2023) found that several factors were significantly associated with poor adherence to self-care practices, such as poor behavioral control (AOR = 0.59, 95% CI: 0.36, 0.97) and low perceived benefits (AOR = 0.20, 95% CI: 0.08, 0.51). The study recommended that healthcare professionals tailor intervention programs targeting these factors to improve self-care adherence and diabetes-related outcomes among individuals living with T2DM.

### 2.4.1 Patient Factors Influencing Self-Care Practices Among Patients Diagnosed with T2DM

The WHO stated that when a person is newly diagnosed with T2DM, they need to modify their personal lifestyle behaviors, develop skills to address life challenges, and also embrace health-seeking habits (WHO, 2021). Doglikuu et al. (2021) stated that it takes time for a person to adjust their lifestyle behaviors to the recommended management of diabetes mellitus after a new diagnosis. This is because it is not easy for an individual to change well-established lifestyle behaviors they have embraced for many years. In addition, the study attributed this to deeply rooted cultural and lifestyle practices, reinforcing the need for care tailored to patient needs. Given that individuals who adhere to the recommended self-management for T2DM experience

improved HbA1c over time ($p < 0.01$) compared to those who recorded poor adherence (Ajrouche et al., 2024).

A study conducted in Saudi Arabia found that patients with T2DM engaged in varying levels of self-care practices, and this was significantly associated with their level of education, awareness of recommended management, duration since diagnosis, and socio-demographic characteristics (Al Bshabshe et al., 2020). A similar study conducted in the US reported that the majority of participants had poor self-care practices, and this was significantly associated with low income ($p = 0.0019$) and low confidence in performing self-care ($p < 0.0001$). The study further observed that low self-confidence levels were significantly associated with poor blood sugar monitoring ($p < 0.0001$) and missing insulin doses ($p = 0.0153$). The study found that self-confidence among individuals with T2DM is a strong determinant of self-care practices (Luciani et al., 2021). Similarly, according to Babazadeh et al. (2023), poor self-care practices and glycemic outcomes were significantly associated with patients' socio-economic status, confidence in executing the recommended self-care, and individual perceptions. For this reason, healthcare providers need to empower patients diagnosed with T2DM through health education and follow-up support to enhance their confidence and address barriers to adherence.

Studies have found that several factors influence adherence to self-care practices among individuals newly diagnosed with T2DM. Kiçaj et al. (2025) observed that patients' socio-demographic characteristics and clinical factors were key determinants of adherence to recommended self-care practices. Some of the factors observed include age; study participants who had lived with the condition for less than 10 years had poor adherence to self-care practices, which was significantly associated with a low level of self-confidence ($p < 0.0001$) and having missed a counselling session on the recommended diabetes management ($p = 0.008$). A similar study by Endale et al. (2025) reported that patients' clinical duration of diabetes and socio-demographic traits do influence their ability to carry out self-care practices. The study further stated that patients who had diabetes for a longer duration were more likely to adhere to the recommended diabetes management regimen compared to the newly diagnosed, who were reported to have poor adherence to the

recommended nutrition therapy, medication, blood glucose monitoring, physical activity, and foot care examination.

In Ethiopia, the majority of the people living with T2DM were found not to adhere to the recommended self-care practices. Of the study participants, 75.9% did not adhere to the recommended nutrition therapy, and 83.5% did not adhere to the recommended blood sugar monitoring. Level of education, employment status, and age were among the factors found to influence patients' self-care management. Further, the study observed that patients aged 40-49 were more likely to adhere to self-care practices than those aged 60-76 (Bonger et al., 2018). A study conducted in Ghana by Afaya et al. (2020) reported that non-adherence to diabetes treatment was significantly associated with younger age (<50 years; $p = 0.016$). Another factor found to cause poor adherence was low educational level, with study participants with an education level below tertiary level being 3.7 times more likely not to adhere than those with higher levels of education ($p = 0.049$). The study further observed that a one-point increase in patients' knowledge was associated with a 3.02-point increase in self-care practice ($p < 0.001$). This highlights the need to adopt patient-centered empowerment programs that encourage patients to adjust their lifestyle behaviors.

Babazadeh et al. (2023) observed that patients' adherence to nutrition therapy significantly influenced their well-being (OR = 1.47, $p = 0.001$). Other determinants found to improve quality of life were monitoring of blood sugar levels (OR, 1.29; $p = 0.002$) and adherence to medication therapy (OR, 1.18; $p = 0.030$). Marital status and gender have also been reported to be some of the significant predictors of self-management among individuals diagnosed with T2DM. A study by Ayatollahi et al. (2018) found that female participants adhered more to self-care practices for T2DM than their male counterparts ($p = 0.015$). Similarly, in Ghana, gender was found to be one of the factors influencing self-care behaviors among patients diagnosed with T2DM; male patients reported better self-management practices ($p = 0.007$) than their female counterparts. The study also observed that increased exposure to diabetes health education was significantly associated with increased self-care

practices, as follows: exercise ($p$ = 0.022), diet ($p$ = 0.002), and foot examination ($p$ = 0.037) (Afaya et al., 2020).

In Ghana, patients diagnosed with T2DM were asked to discuss the challenges they faced in their self-management. The study findings reported four main factors, which are: counselling process, the content shared during the diabetes health education sessions, individual confusion on the recommended diet therapy, social interferences with study participants, whereby patients stated family gathering as the reason for diverting their dietary goals, and fear of being unwell, leading to non-disclosure (Hushie, 2019). Studies have also reported religion as another factor influencing self-care behaviors among people living with T2DM. Similarly, Mirzazadeh-Qashqaei et al. (2023) reported a positive relationship between a patient's belief in religion and their efficacy in performing self-care practices ($r$ = 0.385, $p$ < 0.01). Thus, embracing interventions that address barriers to self-management among patients with T2DM is crucial for improving adherence.

Zaini et al. (2025) stated that an individual's perception of an illness and self-care management practices should be considered when developing strategies to promote adherence to T2DM management. Further, the study found that patients' perceptions of illness were significantly associated with their self-efficacy. Likewise, Sørensen et al. (2020) stated that for healthcare professionals to positively influence a patient's perception, they should aim to offer structured, continuous team-based care. The study found that most clinicians focused only on patients' biomedical aspects, not their emotional and psychological needs. Thus, identifying patient factors influencing self-care practices will guide healthcare professionals in understanding the factors they can adopt during this critical period when an individual is newly diagnosed with T2DM.

### 2.4.2 Institutional Factors Influencing Self-Care Practices Among Patients Diagnosed with T2DM

Diabetes is a chronic disease whose management is complex and requires a collaborative management approach. According to ADA (2025), healthcare professionals are the primary source of health information on recommended diabetes

management, and it advocates a multidisciplinary approach when caring for these patients. Sørensen et al. (2020) stated that for hospitals to offer quality diabetes care, they must adopt a collaborative management approach by utilizing healthcare providers who have been trained in diabetes management. Additionally, healthcare providers caring for patients with T2DM should provide diverse care that addresses patients' behavioral, psychological, and environmental factors.

According to the CDC (2024), healthcare professionals tasked with empowering patients diagnosed with diabetes mellitus should include clinicians, nutritionists, nurses, and trained diabetes educators. Similarly, according to ADA (2025), an interdisciplinary team offering diabetes education should include a trained diabetes educator who leads the sessions. Further, where necessary, the ADA advocates that family members should also be educated about the recommended management of T2DM. According to Grohmann et al. (2017), multidisciplinary healthcare professionals tasked with providing diabetes care should provide information that is consistent and tailored to patients' needs. In addition, they should take time to empower newly diagnosed individuals with T2DM by explaining in detail the recommended management and helping them navigate their new journey.

A study by Rubin & Shah (2021) found that telemedicine use in the management of T2DM was effective in reducing healthcare costs and improving patients' quality of care. The study observed that the use of electronic health record systems helped clinicians predict patients' readmission risk. Similarly, Rozzino et al. (2024) reported that when healthcare professionals identify the risk of readmission among patients with T2DM, this has a major impact on healthcare costs. Thus, clinicians should strive to identify patients at high risk of readmission during the index hospitalization to improve clinical outcomes and relieve the heavy financial burden associated with the complex management of diabetes mellitus.

Seboka et al. (2021) stated that there is a need for healthcare facilities offering diabetes management to invest in technology for the purpose of improving the quality of care offered. The study reported that incorporating technology into the routine care of patients diagnosed with diabetes mellitus was significantly associated

with a change in attitude among healthcare professionals. Similarly, Rozzino et al. (2024) observed that the use of telemedicine in the management of T2DM reduced healthcare costs and improved the quality of care for patients with diabetes mellitus. The study observed that tele-monitoring after discharge was significantly associated with lower re-admission rates (15.4% lower overall; $p = 0.015$).

Other institutional factors found to influence self-care practices include poor instruction from clinicians to patients. Atinga et al. (2018) observed that poor prescription instructions by the doctors were associated with non-adherence to prescribed treatment among patients diagnosed with T2DM and hypertension in Ghana. Further, the study observed that this led to poor perception among the patients on the prescribed drugs, in that they believed that the drugs had low efficacy in treating diabetes mellitus. As a result of this, the majority of the patients opted to discontinue the treatment and instead chose to use herbal medicine. Additionally, the study reported that the cost of medication, poor awareness of the drug's mechanism of action, and failure of healthcare professionals to offer patient-centered care were also found to cause poor long-term adherence to the recommended management. Anvari et al. (2024) observed that patients diagnosed with diabetes mellitus who attended outpatient clinics had substantial non-adherence to recommended annual diabetic eye examinations, with barriers including limited access to ophthalmic services, concerns related to the Coronavirus Disease 2019 (COVID-19) pandemic, and insufficient information about the necessity of screening.

In Zimbabwe, several factors related to healthcare facilities were found to influence self-management among patients diagnosed with T2DM. A study by Kuguyo et al. (2020) reported that a shortage of healthcare professionals led to work overload, exhaustion due to long working hours, and overburdening of hospital facilities. As a result, these factors negatively affected the standard of care provided to people living with diabetes, particularly the quality of diabetes education. Similarly, Abraham et al. (2024) reported that in Africa, the shortage of healthcare professionals and ineffective communication between clinicians and patients are among the factors affecting patient-centered care. In addition, Bosun-Arije et al. (2020) stated that

complex hospital policies and the shortage of healthcare professionals trained in diabetes management influenced the quality of care provided at the hospital.

In Nigeria, some factors found to influence clinical outcomes among patients diagnosed with T2DM included the cost of healthcare and the availability of drugs. These factors were significantly associated with uncontrolled blood sugar levels, poor self-care behaviors, early development of T2DM-related complications, and poor clinician-to-patient relationship (Bosun-Arije et al., 2020). A similar study by Suglo & Evans (2020) found that long wait times at the diabetes clinic and the high cost of healthcare are the major factors influencing patients' self-care practices for T2DM. Likewise, Okurumeh et al. (2022) reported that the high cost of buying drugs and poor awareness of the recommended diet negatively influenced an individual’s self-care practices. Among the reasons they chose not to attend diabetes education programs, patients reported strict scheduling for the diabetes counselling sessions and a delayed appointment process as barriers. The patients also reported that, due to financial constraints, they were unable to attend the hospital's diabetes counselling sessions (Tharakan et al., 2024).

Abu and Llahana (2025) observed that some organizational factors influencing self-management among patients with T2DM included multidisciplinary care and affordability. The study found that, through a multidisciplinary approach, healthcare providers were able to offer patient-tailored, culturally centered education. As a result, the healthcare provider and the patient established a good rapport, which motivated the patient to attend follow-up clinics, thereby improving treatment adherence. A similar study by Wang et al. (2025) reported that one of the major barriers to effective self-management of T2DM is the lack of up-to-date clinical expertise in diabetes management. The study reported that healthcare professionals who lacked knowledge of recommended diabetes management lacked confidence in guiding patients to achieve the set healthcare goals. They also lacked skills in guiding patients in insulin administration and in motivating patients to change their lifestyle behaviors.

A study by Durai et al. (2021) stated that when focused diabetes health education is used in counselling patients diagnosed with T2DM, it leads to improved adherence to self-care practices. Further, the study found that strict patient monitoring during follow-up visits at the diabetes clinic improved clinical outcomes. Similarly, Kong & Cho (2020) reported that utilization of patient-centered health interventions was significantly associated with patients' efficacy in their self-care practices. Likewise, Li et al. (2025) observed that among patients diagnosed with Diabetes Foot Ulcer, the majority had poor clinical outcomes, and this was significantly associated with poor clinician-patient relationships, poor adherence to the scheduled follow-up visits, and the absence of diabetes health education on the recommended foot examination. Bet & Ade-Oshifogun (2024) observed that structured education on diabetes management among patients newly diagnosed with T2DM positively influenced their lifestyle behaviors and self- efficacy. Therefore, clinicians need to focus on enhancing health literacy through structured patient education programs in order to improve self-efficacy among patients newly diagnosed with T2DM.

A study by Abose et al. (2024) found that, compared with the average, 64.2% of patients diagnosed with T2DM in Ethiopia did not adhere to the recommended diet, and this was significantly associated with poor attendance at scheduled health education sessions (32%). A study done in the same region by Atinafu & Tilahun (2025) reported that patients who received health education on the recommended nutrition at the diabetes clinic were significantly more likely to adhere to the recommended diet compared to those who did not receive the education (AOR) = 1.14 (95 % CI: 1.04–1.95). These findings are consistent with a study by Cheng et al. (2021), which found that empowerment programs among patients with T2DM are significantly associated with better blood sugar control. Thus, great emphasis should be placed on hospitals offering diabetes empowerment interventions to stem the rising morbidity and mortality due to type 2 diabetes mellitus.

Hasan et al. (2024) stated that social support among patients diagnosed with T2DM was significantly associated with improved self-care practices. The study found that social support was positively and significantly associated with good self-care practices ($r = 0.370$, $p = 0.001$). As thus, it helped in motivating patients to change

their lifestyle habits and adopt the recommended management Similarly, Reshma et al. (2021) observed that some of the factors associated with poor self-care practices among patients diagnosed with T2DM included having no trained diabetes educators at the clinic, failure of the clinicians to offer any social support to these patients and to involve patients in planning their healthcare and poor communication between the healthcare professional and the patient. These findings highlight the need for healthcare professionals to incorporate social support into routine T2DM management to motivate patients. Additionally, healthcare professionals should adopt a holistic approach that provides individualized health education to patients newly diagnosed with T2DM, helping them adjust their lifestyle behaviors with ease.

### 2.5 Patient-Tailored Activation Interventions Used in Empowering Patients Diagnosed with T2DM

Patient-activation intervention is a strategy tailored to activation levels that aims to ensure patients achieve self-efficacy in managing their health. PAM®-13 is primarily used by healthcare professionals to tailor care for patients diagnosed with chronic conditions (Mei-Yu et al., 2020). Almutairi et al. (2024) stated that patient activation-tailored interventions should be integrated into the primary care of patients with uncontrolled glycaemia to assist them in acquiring the necessary knowledge on disease management, skills, and dependence for them to enhance their self-care practices. Through patient activation-tailored intervention, clinicians are able to predict the rate of hospitalization, utilization of the emergency department, and clinical outcome among individuals diagnosed with chronic conditions (Almutairi et al., 2020).

Through patient-activation intervention, an individual is informed, skilled, and empowered to carry out activities that promote self-efficacy (Mirmazhari et al., 2022). Additionally, when a patient is activated, they are willing to take actions that will enable them manage their health on their own and also play a central role in making decisions regarding their healthcare (Janamian et al., 2022). Likewise, Almutairi et al. (2023) reported that a tailored patient activation intervention involves activities an individual undertakes to increase their activation levels (knowledge,

skills, and confidence). Thus, patient activation-tailored intervention has been recognized as a vital contributor to improving patients' clinical outcomes and preventing or delaying short-term and long-term complications of a disease. Therefore, tailoring interventions based on patients' activation levels is an essential pillar for improving self-care management of chronic conditions (Hosseinzadeh et al., 2022).

Almutairi et al. (2020) reported that integrating activation interventions into routine patient care for individuals with T2DM improved self-care behaviors and glycemic control. The study found that incorporating a patient activation intervention in patients with low activation levels led to significant improvements in their knowledge, skills, and confidence. This highlights the importance of utilizing patient activation-tailored interventions in the management of diabetes mellitus. Adapting the PAM®-13 into routine care for people diagnosed with diabetes will enable them to acquire problem-solving skills and empower them to make appropriate decisions regarding their health (Ibrahim et al., 2024).

According to Hussein et al. (2022), activation among patients with chronic conditions is a key principle in offering patient-centered care, as it empowers patients to take a more active role in managing their health and reducing healthcare costs. Additionally, according to Kim (2020), patient-activation intervention refers to a healthcare provider's use of the PAM®-13 tool to assess and plan interventions to empower patients diagnosed with type 2 diabetes mellitus. Magadi et al. (2022) stated that a person's level of confidence, knowledge, and skills to manage their own health is referred to as patient activation, and it's mostly assessed using the PAM®-13. Therefore, patient activation-tailored intervention ought to be adopted in the clinical settings during the planning of patients' self-care with the aim of improving an individual's health outcome and reducing the cost of healthcare.

With the continuously rising prevalence of T2DM and other non-communicable diseases, there has been a growing trend toward the use of tailored interventions aimed at empowering patients to achieve self-efficacy (Thirunavukkarasu & Alsaidan, 2025). According to Bu & Fancourt (2021) , there is an increase in the

utilization of patient-activation tailored intervention modalities among clinicians and policymakers. Several countries around the globe are promoting the use of the PAM®-13 tool to plan care for individuals diagnosed with chronic conditions to improve their quality of life and reduce rising morbidity and mortality rates. Kearns et al. (2020) stated that the rise in the use of evidence-based, tailored interventions is mainly because these modalities are patient-centered, focusing more on engaging patients rather than routine care oriented solely to medical management.

In the USA, several studies have highlighted the significant role patient activation interventions play in ensuring patients achieve self-efficacy in managing their health. One of the activation intervention strategies used in the USA is the US Department of Defense Mobile Health Care Environment among individuals diagnosed with T2DM. The aim of this program is to increase patient activation levels and enhance patients' self-care practices. The study found that patients who received the intervention showed significant improvement in their patient activation scores, glycated hemoglobin (HbA1c), and low-density lipoprotein (LDL) levels. Further, patients with low activation levels showed significant improvements in BMI, High-Density Lipoprotein (HDL) cholesterol levels, and blood pressure (Gimbel et al., 2020). A similar program also exists in the Netherlands: a group-based walking intervention for individuals with T2DM, aimed at improving their well-being. The study findings from this intervention program showed a significant increase in the patient's activation scores from baseline, with correlated improvements in self-care practices and clinical outcomes ($t(602) = 2.53$, $p = 0.012$) (Regeer et al., 2022).

In Australia, the Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) program, which emphasizes patient empowerment, is one of the strategies found to increase knowledge, skills, and confidence among patients newly diagnosed with T2DM. Findings from this study showed that patients newly diagnosed with T2DM who participated in the DESMOND program successfully reduced their body weight, ceased smoking, and their depression levels also reduced (Miller et al., 2020). This program focuses on increasing patients' activation levels by advocating for behavior change and, eventually, improving their self-efficacy in managing their condition at home. Currently, the DESMOND program is the only

evidence-based self-management program available for people diagnosed with T2DM in Australia.

In Africa, there exist shortfalls when it comes to the adoption of patient-tailored diabetes intervention among people living with the condition. Majorly, healthcare professionals utilize group structured health education strategies when offering counselling to patients diagnosed with diabetes mellitus. Endale et al. (2025) observed that incorporating structured health education into routine care among people living with T2DM in Ethiopia improved their self-care behaviors. The study recommended that structured education should be integrated into the routine diabetes care to enhance patients' adherence to self-care practices. In Kenya, diabetes health education was established as a partnership among the World Diabetes Federation (WDF), the Kenya Diabetes Information Center (KDIC), and the Ministry of Health, Kenya. Through this partnership, the Ministry of Health in Kenya introduced guidelines for healthcare providers responsible for counselling patients on diabetes self-management. In addition, IDF (2023) guidelines state that for a healthcare professional to offer diabetes health education, they must be trained to assess, plan, and provide the recommended management and follow-up care. Further, the IDF has developed curriculum modules that healthcare professionals should consult when providing patient education. The curriculum states that diabetes education should be individualized and tailored to the patient's preferences and values.

### 2.6 Effect of Patient-Activation Interventions on Patient Activation Among Patients Diagnosed with T2DM

Due to the rising prevalence of T2DM globally, studies have reported an increase in the utilization of patient activation-tailored interventions among people diagnosed with chronic conditions (Lightfoot et al., 2022). The study recommended that healthcare professionals assess patients' activation levels during the initial visit and use this data to tailor patient care and interventions, aiming to increase their activation. The goal is to empower and motivate patients to engage continuously in their self-management. Through patient activation-tailored interventions, individuals diagnosed with chronic conditions are required to participate in decision-making

about the self-management of their conditions and the prevention of complications. (Almutairi et al., 2023) stated that when patients perceive health information through their health-care providers, it leads to improved activation levels. Similarly, Lee et al. (2025) stated that when healthcare professionals conduct an initial assessment to identify patients' health needs with T2DM, they are likely to achieve better glycemic control over time.

In Australia, newly diagnosed patients with T2DM were enrolled in a patient activation-tailored intervention program. The study found that the majority of patients had a 9.7-point increase in activation levels, with the majority of them being those who had scored the lowest activation level (level 1) before the intervention (Miller et al., 2020). An increase in patients' activation scores has been significantly associated with improved clinical outcomes, lifestyle behaviors, quality of life, and reduced hospitalizations (Mosen et al., 2023). With any positive change in patients' activation scores, a corresponding increase in self-management behavior has been observed, and this has been significantly associated with sustained behavior change (Lin et al., 2020). Similarly, Hernar et al. (2023) reported that patients who attained high activation levels exhibited better health-related behaviors and better experiences with their healthcare providers than those with low activation levels.

Similarly, a systemic review found that higher patient activation levels were significantly associated with lower rates of hospital admission (RR [95% CI] = 0.69 [0.61; 0.77], I2 = 78%) and emergency department visits (RR [95% CI] = 0.76 [0.70; 0.84], I2 = 72%) (Anderson et al., 2022). These findings highlight the effectiveness of patient activation-tailored intervention programs in reducing the cost of health care among patients as well as preventing avoidable hospital admissions. Therefore, the utilization of patient-activation-tailored interventions creates a patient-centered approach in which patients can express their needs to healthcare providers.

Magadi et al. (2022) reported that when individuals diagnosed with chronic disorders were managed with individualized, tailored interventions, their sense of well-being improved and they experienced reduced disease symptoms. Additionally, patients with low activation levels had higher disease symptom burden and reduced quality of

life. According to Lightfoot et al. (2022), an increase in patient activation is significantly associated with improved self-management behaviors, better clinical outcomes, higher quality of life, lower hospital admission rates, and lower healthcare costs. In addition, high activation scores have also been significantly associated with reduced body mass index, low levels of depression, and improved engagement in physical activity compared to the patients who had scored low patient activation levels (Tusa et al., 2020).

A study by Westman et al. (2022) observed that patients who scored level 4 on the PAM®-13 tool reported that they were able to influence healthcare decisions (46.6% vs. 20.8%) and they also asked questions regarding their management regime (93.4% vs. 68.4%) compared to patients who scored low activation levels. The study further reported a significant association between patients' perceptions and their activation levels. According to Jones et al. (2021), patient activation-tailored interventions are key in promoting health literacy and self-efficacy among patients diagnosed with chronic conditions. The study observed that an increase in patient activation level was significantly associated with improved self-efficacy, health literacy, and positive perception that self-management would control their condition. A similar study by Almutairi et al. (2023) observed that when clinicians adopted patient activation-tailored interventions among the T2DM population, it was associated with a significant increase in patient activation levels from 54.74 to 61.58 ($p < 0.001$), while mean HbA1c decreased from 8.38% to 7.55% after six months of intervention ($p < 0.001$). The study findings highlight the positive impact of incorporating individualized diabetes care tailored to patients' needs, especially among those with uncontrolled blood sugar levels.

### 2.7 Effect of Patient-Activation Interventions on Self-Care Practices Among Patients Diagnosed with T2DM

Several studies have reported that there is a significant association between patient activation-tailored interventions and improved health care outcomes. In England, patient activation-tailored interventions have been significantly associated with an increase in healthcare service utilization. Furthermore, patient activation intervention

has been found to be a potential strategy for easing the burden of T2DM on patients, hospitals, and the community (Bu & Fancourt, 2021). Individuals diagnosed with T2DM require permanent lifestyle changes to achieve a good clinical outcome (Cheng et al., 2025). Similarly, patient activation-tailored interventions have been found to improve self-care practices and psychological well-being of patients by decreasing their anxiety and stress levels (Lin et al., 2020). Almutairi et al. (2020) also observed that empowered or activated patients are more likely to practice better self-care management. Likewise, Almutairi et al. (2024) stated that patient activation-tailored intervention enables patients who are newly diagnosed with a chronic condition become confident in sharing their health concerns with their healthcare professional.

Almutairi et al. (2023) observed that integration of patient activation-tailored intervention programs into the primary care of patients with uncontrolled diabetes led to a significant decrease in their HbA1c levels from 8.38% to 7.55% ($p < 0.001$). Additionally, a 1% decrease in patients' HbA1c has been associated with a significant reduction in the risk of diabetes-related complications (Lind et al., 2021). Moreover, Ory et al. (2025) observed that adults who participated in structured self-management education and support interventions had fewer diabetes mellitus complications than the control group that received routine care. Thus, patient activation intervention strategies can be used to achieve long-term goals, aiming to reduce morbidity and mortality rates associated with T2DM. It is important to note that when a patient's activation level changes, their health outcome changes in the same direction.

According to Lin et al. (2020), integrating a patient activation intervention into the management of T2DM is significantly associated with lower HbA1c levels, body weight, and blood pressure. Likewise, Almutairi et al. (2020) observed that patient activation intervention led to improvement in patients' self-management. A study by Zamanillo-Campos et al. (2025) evaluating a tailored text message intervention (DiabeText) among adults with poorly controlled T2DM reported significant improvements in patients' HbA1c (OR = 1.4; 95% CI = 1.0–1.9; $p < 0.05$) and self-care practices over 12 months, reflecting improved diabetes self-management

behaviors. These findings reflect improved self-care practices, with the majority of them reporting high satisfaction with the support they received. Likewise, Cheng et al. (2021) found that patients with poorly controlled glucose levels (HbA1c > 58 mmol/L) who participated in an empowerment intervention program reported significant improvements in self-management, glycemic control, stress levels, and quality of life.

### 2.8 Theoretical Framework

This study was guided by the Health Belief Model (HBM). The Model was developed in the 1950s by a group of public health scientists who sought to understand why people refused to participate in programs implemented by the healthcare professionals to screen for and prevent diseases. The scientist discovered that people refused to participate in these programs because they either did not exhibit any disease-related symptoms or were unaware of their susceptibility to the disease and its associated risks. Many felt that undergoing screening was a waste of time and that the perceived barriers to prevention outweighed the potential benefits (LaMorte, 2018). Thus, the HBM is an appropriate framework for addressing individual lifestyle choices and promoting practices that foster healthy behaviors.

This model has been found to positively influence patients' adherence to their management regimen. The model assumption is that an individual will only seek health services if they are faced with a health threat. When adopted in the management of patients diagnosed with a chronic condition, the model aims to empower patients with knowledge to change their perceptions and engage in recommended self-care practices. Kassahun et al. (2016) stated that diabetes health education plays a very crucial role in maintaining optimal glycemic control among individuals diagnosed with T2DM. Thus, this study adopted the HBM to develop a diabetes education module to educate and motivate newly diagnosed individuals with T2DM to modify their lifestyle behaviors. According to the HBM, six constructs determine whether an individual will engage in health-promoting behaviors: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, modifying factors, and cues to action.

**Perceived threat –** a combination of perceived susceptibility and severity. Perceived susceptibility is a person's belief that they are at risk of a particular disease. For this reason, they are more likely to engage in health-promoting behaviors that help reduce their risk of developing the specific disease. Likewise, people with low perceived susceptibility are unlikely to change their behavior because they believe they are not at risk of developing the disease. Perceived severity refers to how an individual perceives the severity of a health problem and the potential health consequences it poses. They must admit that the disease poses negative consequences to them. In this study, adults newly diagnosed with T2DM were exposed to a health education counselling session on the dangers posed by elevated blood glucose levels and their susceptibility to diabetes related complications. Individuals who perceive a health problem as serious are more likely to engage in health-promoting behaviors to prevent the disease or reduce the disease severity.

**Perceived benefits** – According to the HBM, this is when an individual believes that engaging in health-seeking behaviors has value or positive consequences, helping them reduce their susceptibility to a particular health problem. In this study, the researcher applied the concept of perceived benefits, such as improved quality of life, to motivate patients newly diagnosed with T2DM to engage in the recommended self-management practices. The researcher emphasized to the patients the benefits of adjusting their lifestyle habits and the impact these changes would have on their clinical outcomes.

**Perceived barriers –** This occurs when an individual believes there are factors that will hinder them from adjusting their lifestyle behavior. According to the HBM, these barriers tend to restrain a person from engaging in health-promoting behaviors. For an individual to achieve effective behavior change, perceived benefits must outweigh perceived barriers. In this study, the researcher collected baseline data to determine factors influencing self-care practices. The data obtained helped the researcher identify which barriers to address during the health education counselling sessions.

**Modifying variables –** factors that influence an individual's perception of their health-related behaviors. They include demographic variables (e.g., age), psychosocial variables (e.g., social class), and structural variables (e.g., prior knowledge of the health problem). According to the HBM, these variables affect an individual's health behavior by influencing their perceptions of threats, barriers, and benefits. Data on the modifying factors were collected at the baseline survey, which served as the independent variable. In addition, the researcher adopted this construct to identify knowledge gaps on the recommended self-management among the study population.

**Cues of action –** According to the HBM, these are triggers or strategies that prompt an individual to engage in health-promoting behaviors. Cues are classified into two types: internal cues (e.g., pain) and external cues (e.g., information from peers, the media, or health care professionals). In this study, the researcher developed a module to empower patients newly diagnosed with T2DM with the knowledge, skills, and confidence needed to engage in recommended self-care practices. After the health education sessions, study participants received follow-up counselling sessions via text messages, reminding them of various aspects of diabetes self-management. The goal was to activate the patients to adopt health-seeking behaviors and adhere to the recommended self-care practices. The study also adopted this construct to engage the study participants in making their personal health goals.

**Self-efficacy –** This concept, introduced in 1988 by Rosenstock, explains differences in health behaviors among individuals diagnosed with a chronic condition (LaMorte, 2018). It refers to an individual's level of confidence or competence in successfully carrying out self-care practices, based on their perceptions and modifying factors.

The Health Belief Model was applied to align the study's scope and specific objectives with its expected outcome. The model also served as a guide during the implementation of a health education module for newly diagnosed adult patients with T2DM. The study participants were led to believe that they were susceptible to diabetes-related complications (perceived susceptibility) and therefore had to participate in diabetes health education sessions to reduce the risks. The researcher

further discussed the dangers of uncontrolled blood glucose levels, noting that they can lead to diabetes-related complications (perceived severity). Patients diagnosed with T2DM must adhere to the recommended self-management to minimize the risk of developing diabetes related complications (perceived benefits). Additionally, the researcher demonstrated to newly diagnosed patients how they could use locally available foods to adhere to the recommended diet (perceived barriers).

The researcher used action cues to develop a diabetes teaching module that empowers patients and encourages them to adopt health-seeking behaviors. Once patients were activated, they were expected to possess the confidence, skills, and knowledge necessary for effective self-care. Ultimately, the goal was for patients to achieve optimal blood glucose control and remain free from diabetes-related complications.

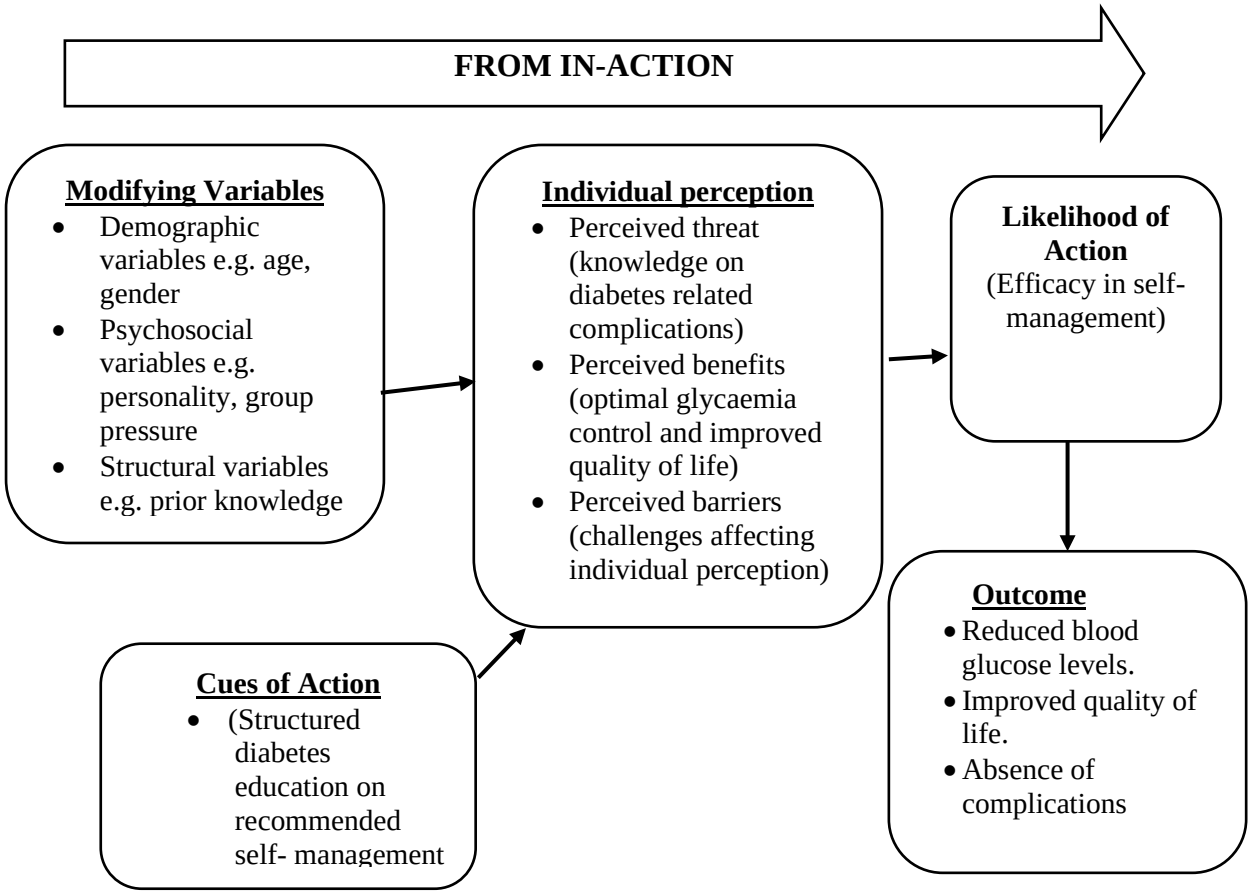


**Figure 2.1: The Health Belief Model** (LaMorte, 2018)

Additionally, the patient-tailored activation intervention in the present study was guided by Bandura's Self-Efficacy Theory (Bandura, 1986), which states that an individual's belief in their ability to perform specific behaviors influences their motivation, effort, and persistent in achieving the set goals. This theory is best applicable to individuals newly diagnosed with T2DM, who are required to adjust their lifestyle behaviors shortly after diagnosis. In the present study, patients' confidence in performing the recommended self-care practices was considered central to their motivation and ability to achieve diabetes self-management goals

The patient-tailored activation intervention therefore aimed at enhancing self-efficacy among patients newly diagnosed with T2DM by providing structured diabetes education. Additionally, the intervention provided opportunities for the participants to observe demonstrations on how to carry out the recommended self-care practices and to receive support in managing emotional and physical barriers to self-care. Moreover, the study participants received continuous encouragement and constructive feedback during the implementation phase of the study. All these strategies help build patients' confidence in their ability to effectively self-manage their condition at home. By strengthening self-efficacy, the patient-tailored activation intervention improved participant's activation levels and consequently promoted adherence to the recommended self-care practices for T2DM. Overall, applying this theory ensured that patients newly diagnosed with T2DM were motivated, empowered, and equipped to take an active role in managing their condition at home.

### 2.9 Conceptual Framework

When a patient is newly diagnosed with T2DM there are several factors that determine how fast they will adjust their lifestyle behaviors. These factors include socio-demographic factors, clinical duration of T2DM, exposure to diabetes health education and the level of awareness on the recommended management for T2DM. All these factors may influence a patient's perception of the condition they are diagnosed with, ultimately affecting their clinical outcomes. Additionally, a patient's perception and knowledge of the recommended self-management for T2DM can influence their activation level (knowledge, skills and confidence) and self-care

practices. For this reason, the health care professionals play a vital role in empowering patients newly diagnosed with T2DM since they are the first point of contact. Therefore, the structured patient activation-tailored intervention aimed to activate patients newly diagnosed with T2DM in order to enhance their activation and improve their self-care practices. This in turn would help patient achieve optimal glycemic control and prevent diabetes related complications.

A conceptual framework was developed to guide the determination of factors influencing self-care practices among patients living with T2DM. The framework captures independent variables, including patient and institutional factors, that may influence an individual's self-care practices. The dependent variables include patient activation and self-care practices, while the outcome reflected improved activation levels and enhanced self-care behaviors. This framework was constructed to illustrate the pathways by which patient and institutional factors influence self-management and to guide data collection and analysis for the study (Figure 2.2).

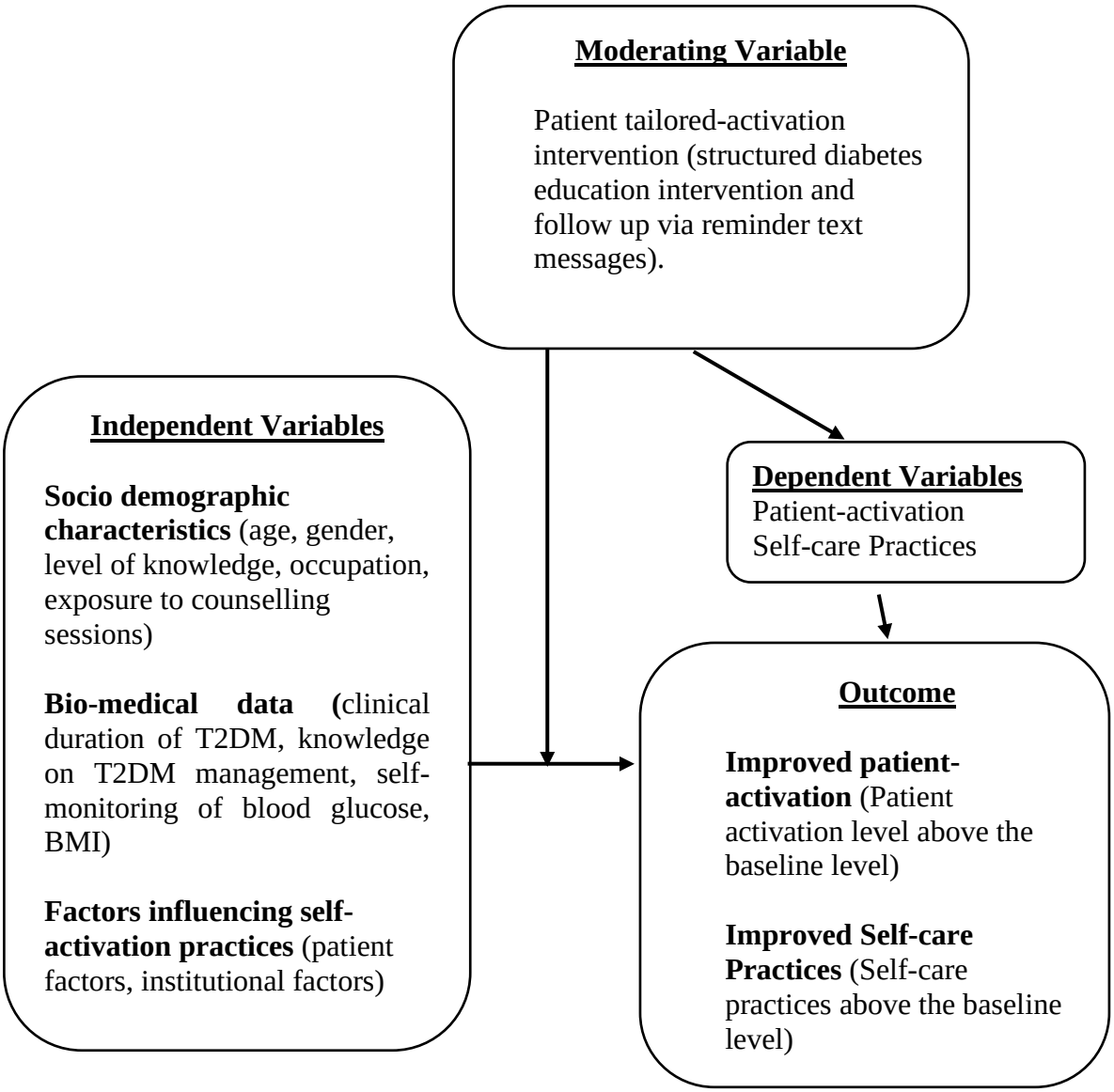


**Figure 2.2: Conceptual Framework**

## 2.10 Summary

Studies have highlighted an increase in the mortality and morbidity rates associated with T2DM. This underscores gaps in the current management regimen for the condition. The American Diabetes Association advocates that healthcare professionals use diabetes-related empowerment intervention strategies when planning care for people living with the condition. Globally, diabetes self-care management education is an integral component in engaging people diagnosed with

the disease. On this note, diabetes mellitus education interventions have become the focus of attention among healthcare professionals. Several diabetes intervention programs have been developed in recent years with the aim of empowering individuals diagnosed with T2DM with the knowledge and skills needed to achieve lifestyle behavior change. In addition, this aims at enabling them to take an active role in the day-to-day management of T2DM. Studies have reported that the adoption of patient empowerment programs in the management of diabetes mellitus enables patient attain optimal control of their blood glucose levels. Thus, the aim of this study was to contribute to the development of programs that can support the early empowerment of patients newly diagnosed with T2DM, helping them adjust their lifestyle behaviors more effectively and with greater ease.

### 2.11 Research Gaps

The management of T2DM has primarily focused on medical treatment and patient education, aiming to achieve optimal glycemic control. Despite these efforts, several studies have reported a rapid increase in the prevalence of uncontrolled diabetes and diabetes related complications. As such, researchers need to explore other effective modalities for the management of T2DM. This will eventually help prevent and reduce rising morbidity and mortality rates. In addition, despite studies supporting the application of patient activation tailored intervention in the management of patients diagnosed with diabetes mellitus, no studies have utilized it among the newly diagnosed T2DM population. In Kenya, there is no study that has aimed to directly assesses activation levels among patients newly diagnosed with T2DM and utilized the data obtained to demonstrate how a change in patient's activation is associated to patient's self-care practices. The American Diabetes Association recommends that diabetes health education should be commenced at the point of diagnosis yet there are limited existing empowerment programs that target patients who are newly diagnosed with T2DM.

# CHAPTER THREE

# METHODOLOGY

## 3.1 Study Design

The study utilized an embedded mixed-methods design, adopting a sequential explanatory mixed-methods approach (QUAN → qual). The quantitative strand, which was the primary component, employed a pre-test–post-test non-equivalent quasi-experimental design. The qualitative strand, embedded within the quantitative phase, adopted a descriptive qualitative design to explain and complement the quantitative findings. Integration of the two strands was achieved through triangulation during interpretation. Since the aim of the study was to establish the cause-and-effect relationship between the independent and dependent variables, the research design was best suited to address the research questions. In addition, the study design was chosen because it minimizes threats to external validity (Siedlecki, 2020).

The study participants were grouped into two groups: the study and the control arm. Participants in the study group received the intervention, while those in the control group continued to receive routine follow-up care at the diabetes clinic. The study was conducted in three phases, including a baseline and post-intervention assessment, as shown in Figure 3.1. In phase 1, a descriptive cross-sectional study design was used to establish patient activation levels (knowledge, skills, and confidence), gaps in diabetes self-care practices, and the factors influencing them. Information obtained in the baseline survey (phase I) was used to develop an education module, which was adopted in phase II. In phase III (post-intervention evaluation), an analytical cross-sectional study design was used to test the relationship between the study intervention and the dependent variables.

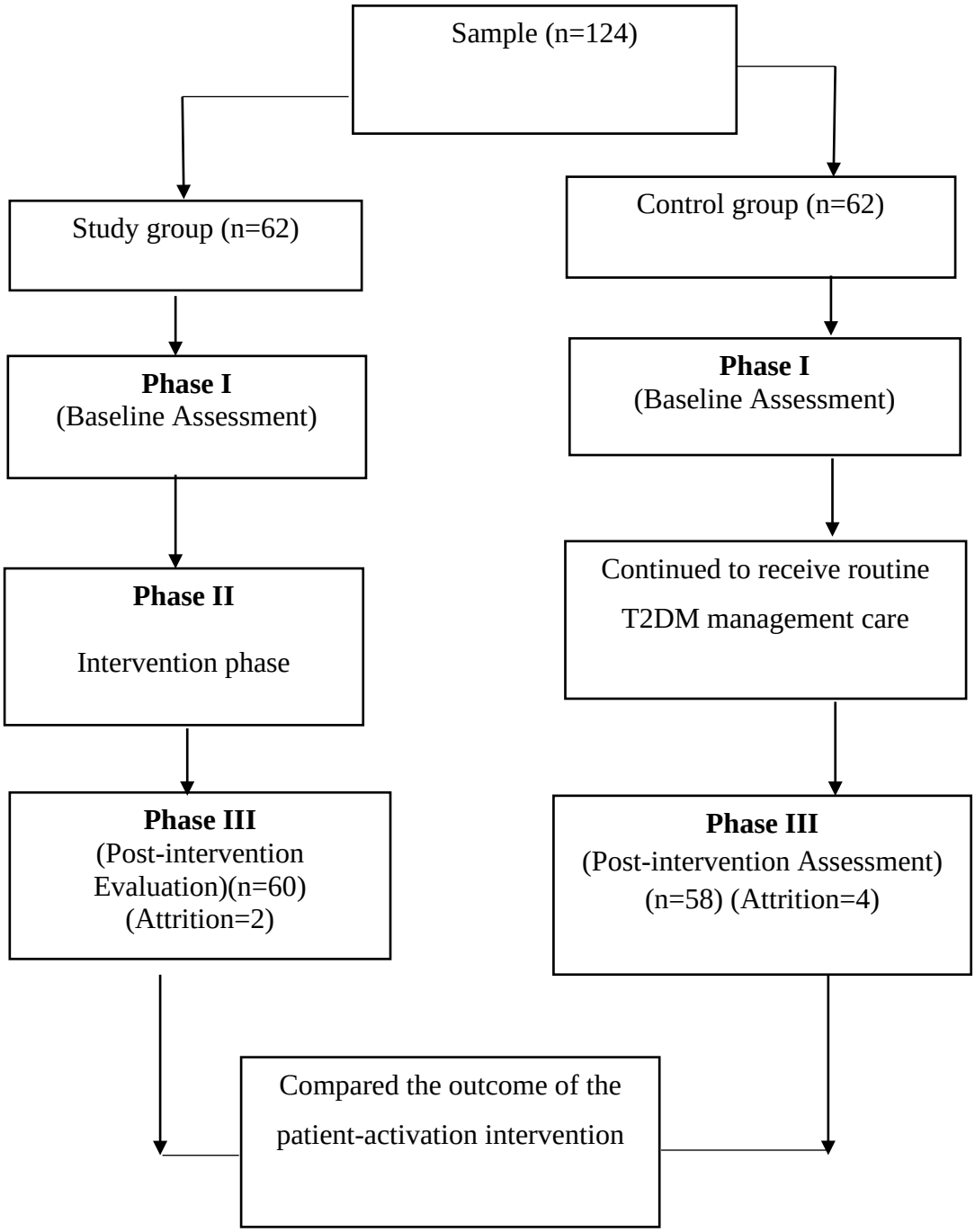


**Figure 3.1: Diagrammatic Presentation of the Study Design**

### 3.2 Study Area

The study was conducted in Muranga and Kiambu Level 5 Hospitals. The Hospitals are located in the Central region of the Republic of Kenya, north of Nairobi and west of Mount Kenya. Central Kenya comprises five counties: Kiambu, Muranga, Nyeri, Nyandarua, and Kirinyaga. Muranga Level 5 Hospital is located in Muranga County, while Kiambu Level 5 Hospital is in Kiambu town, the commercial and administrative hub of Kiambu County. Muranga Level 5 Hospital was selected as the study group, and Kiambu Level 5 Hospital as the control group. Muranga Level 5 Hospital, located in Muranga town, serves patients from the entire Muranga County and has a bed capacity of 317, while Kiambu Level 5 Hospital has a bed capacity of 370.

Kenya's healthcare system follows a tiered referral framework in which Level 2 dispensaries refer patients to Level 3 health centres, which in turn escalate cases to Level 4 sub-county hospitals. Complex and stabilized cases are ultimately referred to Level 5 county referral hospitals. This study was conducted at Kiambu and Murang'a Level 5 Hospitals, whose patient populations reflect cumulative referrals from the lower tiers of the healthcare system.

Urban centers in Kenya have been reported to have a high risk for metabolic syndrome at 25.6%, and this has increased the risk for T2DM fivefold (Omuse et al., 2017). Moreover, Kiambu and Muranga Counties have the highest population at 1, 623, 282 and 942, 581 respectively (Kenya National Bureau of Statistics [KNBS], 2019). In addition, Muranga County has a population of 29,711 in its urban centers, while 60% of Kiambu County's population resides there. Therefore, selecting the two level 5 hospitals was a true representation of the general population. According to the Kenya Demographic and Health Survey, Central Kenya has the second-highest cases of NCDs at > 50%, and out of this, T2DM ranks the highest at 41% (KNBS, 2023). Therefore, the two Level 5 Hospitals were purposively selected.

### 3.3 Study Population

The study population consisted of adult patients newly diagnosed with T2DM who were seeking diabetes care in the selected study areas. Muranga level 5 hospital offers diabetes care services to approximately 25 patients per month, while Kiambu level 5 hospital attends to an average of 24 patients per month. To obtain qualitative data on the institutional factors influencing self-care practices, all healthcare professionals responsible for providing health education to patients diagnosed with T2DM were included in the study. In each hospital, approximately three healthcare professionals are permanently stationed at the diabetes clinic.

### 3.4 Sample Size Determination

The sample size for the study was determined using the formula for comparative studies with proportions (Peacock & Peacock, 2011).

$$n = \frac{K\,[P_1\,(1 - P_1) + P_2\,(1 - P_2)]}{(P_1 - P_2)^2}$$

n= Sample size in each group

K= multiplier that depends on the significance level and power

P1= the expected population proportion in the control group (pre-intervention) = 0.3

P2= the expected population proportion in the study group (post-intervention) = 0.59

$\alpha$ = the significance level (0.05)

(1 - $\beta$) = the power of the test (0.90)

**Table 3.1: Multipliers for Studies Comparing Two Proportions**

| | Significance level ∝ | | |
|---|---|---|---|
| **Power (1- $\beta$)** | **5%** | **1%** | **0.1%** |
| 80% | 7.8 | 11.7 | 17.1 |
| 90% | 10.5 | 14.9 | 20.9 |
| 95% | 13.0 | 17.8 | 24.3 |
| 99% | 18.4 | 24.1 | 31.6 |

K= 10.5

P1 and P2 were obtained from a previous study by Miller et al. (2020). P1 was 30% (the proportion of study participants who scored patient activation level 4 in the pre-intervention assessment), and P2 was 59% (the proportion of study participants who scored patient activation level 4 in the post -intervention assessment).

Therefore,

$$\mathbf{n = \frac{K\,[P_1\,(1 - P_1) + P_2\,(1 - P_2)]}{(P_1 - P_2)^2}}$$

$$n = \frac{10.5\,[0.3(1-0.3) + 0.59(1-0.59)]}{(0.3-0.59)^2}$$

n= 56.25

10% was included to cater for the dropout rate

n= 62

- A total of 124 patients newly diagnosed with T2DM were included in the study; 62 participants were from each study group.

### 3.5 Sampling Procedure

Purposive sampling was used to select Muranga and Kiambu level 5 hospitals as the study areas. The two level 5 hospitals are located in the Central region of Kenya, where empirical studies have reported a high prevalence of diabetes mellitus of 7.2%, exceeding the national average of 3.3% (Muriithi et al., 2021). Additionally, in Muranga County, the MOH has issued a warning about the rapidly rising number of newly diagnosed T2DM patients (MCNAP, 2020). Therefore, the researcher's application of the purposive sampling method was appropriate for obtaining the relevant data needed to achieve the research objective. To avoid contamination of the study, Kiambu Level 5 hospital, the control group, is roughly 90 kilometers from the intervention arm; thus, the risk of communication between the study participants in the control and study arms was minimized.

The study adopted a mixed-methods approach, collecting both quantitative and qualitative data. Simple random sampling was used to select patients newly diagnosed with T2DM for follow-up at the selected level 5 hospitals to collect quantitative data. To begin with, the researcher, together with the research assistants, accessed the patients' registry at each study site's diabetes clinic and identified all patients registered as newly diagnosed with T2DM. A newly diagnosed patient was defined as an individual who had been registered as having T2DM within the last 6 months at the time of data collection. Based on the inclusion criteria, the number of participants available at each site in January 2023 was 150 at Kiambu Level 5 Hospital (control group) and 144 at Muranga Level 5 Hospital (study group). Next, the research team developed a sampling frame comprising a list of all patients newly diagnosed with T2DM at the hospitals. They later numbered all participants consecutively, and a computer-generated random-number list was used to draw the desired sample size. A sample size of 62 patients newly diagnosed with T2DM was selected from each study arm.

To obtain qualitative data on patient and institutional factors influencing self-care practices, the researcher conducted Focus Group Discussions (FGDs) with patients newly diagnosed with T2DM. Purposive sampling was used to select participants for

the focus group discussion. All patients newly diagnosed with T2DM who took part in the quantitative phase of data collection were randomly allocated into groups comprising six to eight participants. This sampling approach ensured that only information-rich cases capable of providing meaningful and in-depth data were included. The researcher conducted four focus group discussions in the control group and five in the study group, upon which saturation was achieved.

The researcher also conducted Key Informant Interviews (KIIs) with healthcare professionals who were directly involved in providing health education to patients newly diagnosed with T2DM. The aim was to collect qualitative data on the institutional factors influencing self-care practices among patients newly diagnosed with T2DM. The purposive sampling method was used to enroll three key informants in each study group, all healthcare professionals working at the diabetes clinics at Muranga and Kiambu level 5 hospitals, who met the inclusion criteria were interviewed.

### 3.6 Inclusion and Exclusion Criteria

#### 3.6.1 Inclusion Criteria

The study included patients who met all of the following criteria:

1. Above 18 years of age, newly diagnosed with T2DM, to ensure legal capacity to provide informed consent and adherence to recommended diabetes management protocols.
2. Newly diagnosed with T2DM as documented in the patient's medical records, to capture early-stage experiences of diagnosis, treatment initiation, and adherence to self-care practices.
3. Registered and actively attending the diabetes clinics at Murang'a Level 5 Hospital and Kiambu Level 5 Hospital during the study period, to ensure exposure to standardized diabetes care services offered at the hospital.
4. Had attended at least one follow-up clinic visit after diagnosis, enabling participants to reflect on their interaction with healthcare providers and initial diabetes education received.

The study included healthcare professionals who met all of the following criteria:

1. Employed at the diabetes clinics of Murang'a Level 5 Hospital and Kiambu Level 5 Hospital during the study period.
2. Directly and actively involved in the care, education, and follow-up of patients diagnosed with T2DM.
3. Had worked in the diabetes clinic for a minimum period of six months to ensure adequate familiarity with clinic processes and patient education practices.

### 3.6.2 Exclusion Criteria

The study excluded the following participants:

1. Patients who were newly diagnosed with T2DM but had already developed diabetes-related complications and were attending other specialized follow-up clinics. This was because these patients received specialized and intensified care that differed from routine diabetes clinic follow-up. Therefore, their inclusion could have influenced self-care practices and outcomes independently of standard diabetes education.
2. Healthcare Professionals (HCPs) who were not directly involved in offering health education to patients newly diagnosed with T2DM were excluded. This ensured that only HCPs with direct experience in diabetes education and patient counseling were included.

## 3.7 Study Variables

The study included independent variables such as patients' socio-demographic characteristics (age, level of knowledge, occupation), and biomedical data (clinical duration of T2DM, current treatment regimen, and body mass index [BMI]). Additionally, patient and institutional factors influencing self-care practices among patients newly diagnosed with T2DM were included as independent variables. The study's moderating variable was the patient-tailored activation intervention, which included a structured diabetes education program and follow-up via reminder text

messages on recommended self-care practices for T2DM management. The dependent variables were patient activation and self-care practices.

### 3.8 Data Collection Tools

Various tools were used to collect data at baseline and the post-intervention phase. One of the tools used was the structured questionnaire (Appendix III), which contained four sections. Section A, aimed at obtaining participants' socio-demographic data, clinical data on the duration of T2DM, and their current treatment regimen. Section B was used to record study participants' biomedical data, including BMI. To assess study participants' self-care practices, a series of 12 statements, modified from the Diabetes Self-Management Questionnaire (DSMQ) Tool (section C), was used. To obtain this data, a four-point Likert scale was used. The scale had scores ranging from applies very much (3), applies to a considerable degree (2), applies to some degree (1), and does not apply (0).

Total scores were calculated as the raw score divided by the theoretical maximum, then transformed to a scale ranging from 0 to 10. The cutoff point was 5.0; thus, a score of 5.1-10.0 was interpreted as indicating that the patient had good self-care practices, while a score of between 0 and 5.0 meant that the patient had poor self-care practices (Bukhsh et al., 2017). Lastly, section D of the structured questionnaire aimed at obtaining institutional factors influencing self-care practices among patients newly diagnosed with T2DM. To obtain this data, a two-point Likert scale ranging from disagree (0) to agree (1) was used.

To establish study participants' activation levels, the Patient Activation Measure® tool (Appendix IV) was used. PAM®-13 is a 13-item tool that assesses patients' level of confidence, awareness, and skills in managing their health independently. The tool contains four levels of activation that individuals diagnosed with chronic illness should progress through to attain effective self-care behaviors (Hibbard et al., 2013). The tool was rated on a scale ranging from strongly disagree (1) to agree strongly (4), and a not applicable (0) option. The total PAM®-13 score was calculated by adding the raw score, dividing by the number of items answered (excluding those marked not applicable), and then multiplying by 13. The final score

was then transformed to a scale with a theoretical range of 0–100 and categorized into one of the following four activation levels: Level 1 (≤ 47.0), interpreted as the study participant being either disinterested in initiating self-management or unable to take active responsibility for their self-care practices. At this level, the patient believes their role is important for achieving a good health outcome. Level 2 (47.1–55.1) – interpreted as indicating that the study participant has some awareness but is still struggling to take an active role in their healthcare. At this level, the patient has the confidence and knowledge needed to take action in their self-care practices. Level 3 (55.2 – 67.0) – interpreted that the study participant is taking active responsibility in their self-management and continues to acquire the needed skills and confidence. At this level, the patient is taking the necessary steps to maintain and improve their health. Level 4 (≥ 67.1) – interpreted as the study participant has the knowledge, skills, and confidence needed to maintain the recommended self-care behaviors. At this level, the patient has acquired the needed knowledge, skills, and confidence and is able to maintain good self-care practices even under stress. In this study, patient activation levels were dichotomized into low and high; levels 1 and 2 indicated low activation, while levels 3 and 4 indicated high activation.

Focus group discussions (Appendix V) were conducted to collect data on patient and institutional factors influencing self-care practices. In addition, a key informant interview guide (Appendix VI) was used to collect data on the institutional factors influencing self-care practices among the newly diagnosed T2DM patients in Muranga and Kiambu level 5 hospitals. Healthcare professionals directly involved in counselling patients newly diagnosed with T2DM were the key informants.

### 3.9 Validity and Reliability of the Data Collection Tools

#### 3.9.1 Pretesting

Pre-testing of the study tools was conducted at Gatundu level 5 hospital to assess their suitability, appropriateness, practicability, and any fieldwork logistics. Thirteen study participants, corresponding to 10% of the total sample size, were selected through simple random sampling. The selected study participants were then informed by the researcher that the study tools were being pre-tested. They were encouraged to

seek clarification on any items they found unclear and to provide suggestions on areas they felt should be improved or included. Any questions identified as ambiguous were revised accordingly. The revised study tools were then administered to other participants, and no further issues were reported.

The researcher also conducted one focus group discussion among the study participants to ascertain the appropriateness of the FGD guide. In addition, two key informant interviews with healthcare professionals were conducted. Data collected from the pre-test study were then cleaned, coded, and analyzed using SPSS version 26. Cronbach's alpha was computed to test for the reliability of the study tools.

### 3.9.2 Validity

The researcher reviewed the study tools and confirmed that they were formulated in line with the study objectives and that each research question included an adequate number of questions to ensure face validity. Construct validity was also ensured, ensuring that the study tools measured what they were intended to measure. A pre-test study was conducted to test the feasibility of the study. Data collected during the pre-test were cross-checked and analyzed to assess data quality. In addition, the research assistants were trained in accordance with the standard guidelines for diabetes management to ensure consistency with the study intervention.

Focus group discussions with patients newly diagnosed with T2DM and key informant interviews with healthcare providers at the diabetes clinic were also conducted during the pre-testing period. The collected qualitative data were cleaned, coded, and analyzed. The research questions were analyzed to ensure clarity, precision, and inclusiveness. To ensure the validity of the qualitative data, the researcher reviewed the original data collected before generating codes to assess the data's credibility.

After the baseline survey, the researcher identified key gaps in T2DM management of patients newly diagnosed with T2DM. A list of recommendations for the content to include in the intervention module was formulated based on these gaps.

Subsequently, a panel of experts was purposively selected, and the Delphi technique was employed to validate the structured diabetes teaching module.

### 3.9.3 Reliability

To ensure reliability, pretested study tools were used. The Cronbach's alpha results indicated that the four construct scales in the study tools were reliable as follows: patient-activation (0.80), self-care practices (0.81), and institutional factors influencing self-care practice (0.74). To avoid interviewer-induced bias, the research assistants were trained in the data collection process prior to the study. Additionally, the research assistants were involved in pre-testing to ensure they administered the study instruments correctly during the study period. The principal investigator conducted at least 5% of the data collection and also counterchecked all the study tools with the research assistants to ensure they were properly completed.

To enhance the trustworthiness of the qualitative data, Lincoln and Guba's (1985) criteria were applied through strategies that address credibility, dependability, transferability, and confirmability. Credibility was enhanced through prolonged engagement and participant clarification during FGDs; dependability through detailed documentation of procedures and systematic analysis; Confirmability was strengthened through reflexive practices, including reflective note-taking by the researcher to minimize personal bias and ensure that findings were grounded in participants' perspectives; Transferability was strengthened by providing rich descriptions of the study context, participant characteristics and data collection procedures at Murang'a and Kiambu Level 5 hospitals, enabling readers to assess applicability to similar settings. Additionally, the research team conducted several debriefings with the study participants, and consensus was obtained from all members of the research team before generating themes. To ensure the rigor of the qualitative data, the researcher maintained an audit trail of all steps in the collection and analysis of the data (Braun & Clarke, 2021).

### 3.10 Recruitment and Training of Research Assistant

Data were collected with the help of two research assistants: a qualified nutritionist holding a Diploma in Nutrition and Dietetics and a nurse with a Bachelor of Science in Nursing degree, both with relevant clinical experience. Their professional backgrounds ensured familiarity with the study population, hospital procedures, and the management of patients with T2DM, making them well-suited to administer questionnaires, conduct interviews, and facilitate FGDs in an accurate and ethical manner. Before data collection, the research assistants underwent orientation and training, including a review of the study objectives, data collection tools, ethical considerations, including confidentiality and informed consent, and standardized procedures for administering quantitative and qualitative instruments. This training ensured consistency, minimized interviewer bias, and enhanced the reliability and validity of the collected data. To reduce data contamination, the researcher recruited one research assistant in each study arm. Further, the research assistants were asked not to discuss any information about the study with their fellow healthcare professionals or utilize the study teaching module to empower participants in the control arm.

### 3.11 Data Collection Process

Permission to conduct the study was sought from Kenyatta University Ethics Review Committee (KU-ERC) and National Commission for Science, Technology & Innovation (NACOSTI). Permission to access study participants was sought from the respective county directors of health and from the administration of each Level 5 Hospital. Upon securing approval to conduct the study, a simple random sampling method was used to select patients newly diagnosed with T2DM who were on follow-up at the selected level 5 hospitals. The selected study participants were approached and asked to participate. Participants who met the inclusion criteria had the purpose of the study, the data collection procedure, and any benefits or risks arising from the study explained, and written consent was obtained from each of them.

All healthcare professionals offering diabetes health education at the selected level 5 hospitals were approached and requested to participate in the study. Those who met the inclusion criteria were informed of the study's purpose, data collection procedure, and any benefits or risks arising from the study, and written consent was obtained from each participant. The study was conducted in three phases and lasted one year. The three phases included:

**Phase I –** This served as the baseline survey and lasted four months, from January to April 2023. The goal of this phase was to answer research questions one to four. A baseline assessment was conducted for both the control and study arms. Structured questionnaires were used to collect data on study participants' socio-demographic characteristics, self-care practices, and factors that hinder or facilitate patients' adjustment to lifestyle behaviors. The PAM®-13 tool was used to collect data on the study participants' activation scores. Data on the study participants' BMI, treatment regimen, and clinical duration of T2DM were also collected.

FGDs were conducted to obtain data on patient and institution factors influencing self-care practices. Participants who were included in the FGD were selected from the predefined pool of those who had completed the quantitative component and met the inclusion criteria for the qualitative phase. Random selection was conducted using a simple random sampling method, in which eligible participants were assigned unique numbers and selected using a random number table. This ensured that each eligible participant had an equal chance of being selected, thereby minimizing selection bias. In addition, the Hawthorne effect was minimized by ensuring that all quantitative data were collected before the qualitative phase and by conducting the FGDs in a non-evaluative, supportive environment that encouraged honest reflection rather than altered behavior. They were conducted by the principal investigator, assisted by two research assistants. Each FGD consisted of six to eight study participants and lasted 40 to 60 minutes. Saturation occurred at four sessions of focus group discussions in the control group and five sessions in the study group.

To avoid dominance bias during the discussion, the principal investigator, who served as the moderator, allocated time to each participant and ensured they had an equal chance to contribute. The FGD was audio recorded and later transcribed verbatim. In addition, key informant interviews were conducted with healthcare professionals to collect data on institutional factors influencing self-care practices among patients newly diagnosed with T2DM. The interviews were conducted by the principal investigator with the help of one research assistant, who was recording. Each interview lasted approximately thirty to forty-five minutes.

Data obtained from the baseline assessment were analyzed, and existing gaps in patient activation, self-care practices, and the factors influencing them were established.

**Phase II –** This was the intervention phase and lasted 4 months. The goal was to address research question number five. Based on the baseline survey findings, the researcher developed and validated the patient-tailored activation module. This took place between May 2023 and July 2023. Thereafter, in August 2023, the research team implemented the structured diabetes education module among the participants in the study arm. The goal was to empower patients newly diagnosed with T2DM with the recommended T2DM management. During this period, study participants in the control arm continued to receive routine healthcare at the diabetes clinic.

**Phase III –** Three months after the intervention phase, the researcher conducted an endline assessment in both study groups. The goal was to address research questions six and seven. This formed the post-intervention evaluation phase and lasted two months, from December 2023 to January 2024. The study tools employed during the baseline assessment were also utilized to collect data in this phase. Upon completion of phase III, participants in the control arm received the same structured education for T2DM management.

### 3.1.2 Data Management

#### 3.12.1 Data Entry and Cleaning

Upon completion of data collection, the researcher assessed the study tools for completeness, legibility, and consistency. Any information found not to be consistent was eliminated. Quantitative data collected were cleaned, coded to enhance data quality, entered into Statistical Package for Social Sciences (SPSS) version 26 for analysis, and password-protected. NVivo 13 software was used to analyze qualitative data. Trustworthiness was established through peer debriefing, and later the research team reviewed the data to confirm the emerging themes.

#### 3.12.2 Data Storage

All electronic data collected was stored securely on a password-protected, encrypted computer, regularly backed up, and anonymized using participant codes to ensure confidentiality and prevent data loss. Similarly, paper-based data were stored in a locked cabinet, with access restricted to the research team, to ensure confidentiality and data security. Stored data was retrieved only during the analysis process and remained stored there until the study was completed. Upon completion of the study, the data were disposed of professionally to prevent unethical use.

#### 3.12.3 Data Analysis and Presentation

The study adopted a mixed-methods approach, collecting and analyzing both quantitative and qualitative data across multiple study phases. Quantitative data were analyzed using descriptive and inferential statistics. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarize patient activation and self-care practice scores, while chi-square tests were used to examine associations between categorical variables. Additionally, both quantitative and qualitative data were collected to explore factors influencing self-care practices. Quantitative data were analyzed using descriptive statistics and binary logistic regression. Qualitative data were analyzed using NVivo 13. A thematic analysis approach was used to examine the data and to identify the main themes and patterns.

At first, the research team familiarized itself with the data collected by transcribing and re-reading the transcripts. The team then generated initial codes that systematically highlighted crucial data. Next, all the codes were collated into possible themes, then patterns were identified, and a thematic map of the analysis was generated. Finally, methodological triangulation was used to compare, integrate, and interpret the collected mixed data.

In phase III (post-intervention), inferential statistics were conducted to assess the effect of the patient-tailored activation intervention on participants' activation and self-care practice. An independent-sample t-test was used to compare the intervention and control groups, and a paired-samples t-test was used to assess within-group changes from baseline to post-intervention. Cohen's *d* was calculated to determine the magnitude of the intervention effect (Table 3.2). Frequencies, standard deviations, percentages, and means were used to describe the data, which were presented in tables and bar graphs.

**Table 3.2: Variables and Methods of Data Analysis**

| | Research objective | Variable | Study Tool | Method of data analysis |
|---|---|---|---|---|
| **1** | To establish patient activation levels among patients newly diagnosed with T2DM in Selected Hospitals, Kenya. | Patient-activation | Patient Activation Measure®-13 (PAM®-13) | -Descriptive Statistics<br>-Chi-square |
| **2** | To determine self-care practices among patients newly diagnosed with T2DM in Selected Hospitals, Kenya. | Self-care practices | Structured questionnaire (DSMQ) | -Descriptive Statistics<br>-Chi-square |
| **3** | To determine patient factors influencing self-care practices among patients newly diagnosed with T2DM in selected hospitals in Kenya. | Patient factors | Focus Group Discussion | -Descriptive Statistics<br>-Thematic analysis<br>-Methodological Triangulation |
| **4** | To determine institutional factors influencing self-care practices among patients newly diagnosed with T2DM in Selected Hospitals, Kenya | Institutional factors | Structured questionnaire<br><br>Key Informant Interview | -Descriptive Statistics<br>-Thematic analysis<br>-Binary Logistic Regression<br>-Methodological Triangulation |
| **5** | To determine the effect of the patient tailored activation intervention on patient-activation | patient-activation | Patient Activation Measure | -Independent sample t-test<br>-Paired sample t- |

| | | | | |
|---|---|---|---|---|
| | levels among patients newly diagnosed with T2DM in Selected Hospitals, Kenya. | | | test<br>- Cohen's *d* |
| **6** | To determine the effect of patient tailored activation intervention on self-care practices among patients newly diagnosed with T2DM in Selected Hospitals, Kenya. | Self-care practices | Structured questionnaire (DSMQ) | -Independent sample t-test<br>-Paired sample t-test<br>- Cohen's *d* |

### 3.13 Ethical Consideration

Ethical approval to conduct the research was sought from Kenyatta University Ethics Review Committee, reference number PKU/25602/E1726 (Appendix XV). Permission to conduct the study was sought from NACOSTI under license number NACOSTI/1/P/22/21150 (Appendix XVI). Authorization to conduct the study was also sought from the Ministry of Health in Kiambu and the Muranga County Health Research Department. Informed consent was sought from the study participants before the commencement of the study (Appendix I and II). This was based on the Declaration of Helsinki, a Statement of ethical principles for medical research involving human subjects, which requires the researcher to clearly explain to study participants the objectives of the study, as well as any benefits and risks that may arise from the study. Participation was voluntary, without coercion, and the study participants were free to withdraw at any time. Study participants were also assured of their privacy, confidentiality, and anonymity. The researcher omitted participants' names from the study materials to ensure anonymity. To ensure confidentiality, all completed data collection tools were stored in secure, lockable drawers accessible only to the research team. Study participants' confidentiality was also assured; audio recordings were used only for transcription and later erased. Additionally, study participants' identification data was coded and was not released to any third party. The study was unlikely to cause harm to participants, as the objective was to develop a teaching module for patients newly diagnosed with T2DM to improve their self-care practices.

Upon completion of the study, the researcher disseminated the research findings through publication in peer-reviewed journals (Appendix XVII). Presentations were conducted at Jomo Kenyatta University of Agriculture and Technology (JKUAT),

School of Nursing, through seminar presentations. Feedback sessions were held at Murang’a and Kiambu Level 5 hospitals to share findings with healthcare professionals and hospital management. Conference presentations at relevant national and international forums were planned to further disseminate the study's findings to the broader scientific community. Additionally, policy briefs summarizing actionable recommendations were prepared for relevant stakeholders within the Ministry of Health.

# CHAPTER FOUR

# RESULTS

## 4.1 Introduction

The purpose of this study was to determine the effectiveness of a patient-tailored activation intervention in enhancing self-care practices and patient activation among patients newly diagnosed with T2DM. After obtaining all required approvals, participants were recruited, and consent forms were signed; data were collected and analyzed in three phases (I, II, and III). This chapter presents the study findings, including socio-demographic characteristics, clinical characteristics, baseline and post-intervention patient activation levels, and self-care practices for all participants.

## 4.2 Social-Demographic Characteristics of the Participants

The study collected data from two sites (control and study groups), with a total sample of 124 participants, equally distributed between the two groups (n = 62 each). The majority of participants were female, 70 (56.5%), with 36 (58.1%) in the study group and 34 (54.8%) in the control group. Regarding age, the highest proportion was in the 40–49 years' age group in the control group, 15 (24.2%), and 22 (35.5%) were aged 60–69 years in the study group. Most participants were married 89 (71.8%), with comparable proportions in the control 44 (71.0%) and study groups 45 (72.6%). The majority of participants identified as Christians: 122 (98.4%) in the control group, 62 (100.0%) in the study group, and 60 (96.8%) overall.

Regarding education, 58 (46.8%) of the participants had primary education, while 46 (37.1%) had secondary education. Regarding participants' occupation status, 55 (44.4%) were self-employed, with 23 (37.1%) in the control group and 32 (51.6%) in the study group. Additionally, 31 (25.0%) of the participants were unemployed, with 14 (22.6%) in the control group and 17 (27.4%) in the study group. In both study sites, the majority of participants, 71 (57.3%), resided in urban settings.

Baseline comparisons showed no statistically significant associations between the socio-demographic characteristics and study group allocation, indicating that the control and study groups were comparable at baseline (Table 4.1).

**Table 4.1: Social-Demographics Characteristics of the Participants**

| Variable | Category | Control N (%) | Study N (%) | Total N (%) | Statistical Significance (0.05) |
|---|---|---|---|---|---|
| Gender | Male | 28 (45.2) | 26 (41.9) | 54 (43.5) | |
| | Female | 34 (54.8) | 36 (58.1) | 70 (56.5) | $\chi2$ (1) = 0.131, $p$ = 0.856 |
| Age | 20-29 | 5 (8.1) | 0 (0.0) | 5 (4.0) | |
| | 30-39 | 10 (16.1) | 7 (11.3) | 17 (13.7) | |
| | 40-49 | 15 (24.2) | 15 (24.2) | 30 (24.2) | Fishers exact = 0.137 |
| | 50-59 | 14 (22.6) | 15 (24.2) | 29 (23.4) | |
| | 60-69 | 13 (21.0) | 22 (35.5) | 35 (28.2) | |
| | <70 | 5 (8.1) | 3 (4.8) | 8 (6.5) | |
| Marital status | Single | 9 (14.5) | 5 (8.1) | 14 (11.3) | |
| | Married | 44 (71.0) | 45 (72.6) | 89 (71.8) | Fishers exact = 0.486 |
| | Widowed | 4 (6.5) | 8 (12.9) | 12 (9.7) | |
| | Divorced/Separated | 5 (8.1) | 4 (6.5) | 9 (7.3) | |
| Religion | Christians | 62 (100) | 60 (96.8) | 122 (98.4) | |
| | No Religion | 0.0 | 2 (3.2) | 2 (1.6) | Fisher's exact = 0.496 |
| Education | None | 0 (0) | 4 (6.5) | 4 (3.2) | |
| | Primary | 25 (40.3) | 33 (53.2) | 58 (46.8) | $\chi2$ (6) = 5.378, $p$ = 0.496 |
| | Secondary | 30 (48.4) | 16 (25.8) | 46 (37.1) | |
| | College/University | 7 (11.3) | 9 (14.5) | 16 (13) | |
| Occupation | Formal employment | 9 (14.5) | 13 (21.0) | 22 (17.7) | |
| | Self-employment | 23 (37.1) | 32 (51.6) | 55 (44.4) | $\chi2$ (6)=12.583, $p$ = 0.055 |
| | Unemployed | 14 (22.6) | 17 (27.4) | 31 (25.0) | |
| | Pensioner | 16 (25.8) | 0 (0.0) | 16 (12.9) | |
| Residence | Urban setting | 55 (88.7) | 16 (25.8) | 71 (57.3) | |
| | Rural setting | 7 (11.3) | 46 (74.2) | 53 (42.7) | $\chi2$ (1) = 1.198, $p$ = 0.274 |

**Key:** N= Frequency %= Percentage

### 4.2.1 Clinical Characteristics of the Participants

Regarding the clinical duration of T2DM, the largest proportion of participants, 45 (36.3%), reported having the condition for four months, comprising 25 (40.3%) in the control group and 20 (32.3%) in the study group. On treatment regimen, the majority of participants, 92 (74.2%), were on oral anti-diabetic drugs only, with 39 (62.9%) from the control group and 53 (85.5%) from the study group.

In terms of BMI, 45 (36.3%) participants had a healthy weight, including 24 (38.7%) in the control group and 21 (33.9%) in the study group. Additionally, 32 (25.8%) participants were overweight, with a higher proportion in the control group, 21 (33.9%), than in the study group, 11 (17.7%). Overall, 42 (36.8%) participants were classified as obese, with the study group recording the highest proportion at 27 (43.5%) (Table 4.2).

**Table 4.2: Clinical Characteristics of the Participants**

| Variable | Category | Control N (%) | Study N (%) | Total N (%) |
|---|---|---|---|---|
| Clinical Duration of T2DM | One month and below | 9 (14.5) | 7 (11.3) | 16 (12.9) |
| | Two months | 7 (11.3) | 5 (8.1) | 12 (9.7) |
| | Three months | 10 (16.1) | 15 (24.2) | 25 (20.2) |
| | Four months | 25 (40.3) | 20 (32.3) | 45 (36.3) |
| | Five months | 6 (9.7) | 4 (6.5) | 10 (8.1) |
| | Six months | 5 (8.1) | 11 (17.7) | 16 (12.9) |
| Treatment Regime | Oral anti-diabetic drugs only | 39 (62.9) | 53 (85.5) | 92 (74.2) |
| | Insulin only | 12 (19.4) | 6 (9.7) | 18 (14.5) |
| | Oral anti- diabetic drugs and insulin | 8 (12.9) | 3 (4.8) | 11 (8.9) |
| | Do not know | 1 (1.6) | 0(0) | 1 (0.8) |
| | On diet only | 2 (3.2) | 0 (0) | 2 (1.6) |
| BMI | Underweight < 18.5 | 2 (3.2) | 3 (4.8) | 5 (4.0) |
| | Normal 18.5-24.9 | 24 (38.7) | 21 (33.9) | 45 (36.3) |
| | Overweight (25-29.9) | 21 (33.9) | 11 (17.7) | 32 (25.8) |
| | Obesity >31 | 15 (24.2%) | 27 (43.5) | 42 (36.8) |

**Key:** N= Frequency %= Percentage

### 4.2 Participants' Activation Levels at Baseline Survey

The study sought to establish activation levels among patients newly diagnosed with T2DM. To determine activation levels, the study used the Patient Activation Measure® tool. It contains questions that seek to assess the patient's level of confidence, awareness, and skills in managing their health. The tool was rated on a scale ranging from strongly disagree (1) to strongly agree (4), and a not applicable (0) option. The data obtained were used to calculate the total activation scores, as shown in Appendix IX (control group) and Appendix X (study group).

#### 4.2.1 Participants' Activation Scores at Baseline Survey

Regarding patient activation scores, the majority of participants in both the control group 55 (88.7%) and the study group 48 (77.4%) agreed that they were responsible for taking care of their health. Similarly, the majority of participants in the control group 55 (88.7%) and in the study group 45 (72.6%), agreed that taking an active role in their health was crucial in managing T2DM.

Regarding participants' knowledge of prescribed medications, the majority in the control group 39 (62.9%), strongly disagreed that they knew the mechanism of action of their medication, while 30 (48.4%) in the study group disagreed with the same statement. Only 27 (43.5%) participants in the control group and 15 (24.2%) in the study group reported maintaining recommended self-care practices, such as healthy eating and regular exercise. Additionally, 23 (37.1%) participants in the control group strongly disagreed that they had confidence in their ability to maintain recommended lifestyle changes during periods of stress, while 27 (43.5%) participants in the study group disagreed (Table 4.3).

**Table 4.3: Participants Activation Scores at Baseline Survey**

| Statements assessing patient-activation levels | | Study arm | N/A (0) N (%) | Disagree Strongly (1) N (%) | Disagree (2) N (%) | Agree (3) N (%) | Agree Strongly (4) N (%) |
|---|---|---|---|---|---|---|---|
| **1** | I am the person who is responsible for taking care of my health | Control | 0 (0.0) | 0 (0.0) | 0 (0.0) | 55 (88.7) | 7 (11.3) |
| | | Study | 0 (0.0) | 1 (1.6) | 4 (6.5) | 48 (77.4) | 9 (14.5) |
| **2** | Taking an active role in my own health care is the most important thing that affects my health | Control | 0 (0.0) | 0 (0.0) | 0 (0.0) | 55 (88.7) | 7 (11.3) |
| | | Study | 0 (0.0) | 1 (1.6) | 12 (19.4) | 45 (72.6) | 4 (6.5) |
| **3** | I am confident I can help prevent or reduce problems associated with my health | Control | 2 (3.2) | 33 (53.2) | 7 (11.3) | 18 2(9.0) | 2 (3.2) |
| | | Study | 1 (1.6) | 13 (21.0) | 22 (35.5) | 24 (38.7) | 2 (3.2) |
| **4** | I know what each of my prescribed medications do | Control | 4 (6.5) | 39 (62.9) | 19 (30.6) | 0 (0.0) | 0 (0.0) |
| | | Study | 1 (1.6) | 18 (29.0) | 30 (48.4) | 13 (21.0) | 0 (0.0) |
| **5** | I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health care problem by myself | Control | 0 (0.0) | 18 (29.0) | 10 (16.1) | 32 (51.6) | 2 (3.2) |
| | | Study | 2 (1.6) | 17 (27.4) | 20 (32.3) | 21 (33.9) | 2 (3.2) |
| **6** | I am confident that I can tell a doctor concerns I have even when he or she does not ask | Control | 1 (1.6) | 0 (0.0) | 2 (3.2) | 26 (41.9) | 33 (53.2) |
| | | Study | 3 (4.8) | 3 (4.8) | 12 (19.4) | 37 (59.7) | 7 (11.3) |
| **7** | I am confident that I can follow through on medical treatments I may need to do at home | Control | 2 (3.2) | 2 (3.2) | 3 (4.8) | 49 (79.0) | 6 (9.7) |
| | | Study | 2 (3.2) | 2 (3.2) | 17 (27.4) | 41 (66.1) | 0 (0.0) |
| **8** | I understand my health problems and what causes them | Control | 0 (0.0) | 30 (48.4) | 27 (43.5) | 4 (6.5) | 1 (1.6) |
| | | Study | 1 (1.6) | 22 (35.5) | 28 (45.2) | 11 (17.7) | 0 (0.0) |
| **9** | I know what treatments are available for my health problems | Control | 2 (3.2) | 40 (64.5) | 15 (24.2) | 5 (8.1) | 0 (0.0) |
| | | Study | 1 (1.6) | 27 (43.5) | 22 (35.5) | 12 (19.4) | 0 (0.0) |

| Statements assessing patient-activation levels | | Study arm | N/A (0) N (%) | Disagree Strongly (1) N (%) | Disagree (2) N (%) | Agree (3) N (%) | Agree Strongly (4) N (%) |
|---|---|---|---|---|---|---|---|
| **10** | I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising | Control | 1 (1.6) | 6 (9.7) | 25 (40.3) | 27 (43.5) | 3 (4.8) |
| | | Study | 0 (0.0) | 15 (24.2) | 32 (51.6) | 15 (24.2) | 0 (0.0) |
| **11** | I know how to prevent problems with my health | Control | 1 (1.6) | 44 (71.0) | 15 (24.2) | 2 (3.2) | 0 (0.0) |
| | | Study | 1 (1.6) | 23 (37.1) | 30 (48.4) | 8 (12.9) | 0 (0.0) |
| **12** | I am confident I can figure out solutions when new problems arise with my health | Control | 0 (0.0) | 47 (75.8) | 10 (16.1) | 5 (8.1) | 0 (0.0) |
| | | Study | 2 (3.2) | 22 (35.5) | 27 (43.5) | 11 (17.7) | 0 (0.0) |
| **13** | I am confident that I can maintain lifestyle changes, like eating right and exercising even during time of stress | Control | 1 (1.6) | 23 (37.1) | 24 (38.7) | 12 (19.4) | 2 (3.2) |
| | | Study | 0 (0.0) | 12 (19.4) | 27 (43.5) | 23 (37.1) | 0 (0.0) |

**Key:** N= Frequency %= Percentage

### 4.2.2 Participants' Activation Levels at Baseline Survey

To establish participants' activation levels, the researcher added the PAM®-13 raw scores above, divided by the number of items answered (excluding those marked not applicable), and multiplied the result by 13. The final score was then transformed to a scale with a theoretical range of 0-100 and categorized into one of the following four activation levels: Level 1 (≤47.0), Level 2 (47.1–55.1), Level 3 (55.2–67.0), and Level 4 (≥67.1).

The majority of the participants scored level 2, with 33 (53.2%) in the control group and 32 (51.6%) in the study group. Only 3 (4.8%) of the study participants from the study group scored level 4 (Figure 4.1).

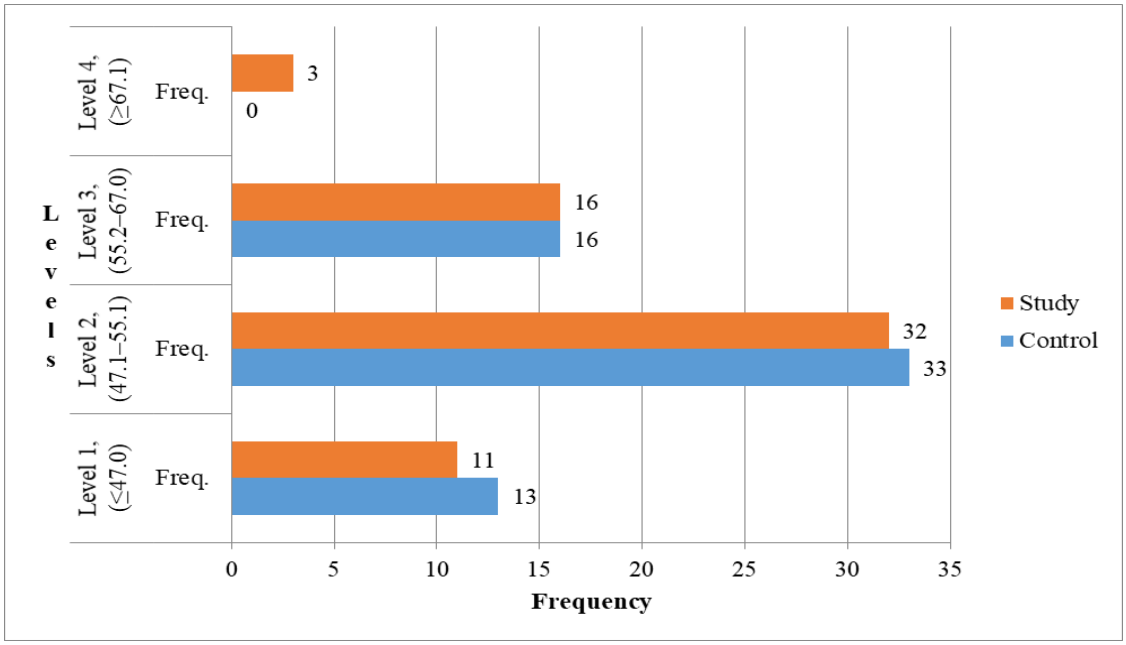


**Figure 4.1: Participants Activation Levels At Baseline Survey**

**Key**

Level 1- Unable to take active responsibility in their self-activation practices.

Level 2 – Have some awareness but still struggling to take active responsibility in their healthcare.

Level 3 – Taking active responsibility for their self-care and continue to develop skills and confidence.

Level 4 – Have knowledge, skills and confidence needed to maintain recommended self-care behaviors.

Next, participants' activation levels were dichotomized into low (Levels 1 and 2) or high (Levels 3 and 4).

The majority, 89 (71.8%) of the participants in the present study, had low activation levels, with 46 (74.2%) in the control group and 43 (69.4%) in the study group (Table 4.4).

**Table 4.4: Participants' Activation Levels at Baseline Survey**

| **Patient-activation levels** | **Study group** | | **Total** | **Odd Ratio (OR) (95% C.I)** |
|---|---|---|---|---|
| | **Control** | **Study** | **N (%)** | |
| | **N (%)** | **N (%)** | | |
| Low activation (≤ 55.1) | 46 (74.2) | 43 (69.4) | 89 (71.8) | 0.59 [0.210-1.681] |
| High activation (≥ 55.2) | 16 (25.8) | 19 (30.6) | 35 (28.2) | |
| Total | 62 (100) | 62 (100) | | |

**Key:** N= Frequency %= Percentage

### 4.2.3 Comparison of Participants' Activation at Baseline in the Study Arms

An independent sample t-test was conducted to compare baseline patient activation mean scores between the two study arms. The findings showed no statistically significant difference between the control arm (M = 52.5, SD = 6.6) and the study group (M = 54.1, SD = 7.9), $t$ (122) = 1.186, two-tailed $p$ = 0.238 (Table 4.5). This indicates that the two groups were comparable at baseline in terms of patient activation.

**Table 4.5: Independent Sample T-Test between the Study Arms at Baseline Survey**

| | Control (N=62) | | Study (N=62) | | | |
|---|---|---|---|---|---|---|
| **Variable** | **M** | **SD** | **M** | **SD** | ***t*-test Statistics** | ***P*-value** |
| Mean Patient-activation scores at baseline | 52.50 | 6.62 | 54.05 | 7.87 | t (122) = -1.186 | 0.238 |

### 4.3 Participants Self-Care Practices at Baseline Survey

The study sought to determine self-care practices among patients newly diagnosed with T2DM. An interviewer-administered questionnaire modified from the DSMQ was used to collect data on participants' self-care practices. Participants were required to describe their self-care practices over the past seven days under each item using a 4-point Likert scale. The scale ranged from applies very much (3) to applies to some degree (1), with does not apply (0). The data obtained were used to determine the total self-care practice scores, as shown in Appendix XI (control group) and Appendix XII (study group).

#### 4.3.1 Participants' Self-Care Practices Score at Baseline Survey

Regarding self-care practices, 6 (9.7%) participants in the control group and 5 (8.1%) in the study group reported following a healthy eating plan in the preceding week. Similarly, only 4 (6.5%) participants in the control group and 1 (1.6%) in the study group reported eating 5 or more servings of fruits and vegetables per day. A majority of participants reported taking their anti-diabetic medications as prescribed, with 34 (54.8%) in the control group and 38 (61.3%) in the study group. In addition, 21 (33.9%) of participants in the control group and 35 (56.5%) in the study group reported monitoring their blood glucose levels to some degree.

Regarding physical activity, 27 (44.3%) of the participants in the control group reported exercising to a considerable degree, while 32 (51.6%) in the study group reported exercising to some degree. Regarding the inspection of shoes as recommended, 37 (59.7%) participants in the control group and 26 (41.9%) in the study group reported inspecting only the inside of their shoes to some degree. Overall, 20 (32.3%) of the participants in each study group reported adherence to their scheduled diabetes clinic follow-up visits (Table 4.6).

**Table 4.6: Self-Care Practices Scores at Baseline**

| Statements Assessing self-care practices | | Study arm | Does not apply to me apply to me (0) N (%) | Applies to me to some degree (1) N (%) | Applies to me to a considerable degree (2) N (%) | Applies to me very much (3) N (%) |
|---|---|---|---|---|---|---|
| **1** | I have followed a healthy eating plan (on average per week in the last one month) | Control | 5 (8.1) | 31 (50.0) | 20 (32.3) | 6 (9.7) |
| | | Study | 0 (0.0) | 32 (51.6) | 25 (40.3) | 5 (8.1) |
| **2** | I eat five or more servings of fruits and vegetables in a day | Control | 6 (9.7) | 39 (62.9) | 13 (21.0) | 4 (6.5) |
| | | Study | 2 (3.2) | 38 (61.3) | 21 (33.9) | 1 (1.6) |
| **3** | I space my carbohydrates evenly throughout the day as recommended | Control | 6 (9.7) | 43 (69.4) | 8 (12.9) | 5 (8.1) |
| | | Study | 0 (0.0) | 28 (45.2) | 34 (54.8) | 0 (0.0) |
| **4** | I take my anti-diabetic drugs as prescribed by the doctor | Control | 6 (9.7) | 5 (8.1) | 17 (27.4) | 34 (54.8) |
| | | Study | 2 (3.2) | 7 (11.3) | 15 (24.2) | 38 (61.3) |
| **5** | I check and record my blood glucose levels as recommended | Control | 12 (19.4) | 21 (33.9) | 21 (33.9) | 8 (12.9) |
| | | Study | 7 (11.3) | 35 (56.5) | 12 (19.4) | 8 (12.9) |
| **6** | I engage in at least 30 minutes of physical activity 3-4 times in a week | Control | 6 (9.8) | 27 (43.5) | 27 (44.3) | 2 (3.3) |
| | | Study | 1 (1.6) | 32 (51.6) | 26 (41.9) | 3 (4.8) |

| | Statements Assessing self-care practices | Study arm | Does not apply to me apply to me (0) | Applies to me to some degree (1) | Applies to me to a considerable degree (2) | Applies to me very much (3) |
|---|---|---|---|---|---|---|
| | | | N (%) | N (%) | N (%) | N (%) |
| **7** | I examine my feet as recommended by the healthcare provider | Control | 17 (27.4) | 38 (61.3) | 5 (8.1) | 2 (3.2) |
| | | Study | 17 (27.4) | 24 (38.7) | 21 (33.9) | 0 (0.0) |
| **8** | I inspect inside my shoes as recommended by the healthcare provider | Control | 18 (29.0) | 37 (59.7) | 5 (8.1) | 2 (3.2) |
| | | Study | 19 (30.6) | 26 (41.9) | 17 (27.4) | 0 (0.0) |
| **9** | I have not smoked at least once in the last 7 days | Control | 2 (3.2) | 1 (1.6) | 1 (1.6) | 58 (93.5) |
| | | Study | 9 (14.5) | 0 (0.0) | 1 (1.6) | 52 (83.9) |
| **10** | I have not taken alcohol at least once in the last 7 days | Control | 5 (8.1) | 0 (0.0) | 2 (3.2) | 55 (88.7) |
| | | Study | 11 (17.7) | 0 (0.0) | 0 (0.0) | 51 (82.3) |
| **11** | I have learnt to solve problems and manage stress | Control | 6 (9.7) | 29 (46.8) | 25 (40.3) | 2 (3.2) |
| | | Study | 10 (16.1) | 22 (35.5) | 30 (48.4) | 0 (0.0) |
| **12** | I have adhered to all my scheduled diabetes clinics | Control | 4 (6.5) | 25 (40.3) | 13 (21.0) | 20 (32.3) |
| | | Study | 11 (17.7) | 16 (25.8) | 15 (24.2) | 20 (32.3) |

**Key:** N= Frequency %= Percentage

### 4.3.2 Participants' Self-Care Practice at Baseline Survey

To obtain participants' self-care practices, the total scores obtained above were used. The total self-care practices raw score was divided by the theoretical maximum score and then transformed to a scale ranging from 0 to 10. The cut-off point was 5; thus, a score of 5.1 to 10.0 indicated good self-care practices, while a score of 0.0 to 5.0 indicated poor self-care practices.

The study found that the majority, 32 (51.6%) of the participants in the control group had good self-care practices, while 39 (62.9%) in the study group scored poor self-care practices (Table 4.7).

**Table 4.7: Participants' Self-Care Practices at Baseline Survey**

| Self-care practices scores | Study group | | Total N (%) | OR (95 % C.I) | |
|---|---|---|---|---|---|
| | Control N (%) | Study N (%) | | Lower | Upper |
| Poor | 30 (48.4) | 39 (62.9) | 69 (55.6) | 1.039 [0.304 - 3.553] | |
| Good | 32 (51.6) | 23 (37.1) | 55 (44.4) | | |
| Total | 62 (100) | 62 (100) | | | |

**Key**

Poor self-care practices - Score of 0.0 – 5.0

Good self-care practices - Score of 5.1 – 10.0

### 4.3.3 Comparison of Self-Care Practices at Baseline Survey between the Study Arms

An independent-samples t-test was conducted to compare baseline mean self-care practice scores between the two study arms. There was no statistically significant difference between the control arm (M = 5.08, SD = 1.22) and the study arm (M = 4.77, SD = 0.96), $t$ (122) = 1.608, two-tailed $p$ = 0.11, indicating baseline comparability between the groups (Table 4.8).

**Table 4.8: Independent Sample T-Test between the Two Study Arm at Baseline Survey**

| Variable | Control (N=62) M | SD | Study (N=62) M | SD | t-test Statistics | P-value |
|---|---|---|---|---|---|---|
| Mean self-care practices at baseline | 5.08 | 1.22 | 4.77 | 0.96 | $t$ (122) = 1.608 | 0.111 |

### 4.4 Patient Factors Influencing Self-Care Practices

The study sought to determine patient-related factors that influence self-care practices among patients newly diagnosed with T2DM. A mixed methods approach was used to collect the data.

Four themes emerged from the focus group discussion on patient-related factors influencing self-care practices: knowledge of self-care practices, personal social network, adherence to treatment, and financial ability (Table 4.9).

**Table 4.9: Themes on Patient Factors Influencing Self-Care Practices**

| | Themes | Subthemes |
|---|---|---|
| 1 | Knowledge on self-care practices | Knowledge on nutrition therapy |
| | | Knowledge on physical activity |
| 2 | Personal social network | Social responsibilities |
| | | Lack of psychological support |
| 3 | Adherence to treatment | Adherence to follow up visits |
| 4 | Financial ability | Lack of finances |

**Knowledge on Self-Care Practices**

Good self-care practices were recorded among 18 (29.0%) participants with secondary education in the control group and 13 (21.0%) participants with primary education in the study group (Table 4.10). This was reflected in the focus group discussions, in which participants described how their education influenced their adherence to the recommended self-care practices. One participant narrated:

> *"The last time when I was checked, the results indicated that my sugar levels were high. The doctor told me how to control my sugars and also on what to eat. I reached form 2 so I understood it. My sugar levels are much better now."* (Respondent 1, FGD 2, control group)

Another participant stated,

> *"Yes, knowledge on diet is very helpful. I was taught what I should be eating, and that is what I am currently doing. I make sure that all my meals have greens and I drink a lot of water. This has helped me control my sugar levels."* (Respondent 4, FGD 1, study group)

**Personal Social Network**

A high proportion of married participants demonstrated good self-care practices, with 25 (40.3%) in the control group and 18 (29.0%) in the study group (Table 4.10). Likewise, several participants reported receiving considerable support from their spouses following their T2DM diagnosis, while others indicated a lack of family support. A participant stated,

> "*My diet is okay because my wife cooks for me what I am supposed to eat*." (Respondent 4, FGD 2, control group)

Another participant stated,

> "*Sometimes I forget to come to the clinic. I live alone and I have no one to remind me when my clinic is due*" (Respondent 2, FGD 4, control group).

Another participant stated,

> "*As a man it is hard to control what is being cooked at home so you end up eating what the rest of the family members are eating*" (Respondent 2, FGD 1, control group).

Half of the participants in the control group 32 (51.6%) who were Christians scored good self-care practices, while 38 (48.4%) in the study group scored poor self-care practices (Table 4.10). Similarly, during the focus group discussions, one participant noted that engaging in religious activities made it challenging to adhere to the recommended self-care practices. One participant narrated,

> "*Sometimes in my church we have ceremonies and you are required to be there the whole day but then they just cook any food. They never consider that some of us have diabetes so I usually carry my own food from home*." (Respondent 1, FGD 5, study group).

**Adherence to Treatment**

Poor self-care practices were observed among participants who were self-employed in both study groups, with 12 (19.4%) in the control group and 19 (30.6%) in the study group (Table 4.10). Similarly, this was reflected in the focus group discussions, where participants reported that their occupation hindered their adherence to recommended self-care practices. For example, one participant stated:

> *"Where I work I am not able to do any physical work and when I get home I am so tired to do anything. Plus, going to the gym is very expensive so you end up never exercising." (Respondent 4, FGD 3, control group).*

Another participant narrated that:

> *"I have missed my scheduled clinic for two months that is in November and December because of my job. I was forced to buy more drugs from the chemist since I was running out of them." (Respondent 1, FGD 4, control group).*

**Financial Ability**

Regarding participants' occupation, the study found that poor self-care practices were most prevalent among self-employed individuals, with 12 (19.4%) in the control group and 19 (30.6%) in the study group (Table 4.10). This finding aligns with insights from the focus group discussions, where many participants indicated that financial constraints hindered their adherence to self-care practices and limited their ability to seek timely treatment. A participant stated that,

> *"There was a time I didn't have money to buy medicine so I ended up not taking them for 2 days. Also I have never found the medicine here at the hospital pharmacy, I always buy them at the private pharmacy and it is very costly*." (Respondent 2, FGD 5, control group).

**Another participant stated,**

> "*I am currently taking four tablets in one day and one tablet costs KES: 70. This to me is very expensive. I always buy alternative drugs that are cheaper than the ones prescribed to me by the doctor*" (Respondent 6, FGD 2, study group).

**Table 4.10: Patient Factors Influencing Self-Care Practices**

| Study Arm | Variable | Category | Self-care Practices | |
|---|---|---|---|---|
| | | | Poor N (%) | Good N (%) |
| Control | Gender | Male | 14 (22.6) | 14 (22.6) |
| | | Female | 16 (25.8) | 18 (29.0) |
| Study | Gender | Male | 17 (27.4) | 9 (14.5) |
| | | Female | 22 (35.5) | 14 (22.6) |
| Control | Age | 20-29 | 3 (4.8) | 2 (3.2) |
| | | 30-39 | 4 (6.5) | 6 (9.7) |
| | | 40-49 | 7 (11.3) | 8 (12.9) |
| | | 50-59 | 8 (12.9) | 6 (9.7) |
| | | 60-69 | 5 (8.1) | 8 (12.9) |
| | | >70 | 3 (4.8) | 2 (8.1) |
| Study | Age | 20-29 | 0 (0) | 0 (0) |
| | | 30-39 | 3 (4.8) | 4 (6.5) |
| | | 40-49 | 10 (16.1) | 5 (8.1) |
| | | 50-59 | 9 (14.5) | 6 (9.7) |
| | | 60-69 | 15 (24.2) | 7 (11.3) |
| | | >70 | 2 (3.2) | 1 (1.6) |
| Control | Marital Status | Single | 7 (11.3) | 2 (3.2) |
| | | Married | 19 (30.6) | 25 (40.3) |
| | | Widowed | 2 (3.2) | 2 (3.2) |
| | | Divorced/Separated | 2 (3.2) | 3 (4.8) |
| Study | Marital Status | Single | 3 (4.8) | 2 (3.2) |
| | | Married | 27 (43.5) | 18 (29.0) |
| | | Widowed | 6 (9.7) | 2 (3.2) |
| | | Divorced/Separated | 3 (4.8) | 1 (1.6) |
| Control | Occupation | Formal employment | 5 (8.1) | 4 (6.5) |
| | | Self-employment | 12 (19.4) | 11 (17.7) |

| Study Arm | Variable | Category | Self-care Practices | |
|---|---|---|---|---|
| | | | Poor N (%) | Good N (%) |
| | | Unemployed | 8 (12.9) | 6 (9.7) |
| | | Pensioner | 5 (8.1) | 11 (17.7) |
| Study | Occupation | Formal employment | 10 (16.1) | 3 (4.8) |
| | | Self-employment | 19 (30.6) | 13 (21.0) |
| | | Unemployed | 10 (16.1) | 7 (11.3) |
| | | Pensioner | 0 (0) | 0 (0) |
| Control | Religion | Christianity | 30 (48.4) | 32 (51.6) |
| | | None | 0 (0) | 0 (0) |
| Study | Religion | Christianity | 38 (61.3) | 22 (35.5) |
| | | None | 1 (1.6) | 1 (1.6) |
| Control | Residence | Urban Setting | 27 (43.5) | 28 (45.2) |
| | | Rural Setting | 3 (4.8) | 4 (6.5) |
| Study | Residence | Urban Setting | 11 (17.7) | 5 (8.1) |
| | | Rural Setting | 28 (45.2) | 18 (29.0) |
| Control | Level of Education | Primary | 14 (22.6) | 11 (17.7) |
| | | Secondary | 12 (19.4) | 18 (29.0) |
| | | College/University | 4 (6.5) | 3 (4.8) |
| Study | Level of Education | None | 3 (4.8) | 1 (1.6) |
| | | Primary | 20 (32.3) | 13 (21.0) |
| | | Secondary | 11 (17.7) | 5 (8.1) |
| | | College/University | 5 (8.1) | 4 (6.5) |

### 4.4.1 Association between Patient Factors and the Self-Care Practices

The study found no significant association between the patient factors and the self-care practices (Table 4.11).

**Table 4.11: Association between Patient Factors Influencing Self-Care Practices and Self-Care Practices**

| Variable | Category | Self-care practices | | df, $\chi^2$ | *P*-value |
|---|---|---|---|---|---|
| | | Good | Poor | | |
| Gender | Male | 31 (25.0%) | 23 (18.5%) | | |
| | Female | 39 (31.5%) | 31 (25.0%) | | |
| | | | | 25, 21.976 | 0.637 |
| Age | 20-29 | 3 (2.4%) | 2 (1.6%) | | |
| | 30-39 | 7 (5.6%) | 10 (8.1%) | | |
| | 40-49 | 17 (13.7%) | 13 (10.5%) | | |
| | 50-59 | 17 (13.7%) | 12 (9.7%) | | |
| | 60-69 | 20 (16.1%) | 15 (12.1%) | 3, 2.514 | 0.489 |
| | >70 | 5 (4.0%) | 3 (2.4%) | | |
| Marital status | Single | 10 (8.1%) | 4 (3.2%) | | |
| | Married | 46 (37.1%) | 43 (34.7%) | | |
| | Widowed | 8 (6.5%) | 4 (3.2%) | 75, 56.910 | 0.941 |
| | Divorced/ Separated | 5 (4.0%) | 4 (3.2%) | | |
| Occupation | Formal Employment | 15 (12.1%) | 7 (5.6%) | | |
| | Self-employed | 31(25.0%) | 24 (19.4%) | 3, 5.402 | 0.161 |
| | Unemployed | 18 (14.5%) | 13 (10.5%) | | |
| | Pensioner | 5 (4.0%) | 11 (8.9%) | | |
| Religion | Christianity | 68 (54.8%) | 54 (43.5%) | 25, 7.530 | 0.859 |
| | Other | 1 (0.8%) | 1 (0.8%) | | |
| Residence | Urban setting | 38 (30.6%) | 33 (26.6%) | 1, 0.582 | 0.590 |
| | Rural setting | 31 (25.0%) | 22 (17.7%) | | |
| Level of Education | None | 3 (2.4%) | 1 (0.8%) | | |
| | Primary | 34 (27.4%) | 24 (19.4%) | | |
| | Secondary | 23 (18.5%) | 23 (18.5%) | 75, 80.402 | 0.314 |
| | College/ University | 9 (7.3%) | 7 (5.6%) | | |

### 4.5 Institutional Factors Influencing Self-Care Practices

The study sought to determine how institutional factors impact self-care practices among patients newly diagnosed with T2DM. A mixed methods approach was employed, using a two-point Likert scale whose scores ranged from (0) disagree to (1) agree. In addition, focus group discussions were conducted with patients newly diagnosed with T2DM, and key informant interviews were conducted with healthcare professionals providing diabetes care to the patients.

Two main categories emerged from the focus group discussions and key informant interviews: enablers and inhibitors. Enablers were factors that enhanced self-care practices among patients newly diagnosed with T2DM. They included: health education, teamwork approach, accessibility of the health facility, and the use of technology. Inhibitors were factors that hindered self-care practices among newly diagnosed diabetic patients. They included a lack of protocols for patient flow prioritization, the absence of follow-up programs, long waiting times, scheduled follow-up visits, and the high cost of medicines and healthcare services (Table 4.12).

**Table 4.12: Themes on Institutional Factors Influencing Self-Care Practices**

| Themes | Sub-themes |
|---|---|
| **Enablers** | |
| Health Education | Provision of patient education to the patients |
| Team work | Adoption of multidisciplinary care |
| Accessibility of healthcare | Close proximity of the hospital to the patients |
| Adoption of technology | Use of SMS to educate patients on self-care |
| **Inhibitors** | |
| Follow-up visits | Fixed scheduled patient clinics |
| Cost of health care | High cost of drugs, consultation fees, and laboratory fees |
| Waiting period | Long waiting hours for the patients |
| Patient follow-up programs | Lack of patients' follow up by the hospital |
| Patient flow | Lack of protocol in patient prioritization |
| Lack of steady supplies | Lack of drugs and health education materials |

## Enablers

### Health Education

The majority of participants in both the control group 59 (95.2%) and the study group 58 (93.5%) reported that health education sessions on diabetes management provided by healthcare providers helped them adjust their lifestyle behaviors (Table 4.13). This was also reflected during the focus group discussion, as noted by one participant,

> *"The last time when I was checked the results indicated that my sugar levels were high. The doctor told me how to control my sugars and also on what to eat. My sugar levels are much better now"* (Respondent 1, FGD 2, control group).

Another participant stated,

> "*Yes, education given on diet is very helpful. I was taught on what I should be eating and that is what I am currently doing. I make sure that all my meals have greens and I drink a lot of water. This has helped me control my sugar levels."* (respondent 1, fgd 2, study group).

### Team Work

Regarding health education received from healthcare professionals 59, (95.2%) participants in the control group and 58 (93.5%) in the study group reported that the information helped them improve their self-care practices (Table 4.13). Likewise, a participant narrated this during the focus group discussion,

> "*I have been taught on what to eat and I always try and eat as told by the doctors. I always make sure that all my meals have greens and I drink a lot of water and this has helped me a lot*" (Respondent 5, FGD 1, control group).

A key informant stated,

> "*Every healthcare worker that attends to a patient who is newly diagnosed with T2DM makes sure that they have educated them on the recommended*

*management for diabetes. Due to this repetition of information patients understanding is enhanced*" (Key informant 3, study group).

Another key informant stated,

"*The hospital offers individualized counseling sessions to patients newly diagnosed with T2DM. So every time a patient comes to the clinic they are taken through the recommended self-management for T2DM by the clinician and nutritionist and we have seen great improvement in their ability to self-manage their sugar levels"* (Key informant 2, control group)

**Accessibility of the Healthcare**

A majority of participants, 34 (54.8%) in the control group and 38 (61.3%) in the study group, reported failing to attend their scheduled follow-up visits because the hospital was far from their area of residence (Table 4.13). During the focus group discussion, participants highlighted that the distance between their residence and the hospital greatly influenced their self-care practices, as stated by one participant,

"*If there was a diabetes clinic near where I live, I would not have any reasons to miss my clinics since I will just walk there. This will help me save on my transport fee and instead use that money to buy my medicine cause currently, for me to come here I have to use transport. And also by walking to the clinic I will be exercising*" (Respondent 2, FGD 4, control group).

Another participant stated,

"*The day I was diagnosed with diabetes I was told to find a hospital near where I live. So I will be going there and I find it to be more convenient and cost friendly for me. I have no reason to miss my clinics"* (Respondent 4, FGD 1, study group).

**Adoption of Technology**

Regarding the use of technology in diabetes management, the majority, 61 (98.4%) of participants in the control group and 62 (100.0%) in the study group, reported that

the hospital had not adopted any form of telemedicine in offering diabetes care (Table 4.13). One of the participant who had benefited from the utilization of technology in their management narrated that,

> *"I have received two messages on my phone asking me: how I am doing, if I am drinking water and if I remembered to take my medicine. This made me feel that someone out there is looking out for me and wishes me well. So since then I always make sure that I take my medicine on time and also drink a lot of water*." (Respondent 3, FGD 2, control group).

A key informant stated,

> "*The hospital should introduce channels in which these patients who are newly diagnosed with T2DM are followed up early in their journey to ensure there is continuity of care even in their homes*" (Key informant 2, study group).

**Inhibitors**

**Follow Up Visits**

A fixed diabetic clinic schedule was reported to interfere with self-care practices, with 43 (69.4%) of participants in the study group and 23 (37.1%) in the control group indicating that fixed follow-up visits hindered their adherence (Table 4.13). This finding was also reflected in the FGDs, where participants highlighted that the spacing of clinic dates affected their self-care practices. One participant stated that:

> *"After being diagnosed with diabetes, I was told to come back after one month. When I returned, my sugar levels were still high and I was admitted, after which the doctors were able to manage my condition, and now I am doing well."* (Respondent 1, FGD 1, control group)

Another participant stated,

> *"I have been to this clinic once, that is immediately after being diagnosed with diabetes and my next appointment was booked in three months' time.*

*Currently I am just taking my medicine. So I would suggest that they should be booking our appointment after a month or less."* (Respondent 6, FGD 4, study group).

Another participant stated,

*"Myself I wasn't given any clinic date. The day I was called and told to come is when I was informed that I was supposed to go to the records and book my appointment."* (Respondent 2, FGD 1, study group).

Another participant stated,

*"Staying away from the hospital for long is not good because you will never know if the exercise you are doing at home is the right ones and if they are helping you. It would be an advantage to have clinics at close intervals." (Respondent 4, FGD 2, study group).*

**Cost of Health Care**

Regarding affordability, most participants, 50 (80.6%) in the control group and 43 (69.4%) in the study group, reported that the high cost of healthcare services made it difficult for them to adhere to their self-care practices (Table 4.13). Likewise, during the focus group discussion, a participant narrated,

*"I have a NHIF card that I pay for monthly which I am supposed to use to pay the doctor's fee and also buy my medicine. Unfortunately, I have never found any drugs here, so I have to go buy using cash outside the hospital and it is very expensive"* (Respondent 3, FGD 5, study group).

A key informant stated,

"*The hospital lacks medicine needed for the management of T2DM most of time, so patients are forced to buy them elsewhere which is quite expensive." Also, sometimes you will find patients are defaulting there follow up visits due to lack of funds*" (Key informant 2, study group).

**Waiting Period**

More than two-thirds of participants in the study group 44 (71.0%) reported missing their scheduled follow-up visits due to long waiting times (Table 4.13). This was also highlighted during the focus group discussions, as narrated by one of the participants,

> *"Sometimes I get very tired when I come to the clinic because we wait for many hours at the registration area, laboratory and the drugs station. The day I am coming to the clinic, I usually carry my breakfast with me. After seeing the doctor, I usually proceed to buy my drugs from the chemist outside the hospital to avoid waiting for long again"* (Respondent 4, FGD 2, control group).

Another participant stated that,

> "*The hospital should consider having more doctors at the diabetes clinic because the ones who are there do their best but the patients are many so we end up waiting for longer hours*" (Respondent 2, FGD 3, study group).

**Patient Follow Up Programs**

The majority, 60 (96.8%) of participants in the control group and 59 (95.2%) in the study group reported that lack of follow-up by their healthcare professionals affected their self-care practices (Table 4.13). Lack of follow-up programs among the newly diagnosed patients was also highlighted in the discussion, as stated by a participant,

> *"During the Christmas holiday the diabetes clinic was closed; the hospital should at least have someone at the clinic to attend to us the patients. Because if one falls sick you have to seek treatment in the private hospitals and the quality of care there is questionable"* (Respondent 5, FGD 3, control group).

A key informant stated,

> *"When a patient is newly diagnosed with T2DM they need to be strictly followed up. Sometimes the patient is diagnosed with diabetes at the*

*outpatient department then goes to book for their clinic and afterwards just goes home without coming here at the diabetes clinic. So this patient goes home with prescribed medicine and has no any information on the recommended management for T2DM.*" (Key informant 2, study group).

Another key informant stated,

*"When a patient is seen at the clinic for the first time they are usually discharged through the nutritionist. Unfortunately, we don't strictly follow up on this patient so they either get lost on follow up or they end up going to private clinics out there. So by the time they are coming back to the diabetes clinic they have very high sugar levels or have already developed diabetes related complications*" (Key informant 1, study group.)

Another key informant stated,

"*When a patient is newly diagnosed with T2DM they need to be really followed up. Sometimes the patient is diagnosed with diabetes at the out-patient department then goes to book for their clinic and afterwards just goes home without coming here at the diabetes clinic. So this patient has no any information on the recommended management for T2DM.*" (Key informant 3, study group)

**Lack of Steady Supplies**

Regarding the availability of resources at the hospital, the majority of participants in the control group 33 (53.2%) and the study group 43 (69.4%) reported that the lack of resources prescribed by the physician hindered their self-care practices (Table 4.13). This was also highlighted during the focus group discussion, as narrated by one participant,

*"After being seen by the doctor they always tell you to go pick our drugs from the pharmacy. After queuing for an hour or so they will tell you that they have run out of the drugs and this is really frustrating*" (Respondent 2, FGD 1, control group).

A key informant narrated that,

> "*The hospital usually stocks anti-diabetic medications and they are very affordable. But due to the high number of patients we see at the clinic the drugs only lasts for a week, forcing majority of the patients to buy them at the private pharmacies and it's expensive*" (Key informant 1, study group)

**Table 4.13: Institutional Factors Influencing Self-Care Practices**

| | **Statement assessing institutional factors** | | **N (%)** | | |
|---|---|---|---|---|---|
| | | | **Disagree (0)** | **Agree (1)** | **Total** |
| **1** | Health education sessions offered by health care workers helped me improve my self-care practices | Study | 4 (6.5) | 58 (93.5) | 62 (100) |
| | | Control | 3 (4.8%) | 59 (95.2) | 62 (100) |
| **2** | Motivation received from my healthcare provider helped me improve my self-care practices | Study | 11 (17.7) | 51 (82.3) | 62 (100) |
| | | Control | 6 (9.7) | 56 (90.3) | 62 (100) |
| **3** | The education received on the mechanism of action of my anti-diabetic drugs helped me improve my self-care practices | Study | 41 (66.1) | 21 (33.9) | 62 (100) |
| | | Control | 28 (45.2) | 34 (54.8) | 62 (100) |
| **4** | Sometimes I miss my scheduled diabetes clinic because the hospital is far from where I live. | Study | 24 (38.7) | 38 (61.3) | 62 (100) |
| | | Control | 28 (45.2) | 34 (54.8) | 62 (100) |
| **5** | High cost of healthcare at the hospital has affected my self-care practices | Study | 19 (30.6) | 43 (69.4) | 62 (100) |
| | | Control | 12 (19.4) | 50 (80.6) | 62 (100) |
| **6** | Health education from the various healthcare providers at the diabetes clinic helped me improve my self-care practices | Study | 11 (17.7) | 51 (82.3) | 62 (100) |
| | | Control | 36 (58.1) | 26 (41. 9) | 62 (100) |
| **7** | Language used by the healthcare provider has helped me improve my self-care practices | Study | 21 (33.9) | 41 (66.1) | 62 (100) |
| | | Control | 8 (12.9) | 54 (87.1) | 62 (100) |
| **8** | Availability of all the resources prescribed by my clinician at the hospital helped me improve my self-care practices | Study | 43 (69.4) | 19 (30.6) | 62 (100) |
| | | Control | 33 (53.2) | 29 (46.8) | 62 (100) |
| **9** | The fixed scheduled diabetic clinic hours interfered with my self-care practices | Study | 19 (30.6) | 43 (69.4) | 62 (100) |
| | | Control | 39 (62.9) | 23 (37.1) | 62 (100) |
| **10** | I sometimes miss my follow up diabetes clinic due to long waiting hours | Study | 18 (29.0) | 44 (71.0) | 62 (100) |
| | | Control | 38 (61.3) | 24 (38.7) | 62 (100) |
| **11** | Social Support offered to me by the hospital helped me improve my self-care practices | Study | 58 (93.5) | 4 (6.5) | 62 (100) |
| | | Control | 57 (91.9) | 5 (8.1) | 62 (100) |
| **12** | Follow-up care offered to me by the healthcare providers helped me improve my self-care practices | Study | 59 (95.2) | 3 (4.8) | 62 (100) |
| | | Control | 60 (96.8) | 2 (3.2) | 62 (100) |
| **13** | Adoption of telemedicine by the hospital helped me improve my self-care practices | Study | 62 (100) | 0 (0.0) | 62 (100) |
| | | Control | 61 (98.4) | 1 (1.6) | 62 (100) |

### 4.5.1 Association between Institutional Factors Influencing Self-Care Practices and Self-Care Practices

The study found a positive association between patient education provided by healthcare providers and self-care practices (OR = 1.887; 95% CI: 1.591–2.238). Similarly, the high cost of health care was found to be statistically significantly associated with self-care practices ($p$ = 0.047). Further, the study found that the language used by the healthcare provider during the patient education session was positively associated with self-care practices (OR = 2.57; 95% CI: 1.036–6.374). Similarly, scheduled clinic visits were statistically significantly associated with self-care practices ($p$ = 0.008), with a negative association (OR = 0.379; 95% CI: 0.183–0.786). Lastly, there was a significant negative association between telemedicine adoption and participants' agreement that it helped them improve their self-care practices (OR = 0.439; 95% CI: 0.360–0.536) (Table 4.14).

**Table 4.14: Association between Institutional Factors Influencing Self-Care Practices and Self-Care Practices**

| | Statement assessing institutional factors | | N (%) Poor Self-care practices | N (%) Good Self-care practices | df, $\chi 2$,*P*-value | Crude Odds Ratio (COR) |
|---|---|---|---|---|---|---|
| **1** | Patient education sessions offered by the health care workers has helped me improve my self-care practices | Disagree | 7 (5.6) | 0 (0.0) | | |
| | | Agree | 62 (50.0) | 55 (44.4) | 1, 5.914,**0.015**** | **OR**=1.887, 95% CI [1.591, 2.238] |
| **2** | Motivation received from my healthcare provider helped me improve my self-care practices | Disagree | 13 (10.5) | 4 (3.2) | | |
| | | Agree | 56 (45.2) | 51 (41.1) | 1, 3.462, 0.063 | OR=2.960, 95% CI [0.907, 9.663] |
| **3** | The education received on the mechanism of action of my anti-diabetic drugs helped me improve my self-care practices | Disagree | 39 (31.5) | 30 (24.2) | | |
| | | Agree | 30 (24.2) | 25 (20.2) | 1, 0.048, 0.826 | OR=1.083, 95% CI [0.531, 2.210] |
| **4** | Sometimes I miss my scheduled diabetes clinic because the hospital is far from where I live. | Disagree | 29 (23.4) | 23 (18.5) | | OR=1.009, 95% CI [0.492, 2.068] |
| | | Agree | 40 (32.3) | 32 (25.8) | 1, 0.001, 0.981 | |
| **5** | High cost of healthcare at the hospital affected my self-care practices | Disagree | 22 (17.7) | 9 (7.3) | 1, 3.932, **0.047**** | OR=2.392, 95% CI [0.997, 5.743] |
| | | Agree | 47 (37.9) | 46 (37.1) | | |
| **6** | Health education from the various healthcare providers at the diabetes clinic helped me improve my self-care practices | Disagree | 27 (21.8) | 20 (16.1) | | |
| | | Agree | 42 (33.9) | 35 (28.2) | 1, 0.100, 0.752 | OR=1.125, 95% CI [0.541, 2.339] |
| **7** | Language used by the healthcare provider helped me improve my self-care practices | Disagree | 21 (16.9) | 8 (6.5) | 1, 4.312**, 0.038**** | **OR=**2.57, 95% CI [1.036, 6.374] |
| | | Agree | 48 (38.7) | 47 (37.9) | | |

| | Statement assessing institutional factors | | N (%) | | df, χ2,P- value | Crude Odds Ratio (COR) |
|---|---|---|---|---|---|---|
| **8** | Availability of all the resources prescribed by my clinician at the hospital helped me improve my self-care practices | Disagree<br>Agree | 45 (36.3)<br>24 (19.4) | 31 (25.0)<br>24 (19.4) | 1, 1.011, 0.315 | OR=1.452, 95% CI [0.701, 3.005] |
| **9** | The fixed scheduled diabetic clinic hours interfered with my self-care practices | Disagree<br>Agree | 25 (20.2)<br>44 (35.5) | 33 (26.6)<br>22 (17.7) | 1, 6.945, 0.008** | **OR**=0.379, 95% CI [0.183, 0.786] |
| **10** | I sometimes miss my follow up diabetes clinic due to long waiting hours | Disagree<br>Agree | 31(25.0)<br>38 (30.6) | 25 (20.2)<br>30 (24.2) | 1, 003, 0.953 | OR=0.979, 95% CI [0.480, 2.488] |
| **11** | Social Support offered to me by the hospital helped me improve my self-care practices | Disagree<br>Agree | 66 (53.2)<br>3 (2.4) | 49 (39.5)<br>6 (4.8) | 1, 1.957, 0.162 | OR=2.694, 95% CI [0.642, 11.306] |
| **12** | Follow-up care offered to me by the healthcare providers helped me improve my self-care practices | Disagree<br>Agree | 68 (54.8)<br>1 (0.8) | 51 (41.1)<br>4 (3.2) | 1, 2.682, 0.101 | OR=5.333, 95% CI [0.579, 49.164] |
| **13** | Adoption of telemedicine by the hospital helped me improve my self-care practices | Disagree<br>Agree | 69 (55.6)<br>0 (0.0) | 54 (43.5)<br>1 (0.8) | 1, 1.265, 0.261 | **OR**=0.439, 95% CI [0.360, 0.536] |

## 4.6 Summary of Baseline Survey Findings (Phase I) and the Study Recommendations

The aim of phase I of this study was to obtain baseline survey findings and was guided by the first four specific objectives. The goal of the first specific objective was to establish the activation levels among patients newly diagnosed with T2DM. According to Hernar et al. (2023), activation levels refer to an individual's knowledge, confidence, and skills in caring for their health.

The current study found that the majority of the participants in both study groups had low activation levels. This indicated that the participants had some awareness of the recommended management for T2DM but lacked the confidence and skills to achieve effective self-care. Anderson et al. (2022) reported that patients' activation levels are effective in guiding clinicians in tailoring interventions, as they are associated with good clinical outcomes and healthcare utilization. Therefore, the current study recommended the development of a patient-activation-tailored intervention that would aid in early empowerment of patients newly diagnosed with T2DM.

The aim of the second objective was to determine self-care practices among patients newly diagnosed with T2DM. The study found that participants had poor adherence to the recommended self-care practices, with most in both study groups scoring average self-care practices. Majorly, the study participants demonstrated a lack of knowledge on the mechanism of action of anti-diabetic medications, with only half of them reporting having adhered to their prescribed treatment. The participants also reported poor adherence to nutrition therapy, foot care, physical activity, and stress management. The study therefore recommended that patients newly diagnosed with T2DM be empowered early, with continuous support throughout their initial and follow-up visits. The goal was to enable participants to acquire knowledge of diabetes management and to develop skills and confidence in carrying out their self-care practices.

The goal of the third objective was to identify patient factors influencing self-care practices. The study found no significant association between patient-related factors and self-care practices. However, during the focus group discussion, participants reported that the cost of financing their healthcare was high and hindered their adherence to follow-up visits, thereby affecting their self-care practices. Receiving support from their spouses and friends was also highlighted as another factor influencing participants' self-care practices. The study therefore recommended the need to develop programs targeting early empowerment of patients newly diagnosed with T2DM. The study also recommended that, during the health education sessions, healthcare professionals emphasize the importance of a patient receiving support from family, friends, and society. In addition, there was a need to raise awareness of the importance of enrolling with the National Health Insurance Fund (NHIF) and the county health insurance program, as they were affordable.

The fourth specific objective aimed at identifying institutional factors influencing self-care practices. The study found a significant association between self-care practices, counselling offered by healthcare professionals, the high cost of healthcare, and the language used by healthcare professionals. Moreover, during the focus group discussion, patients newly diagnosed with T2DM reported that health education received from their healthcare professionals helped them adjust their lifestyle behaviors. Long wait times at the diabetes clinic were also highlighted as one of the factors influencing participants' adherence to follow-up visits. Most participants reported failing to attend their scheduled follow-up visits because the hospital was far from their homes.

The study also conducted key informant interviews with healthcare professionals to determine institutional factors influencing self-care practices. Some of the informants reported that the lack of follow-up programs among patients newly diagnosed with T2DM led to loss of contact with the patients. The health care professionals recommended the need to develop a follow-up framework to aid in tracking the care of patients newly diagnosed with T2DM. Another factor highlighted during the key informant interview is the adoption of a team-based approach while offering health education to these patients. Some of the informants

reported that the involvement of all healthcare professionals would help reduce long wait times and motivate patients to attend their follow-up visits. The study therefore recommended the need to develop a team-based care approach for the management of patients newly diagnosed with T2DM. In addition, the study recommended introducing follow-up programs for patients newly diagnosed with T2DM, which would aid in mapping their self-care journey (Table 4.15).

**Table 4.15: Baseline Survey Findings and the Study Recommendations**

| | Specific Objective | Findings | Recommendations |
|---|---|---|---|
| **1** | To establish patient-activation levels. | - Low activation levels: control group (74.2%), study group (69.4%).<br>-Participants had low awareness, low confidence levels, and poor skills. | - Create awareness on T2DM management.<br>- Use visual aids to demonstrate self-care practices.<br>**Goal:** To increase their knowledge, confidence, and skills. |
| **2** | To determine self-care practices | -Poor self-care practices: control group (48.4%), study group (62.9%).<br>-Poor adherence to the following aspects of self-care practices: nutrition therapy, foot care, physical activity, and stress management. | - Offer health education on the various aspects of diabetes management.<br>**Goal:** To activate and continuously empower them during their initial and follow-up visits. |
| **3** | To determine patient factors influencing self-care practices | Patient factors found to influence self-care practices: adherence to follow-up visits, personal social networks, and financial ability. | Offer health education emphasizing:<br>-Importance of adhering to follow-up visits.<br>- Need for family and society support.<br>-Importance of enrolling in NHIF and the county insurance health program scheme. |
| **4** | To determine institutional factors influencing self-care practices | Institutional factors found to influence self-care practices: teamwork, patient follow-up, cost of healthcare, and long waiting hours. | -Involve all healthcare professionals during the counselling sessions.<br>-Encourage patients to utilize level 3 and 4 hospitals close to their residential areas.<br>- Offer follow-up care after the intervention. |

## 4.7 Development, Validation and Implementation of a Patient Tailored-Activation Intervention

In Phase II, the goal was to develop, validate, and implement the structured diabetes education module for patients newly diagnosed with T2DM (fifth specific objective). This section describes the process followed during the module's (intervention's) development, validation, and implementation. After the module was implemented, participants were followed for 3 months, marking the end of phase II.

### 4.7.1 Validation of Module Content by Expert Panelists

The module content was based on the baseline survey findings, which showed that the majority of participants had low activation levels and poor self-care practices. In addition, the study reported that several patient and institutional factors influenced participants' self-care practices. For this reason, the study recommended the development and implementation of a patient-tailored activation intervention module.

The researcher generated content on T2DM management for inclusion in the diabetes teaching module through group discussions among the research team and a literature review of documents on the national policy regarding diabetes education. The content was then validated by a panel of nine experts, including two medical officers, two nurses, one clinical officer, and four nutritionists, of whom two were trained diabetes educators. The panelists were required to respond to various items, including the need to raise awareness of aspects of self-care practices, the significance of enrolling with NHIF, and the importance of adhering to follow-up visits.

The researcher then developed a questionnaire to help in the validation of the content and submitted it to the panel of experts for them to rate and offer any additional suggestions (Appendix VII). The module was subjected to two rounds of the Delphi technique. According to Diamond et al. (2014) and Grant and Khodyakov (2025), to attain consensus, the Delphi technique should be conducted through a minimum of two rounds. During round one, the majority of the panelists agreed that the following

aspects of self-care practices were essential in empowering patients newly diagnosed with T2DM: medical management of T2DM, nutrition therapy, foot care, and physical activity. In addition, during round one, some of the panelists recommended that there was a need to emphasize self-monitoring of blood glucose levels, mostly to patients who were on insulin treatment. Likewise, since most of the participants had cited lack of finances as one of the patient factors influencing their self-care practices, the panelist recommended that there was a need to sensitize the patients on the importance of enrolling with the county healthcare scheme, as it was cheaper. Upon receiving feedback from the panelists during the Delphi round one, the average level of agreement was 88.0% (Table 4.16).

**Table 4.16: Results from Expert Panelists on Content Validation (Round I)**

| SNO | Study Recommendations | Content to be included in the module | Expert Responses (Round I) | | Remarks |
|---|---|---|---|---|---|
| | | | Yes | No | |
| | | | N (%) | N (%) | |
| **1** | Create awareness on T2DM. | Define what is T2DM | 7 (77.8) | 2 (22.8) | Focus more on pathophysiology |
| | | Medical Management of T2DM | 7 (77.8) | 2 (22.8) | Insist more on treatment adherence and the side effects |
| **2** | Offer health education on the various aspects of T2DM management. | Nutrition therapy | 8 (88.9) | 1 (11.1) | Use the food pyramid & plate model in the Kenyan culture. |
| | | Foot care | 7 (77.8) | 2 (22.8) | Emphasize on daily foot care and inspecting shoes |
| | | Physical Activity | 9 (100) | 0 (0) | |
| | | Self-monitoring of blood glucose | 8 (88.9) | 1 (11.1) | Emphasize mostly for patients on insulin |
| | | Diabetes mellitus and alcohol | 9 (100) | 0 (0) | |
| | | Diabetes mellitus and smoking | 8 (88.9) | 1 (11.1) | Highlight on the complications |
| | | Diabetes mellitus and stress | 9 (100) | 0 (0) | |
| **3** | Emphasize the need for family and society support. | Importance of family and society support | 9 (100) | 0 (0) | |
| **4** | Emphasize the Importance of enrolling in NHIF | Significance of enrolling in NHIF | 7 (77.8) | 2 (22.8) | Encourage patients to enroll with the county insurance health program, it's cheaper. |
| **5** | Emphasize the importance of adhering to follow up visits. | Importance of adhering to follow up visits | 8 (88.9) | 1 (11.1) | Encourage patients to utilize level 3 and 4 hospitals close to their residential areas. |
| **6** | Offer follow-up care after the intervention. | Setting goals to promote self-care efficacy | 7 (77.8) | 2 (22.8) | Add more on health seeking behaviors<br>Let each patient know which gaps they need to meet. |
| | Average Level of Agreement | | 88.0 % | | |

Recommendations from round one were addressed, and the content validation tool was resubmitted to the panel of experts for the second round of the Delphi. The majority of the experts agreed on most of the content to be included in the module. During round two, the average level of agreement was at 98.3%. Consensus was reached, and the researcher proceeded to develop the module (Table 4.17).

**Table 4.17: Results from Expert Panelists on Content Validation (Round II)**

| | Study Recommendations | Content to be included in the module | Expert Responses (Round II) | |
|---|---|---|---|---|
| | | | Yes | No |
| | | | N (%) | N (%) |
| **1** | Create awareness on T2DM. | Pathophysiology of T2DM | 9 (100) | 0 (0) |
| | | Mechanism of action & side effects of anti-diabetes drugs | 9 (100) | 0 (0) |
| **2** | Offer health education on the various aspects of T2DM management. | Recommended diet therapy | 9 (100) | 0 (0) |
| | | Foot care (drying of feet, foot care and inspecting shoes) | 9 (100) | 0 (0) |
| | | Physical Activity | 9 (100) | 0 (0) |
| | | Self-monitoring of blood glucose | 9 (100) | 0 (0) |
| | | Diabetes mellitus and alcohol | 9 (100) | 0 (0) |
| | | Diabetes mellitus and smoking & related complications | 9 (100) | 0 (0) |
| | | Diabetes mellitus and stress | 9 (100) | 0 (0) |
| **3** | Emphasize the need for family and society support. | Importance of family and society support | 9 (100) | 0 (0) |
| **4** | Emphasize the Importance of enrolling in NHIF | Significance of enrolling in NHIF & county insurance health program | 8 (88.9) | 1 (11.1) |
| **5** | Emphasize the importance of adhering to follow up visits. | Importance of adhering to follow up visits. Awareness on levels 3 and 4 hospitals | 9 (100) | 0 (0) |
| **6** | Offer follow-up care after the intervention. | Guide patients in setting achievable goals | 8 (88.9) | 1 (11.1) |
| | Average Level of Agreement | | 98.3% | |

### 4.7.2 Development of the Patient Activation Intervention Module

The module's development was based on the baseline survey recommendations and information from the panel of experts. By consensus, the panel of experts agreed that

patients newly diagnosed with T2DM should be informed about the medical management of T2DM, the mechanisms of action of antidiabetic medicines, and their side effects. Other aspects of diabetes management that the expert panelists were in consensus on included: nutrition therapy, foot care, physical activity, the importance of social support, the significance of enrolling in healthcare schemes, and the importance of adhering to scheduled follow-up visits.

The Association of Diabetes Care and Education Specialists (ADCES) diabetes care and education curriculum served as the framework for developing the intervention module (ADCES 2021). ADCES recommends that healthcare professionals offering diabetes education follow a comprehensive process comprising five steps: assessment, goal setting, planning, implementation, and evaluation. ADCES has also mapped seven aspects of self-care practices that are essential for effective self-management, including: healthy eating, monitoring blood glucose, being active, taking prescribed medications, healthy coping, problem-solving, and reducing risks. The module was then modified to align with Kenyan culture, as recommended by (MOH, 2018). The Health Belief Model was used to guide the delivery of the education module, in which constructs such as perceived severity, benefits, and cues to action were used to initiate behavior change.

### 4.7.3 Validation of the Intervention Module by Expert Panelists

Following the development of the module, the next step was validation. To validate the module, the researcher developed a validation tool to assess its applicability (Appendix XIII). The module's validation criteria were derived from the theory evaluation framework proposed by Chinn and Kramer (2014). The module, together with the validation tool, was emailed to the panel of experts, and verbal consent was sought. The expert panelists were required to fill the spaces provided in the validation tool by indicating either "YES" or "NO" against each criterion description. A space was also provided in the tool for the experts to indicate their recommendations. The validation criteria included the following:

**Simplicity:** The expert panelists were required to indicate their agreement or disagreement with whether the concepts used in the module were easily understood, whether the language used was clear, and whether the time indicated for implementing the module was adequate.

**Clarity:** This component required the expert panelists to provide their views on whether the different aspects of diabetes management included in the module were consistent. They were also required to comment on whether the relationship between the aspects of diabetes management was clearly explained and if the images and diagrams included in the module were clear and supported by logical meaning.

**Generality:** This criterion required the expert panelists to evaluate and provide their views on whether the module's content covered a wide range of recommended management for T2DM.

**Accessibility:** The expert panelist was required to evaluate whether the module's objectives were feasible to implement among patients newly diagnosed with T2DM.

**Significance of the module:** In this criteria component, the expert panelists were required to provide their views on whether the module's content was significant in helping patients newly diagnosed with T2DM adjust their lifestyle behaviors.

#### 4.7.3.1 Results from Expert Panelists on Module Validation

Module validation was conducted in two rounds of the Delphi method. In round one, the experts reached an agreement level of 81.1%, demonstrating consensus on most of the content and providing recommendations to refine and strengthen the module. Some of the recommendations included using simplified terms that would be easily understood by the study participants and using images relatable to Kenyan culture. In addition, the panel recommended that the time taken during health education should not be more than three hours per session and that there was a need to involve all the healthcare professionals during the implementation phase (Table 4.18).

**Table 4.18: Results from Expert Panelists on Module Validation (Round I)**

| | Validation Criteria | Criteria Description | Expert Panelist Responses (Round I) Yes | No | Remarks |
|---|---|---|---|---|---|
| | | | N (%) | N (%) | |
| **1** | Simplicity | Module is simple and logic | 5 (55.6) | 4 (44.4) | Simplify the content and the technical terms used |
| | | Language used is clear and easy to understand | 5 (55.6) | 4 (44.4) | Simplify the terms used e.g. lab investigations |
| | | The duration of time indicated for the counselling session is appropriate | 5 (55.6) | 4 (44.4) | A session of 3 hours is long |
| **2** | Clarity | Content is consistent and creates a clear meaning | 9 (100) | 0 (0) | |
| | | Images and diagrams included are clear and supported by logical meaning | 7 (77.8) | 2 (22.2) | Use images relatable in the Kenyan culture |
| | | Relationship between the various self-care modalities has been clearly explained | 9 (100) | 0 (0) | |
| | | Content in the module has been organized in a systematic manner to ensure flow | 9 (100) | 0 (0) | |
| **3** | Generality | The module covers a wide scope of recommended diabetes management | 9 (100) | 0 (0) | |
| **4** | Accessibility | The purpose of the module is easily achievable in terms of implementation | 6 (66.7) | 3 (33.3) | Engage all healthcare workers |
| **5** | Significance of the module | The module is significant to adult patients newly diagnosed with T2DM | 9 (100) | 0 (0) | |
| | **Average Level of Agreement** | | **81.1 %** | | |

Feedback received from the experts was used to modify and enhance the module. The module was then subjected to the second round of Delphi, upon which consensus was reached at 95.6% (Table 4.19).

**Table 4.19: Results from Expert Panelist on Module Validation (Round II)**

| | Validation Criteria | Criteria Description | Expert Panelist Responses (Round II) | |
|---|---|---|---|---|
| | | | Yes | No |
| | | | N (%) | N (%) |
| **1** | Simplicity | The module is simple and easily understandable | 8 (88.9) | 1 (11.1) |
| | | The language used is clear and easy to understand | 8 (88.9) | 1 (11.1) |
| | | The duration of time indicated for the counselling session is applicable | 7 (77.8) | 2 (22.2) |
| **2** | Clarity | The content is consistent and creates a clear meaning | 9 (100) | 0 (0) |
| | | Images and diagrams included in the module are clear and supported by logical meaning | 9 (100) | 0 (0) |
| | | The relationship between the various self-care modalities has been clearly explained | 9 (100) | 0 (0) |
| | | Content in the module has been organized in a systematic manner to ensure flow | 9 (100) | 0 (0) |
| **3** | Generality | The module covers a wide scope of recommended diabetes management | 9 (100) | 0 (0) |
| **4** | Accessibility | The purpose of the module is easily achievable in terms of implementation | 9 (100) | 0 (0) |
| **5** | Significance of the module | The module is significant to adult patients newly diagnosed with T2DM | 9 (100) | 0 (0) |
| | Average Level of Agreement | | 95.6% | |

### 4.7.4 Implementation of the Intervention Module

Using the validated diabetes teaching module (Appendix XIV), education sessions were conducted in August 2023.

The 62 participants were divided into four groups and underwent three educational sessions, each lasting one hour. The sessions were conducted by healthcare professionals who had received training on diabetes management and were currently working at the diabetes clinic. For the study group, the team included one medical officer, two nurses, and two nutritionists. Prior to implementing the patient-activation intervention module, all participating healthcare professionals were trained on the content, sequence, and duration of sessions to ensure uniform delivery of information to patients. The principal investigator also actively participated in conducting the education sessions. As such, the health education sessions were standardized by using a pre-designed training manual and structured session guide. Various teaching methods were used during the counselling sessions, including lectures, group discussions, demonstrations, and video-assisted learning (Table 4.20).

**Table 4.20: Health Education Session Schedule**

| **Session 1: Introduction** | **Session 2: Various aspects of T2DM management** | **Session 3: Goal Setting** |
|---|---|---|
| ✓ What is T2DM?<br>✓ What are the risk factors for T2DM?<br>✓ What are the normal blood glucose levels?<br>✓ Uncontrolled diabetes can lead to complications<br>✓ Medication management for T2DM | ✓ Healthy eating<br>✓ Meal planning<br>✓ Physical activity<br>✓ Self-monitoring<br>✓ Foot care | ✓ Diabetes and alcohol<br>✓ Diabetes and smoking<br>✓ Diabetes mellitus and stress<br>✓ Evaluation<br>✓ Goal Setting |

Upon completion of the health education sessions, participants in the study group were followed up for three months. The follow-up entailed weekly text reminders via Short Message Service (SMS) sent by the research team using the hospital's approved mobile messaging system. The SMSs included key reminders on various aspects of T2DM self-care practices, such as medication adherence, foot care, physical activity, self-monitoring of blood glucose levels, and nutrition therapy. A

standard set of messages was prepared and sent to all participants. The goal was to activate and support participants in engaging with the recommended management practices for T2DM. During this period, study participants in the control group continued to receive routine healthcare at the diabetes clinic.

### 4.7.5 Evaluation

Following the three-month period, an evaluation was conducted among participants in both study groups between December 2023 and January 2024. The evaluation process formed the post-intervention evaluation phase (phase III). The study tools used at baseline in assessing activation levels and self-care practices were also used during phase III. After the evaluation process, participants in the control group were subjected to the health education session using the activation intervention module. The sessions were facilitated by one clinical officer and two nutritionists.

## 4.8 Participants' Activation Scores at Post-Intervention Evaluation (Phase III)

At post-intervention evaluation, the aim of the study was to investigate whether a structured, patient-tailored activation education module enhanced activation levels among individuals newly diagnosed with T2DM. This evaluation was done three months after participants had received the structured education sessions. The study employed the same tool used during the baseline survey (Phase I). This evaluation was done among 58 and 60 participants in the control and study groups, respectively. The paired t-test analysis was conducted using complete-case data only. Participants who did not complete post-intervention evaluation were excluded from the analysis, as required for t-test assumptions. Attrition was low in both the study group (3.2%) and the control group (6.5%).

The PAM®-13 tool was used to collect data on participants’ activation levels. The tool was rated on a scale ranging from strongly disagree (1) to strongly agree (4), and a not applicable (0) option. The first step was to obtain participants' activation scores. The total raw score was computed, divided by the number of applicable items answered, and then multiplied by 13. Appendix IX (control group) and Appendix X (study group).

Regarding participants' activation scores, the study found that more than half, 31 (53.4%) of the participants in the control group and 38 (63.3%) in the study group agreed that they were responsible for taking care of their health. Only 5 (8.6%) of the participants in the control group agreed that they knew the mechanism of action of the antidiabetic medications that they had been prescribed. When asked whether they had maintained their lifestyle behaviors only as recommended by their healthcare professional, 5 (8.6%) in the control group reported adherence (Table 4.21).

**Table 4.21: Patient-Activation Scores at Post-Intervention Assessment**

| | Statements assessing patient-activation levels | Study arm | Disagree Strongly (1) N (%) | Disagree (2) N (%) | Agree (3) N (%) | Agree Strongly (4) N (%) | N/A (0) N (%) |
|---|---|---|---|---|---|---|---|
| **1** | I am the person who is responsible for taking care of my health | Study | 1 (1.7) | 1 (1.7) | 38 (63.3) | 20 (33.3) | 0 (0.0%) |
| | | Control | 3 (5.2) | 0 (0.0) | 31 (53.4) | 24 (41.4) | 0 (0.0%) |
| **2** | Taking an active role in my own health care is the most important thing that affects my health | Study | 0 (0.0) | 1 (1.7) | 37 (61.7) | 21 (35.0) | 0 (0.0%) |
| | | Control | 0 (0.0) | 3 (5.2) | 35 (60.3) | 20 (34.5) | 0 (0.0%) |
| **3** | I am confident I can help prevent or reduce problems associated with my health | Study | 4 (6.7) | 21 (35.0) | 28 (46.7) | 6 (10.0) | 1 (1.7) |
| | | Control | 11 (19.0) | 26 (44.8) | 20 (34.5) | 1 (1.7) | 0 (0.0) |
| **4** | I know what each of my prescribed medications do | Study | 3 (5.0) | 23 (38.3) | 22 (36.7) | 12 (20.0) | 0 (0.0) |
| | | Control | 37 (63.8) | 15 (25.9) | 5 (8.6) | 0 (0.0) | 0 (0.0) |
| **5** | I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health care problem by myself | Study | 9 (15.0) | 24 (40.0) | 15 (25.0) | 12 (20.0) | 0 (0.0%) |
| | | Control | 19 (32.8) | 24 (41.4) | 12 (20.7) | 3 (5.2) | 0 (0.0) |

| | Statements assessing patient-activation levels | Study arm | Disagree Strongly (1) N (%) | Disagree (2) N (%) | Agree (3) N (%) | Agree Strongly (4) N (%) | N/A (0) N (%) |
|---|---|---|---|---|---|---|---|
| **6** | I am confident that I can tell a doctor concerns I have even when he or she does not ask | Study | 2 (3.3) | 8 (13.3) | 46 (76.7) | 4 (6.7) | 0 (0.0) |
| | | Control | 1 (1.7) | 10 (17.2) | 41 (70.7) | 6 (10.3) | 0 (0.0) |
| **7** | I am confident that I can follow through on medical treatments I may need to do at home | Study | 7 (11.7) | 14 (23.3) | 29 (48.3) | 10 (16.7) | 0 (0.0) |
| | | Control | 3 (5.2) | 23 (39.7) | 30 (51.7) | 2 (3.4) | 0 (0.0) |
| **8** | I understand my health problems and what causes them | Study | 1 (1.7) | 23 (38.3) | 29 (48.3) | 7 (11.7) | 0 (0.0) |
| | | Control | 37 (63.8) | 16 (27.6) | 5 (8.6) | 0 (0.0) | 0 (0.0) |
| **9** | I know what treatments are available for my health problems | Study | 12 (20.0) | 26 (43.3) | 18 (30.0) | 4 (6.7) | 0 (0.0) |
| | | Control | 38 (65.5) | 18 (31.0) | 2 (3.4) | 0 (0.0) | 0 (0.0) |
| **10** | I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising | Study | 3 (5.0) | 21 (35.0) | 25 (41.7) | 9 (15.0) | 2 (3.3) |
| | | Control | 18 (31.0) | 35 (60.3) | 5 (8.6) | 0 (0.0) | 0 (0.0) |
| **11** | I know how to prevent problems with my health | Study | 12 (20.0) | 24 (40.0) | 19 (31.7) | 5 (8.3) | 0 (0.0) |
| | | Control | 36 (62.1) | 18 (31.0) | 4 (6.9) | 0 (0.0) | 0 (0.0) |
| **12** | I am confident I can figure out solutions when new problems arise with my health | Study | 25 (41.7) | 17 (28.3) | 13 (21.7) | 4 (6.7) | 1 (1.7) |
| | | Control | 39 (67.2) | 17 (29.3) | 2 (3.4) | 0 (0.0) | 0 (0.0) |
| **13** | I am confident that I can maintain lifestyle changes, like eating right and exercising even during time of stress | Study | 8 (13.3) | 17 (28.3) | 26 (43.3) | 8 (13.3) | 1 (1.7) |
| | | Control | 34 (58.6) | 20 (34.5) | 4 (6.9) | 0 (0.0) | 0 (0.0) |

### 4.8.1 Participants' Activation Levels

To obtain participants' activation levels, the researcher utilized the final scores derived above, then transformed them to a scale with a theoretical range of 0-100 and categorized them into the four activation levels. The study then dichotomized activation levels into low (levels 1 and 2) and high (levels 3 and 4).

At post-intervention evaluation, the majority, 52 (86.7%), in the study group attained high activation levels, an improvement from the 19 (30.6%) who had achieved high activation levels at baseline. However, the control group showed a decrease in the proportion of participants with high activation levels from 16 (25.8%) at baseline to 13 (22.4%) at post-intervention (Table 4.22).

**Table 4.22: Comparison of Participants' Activation Levels at Baseline and Post-Intervention Assessment**

| **Study Arm** | | **Patient-activation Levels** **Low** (≤ 55.1) | **High** (≥ 55.2) | **Total** |
|---|---|---|---|---|
| | | N (%) | N (%) | N (%) |
| Control group | Baseline (N=62) | 46 (74.2) | 16 (25.8) | 62 (100) |
| | Post-intervention (N=58) | 45 (77.6) | 13 (22.4) | 58 (100) |
| Study Group | Baseline (N=62) | 43 (69.4) | 19 (30.6) | 62 (100) |
| | Post Intervention (N=60) | 8 (13.3) | 52 (86.7) | 60 (100) |

**Key:** N= Frequency %= Percentage

### 4.8.2 Comparing Baseline and Post-Intervention Patient-Activation Means between the Two Study Groups

An independent sample t-test was performed to compare patient-activation means between the two study groups. The study findings indicated that the pre-intervention mean of the control group (M = 52.50, SD = 6.62) was not statistically different from

that of the study group (M = 54.05, SD = 7.87), *t* (122) = 1.186, *p* = 0.265. Whereas, the post-intervention patient-activation mean of the study group (M = 63.79, SD = 15.51) was not statistically significantly higher than that of the control group (M = 47.41, SD = 14.08), *t* (122) = 6.158, p = 0.630 (Table 4.23).

**Table 4.23: Mean, Standard Deviation and T-Test of Post-Intervention Patient-Activation**

| | **Control** | | **Study** | | | |
|---|---|---|---|---|---|---|
| | **M** | **SD** | **M** | **SD** | **Test statistics** | ***P-value*** |
| (Pre-intervention) Patient-activation Mean | 52.50 | 6.62 | 54.05 | 7.87 | *t*(122) = -1.186 | 0.265 |
| (Post-intervention) Patient-activation Mean | 47.41 | 14.08 | 63.79 | 15.51 | *t*(122) = -6.158 | 0.630 |

### 4.8.3 Comparing Baseline and Post-Intervention Patient-Activation Means Within Each Study Group

A paired sample t-test was conducted to test the null hypothesis that the patient-tailored activation intervention is not effective in enhancing activation levels among patients newly diagnosed with T2DM. The null hypothesis was rejected for both the intervention group ($p < 0.001$) and the control group ($p = 0.013$).

The study used participants' activation scores to compute the mean. The study findings indicated that within the control group, the mean patient activation score at post-intervention (M = 47.41, SD = 14.08) was statistically significantly lower than the baseline mean (M = 52.50, SD = 6.62), *t* (61) = 2.559, *p* = 0.013. Additionally, the effect size analysis demonstrated a moderate decrease in patient activation in the control group ($d = -0.46$) from baseline to post-intervention.

Whereas in the study group, the mean patient activation score at post-intervention (M = 63.79, SD = 15.51) was statistically significantly higher than the baseline mean (M = 54.05, SD = 7.87), $t$ (61) = 4.474, $p < 0.001$. Additionally, the study group exhibited a large positive effect ($d$ = 0.80), reflecting a substantial improvement in patient activation following the intervention (Table 4.24).

**Table 4.24: Mean, Standard Deviation, *T*-Test Value, and Effect Size of Baseline and Post-Intervention Patient-Activation**

| | **Baseline** | | **Post-intervention** | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **M** | **SD** | **M** | **SD** | ***t*-test** | ***P-value*** | **Cohen's d** |
| Patient-activation (Control group) | 52.50 | 6.62 | 47.41 | 14.08 | $t$ (61)=-2.559 | 0.013 | ─ 0.46 |
| Patient-activation (Study group) | 54.05 | 7.87 | 63.79 | 15.51 | $t$ (61)= -4.474 | 0.000 | 0.80 |

### 4.9 Self-Care Practices Scores at Post-Intervention Evaluation (Phase III)

The aim of the study was to investigate whether a structured patient activation education module enhanced self-care practices among patients newly diagnosed with T2DM. The modified DSMQ tool administered during the baseline survey (Phase I) was again used. Study participants reported their self-care practices over the preceding seven days for each item on a 4-point Likert scale.

Self-care practice scores were calculated by dividing the total raw score from the modified DSMQ by the theoretical maximum, then transforming the result to a standardized scale ranging from 0 to 10. In this study, participants' various aspects of self-care practices were represented by a single composite score ranging from 0 to 10, as shown in Appendix XI (control group) and Appendix XII (study group).

At post-intervention evaluation, the study found that the majority of the participants, 49 (81.7%) in the study group and 31 (53.4%) in the control group, adhered to the prescribed anti-diabetic medications. Regarding adherence to the recommended physical activity, only 6 (10.0%) in the study group reported exercising for at least 30 minutes 3-4 times a week (Table 4.25).

**Table 4.25: Self-Care Practices Scores at Post-Intervention Evaluation**

| | Statements Assessing self-care practices | Study group | Applies to me very much (3) | Applies to me to a considerable degree (2) | Applies to me to some degree (1) | Does not apply to me (0) |
|---|---|---|---|---|---|---|
| **1** | I have followed a healthy eating plan (on average per week in the last one month) | Study<br>Control | 24 (40.0)<br>14 (24.1) | 26 (43.3)<br>21 (36.2) | 9 (15.0)<br>22 (37.9) | 1 (1.7)<br>1 (1.7) |
| **2** | I eat five or more servings of fruits and vegetables in a day | Study<br>Control | 6 (10.0)<br>4 (6.9) | 35 (58.3)<br>14 (24.1) | 14 (23.3)<br>39 (67.2) | 5 (8.3)<br>1 (1.7) |
| **3** | I space my carbohydrates evenly throughout the day as recommended | Study<br>Control | 9 (15.0)<br>5 (8.6) | 27 (45.0)<br>23 (39.7) | 22 (36.7)<br>29 (50.0) | 2 (3.3)<br>1 (1.7) |
| **4** | I take my anti-diabetic drugs as prescribed by the doctor | Study<br>Control | 49 (81.7)<br>31 (53.4) | 11 (18.3)<br>20 (34.5) | 0 (0.0)<br>5 (8.6) | 0 (0.0)<br>2 (3.4) |
| **5** | I check and record my blood glucose levels as recommended | Study<br>Control | 20 (33.3)<br>4 (6.9) | 23 (38.3)<br>5 (8.6) | 13 (21.7)<br>22 (37.9) | 4 (6.7)<br>26 (44.8) |
| **6** | I engage in at least 30 minutes of physical activity 3-4 times in a week | Study<br>Control | 6 (10.0)<br>0 (0.0) | 32 (53.3)<br>15 (25.9) | 18 (30.0)<br>41 (70.7) | 4 (6.7)<br>2 (3.4) |
| **7** | I examine my feet as recommended by the healthcare provider | Study<br>Control | 7 (11.7)<br>11 (19.0) | 27 (45.0)<br>22 (37.9) | 24 (40.0)<br>24 (41.4) | 2 (3.3)<br>1 (1.7) |
| **8** | I inspect inside my shoes as recommended by the healthcare provider | Study<br>Control | 7 (11.7)<br>10 (17.2) | 25 (41.7)<br>19 (32.8) | 27 (45.0)<br>28 (48.3) | 1 (1.7)<br>1 (1.7) |

| | Statements Assessing self-care practices | Study group | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|
| **9** | I have not smoked at least once in the last 7 days | Study<br>Control | 58 (96.7)<br>46 (79.3) | 0 (0.0)<br>1 (1.7) | 0 (0.0)<br>4 (6.9) | 2 (3.3)<br>7 (12.1) |
| **10** | I have not taken alcohol at least once in the last 7 days | Study<br>Control | 58 (96.7)<br>45 (77.6) | 0 (0.0)<br>1 (1.7) | 0 (0.0)<br>5 (8.6) | 2 (3.3)<br>7 (12.1) |
| **11** | I have learnt to solve problems and manage stress | Study<br>Control | 8 (13.3)<br>1 (1.7) | 23 (38.3)<br>11 (19.0) | 18 (30.0)<br>42 (72.4) | 11 (18.3)<br>4 (6.9) |
| **12** | I have adhered to all my scheduled diabetes clinics | Study<br>Control | 39 (65.0)<br>23 (39.7) | 18 (30.0)<br>22 (37.9) | 3 (5.0)<br>12 (20.7) | 0 (0.0)<br>1 (1.7) |

### 4.9.1 Participants' Self-Care Practices at Phase III

The researcher used the self-care practices scores derived above to categorize participants' practices as either good (>5.1) or poor (≤5.0). At post-intervention evaluation, the study observed an increase in the proportion of participants who attained good self-care practices scores in both study arms. In the control group, 40 (69.0%) participants attained good self-care practices compared to 32 (51.6%) at baseline. Similarly, in the study group 57 (95.0 %) participants achieved good self-care practice level compared to 23 (37.1%) at baseline (Table 4.26).

**Table 4.26: Comparison of Self-Care Practices Levels at Pre and Post-Intervention Assessment**

| Study Arm | | Self-care practices Scores<br>Low (N %) | <br>High N (%) | <br>Total (N% ) |
|---|---|---|---|---|
| Control group | Pre-intervention (N=62) | 30 (48.4) | 32 (51.6) | 62 (100) |
| | Post-intervention (N=58) | 18 (31.0) | 40 (69.0) | 58 (100) |
| Study group | Pre-intervention (N=62) | 39 (62.9) | 23 (37.1) | 62 (100) |
| | Post Intervention (N=60) | 3 (5.0) | 57 (95.0) | 60 (100) |

**Key:** N= Frequency %= Percentage

### 4.9.2 Comparing Baseline and Post-Intervention Self-Care Practices Means between the Two Study Arms

An independent sample t-test was conducted to compare self-care practices between the two study groups. The findings showed that the pre-intervention mean score of the control group (M = 5.08, SD = 1.22) was not statistically different from that of the study group (M = 4.77, SD = 0.96), $t$ (122) = 1.680, $p$ = 0.111. However, the post-intervention results indicated that the study group's mean self-care practices score (M = 6.77, SD = 1.67) was statistically significantly higher than the control group's (M = 5.28, SD = 1.77), $t$ (122) = 4.822, $p < 0.001$ (Table 4.27).

**Table 4.27: Mean, Standard Deviation and T-Test of Pre-Intervention and Post-Intervention Self-Care Practices**

| | **Control** | | **Study** | | | |
|---|---|---|---|---|---|---|
| | **M** | **SD** | **M** | **SD** | ***t*-test** | ***P-value*** |
| (Pre-intervention) Self-care practices | 5.08 | 1.22 | 4.77 | 0.96 | t(122) = 1.680 | 0.111 |
| (Post-intervention) self-care practices | 5.28 | 1.77 | 6.77 | 1.67 | t(122) = -4.822 | 0.000 |

### 4.9.3 Comparing Baseline and Post-Intervention Self-Care Practices Means Within each Study Group

A paired-samples t-test was conducted to test the null hypothesis that the patient-tailored activation intervention is not effective in enhancing self-care practices among patients newly diagnosed with T2DM in selected hospitals in Kenya. The null hypothesis was rejected for the intervention group ($p < 0.001$) but not rejected for the control group ($p = 0.428$).

The study findings showed that within the control group, the post-intervention mean self-care practice score (M = 5.28, SD = 1.77) was slightly higher than the baseline mean score (M = 5.08, SD = 1.22); however, this difference was not statistically significant, $t$ (61) = 0.798, $p$ = 0.428. Additionally, the effect analysis demonstrated a small increase in the control group ($d$ = 0.13)

In the study group, the post-intervention mean self-care practice (M = 6.77, SD = 1.67) was significantly higher than the baseline mean score (M = 4.77, SD = 0.96). This difference was statistically significant, $t$ (61) = 8.229, $p < 0.001$. Additionally, the effect analysis demonstrated a very large increase in the study group ($d$ = 1.47) (Table 4.28).

**Table 4.28: Mean, Standard Deviation, *T*-Test Value, and Effect Size of Pre And Post-Intervention Self-Care Practices**

| | **Baseline** | | **Post-intervention** | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **M** | **SD** | **M** | **SD** | ***t*-test** | ***p*-value** | **Cohen's *d*** |
| Self-care practices (Control group) | 5.08 | 1.22 | 5.28 | 1.77 | t(61)=-0.798 | 0.428 | 0.13 |
| Self-care practices (Study group) | 4.77 | 0.96 | 6.77 | 1.67 | *t*(61)=-8.229 | 0.000 | 1.47 |

# CHAPTER FIVE

# DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Discussion

The current quasi-pre and post-experimental study aimed at determining the effect of a patient-tailored activation intervention versus usual care in patients newly diagnosed with T2DM. This chapter discusses the study findings based on the study-specific objectives and in relation to other studies on enhancing self-care among patients living with T2DM. Lastly, the chapter concludes with a summary of the study findings and recommendations.

### 5.1.1 Study Sample Description

In the current study, the majority of participants were female, married, and self-employed. Also, most participants had completed either primary or secondary education. Similar demographic characteristics findings have been reported in other studies (Miller et al., 2020; Otieno et al., 2020). Findings were inconsistent with a study conducted in Australia, where men were the predominant gender (70%) among all study participants (Zimbudzi et al., 2017). In the current study, the majority of participants were aged 40-69. A similar study conducted in the Netherlands reported consistent findings: the mean age of the participants was 66 years, and the majority were female and highly educated (Rutten et al., 2020). The high proportion of women seeking healthcare could be associated with the fact that most patients who engage in preventive health behaviors for diabetes are women, adults aged 65 and older, and those with a higher level of education.

Regarding study participants' clinical characteristics, the majority of patients in the present study were in the early stages of T2DM, had lived with T2DM for 6 months, and were on oral antidiabetic agents. Similar clinical characteristics were reported in a study by Rutten et al. (2020), in which the majority of participants were on oral glycemic control agents and had a clinical duration of T2DM of less than 5 years. The current study's findings are inconsistent with a study conducted in the

Netherlands, which found a median duration of T2DM of 10 years (Rutten et al., 2020). In the present study, most participants were obese. Regeer et al. (2022) reported similar findings, whereby more than half, 73.4% of people living with T2DM were obese, underscoring the critical role of weight management in the management of T2DM.

### 5.1.2 Patient Activation Among Patients Newly Diagnosed with Type 2 Diabetes Mellitus

The Patient Activation Measure® tool can categorize patients based on their needs and perceptions of their health in relation to self-care management (Tusa et al., 2020b). Findings from this study showed that a substantial proportion of patients newly diagnosed with T2DM registered low activation levels: 46 (74.2%) in the control group and 43 (69.4%) in the study group. This indicated that study participants had some knowledge of diabetes management but were still struggling to take action in their self-care management. The study findings were consistent with a study conducted in Ethiopia, which found that the majority (75.6%) of patients diagnosed with T2DM showed low activation, while the remaining 24.4% showed high activation (Assefa et al., 2019). Indicating that low patient activation is a common challenge in low and middle-income settings.

In Brazil, a study conducted among patients diagnosed with T2DM attending primary care facilities reported similar findings whereby, (33%) of the patients were at the lowest activation level 1, (27.5%) were at level 2 and about (30%) were at level 3 while few patients scored level 4 (9.5%) (de Leon et al., 2024). The study found that low activation was associated with participants' socio-demographic characteristics and poor health. Early identification of patients' activation may facilitate the delivery of patient-centered, culturally sensitive care tailored to individual needs, since interventions tailored to activation levels help patients develop the skills needed to practice recommended self-care.

A study conducted in the UK reported inconsistent findings, with the majority of patients found to be highly activated at baseline: 321 (45.9%) at level 3 and 99 (14.1%) at level 4 (Twigg et al., 2019). The study attributed the high activation levels

to the questionnaire's self-report nature, in which patients were asked to recall healthcare services received over the last 12 months. Likewise, the current study's findings were inconsistent with a study conducted in the USA, which found that the majority of patients with T2DM (76.6%) had a PAM®-13 level of 3 at baseline. The high activation among this population was associated with the fact that the mean duration since diagnosis of T2DM was 10.4 (SD: 8.3) years (Lamerato et al., 2018). Collectively, these findings imply that health system approaches and duration of T2DM may partly explain the low activation levels observed in the current study.

In this study, the mean patient activation score was 52.50 (±6.62) in the control group and 54.05 (±7.87) in the study group, indicating low activation among the study participants. The Findings were consistent with a study conducted in the Netherlands, where the diabetes federation developed a four-step person-centered consultation model among people living with T2DM; at baseline, the mean activation was 58.9 (±11.7) (Rutten et al., 2020). Likewise, a study done in Australia aiming to determine the association between patient activation levels and self-care management found that the mean patient activation score was 57.6 (±15.5) (Zimbudzi et al., 2017). The study found that low activation scores were associated with shorter clinical duration of T2DM among participants. Taken together, these findings suggest that individuals newly diagnosed with T2DM may have limited confidence and knowledge in managing their condition, underscoring the need for early, tailored interventions to enhance activation.

Findings from this study were also consistent with a study conducted in Saudi Arabia, which aimed to evaluate the effect of a patient-tailored activation intervention among people living with T2DM. The study findings indicated that at baseline, the mean patient activation score was 54.74 (SD = 11.60) (Almutairi et al., 2023b). The present study's findings were consistent with a Korean study that found that patients with T2DM for 0 to 6 years showed lower activation levels (Kim, 2021). The authors attributed this pattern to participants' lack of exposure to patient-tailored interventions. Therefore, these findings imply that patient activation may be strongly influenced by the duration of T2DM and early access to targeted empowerment strategies.

In the present study, the mean activation score was lower than that reported in a study by Glenn, which found inconsistent findings; the mean patient activation score was 60.48 (SD=12.9). The study linked the high activation among participants to the study sample's predominance of older, female participants (Glenn et al., 2020). In this longitudinal study conducted in the USA, which aimed to determine whether a community-based Diabetes Self-Management Support (DSMS) program increased activation scores, the baseline mean activation score was high: 63.44 (61.28–65.60). The study associated the high activation with participants' prior exposure to diabetes self-management education before the study commenced (Dietz et al., 2022). Taken together, these findings indicate that patient activation can be shaped not only by the individual's clinical factors but also by their demographic characteristics and prior exposure to structured diabetes education.

Studies from different countries have reported somewhat different mean activation scores than those in the current study. In Australia, Miller found that at baseline, the majority of patients newly diagnosed with T2DM were highly activated, with 100 (42.9%) of the participants scoring level 3 (Miller et al., 2020). The study attributed this to the high proportion of participants who were self-referred to the DESMOND program. In Korea, a study aiming to determine the influence of patient activation on self-care practices found that the average patient activation score at baseline was 67.8 (±16.72) (Choi & Kim, 2020). A study conducted in Norway aimed at examining the effect of a group-based Diabetes Self-Management Education (DSME) among patients diagnosed with T2DM found that the mean PAM®-13 score at baseline was 64 (SD = 15) (Fløde et al., 2017). Developed countries have reported higher activation levels among people living with T2DM, indicating the existence of barriers among individuals diagnosed with T2DM in Kenya.

### 5.1.3 Self-Care Practices Among Patients Newly Diagnosed with Type 2 Diabetes Mellitus

Self-care practices such as diet, exercise, treatment adherence, and stress management play a critical role in achieving glycemic control. The present study was conducted to determine self-care practices among patients newly diagnosed with

T2DM. Analyses of various aspects of T2DM management showed that adherence to prescribed medication was the most commonly practiced self-care aspect, with more than half (58.1%) of participants reporting adherence to their prescribed treatment in the last 7 days. These findings were consistent with a study conducted in Ethiopia, which found that the majority (82.2%) of patients diagnosed with T2DM reported adhering to their prescribed treatment (Mekonnen & Hussien, 2021). The high adherence to prescribed treatment compared to other self-care aspects could indicate that patients diagnosed with T2DM prefer taking medications rather than adjusting their lifestyle behavior.

Self-care practices play a very crucial role in achieving glycemic control among people diagnosed with T2DM. The current study found that participants had poor compliance with most self-care aspects. Regarding adherence to the recommended diet, only (8.9%) of the participants in this study reported that they had followed a healthy eating plan. Findings were consistent with a study conducted in Kenya, which found that only half (50.9%) of patients diagnosed with T2DM in Kitui County had adhered to the recommended dietary plan (Musembi et al., 2023). Regarding engaging in physical activity only (4.03%) of the participants in this study stated that they engaged in 30-minute physical activity for at least five days a week as recommended. Findings were consistent with a study done in Malaysia, where only (29.1%) of patients diagnosed with T2DM engaged in the recommended physical activity (Gunggu et al., 2016). The study reported that poor adherence to exercise was associated with age, as almost half of the participants were aged 60 or older. These findings indicate that adherence to the recommended physical activity for diabetes mellitus remains a big challenge among most patients diagnosed with the condition.

Proper foot care is crucial in preventing diabetes complications such as foot ulcers and limb amputation. However, this study found that only (1.6%) of the participants performed foot care and inspected inside their shoes as recommended by their healthcare provider. These findings are inconsistent with a study conducted in Saudi Arabia, where foot care compliance was the most adhered-to self-care practice (Saad et al., 2018). The study associated good foot care practices with the Islamic practice

of ablution, in which individuals wash their feet in preparation for prayers, and with the cultural dress code of wearing open shoes with feet and toes exposed. These findings suggest that cultural and religious practices substantially shape foot care practices and highlight the need for culturally tailored education strategies to promote adherence to recommended self-care practices.

Regarding mean self-care practices, the majority of participants in this study scored poorly, with a mean of 4.9 out of 10, indicating a deficit in key areas of T2DM self-management. The findings are closely related to a similar study done in Kenya, where the mean self-care score among patients diagnosed with T2DM in Thika County was 7.6 out of 14 (Wamucii et al., 2020). A study conducted in Saudi Arabia reported consistent findings, with patients living with T2DM scoring 5.04 out of 10 on a self-care practices scale (Al-Qahtani, 2020). In Ethiopia, 49% (95% CI: 43-56%) of individuals living with T2DM reported optimal self-care practices, indicating that a substantial proportion of patients fail to achieve adequate self-management (Ketema et al., 2020). Collectively, these findings show that inadequate self-care practices remain a widespread concern, underscoring the need for continuous patient support to improve long-term diabetes outcome.

The present study's findings were inconsistent with a Malaysian study, in which participants reported a high mean self-care practices score of 7.48 (±1.32). The study found that poor self-care practices were associated with a short duration of T2DM (< 1 year; $p = 0.010$) (Ang et al., 2018). The contrasting findings regarding self-care practices across regions may be influenced by cultural and socio-economic differences among these countries.

### 5.1.4 Patient Factors Influencing Self-Care Practices Among Patients Diagnosed with T2DM

The present study sought to identify patient factors that influence the execution of recommended self-care practices among patients newly diagnosed with T2DM. Quantitative analysis found no significant association between the patient factors assessed and self-care practices. This finding suggests that, within the limits of the

measured variables, socio-demographic characteristics alone may not adequately explain variations in self-care practices among the newly diagnosed population.

However, findings from the qualitative component of the mixed-methods approach provided contextual insights. Participants identified age, gender, spousal support, finances, and religious beliefs as key factors influencing their self-care practices. The findings are in line with a study conducted in Kenya, which found that unaffordable care and less family support in carrying out daily self-care practices were associated with poor adherence to self-care practices (Barasa Masaba & Mmusi-Phetoe, 2021). A similar study conducted in Italy reported that patients' age influenced self-care practices, with participants who had lived with T2DM for less than 10 years exhibiting lower self-management practices (Ausili et al., 2018). These findings suggest that patients socio-demographic characteristics play a crucial role in shaping their ability to engage in recommended self-care practices.

In India, similar patient factors were found to influence self-care practices. The study found that women were more likely than men to avoid prohibited foods (Matpady et al., 2020). Alike findings were also reported in Australia, where age was indicated as one of the contributing factors to poor adherence to self-care practices. The study noted that participants aged 50 or older were unable to engage in regular physical activity as recommended (Gunggu et al., 2016). The current study's findings are also consistent with a study conducted in Ethiopia, which reported that age and finances were among the factors shaping patients' adherence to recommended self-care practices. The study found that patients aged 40-49 were more likely to adhere to self-care practices than those aged 60-76 (Bonger et al., 2018). A study conducted in Saudi Arabia also reported consistent findings with the present study; poor self-care practices were significantly associated with being married (OR=2.178, p = 0.035 (Al-Qahtani, 2020). These findings underscore the multifaceted influence of socio-demographic characteristics on T2DM management.

Several previous studies have reported findings inconsistent with the current study. A study conducted in Ghana found that participants with lower educational qualifications were 3.7 times more likely not to adhere to self-care practices than

those with higher educational qualifications ($p$ = 0.049) (Afaya et al., 2020). In India, among patients diagnosed with T2DM, a high level of education was significantly associated with high efficacy in self-care practices ($p$ = 0.005) (Matpady et al., 2020). Likewise, current findings are also incongruent with a study done in Ghana where good self-care practices were significantly associated with primary level of education (AOR: 4.82; 95% CI 1.88, 12.35), and being on oral antidiabetic drugs (AOR: 2.87; 95% CI 1.43, 5.76) (Abate et al., 2018). Overall, these findings indicate that the relation between patient factors and adherence to self-care practices may be context-specific.

Findings from the present study suggest that clinicians should categorize patients by level of education, treatment regimen, social support, and source of income to motivate them to perform their self-care practices. Generally, several studies have found that patient factors do actually influence self-care practices among patients living with T2DM. It is therefore vital that, during initial contact with a person newly diagnosed with T2DM, healthcare professionals aim to identify patient factors that influence self-care practices and later use this data to tailor individualized, patient-centered diabetes self-management education.

### 5.1.5 Institutional Factors Influencing Self-Care Practices Among Patients Diagnosed with T2DM

People living with T2DM are advised to follow a wide range of self-care practices to manage their glycemic levels and maintain their health. However, various factors hinder or facilitate patients' execution of these practices. The aim of this study was to identify institutional factors influencing self-care practices among patients newly diagnosed with T2DM. The study found a statistically significant association between counselling offered by healthcare professionals and self-care practices ($p$ = 0.015). These findings align with a study conducted in Pakistan among people living with T2DM, which found that health education provided by healthcare providers played a crucial role in achieving self-care efficacy (Bukhsh et al., 2020). Study findings are also consistent with a study conducted in the USA, which found that structured diabetes education for patients diagnosed with T2DM positively

influenced their self-care management (Khairnar et al., 2019). These findings highlight that when patients receive healthcare system support early, they are more motivated to engage in self-care management.

In addition, the present study found a significant association between the high cost of healthcare and self-care practices ($p$ = 0.047). A study done in Ethiopia similarly reported that the affordability of healthcare services was a barrier to adherence to Diabetes Self Care (DSC) practices (Zewdie et al., 2022). The present study's findings are also consistent with a study conducted in the USA, which found that the cost of anti-diabetic medications hindered patients' adherence to recommended self-care management among people living with T2DM (Khairnar et al., 2019). The current study's findings are inconsistent with a study conducted in Australia, which found that healthcare costs were not a major barrier to self-care practices (Dao et al., 2019). Highlighting that the impact of financial factors on self-care practices vary depending on the healthcare systems and socio-economic context.

Moreover, the current study's findings indicated a statistically significant association between scheduled follow-up visits and self-care practices ($p$ = 0.008). The findings are consistent with a study done in Ethiopia, which reported that lack of organized services at the diabetes clinic was one of the barriers to self-care management among patients with T2DM (Letta et al., 2022). A similar study conducted in Ghana reported that follow-up clinic visits were associated with non-adherence to self-care practices among patients with diabetes mellitus (Atinga et al., 2018). The present study's findings are incongruent with a study conducted in the USA, which found that patient-friendly follow-up visits influenced patients' adherence to self-care practices (Khairnar et al., 2019). These findings imply that structured patient follow-up is a key strategy in strengthening patients adherence to the recommended management for T2DM.

The current study also sought to identify healthcare professionals' perspectives on institutional factors that hinder or facilitate adherence to self-care management among patients newly diagnosed with T2DM. Some of the factors identified as enablers of self-care management include a team-based approach and the adoption of

technology in routine diabetes care. The findings are consistent with a study conducted in Iran, which found that the use of technology in managing chronic conditions positively influenced patients' clinical outcomes (Ayatollahi et al., 2018). A similar study conducted in Australia found that incorporating multidisciplinary care among patients diagnosed with T2DM was associated with good self-care practices (Dao et al., 2019). Therefore, a multidisciplinary care approach and adoption of technology enhance patients' ability to practice the recommended management for diabetes mellitus.

Factors found to hamper self-care management in the present study include long waiting hours, lack of patient follow-up programs, fixed follow-up visits ($p = 0.008$), (OR = 0.379; 95% CI: 0.183–0.786), high drug costs ($p = 0.047$), limited resources such as drugs and health education materials, and a shortage of trained healthcare professionals. The findings are consistent with a study conducted in Ethiopia, which found that access to health facilities was one of the major barriers to diabetes self-care (DSC) practices (Zewdie et al., 2022). These results indicate that hospital-related factors are critical in supporting patients adjust their lifestyle behaviors.

The current study's findings are also consistent with a study conducted in Ethiopia, which found that patients who received social support from their healthcare providers achieved greater efficacy in their self-care practices (AOR 3.09, 95% CI 1.76–5.4, $p \leq 0.01$) (Gulentie et al., 2020). Scarcity of resources at the hospital and a lack of skilled healthcare professionals offering specialized diabetes care were associated with poor self-care practices in a similar study conducted in Fiji (Kumar & Mohammadnezhad, 2022). Taken together, these current study's findings indicate that institutional factors play a crucial role in shaping patients' self-care practices. From the perspectives of both patients newly diagnosed with T2DM and healthcare professionals providing diabetes care, diverse factors influence self-care practices, and these factors need to be addressed to promote effective self-management among patients newly diagnosed with T2DM.

### 5.1.6 Patient-Activation Interventions Used to Enhance Self-Care Practices Among Patients Diagnosed with Type 2 Diabetes Mellitus

Patient-Activation tailored Interventions (PAI) engage patients in individualized care and aim to increase their confidence, knowledge, and skills to manage their health, also described as patient activation levels (Bolen et al., 2014). Several countries have adopted PAI programs to enhance self-care management among people diagnosed with T2DM. In Australia, the Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) program was developed and tailored based on patients' activation levels. The aim of the program was to increase patients' activation levels by advocating for their behavior change and eventually improving their self-efficacy in managing their condition at home (Miller et al., 2020). Currently, the DESMOND program is the only evidence-based self-management program available for people newly diagnosed with T2DM in Australia.

In Saudi Arabia, a PAM®-13 tailored intervention was developed, aiming to empower patients through face-to-face counselling sessions and follow-up telephone calls. The study's findings indicated that the intervention was effective in increasing patients' activation scores, which were associated with improved self-care practices (Almutairi et al., 2023). In Norway, a group-based Diabetes Self-Management Education (DSME) program was established, aiming to increase patients' activation levels (Fløde et al., 2017). Cheng et al. (2021) reported that empowerment programs are associated with good glycemic control among people diagnosed with T2DM. Similarly, a meta-analysis reported that interventions tailored to patients' activation level were effective in increasing knowledge, skills, and confidence among people diagnosed with chronic conditions (Lin et al., 2020).

In the USA, the US Department of Defense's Mobile Health Care Environment (MHCE) program was developed among patients living with T2DM. This was a patient-centered program whose aim was to activate patients to engage in their self-care management. Upon implementation of the MHCE program, study findings showed significant improvements in patients' BMI, HbA1c, and HDL cholesterol levels (Gimbel et al., 2020). These study findings imply that a patient-centered

program can yield optimal results in the early prevention of diabetes-related complications.

Studies have shown that for diabetes education intervention to be effective, a combination of both face-to-face counselling and telephone conversations should be adopted. In the USA, a study was conducted to determine whether a Registered Nurse (RN) telephone intervention or a Community Health Worker (CHW) intervention was more effective at increasing patient activation scores among adults with T2DM. The study findings showed that the CHW intervention group showed a significant improvement compared to the RN telephone group (Glenn et al., 2020). In its recommendations, the study highlighted the importance of combining in-person health education sessions with telephone follow-ups. A similar study conducted in the USA observed that a combination of telephone follow-up and one-on-one patient health education sessions was effective in helping patients adopt preventive health behaviors (Kangovi et al., 2017).

Patient activation intervention programs are key in empowering individuals diagnosed with T2DM. The aim of this study was to empower patients newly diagnosed with T2DM by increasing their knowledge, skills, and confidence in the recommended self-care practices. Diabetes education interventions tailored to patients' activation levels have been found to promote adherence to recommended self-care practices compared with routine diabetes care (Alexander, 2018). Likewise, structured diabetes education on the recommended management of T2DM has been found to positively influence patients' lifestyle behaviors and aid in achieving self-efficacy (S.-K. Lee et al., 2019). This study, therefore, recommends that healthcare professionals tailor diabetes care to patients' levels of activation. In addition, healthcare professionals should regularly assess activation levels among patients with T2DM to monitor their progress and clinical outcomes. The goal is to strengthen the patient's role in self-managing their health.

In Kenya, diabetes education is provided by health care professionals offering diabetes care. However, the diabetes education offered is not standardized in terms of content, teaching methods, and duration. Hence, this study aimed at developing a

patient-tailored activation intervention for patients newly diagnosed with T2DM. The study recommended that patients newly diagnosed with T2DM should undergo three or more structured diabetes education sessions, delivered both individually and in groups. A study conducted in Turkey found that patients diagnosed with T2DM who received three or more sessions of diabetes care education, both individually and in group follow-up, recorded a significant increase in self-care efficacy and blood glucose monitoring ($p < 0.05$) (Celik et al., 2022). Similarly, a three-month follow-up study found that patients who used technology more frequently had better control of their blood glucose levels than those who used it less frequently (Su et al., 2019). It is for this reason that this study designed a patient-tailored activation intervention program targeting patients newly diagnosed with T2DM, implemented in group sessions, and later followed up for 3 months via SMS.

### 5.1.7 Effect of Patient-Tailored Activation Intervention on Patient Activation Scores and Levels

In this quasi-experimental study, after the implementation of the patient-tailored activation intervention, the study group registered a (9.74-fold) significant increase in their mean patient activation scores from 54.05 (±7.866) at pre-intervention to 63.79 (±15.51) at post-intervention ($t$ (61) = 4.474, $p < 0.001$, $d = 0.80$). At the same time, participants in the control group showed a decrease in their mean patient activation scores from 52.50 (±6.62) at baseline to 47.41 (±47.41) at post-intervention ($t$ (61) = -2.559, $p = 0.013$, $d = -0.46$). The present study findings indicate that a patient-tailored activation intervention can indeed enhance knowledge, skills, and confidence in people newly diagnosed with T2DM. An increase in patient activation scores were significantly associated with improved glycemic control, with mean HbA1c levels decreasing from 8.38 to 7.55 ($p < 0.001$) (Almutairi et al., 2023). Therefore, the current study's findings demonstrate that interventions tailored to patients' activation levels have the potential to improve health outcomes in people newly diagnosed with T2DM.

The current study's findings are consistent with a six-month pre- and post-intervention study conducted in Saudi Arabia. The study tailored an intervention based on patients' activation levels: participants were exposed to a three-month face-to-face education session, followed up monthly by telephone for another three months post-intervention. Upon evaluation, the study found a significant increase in activation scores from a baseline mean of 54.74 (SD = 11.60) to a post-intervention mean of 61.58 (SD = 15.69). This was an improvement of 6.83 points ($t$ (80) = −5.30, $p$ < 0.001) (Almutairi et al., 2023b). These findings suggest that tailoring interventions based on patients' activation levels is highly likely to improve their self-care practices and clinical outcomes.

Rutten et al. (2020) conducted a study in which activation levels were assessed before and after the implementation of a person-centered review model among people living with diabetes in the Dutch Community. Findings from this study were consistent with the present study, in which, after a one-year follow-up, participants' activation levels increased by 1.53 units (95% CI 0.67 to 2.39, $p$ = 0.001). Additionally, the greatest improvement was observed in the group with the lowest baseline activation level (+11.4), which was associated with improved perceptions of healthcare. The study also reported a slight improvement in clinical outcomes among participants, which was attributed to its short duration. Similarly, the current study's findings are consistent with a Norwegian study that implemented a group-based DSME program among patients with T2DM. Three months post-intervention, the study registered a significant improvement in the mean PAM®-13 scores from baseline (64 [SD = 15] vs. 70 [SD = 14]), $p$ < 0.001) (Fløde et al., 2017). The study found that participants' activation scores remained elevated three months after the group training was incorporated into routine diabetes care. This highlights that early patient activation is effective in improving patients' knowledge, skills, and confidence.

An increase in patient activation scores was also reported in a study done in Australia among individuals newly diagnosed with T2DM. The study sought to determine the effects of a structured diabetes education program on ongoing and newly diagnosed patients. The findings in this study demonstrated a significant effect, with

participants' PAM®-13 scores increasing by 9.7 points ($p < 0.001$) from a baseline median PAM®-13 score of 65.8 (IQR: 52.9-75.5) to a post-intervention mean score of 75.5 (IQR: 65.8-83.7). Moreover, the study established that more than half of the study participants recorded a clinically significant increase of at least 5 points in their activation scores (Miller et al., 2020).The study's findings indicate that structured diabetes education tailored to patients' activation levels is effective in increasing patients' engagement in recommended self-management.

In the USA, a similar improvement in activation scores was reported following a Mobile Health Care Environment (MHCE) intervention program among individuals diagnosed with T2DM. At 12 months post-intervention, the study found that the intervention group registered a significant improvement in their activation scores (15.93, 95% CI 8.99 to 22.87). The study found that, compared to the control group, the intervention group demonstrated an improvement in the activation score, which was significantly associated with improvements in participants' cardiovascular outcomes (Gimbel et al., 2020). This demonstrated that behavioral messages tailored according to patient activation scores were effective in empowering patients to engage in self-management behaviors.

Several studies have also shown that interventions tailored to patients' activation scores are effective in empowering patients with T2DM. In the USA, a study was conducted to boost patient activation scores among patients diagnosed with T2DM by comparing the efficacy of a Registered Nurse (RN) telephone intervention and a Community Health Worker (CHW) intervention. Three months post-intervention, the CHW group registered a statistically significant difference in activation scores, baseline (M = 60.31, SD = 13.3), after 3 months ([M = 68.89, SD = 16.39], $t$ (22) = 2.924, $p$ =0.008 (Glenn et al., 2020). Similarly, a study conducted in the Netherlands reported similar findings: after 20 weeks of follow-up following a diabetes education intervention, activation levels changed significantly (56.98 ± 9.23–58.04 ± 10.0, $t$ (602) = 2.53, $p$ = 0.012). Furthermore, the study observed that an increase in patient activation scores was significantly associated with better self-care management: exercise (β = 0.17), diet (β = 0.20 and a decrease in BMI (β = −0.28) (Regeer et al., 2022). Therefore, patient activation-tailored interventions have the potential to equip

patients diagnosed with T2DM with the knowledge, skills, and confidence needed to achieve self-efficacy in their self-care management.

Regarding patient activation levels, the present study found that after a 3-months follow up there was an overall improvement in the proportion of individuals who scored high activation levels in the study group, baseline 19 (30.6%) to 52 (86.7%) at post-intervention while the proportion of highly activated participants in the control group dropped from baseline at 16 (25.8%) to 13 (24.2%) at post-intervention. These findings indicate that participants exposed to the study interventions were more likely to engage in health-seeking behaviors, thereby promoting more effective self-care management of T2DM than their counterparts in the control group. Therefore, when health-care professionals offering diabetes care adopt patient activation intervention targeting persons newly diagnosed with T2DM, it leads to an increase in their activation level.

In addition, these findings suggest that clinicians should prioritize patients with low activation scores and offer health education, since low-activated patients have been found to benefit most from interventions tailored to their activation levels. A study conducted in Saudi Arabia found that patients with low activation levels (PAM®-13 levels 1 and 2) showed greater change in their activation scores. Additionally, an increase in patient activation scores were significantly associated with improved glycemic control, with mean HbA1c levels decreasing from 8.38 to 7.55 ($p < 0.001$) (Almutairi et al., 2023). Likewise, a study conducted in the USA observed that individuals who recorded an increase in their activation scores used health care resources more effectively than those who were less activated. Further, the study observed that in a population with highly activated patients, the economic burden on the healthcare system declined (Gimbel et al., 2020). These results highlight that highly activated patients have a better perception of their healthcare than less activated patients.

### 5.1.8 Effect of Patient Activation-Intervention on Self-Care Practices Among Patients Diagnosed with T2DM

This study hypothesized that a patient-tailored activation intervention would enhance self-care practices among patients newly diagnosed with T2DM. The study findings indicated that both the control and study groups registered improvement in their self-care practices scores. The mean self-care practices score in the study group was statistically significantly higher at post-intervention 6.77 (SD ±1.67) compared to the baseline score 4.77 (SD ±0.96) ($t$ (61) = -8.229, $p$ < .001, $d$ = 1.47) while there was no significant change observed in the control group from baseline 5.08 (SD ±1.22) and at post-intervention 5.28 (SD ±1.77) ($t$ (61) = -0.798, $p$ = 0.428, $d$ = 0.13). The current study's findings are in line with a study conducted in Kenya, which found that a structured diabetes education intervention increased participants' self-care practice scores. The study found that at three months' post-intervention the self-care practices of the study respondents in the experimental group (M = 7.94, SD = 1.31) was statistically significantly higher compared to the control group (M = 6.37, SD = 1.82) ($t$ (96) = 5.32, one tailed $p$ < .001, $d$ = 1.01) (Bet & Ade-Oshifogun, 2024b). Therefore, patient education is critical in enhancing adherence to the recommended self-care practices among people living with T2DM.

Previous studies done in Africa have reported similar findings. In Nigeria, a study assessing the effect of a Diabetes Care Intervention (DCI) across urban and rural facilities found that at six months post-intervention, the experimental group showed a significant improvement ($p$ < 0.05) across the various domains of self-care practices (Osarenmwinda & Erah, 2023). Tamiru et al. (2023) conducted a nurse-led self-management education intervention among people living with T2DM in Ethiopia. The study findings reported similar findings whereby, the mean self-care practices in the intervention group was significantly higher at end-line (3.47 ±0.08) than at baseline (2.34 ±0.05) ($p$ = 0.00) while in the control group there was no significant difference at end line (2.45 ± 0.06) compared to the baseline (2.35 ± 0.06) ($p$ = 0.92). These findings demonstrate that structured patient interventions can effectively enhance patients' engagement in self-care practices

A randomized controlled trial conducted in South Africa found that a diabetes foot-care education intervention improved foot-care practices among people living with T2DM. The study findings indicated that the intervention group that received a combination of face-to-face health education and instructional hand-outs registered significantly greater improvement in their mean scores (baseline 3.3 out of 5.0 and post-intervention 4.6 out of 5.0) ($p < 0.001$) (Manickuma et al., 2022). The findings were consistent with a field trial intervention study conducted in Egypt to determine the effectiveness of health education on foot care practices among patients with diabetes mellitus. Study findings showed that patients at high risk of diabetic foot disease demonstrated significant improvement in their foot care practice score, from a median of 5 at pre-intervention to 8 at post-intervention ($p < 0.001$) (Mohamed & El Shabrawy, 2017). As such, integrating patient-centered interventions into routine diabetes care plays a crucial role in empowering patients to practice recommended diabetes management and improve long-term health outcomes.

Studies done in other countries also reported similar findings. In Iran, a mobile-based education intervention was found to be effective in improving self-care practices among elderly people living with T2DM. The study found that at three months post-intervention, participants in the experimental group who received an online training program via mobile phone significantly improved their mean self-care score (53.56 vs. 44.95) ($p < 0.001$). The study further noted that after the health education intervention, there was a significant reduction in the blood glucose levels of study participants in the experimental group compared to the control group (7.00 vs. 7.32%) ($p = 0.001$) (Esferjani et al., 2022). These findings demonstrate that mobile technology is an effective tool for delivering patient-centered education and supporting patients in adhering to recommended self-care practices. In addition, incorporating mobile-based interventions into routine diabetes care could empower patients who struggle to attend in-person follow-up visits.

A randomized controlled trial in Spain found that self-management education for patients with T2DM increased their self-efficacy. The study findings were in line with the present study; participants in the intervention group registered a significant increase in their mean self-care score; baseline (6.8 (±17); post-intervention 7.4

(±1.3), $p$ = 0.012. The present study's findings are also consistent with a patient-activation intervention conducted in a Saudi Arabian primary care setting, which indicated that at six months, the intervention group showed a statistically significant change in self-care practices from 6.29 to 7.22 ($p$ = 0.01) (Almutairi et al., 2023b). Overall, these findings imply that early targeted patient education is a critical determinant of an individual's adherence to self-care practices.

A study conducted in the USA reported similar findings in which, at four months after implementation of a community-based diabetes self-management support (DSMS) program, there was a significant increase in all the Self-care Subscales of the Summary of Diabetes Self-care Activities (SDSCA) (general and specific diet, blood glucose monitoring, physical activity, and foot care) ($p < 0.001$) ) (Dietz et al., 2023). These findings support a study conducted in Kenya that assessed the effect of DSME compared with usual care in patients with T2DM. After a 6-month follow-up, the study found no significant change in either the primary (HbA1c) or secondary (self-care practices) health outcomes (Gathu et al., 2018). The study linked this to the fact that the intervention program was implemented for a short duration and then intensified. Similarly, a longitudinal study conducted in England reported inconsistent findings: patients' self-care practices declined after 2 years, and this was associated with poor knowledge of the recommended management for T2DM (Coates et al., 2018). These contrasting findings imply that the effectiveness of a structured diabetes education program may depend on its duration and the reinforcement provided.

Overall, most studies have shown that structured diabetes education leads to significant improvements in patients' health outcomes after diagnosis with T2DM. This underscores the need for healthcare professionals offering diabetes care to incorporate structured diabetes education programs targeting individuals newly diagnosed with T2DM, as uptake of diabetes education has been found to be low among this population (Winkley et al., 2016; Davies et al., 2024). Ensuring easy accessibility of education interventions that are tailored to patients needs will be essential in promoting long-term adherence to self-care practices.

## 5.2 Limitations and Delimitations of the Study

The study relied on self-report data collection, which could have led to reporting bias. To counter this, the researcher ensured that the study's purpose was clearly explained to the participants and that the importance of honest responses was emphasized. Participants were also required to recall their self-care practices over the last seven days, which could have introduced recall bias. To counter this, the researcher used a mixed-methods study design, combining quantitative and qualitative data to generate a more complete dataset. The study area was limited to two counties in the Central region of Kenya, which were purposively sampled and predominantly inhabited by a single major ethnic group. Therefore, the findings of this study may not be generalized to other counties in the country, which may have different cultural beliefs that may influence their self-care practices. However, the study participants from the two counties had characteristics similar to those of other populations in the other counties; therefore, they are likely to yield homogeneous findings. Study participants were followed for three months, so the long-term effects of the intervention on patients newly diagnosed with T2DM were not assessed. The patient-activation intervention module developed in this study may not have addressed all the factors influencing self-care practices, as some require changes in hospital policies and guidelines. However, recommendations were shared with policymakers at the county hospitals; therefore, it is expected that they shall be addressed

## 5.3 Conclusion

At baseline, patient activation levels were abysmally low, indicating that the majority of patients newly diagnosed with T2DM had some awareness of recommended T2DM management but lacked the confidence and skills to achieve effective self-care. Additionally, low activation levels indicated that respondents believed their role in managing T2DM was crucial to achieving good clinical outcomes, but did not take the necessary steps to adopt the recommended self-care practices.

In addition, a noticeable proportion of patients newly diagnosed with T2DM had inadequate self-care practices, more so in terms of diet therapy, foot care, and follow-up visits. The study also recorded that smoking and alcohol intake were prevalent among patients newly diagnosed with T2DM. Despite the Ministry of Health, Kenya's initiative to promote better management of T2DM, the study revealed that patients newly diagnosed with T2DM were less empowered and lacked the necessary knowledge, skills, and confidence to implement the recommended self-care management.

Many factors were found to influence self-care practices; however, the study found no statistically significant association between patient-related factors and self-care practices.

> This study, therefore, accepts the null hypothesis that there is no significant relationship between patient factors and self-care practices among patients newly diagnosed with T2DM in selected hospitals in Kenya.

However, regarding institutional factors, there was a statistically significant association between counselling offered by the health care provider, the high cost of health care services, fixed-scheduled follow-up visits, and self-care practices. The main factors identified to influence self-care practices were addressed during the implementation phase.

> This study therefore rejects the null hypothesis that there is no significant relationship between institutional factors and self-care practices among patients newly diagnosed with T2DM in selected hospitals in Kenya.

The study showed that a patient-activation intervention was key in empowering patients newly diagnosed with T2DM; participants in the study group showed a significant improvement in activation scores.

> This study therefore rejects the null hypothesis that there is no significant relationship between patient-tailored activation intervention and patient-

activation levels among patients newly diagnosed with T2DM in selected hospitals in Kenya.

Notably, self-care practices among the study participants also significantly increased from baseline. Therefore, there is potential in early patient empowerment for those newly diagnosed with T2DM, as it has been found useful in equipping patients with the knowledge, skills, and confidence needed to engage in self-care practices.

This study therefore rejects the null hypothesis that there is no significant relationship between patient-tailored activation intervention and self-care practices among patients newly diagnosed with T2DM in selected hospitals in Kenya.

### 5.4 Recommendations

To ensure early empowerment of patients newly diagnosed with T2DM, the study recommends the following to all the stakeholders, both at the National and County Governments, involved in developing policies on the management of Type 2 Diabetes Mellitus;

**Practice Recommendations:**

1. There is a need to identify and address existing factors that enhance or hinder adherence to the recommended management for T2DM. This will enable healthcare professionals to develop targeted, evidence-based, patient-centered educational approaches.
2. Healthcare providers should be able to identify the health needs of patients newly diagnosed with T2DM and develop evidence-based strategies to raise awareness of the recommended management for T2DM. This will then build up patients' confidence and skills to execute the recommended self-care practices.
3. Clinicians also need to develop strategies to continuously identify patients who are less activated and are struggling to adhere to their self-care practices.

Developing programs, such as family- and community-based support groups, could play a significant role in providing patients with the necessary support.

**Policy Recommendations**

1. Despite there being evidence on the continuous empowerment of people living with T2DM, there is a lack of a proper framework on how newly diagnosed patients are taken care of or followed up. This highlights the need to develop and implement a follow-up framework, such as mHealth, to aid in tracking the care of patients newly diagnosed with T2DM. This will help healthcare providers map patients' self-care journeys.
2. In order to ensure that patients receive up to date information on the recommended diabetes management it is important for healthcare professionals offering diabetes care be up to speed on the current management for T2DM. This study therefore recommends that a policy be made that all healthcare providers offering diabetes care should be trained diabetes educators and should attend Continuous Medical Education (CMEs).

**The study also recommends that:**

1. Further research is needed to determine whether introducing a follow-up program, along with continuous support for individuals newly diagnosed with T2DM, could help patients adhere to various aspects of T2DM self-care practices and thus narrow existing gaps in diabetes self-care management.
2. Further research is needed to determine whether establishing a patient-activation intervention for individuals newly diagnosed with T2DM could reduce the high morbidity and mortality associated with the condition in Kenya.

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# APPENDICES

## Appendix I: Informed Consent for Patients' Newly Diagnosed with T2DM

My name is Loise Ndirangu, I am a PhD in Nursing student from Jomo Kenyatta University of Agriculture and Technology. I am conducting a study titled "Utilization of Patient-activation Intervention to Enhance Self-care Practices among Patients Newly Diagnosed with Type 2 Diabetes Mellitus in Selected Hospitals, Kenya".

The information obtained from this study will be used to enhance self-activation practices among adult patients' newly diagnosed with type 2 diabetes mellitus (T2DM) through a structured patient education strategy on the recommended management for type 2 diabetes mellitus. Additionally, the study will assist the hospital and the Ministry of Health to develop guidelines that will aim to empower adult patients' newly diagnosed with T2DM. This will aid in preventing early development of diabetes related complications among patients diagnosed with T2DM.

### Procedures to be followed

You have been selected to participate in the study because you are an adult newly diagnosed with T2DM. If you agree to participate in the study you will be asked a few questions regarding your self-care management practices since you were diagnosed with T2DM and any factors influencing them for a period of 30 minutes. This will be based on your responsibility in: nutritional habits, exercise, self-monitoring of blood glucose levels, treatment adherence, health seeking behaviors and problem solving skills. All the information you share will be handled with confidentiality. After obtaining this data a trained diabetes educator shall take you through a health education session lasting approximately three hours either immediately after you answer the questions or three months after you answer the same questions. The goal is to enable the researcher evaluate the effectiveness of the diabetes health education you have received.

**Voluntarism**

Your agreement to participate in this study is voluntary. You will get the same services and care whether you agree to join the study or not and your decision will not change the care you will receive. You have a right to refuse responding to any questions and may stop the interview at any time. You may also withdraw from the study at any time without any consequences to the services you receive here or any other organization now or in the future. After reading the explanation, please feel free to ask any questions that will enable you to understand clearly the nature of the study. Please remember that participation in this study is voluntarily. The study will take place in three phases and is anticipated to last seven months.

**Discomforts and Risks**

Some of the questions that you will be asked may make you uncomfortable. If this happens, you may refuse to answer these questions if you choose so and you can also stop the interview at any time. All the information shared with us will be kept confidential and the researcher will not include your name on any research documents. This will be done to ensure that the risk of you disclosing your information is fully minimized. The procedure to obtain data on your current RBS and FBS levels will be part of your routine care and will be collected by your usual healthcare provider. There will be some pain or discomfort but the healthcare provider will try their best to minimize this by being gentle. The interviewer may add approximately 30 minutes to the time you wait before receiving your routine diabetes care at the diabetes clinic.

**Benefits**

If you participate in this study you will help us learn the factors influencing self-activation practices and knowledge gaps among adult patients' who are newly diagnosed with T2DM. You will benefit from this study by receiving structured health education on the recommended diabetes management from trained diabetes educators and being screened for your blood glucose levels. If you are found to have any health problem, you will be referred for treatment.

**Reward**

If you agree to participate in this study, transport expenses will be reimbursed at 500/-.

**Confidentiality**

The researcher will conduct the interviews and examination in a private setting within the clinic. Information obtained from you will be handled with confidentiality. Your name will not be mentioned or used during data handling or used in publication of results. Codes will be used instead and data collected during the study will be stored safely in locked cabinet at Jomo Kenyatta University of Agriculture and Technology and will only be accessed by the research team. All the information obtained from you will be kept private and only shared with the study team.

**Contact Information**

If you have questions about the study call Loise Ndirangu on Telephone Number: 0722223167 or Supervisors: Dr. Bernard Mbithi, Lecturer, JKUAT Telephone No: 0783084220, Dr. Wallace Karuguti, Lecturer JKUAT. Telephone No: 0739968856 and Dr. Lister Onsongo Lecturer, Kenyatta University. Telephone No: 0700004288.

However, if you have questions about your rights as a study participant: You may contact Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke

**Participant's statement**

The above information regarding my participation in the study have been explained to me and I had the opportunity to ask questions and all were answered to my satisfaction. I hereby, give consent for my participation as explained to me. I fully understand that my participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that if I choose to leave the study my decision will not change the care

that I will receive from the clinic today or care that I will get from any other clinic at any other time.

Name of Participant: ……..

Participants Code No: ……..……..

Participants Mobile No: …….....…….

Signature or Thumbprint……. Date……

Name of Representative/Witness…….……

Relationship to Subject……..

(Where necessary)

**Investigators statement**

I, the undersigned, have explained to the volunteer in a language s/he understands, the procedures to be followed in the study and the risks and benefits involved

Name of Interviewer …… ……..

Signature……. Date……

## Appendix II: Informed Consent for Healthcare Professional

My name is Loise Ndirangu, I am a PhD in Nursing student from Jomo Kenyatta University of Agriculture and Technology. I am conducting a study titled "Utilization of Patient-activation Intervention to Enhance Self-care Practices among Patients Newly Diagnosed with Type 2 Diabetes Mellitus in Selected Hospitals, Kenya**"**

The information obtained will be used to enhance self-activation practices among adult patients' newly diagnosed with T2DM through a structured patient education strategy on the recommended management for T2DM. Additionally, the study will assist the Ministry of Health to develop guidelines that will aim to empower adult patients' who are newly diagnosed with T2DM. This will aid in mitigating the rising prevalence of diabetes related complications among patients diagnosed with T2DM.

### Procedures to be followed

Participation in this study will require that I ask you some questions regarding your role in empowering patients newly diagnosed with T2DM and the institutional factors influencing them. The goal is to enable the researcher determine the institutional factors influencing self-activation practices among adult patients' newly diagnosed with T2DM at Muranga and Kiambu level 5 hospitals. I will audio record all the information you provide to me, this data will only be used for the purpose of transcription and will later be erased.

### Voluntarism

Your agreement to participate in this study is voluntary. You have a right to refuse responding to any questions and may stop the interview at any time. You may also withdraw from the study at any time without any consequences on your job responsibilities at the hospital now or in the future. After reading the explanation, please feel free to ask any questions that will enable you to understand clearly the nature of the study. Please remember that participation in this study is voluntarily.

**Discomforts and Risks**

Some of the questions that you will be asked may make you uncomfortable. If this happens, you may refuse to answer these questions if you choose so and you can also stop the interview at any time. All the information shared with us will be kept confidential and the researcher will not include your name on any of the research documents. This will be done to ensure that the risk of you disclosing your information is fully minimized. The interviewer may add approximately one hour to the time you use to offer healthcare to patients at the diabetes clinic.

**Benefits**

If you participate in this study you will help us learn about the institutional factors influencing self-activation practices among adult patients' who are newly diagnosed with T2DM. There will be no direct benefit to you as the healthcare professional. The study will however benefit the policy makers on the measures they can use to develop guidelines that will aim to empower adult patients' newly diagnosed with T2DM.

**Reward**

If you agree to participate in this study, lunch will be provided at 1,000/-

**Confidentiality**

The researcher will conduct the interviews in a private setting within the clinic. Information obtained from you will be handled with confidentiality. Your name will not be mentioned or used during data handling or used in publication of results. Codes will be used instead and data collected during the study will be stored safely in locked cabinet at Jomo Kenyatta University of Agriculture and Technology and will only be accessed by the research team. All the information obtained from you will be kept private and only shared with the study team.

**Contact Information**

If you have questions about the study call Loise Ndirangu on Telephone Number: 0722223167 or Supervisors: Dr. Bernard Mbithi, Lecturer, JKUAT Telephone No: 0783084220, Dr. Wallace Karuguti, Lecturer JKUAT. Telephone No: 0739968856 and Dr. Lister Onsongo Lecturer, Kenyatta University. Telephone No: 0700004288.

However, if you have questions about your rights as a study participant: You may contact Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke

**Participant's statement**

The above information regarding my participation in the study have been explained to me and I had the opportunity to ask questions and all were answered to my satisfaction. I hereby, give consent for my participation as explained to me. I fully understand that my participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that if I choose to leave the study my decision will not change my responsibilities at the hospital.

Name of Participant: ……. ……..

Participants' Code No: ……...

Signature …… Date……...

**Investigators statement**

I, the undersigned, have explained to the volunteer in a language s/he understands, the procedures to be followed in the study and the risks and benefits involved

Name of Interviewer …… ……..

Signature……. Date…….

## Appendix III: Study Questionnaire

| | | |
|---|---|---|
| **Date: ……**<br>**Participants Code No: ……...**<br>**Researchers Name: ……..** | | |
| **General Guidelines:**<br>1. The questionnaire has five sections, kindly complete all the sections.<br>2. Feel free to ask for clarifications whenever in need. | | |
| **SECTION A: SOCIO-DEMOGRAPHIC DATA.** | | |
| **1** | Kindly indicate your gender | 1. Male<br>2. Female |
| **2** | Kindly indicate your age | 1. <20<br>2. 20-29<br>3. 30-39<br>4. 40-49<br>5. 50-59<br>6. 60-69<br>7. < 70 |
| **3** | What is your Marital Status? | 1. Single<br>2. Married<br>3. Widowed<br>4. Divorced/ Separated |
| **4** | What is your occupational status? | 1. Formal employment<br>2. Self-employment<br>3. Unemployed<br>4. Pensioner |
| **5** | What is your religion? | 1. Christianity<br>2. Islam<br>3. Hindu<br>4. None |
| **6** | Where do you live? | 1. Urban setting<br>2. Rural setting |
| **7** | What is your highest level of educational? | 1. None<br>2. Primary<br>3. Secondary<br>4. College/ University |
| **8** | How long have you had diabetes? | 1. One Month and below<br>2. Two Months<br>3. Three Months<br>4. Four Months<br>5. Five months<br>6. Six Months |
| **9** | What regime of T2DM treatment are you on? | 1. Oral anti-diabetic drugs only<br>2. Insulin only<br>3. Oral anti-diabetic drugs and Insulin<br>4. Do Not Know |

| **SECTION B: STUDY PARTICIPANTS BIO-MEDICAL DATA**<br><br>***(To be filled by the researcher / Research Assistant)*** | | |
|---|---|---|
| **Parameters** | **Baseline Assessment**<br><br>**Date……** | **Post- Intervention Assessment**<br><br>**Date……** |
| Weight (kgs) | | |
| Height (cm) | | |
| BMI | | |

**SECTION C: SELF-CARE PRACTICES**

The statements below describe your self-care practices related to T2DM. Based on your self-care over the last 7 days, kindly specify the extent to which the statement applies to you.

| | | **Applies to me very much**<br><br>**(3)** | **Applies to me to a considerable degree**<br><br>**(2)** | **Applies to me to some degree**<br><br>**(1)** | **Does not apply to me**<br><br>**(0)** |
|---|---|---|---|---|---|
| **1** | I have followed a healthy eating plan (on average per week in the last one month) | | | | |
| **2** | I eat five or more servings of fruits and vegetables in a day | | | | |
| **3** | I space my carbohydrates evenly throughout the day, as recommended. | | | | |
| **4** | I take my anti-diabetic drugs (e.g. insulin, tablets) as prescribed by the doctor | | | | |
| **5** | I check and record my blood glucose levels as recommended by the healthcare provider | | | | |
| **6** | I engage in at least 30 minutes of physical activity 3-4 times in a week as recommended by healthcare professional | | | | |
| **7** | I examine my feet as recommended by the healthcare professional | | | | |
| **8** | I inspect inside my shoes as recommended by the healthcare professional | | | | |
| **9** | I have not smoked at least once in the last 7 days | | | | |
| **10** | I have not taken alcohol at least once in the last 7 days | | | | |
| **11** | I have learnt to solve problems and manage stress | | | | |
| **12** | I have adhered to all my scheduled diabetes clinics recommended for my diabetes management | | | | |

**SECTION D: INSTITUTIONAL FACTORS INFLUENCING SELF-CARE PRACTICES**

| | Factors | Response | |
|---|---|---|---|
| | | **Disagree (0)** | **Agree (1)** |
| **1** | Counselling sessions offered to me has made it easy for me to engage in self-care practices | | |
| **2** | My healthcare provider motivates me to engage in the self-care practices | | |
| **3** | My healthcare provider has educated me on the mechanism of action of my prescribed anti-diabetic drugs | | |
| **4** | Sometimes I miss my scheduled diabetes clinic because the hospital is far from where I live | | |
| **5** | High cost of healthcare at the hospital has made me not adhere to self-care practices | | |
| **6** | Counselling from the different healthcare providers at the diabetes clinic has enabled me adhere to self-care practices | | |
| **7** | Language used by the healthcare provider has enhanced my ability to understand self-care practices | | |
| **8** | Availability of all the resources prescribed by my clinician at the hospital has enabled me adhere to self-care practices | | |
| **9** | The scheduled diabetic clinic hours has interfered with my self-care practices | | |
| **10** | I sometimes miss my follow-up diabetes clinic due to long waiting hours | | |
| **11** | Social Support offered to me by the hospital has enabled me adhere to my self-care practices | | |
| **12** | Follow-up care e.g. (by CHWs) offered to me has enabled me adhere to my self-care practices | | |
| **13** | Adoption of telemedicine e.g. (reminder SMS) by the hospital has enabled me adhere to self-care practices | | |

## Appendix IV: Patient Activation Measure® -13 Tool (PAM®-13)


Below are some statements that people sometimes make when they talk about their health. Please indicate how much you agree or disagree with each statement as it applies to you personally by circling your answer. Your answers should be what is true for you and not just what you think others want you to say.

If the statement does not apply to you, circle N/A.

| | | | | | |
|---|---|---|---|---|---|
| 1. When all is said and done, I am the person who is responsible for taking care of my health | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 2. Taking an active role in my own health care is the most important thing that affects my health | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 3. I am confident I can help prevent or reduce problems associated with my health | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 4. I know what each of my prescribed medications do | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 5. I am confident that I can tell whether I need to go to the doctor or whether I can take care of a health problem myself | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 6. I am confident that I can tell a doctor concerns I have even when he or she does not ask | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 7. I am confident that I can follow through on medical treatments I may need to do at home | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 8. I understand my health problems and what causes them | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 9. I know what treatments are available for my health problems | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 10. I have been able to maintain (keep up with) lifestyle changes, like eating right or exercising | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 11. I know how to prevent problems with my health | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 12. I am confident I can figure out solutions when new problems arise with my health | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |
| 13. I am confident that I can maintain lifestyle changes, like eating right and exercising, even during times of stress | Disagree Strongly | Disagree | Agree | Agree Strongly | N/A |

**Appendix V: Focus Group Discussion Guide**

Patient factors influencing self-care practices among patients' newly diagnosed with T2DM.

**Discussion guide for the focus group discussion**

I would like to ask you about the individual factors that have influenced your self-care practices.

a) **What do you think about the diabetes health education you received?**

   **Probes:**

   *Was it useful?*

   *Was the information you received adequate to enable you adjust your lifestyle behaviours?*

b) **What did your latest blood test say about your blood glucose level**
   **Probe:** *(Within the normal range, a bit high, very high, I don't know)*
c) **Having been counselled on self-care practices are there any areas that you are currently struggling to adjust to?**
   **Probes:** *(Nutrition, physical activity, feet examination, self-monitoring of blood sugar levels, taking of prescribed medications)*
d) **What do you think is making you struggle with your self-care practices?**
   **Probe:** *(Age, gender, marital status, level of education, self-confidence, finances, cultural beliefs, family support, society responsibilities, work schedule, access to health facility, religion, friends)*
e) **Now, what areas do you think the hospital should improve on to help you engage in the recommended self-care practices?**
   **Probe:** *(Use of technology, flexible scheduled counselling sessions, multidisciplinary health education, and allocation of more trained diabetes educators at the diabetes clinic)*

   **Conclusion:** That's all the questions I have for you.
   Now, is there anything else regarding your self-care practices that you would like to talk about?

**That's the end of the discussion. Thank you very much for your participation.**

## Appendix VI: Key Informant Interview Guide

Institutional factors influencing self-care practices among adult patients' newly diagnosed with T2DM.

### Introduction

I would like to take this opportunity to thank you for agreeing to participate in the study. Your contribution will inform the researcher on very pertinent details regarding empowering patients' newly diagnosed with type 2 diabetes mellitus. This interview will take approximately 30-45 minutes.

Is it okay for me to proceed with the interview?

### Guiding questions

- Does the hospital offer individualized or group counselling sessions among patients' newly diagnosed with T2DM?
- Is a team based approach used in empowering patients newly diagnosed with T2DM?
- ❖ Do you think the mode of delivery of the counselling sessions enables patients' newly diagnosed with T2DM adhere to self-activation practices?
- ❖ Do you think the mode of delivery of the counselling sessions at the hospital has empowered the patients to achieve normoglycemia?
    - If No, what do you think the hospital should do to facilitate this?
- Does the hospital offer any social support to patients newly diagnosed with T2DM?
- Has the hospital adopted any form of telemedicine in the management of T2DM?
- What other institutional factors do you think influence self-activation practices among adult patients diagnosed with T2DM?
- What do you think the hospital should improve on in order to help these patients adhere to the recommended self-care practices and for them to achieve normoglycemia?

### Conclusion

- What are your recommendations in relation to empowering patients' newly diagnosed with type 2 diabetes mellitus?

**That's the end of the interview. Thank you very much for your time.**

**Appendix VII: Expert Panelist Consent Form on Validation of the Content to be Included in the Module for the First Round of Data Collection in Phase II of the Study**

I am a student at Jomo Kenyatta University of Agriculture and Technology (JKUAT) pursuing PhD in Nursing. As part of the fulfillment of the requirement for the award of the Doctor of Philosophy in Nursing, I am carrying out a study entitled "Utilization of Patient-activation Intervention to Enhance Self-care Practices among Patients Newly Diagnosed with Type 2 Diabetes Mellitus in Selected Hospitals, Kenya". This is the second phase of the study. In phase I of the study data was collected from patients newly diagnosed with T2DM and the healthcare professionals providing diabetes care to these patients. Findings from phase I of the study showed that there existed gaps in the self-care practices of these patients hence the recommendation for developing the current data collection tool whose aim is to come up with measures addressing these gaps. You have been selected as one of the expert participants to add more inputs to the phase I findings using the questionnaire attached. Your participation is voluntary and there are no direct benefits attached. However, results of the study are expected to aid patients newly diagnosed T2DM adjust their lifestyle behaviours leading to good clinical outcome. In case of any clarification feel free to contact the researcher Loise Ndirangu, Mobile No: 0722223167, Email: nndirangu35@gmail.com.

**Participation Declaration**

I have understood the purpose of this study and I voluntarily accept to participate.

Respondents Signature ……. Date: …….....

**Part II: Content Validation Tool**

**Tick (✓) appropriately according to your own views regarding self-care practices among patients newly diagnosed with T2DM**

| | Areas arising from phase I findings & the recommendations | Content to be included in the module | Responses | | Comments |
|---|---|---|---|---|---|
| | | | Yes<br>N (%) | No<br>N (%) | |
| **1** | Challenges faced by patients newly diagnosed with T2DM | Lack of knowledge on pathophysiology of T2DM | | | |
| | | Lack Of knowledge on mechanism of action of anti-diabetes medications | | | |
| | | Lack of skills on self-care practices | | | |
| | | Lack of confidence | | | |
| | | Lack of finances | | | |
| | | Lack of resources at the health facility (medicine & laboratory services) | | | |
| | | Lack of family and society support | | | |
| | | Lack of follow up by the healthcare providers | | | |
| **2** | Measures that should be taken to promote adjusting and adherence to self-care practices | Regular counselling of patients newly diagnosed with T2DM | | | |
| | | Adopt structured counselling sessions offered by trained diabetes educators | | | |
| | | Availability of required resource's at the hospital | | | |
| | | Adoption of team based approach in offering counselling sessions | | | |
| | | Adoption of telemedicine as a mode of patient follow up | | | |
| **3** | Aspects of diabetes management that should be included during counselling of patients newly diagnosed with T2DM | Pathophysiology of T2DM | | | |
| | | Medical Management of T2DM (Mechanism of Action of anti-diabetes medications | | | |
| | | Nutrition therapy | | | |
| | | Foot care (drying of feet and inspecting shoes) | | | |
| | | Physical Activity | | | |
| | | Self-monitoring of blood glucose | | | |
| | | Diabetes mellitus and alcohol | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | Diabetes mellitus and smoking | | | |
| | | Diabetes mellitus and stress | | | |
| | | Importance of family and society support | | | |
| | | Significance of enrolling in NHIF and the County Health Scheme | | | |
| | | Importance of adhering to follow up visits | | | |
| | | Importance of goal setting | | | |

**Appendix VIII: Expert Panelist Consent Form on Module Validation for the Second Round of Data Collection in Phase II of the Study.**

Thank you for your participation and prompt response in round one data collection tool. After analysis of the data collected the findings formed the basis for developing the attached structured diabetes education module. You are kindly requested to respond to the items indicated in the tool by either ticking either Yes or No against each of the item. Your participation is voluntarily and there are no direct benefits attached to this participation. However, the findings from the study are expected to promote utilization of structured diabetes patient education among patients newly diagnosed with T2DM thus helping them adjust their lifestyle behaviours leading to good clinical outcome. In case of any clarification feel free to contact the researcher Loise Ndirangu, Mobile No: 0722223167, Email: nndirangu35@gmail.com.

**Participation Declaration**

I have understood the purpose of this study and I voluntarily accept to participate.

Respondents Signature ……. Date: …….....

**Part II: Module Validation Tool**

**Kindly indicate your responses by ticking (✓) either "Yes" or "No" in the space provided against each validation criteria. Your comments on each evaluation criteria will be highly appreciated**

| | Validation Criteria | Criteria Description | Expert Panelist Responses | | Comments |
|---|---|---|---|---|---|
| | | | Yes<br>N (%) | No<br>N (%) | |
| 1 | Simplicity | The module is simple and easily understandable | | | |
| | | The language used is clear and easy to understand | | | |
| | | The duration of time indicated for the counselling session is applicable | | | |
| 2 | Clarity | The content is consistent and creates a clear meaning | | | |
| | | Images and diagrams included in the module are clear and supported by logical meaning | | | |
| | | The relationship between the various self-care modalities has been clearly explained | | | |
| | | Content in the module has been organized in a systematic manner to ensure flow | | | |
| 3 | Generality | The module covers a wide scope of recommended diabetes management | | | |
| 4 | Accessibility | The purpose of the module is easily achievable in terms of implementation | | | |
| 5 | Significance of the module | The module is significant to adult patients newly diagnosed with T2DM | | | |
| | | | | | |

## Appendix IX: Patient Activation Scores at Baseline and Post-intervention (Control Group)

| | | Patient Activation Scores/100 | | | | | Patient Activation Scores/100 | |
|---|---|---|---|---|---|---|---|---|
| **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** | | **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** |
| **1** | 517 | 44.2 | 44.2 | | **32** | 516 | 42.3 | 44.2 |
| **2** | 511 | 42.3 | 46.2 | | **33** | 514 | 53.8 | 42.3 |
| **3** | 137 | 45.5 | 63.5 | | **34** | 506 | 61.5 | 51.9 |
| **4** | 133 | 38.5 | 50 | | **35** | 516 | 61.5 | 44 |
| **5** | 508 | 46.2 | 40.4 | | **36** | 520 | 51.9 | 40.4 |
| **6** | 520 | 66.5 | 48.1 | | **37** | 513 | 48.1 | 44.2 |
| **7** | 509 | 51.9 | 53.9 | | **38** | 516 | 51.9 | 51.9 |
| **8** | 510 | 63.5 | 69 | | **39** | 505 | 43.2 | 51.8 |
| **9** | 511 | 45.5 | 53.3 | | **40** | 503 | 55.8 | **Attrition** |
| **10** | 507 | 53.8 | 71 | | **41** | 512 | 61.5 | 46.2 |
| **11** | 517 | 44.2 | 46.2 | | **42** | 519 | 53.8 | 42.3 |
| **12** | 506 | 53.8 | 55.8 | | **43** | 519 | 48 | 55.8 |
| **13** | 517 | 40.4 | 57.7 | | **44** | 517 | 51.9 | 41.1 |
| **14** | 503 | 50 | 50 | | **45** | 517 | 46.2 | 48.1 |
| **15** | 508 | 54.5 | 55.8 | | **46** | 517 | 51.9 | **Attrition** |
| **16** | 507 | 50 | 53.8 | | **47** | 435 | 50 | 46.2 |
| **17** | 505 | 46.2 | 51.9 | | **48** | 504 | 54.5 | 48.1 |
| **18** | 517 | 51.9 | 51.9 | | **49** | 507 | 71.2 | 51.9 |
| **19** | 515 | 55.8 | 57.7 | | **50** | 510 | 50 | 46.2 |
| **20** | 504 | 61.5 | 53.8 | | **51** | 509 | 52.1 | 55.8 |
| **21** | 518 | 50 | 46.2 | | **52** | 508 | 44.2 | 44.2 |
| **22** | 510 | 53.8 | 51.9 | | **53** | 511 | 48.1 | 53.8 |
| **23** | 516 | 53.8 | **Attrition** | | **54** | 511 | 51.9 | 50 |
| **24** | 508 | 50 | 51.9 | | **55** | 518 | 51.9 | 44.2 |
| **25** | 518 | 59.6 | 59.6 | | **56** | 510 | 61.5 | 46.2 |
| **26** | 516 | 53.8 | 63.4 | | **57** | 520 | 50 | 46.2 |
| **27** | 517 | 48.1 | 46.2 | | **58** | 518 | 52 | 51.9 |
| **28** | 515 | 64.6 | 59.6 | | **59** | 505 | 53.8 | 44.2 |
| **29** | 508 | 57.7 | **Attrition** | | **60** | 508 | 55.8 | 51.9 |
| **30** | 514 | 53.8 | 44.2 | | **61** | 504 | 63.5 | 50 |
| **31** | 510 | 53.8 | 48.1 | | **62** | 509 | 55.8 | 50 |

## Appendix X: Patient Activation Scores at Baseline and Post-intervention (Study Group)

| | | Patient Activation Scores/100 | | | | | Patient Activation Scores/100 | |
|---|---|---|---|---|---|---|---|---|
| **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** | | **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** |
| **1** | 363 | 52 | 71.2 | | **32** | 365 | 53.8 | 69.2 |
| **2** | 361 | 59.6 | **Attrition** | | **33** | 373 | 46.2 | 63.5 |
| **3** | 390 | 53.8 | 65.3 | | **34** | 366 | 53.8 | 55.8 |
| **4** | 386 | 65.4 | 61.5 | | **35** | 376 | 51.9 | 65.4 |
| **5** | 385 | 51.9 | 63.5 | | **36** | 376 | 69.2 | 65.4 |
| **6** | 373 | 65.4 | 63.5 | | **37** | 742 | 50 | 65.4 |
| **7** | 362 | 51.9 | 63.5 | | **38** | 372 | 53.8 | 50 |
| **8** | 377 | 61.5 | 82.7 | | **39** | 386 | 42.3 | 63.4 |
| **9** | 370 | 53.8 | 67.3 | | **40** | 386 | 46.2 | **Attrition** |
| **10** | 390 | 59.1 | 53.8 | | **41** | 388 | 69.2 | 69.2 |
| **11** | 359 | 50 | 63.5 | | **42** | 946 | 40.3 | 59.6 |
| **12** | 951 | 54.2 | 90.4 | | **43** | 381 | 53.8 | 50 |
| **13** | 390 | 50 | 84.6 | | **44** | 384 | 53.8 | 61.5 |
| **14** | 385 | 53.8 | 75 | | **45** | 384 | 44.2 | 46.1 |
| **15** | 392 | 50 | 50 | | **46** | 383 | 65.4 | 67.3 |
| **16** | 379 | 57.5 | 65.3 | | **47** | 377 | 50 | 51.9 |
| **17** | 391 | 57.7 | 82.7 | | **48** | 377 | 50 | 63.5 |
| **18** | 391 | 55.8 | 63.5 | | **49** | 377 | 57.7 | 76.9 |
| **19** | 386 | 50 | 59.6 | | **50** | 387 | 44.2 | 82.7 |
| **20** | 386 | 53.8 | 90.3 | | **51** | 949 | 44.2 | 59.6 |
| **21** | 390 | 50 | 57.7 | | **52** | 382 | 50 | 84.6 |
| **22** | 383 | 65.3 | 46.2 | | **53** | 385 | 55.8 | 71.1 |
| **23** | 361 | 50 | 69.2 | | **54** | 379 | 63.5 | 59.6 |
| **24** | 371 | 73.1 | 69.2 | | **55** | 385 | 71.1 | 71.2 |
| **25** | 369 | 50 | 71.2 | | **56** | 388 | 51.9 | 67.2 |
| **26** | 369 | 75 | 63.5 | | **57** | 384 | 44.2 | 51.9 |
| **27** | 369 | 55.8 | 58.8 | | **58** | 384 | 46.2 | 65.4 |
| **28** | 372 | 50 | 73.1 | | **59** | 383 | 50 | 65.2 |
| **29** | 373 | 46 | 63.5 | | **60** | 379 | 46.2 | 88.5 |
| **30** | 373 | 61.5 | 61.5 | | **61** | 384 | 43.3 | 61.5 |
| **31** | 373 | 51.9 | 65.4 | | **62** | 383 | 53.8 | 65.4 |

## Appendix XI: Self-care Practices Scores at Baseline and Post-intervention (Control Group)

| | | Self-care practices scores/10 | | | | Self-care practices scores/10 | |
|---|---|---|---|---|---|---|---|
| **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** | **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** |
| **1** | 517 | 3.8 | 3.9 | **32** | 516 | 4.4 | 4.4 |
| **2** | 511 | 4.4 | 6.1 | **33** | 514 | 5.2 | 5.8 |
| **3** | 137 | 1.6 | 3.9 | **34** | 506 | 6.1 | 5.8 |
| **4** | 133 | 1.6 | 5.8 | **35** | 516 | 5.5 | 5.3 |
| **5** | 508 | 3.8 | 5.3 | **36** | 520 | 5.2 | 5.0 |
| **6** | 520 | 7.7 | 6.1 | **37** | 513 | 4.1 | 4.4 |
| **7** | 509 | 6.6 | 6.9 | **38** | 516 | 5.5 | 6.4 |
| **8** | 510 | 6.6 | 6.9 | **39** | 505 | 4.7 | 5.0 |
| **9** | 511 | 5.3 | 5.8 | **40** | 503 | 5.5 | **Attrition** |
| **10** | 507 | 5.6 | 8.3 | **41** | 512 | 6.1 | 6.9 |
| **11** | 517 | 4.1 | 5.0 | **42** | 519 | 5.5 | 6.7 |
| **12** | 506 | 5.8 | 4.4 | **43** | 519 | 3.8 | 6.7 |
| **13** | 517 | 3.8 | 6.1 | **44** | 517 | 3.8 | 4.2 |
| **14** | 503 | 4.4 | 3.9 | **45** | 517 | 4.1 | 5.8 |
| **15** | 508 | 5.2 | 6.1 | **46** | 517 | 5.2 | **Attrition** |
| **16** | 507 | 4.4 | 5.3 | **47** | 435 | 4.7 | 5.2 |
| **17** | 505 | 3.3 | 3.3 | **48** | 504 | 4.4 | 5.0 |
| **18** | 517 | 5.8 | 8.0 | **49** | 507 | 6.3 | 6.1 |
| **19** | 515 | 6.6 | 6.1 | **50** | 510 | 5.0 | 6.1 |
| **20** | 504 | 6.1 | 5.8 | **51** | 509 | 5.5 | 6.1 |
| **21** | 518 | 5.0 | 5.8 | **52** | 508 | 3.6 | 4.4 |
| **22** | 510 | 4.4 | 7.5 | **53** | 511 | 4.4 | 6.7 |
| **23** | 516 | 5.0 | **Attrition** | **54** | 511 | 5.2 | 4.4 |
| **24** | 508 | 5.0 | 3.9 | **55** | 518 | 7.7 | 4.7 |
| **25** | 518 | 6.6 | 6.1 | **56** | 510 | 6.6 | 6.6 |
| **26** | 516 | 5.0 | 6.4 | **57** | 520 | 5.5 | 5.0 |
| **27** | 517 | 4.7 | 5.8 | **58** | 518 | 3.6 | 7.2 |
| **28** | 515 | 5.5 | 8.3 | **59** | 505 | 4.4 | 5.0 |
| **29** | 508 | 7.7 | **Attrition** | **60** | 508 | 5.8 | 3.9 |
| **30** | 514 | 4.4 | 5.3 | **61** | 504 | 6.3 | 5.0 |
| **31** | 510 | 5.5 | 5.5 | **62** | 509 | 6.1 | 5.6 |

## Appendix XII: Self-care Practices Scores at Baseline and Post-Intervention (Study Group)

| | | Self-care Practices scores /10 | | | | | Self-care Practices scores /10 | |
|---|---|---|---|---|---|---|---|---|
| **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** | | **S/NO** | **Participants Code** | **Baseline** | **Post-intervention** |
| **1** | 363 | 3.3 | 8.3 | | **32** | 365 | 5.0 | 7.8 |
| **2** | 361 | 5.3 | **Attrition** | | **33** | 373 | 4.2 | 6.1 |
| **3** | 390 | 3.0 | 8.1 | | **34** | 366 | 5.0 | 7.5 |
| **4** | 386 | 5.0 | 5.8 | | **35** | 376 | 5.0 | 6.9 |
| **5** | 385 | 3.8 | 8.1 | | **36** | 376 | 5.6 | 7.5 |
| **6** | 373 | 5.5 | 7.7 | | **37** | 742 | 4.7 | 8.1 |
| **7** | 362 | 4.2 | 6.6 | | **38** | 372 | 4.4 | 5.3 |
| **8** | 377 | 5.8 | 8.1 | | **39** | 386 | 4.7 | 8.6 |
| **9** | 370 | 4.7 | 6.4 | | **40** | 386 | 4.4 | **Attrition** |
| **10** | 390 | 5.3 | 5.8 | | **41** | 388 | 5.5 | 7.2 |
| **11** | 359 | 7.2 | 5.0 | | **42** | 946 | 3.3 | 6.1 |
| **12** | 951 | 3.6 | 8.1 | | **43** | 381 | 5.3 | 7.2 |
| **13** | 390 | 3.3 | 5.3 | | **44** | 384 | 5.0 | 5.8 |
| **14** | 385 | 2.5 | 6.9 | | **45** | 384 | 3.8 | 4.7 |
| **15** | 392 | 3.3 | 6.9 | | **46** | 383 | 5.8 | 8.6 |
| **16** | 379 | 5.0 | 6.9 | | **47** | 377 | 4.4 | 5.0 |
| **17** | 391 | 6.0 | 8.1 | | **48** | 377 | 5.8 | 6.7 |
| **18** | 391 | 4.0 | 8.6 | | **49** | 377 | 5.0 | 7.8 |
| **19** | 386 | 3.8 | 6.4 | | **50** | 387 | 4.7 | 7.2 |
| **20** | 386 | 4.7 | 8.1 | | **51** | 949 | 4.7 | 6.1 |
| **21** | 390 | 5.6 | 6.9 | | **52** | 382 | 5.3 | 8.1 |
| **22** | 383 | 5.5 | 5.3 | | **53** | 385 | 5.6 | 7.5 |
| **23** | 361 | 5.0 | 5.6 | | **54** | 379 | 5.8 | 5.8 |
| **24** | 371 | 5.6 | 6.1 | | **55** | 385 | 6.1 | 8.3 |
| **25** | 369 | 5.0 | 6.9 | | **56** | 388 | 4.2 | 7.2 |
| **26** | 369 | 6.4 | 6.9 | | **57** | 384 | 3.3 | 5.3 |
| **27** | 369 | 5.6 | 8.6 | | **58** | 384 | 3.1 | 5.3 |
| **28** | 372 | 5.3 | 6.7 | | **59** | 383 | 3.6 | 7.5 |
| **29** | 373 | 4.2 | 8.1 | | **60** | 379 | 3.9 | 9.4 |
| **30** | 373 | 6.1 | 6.4 | | **61** | 384 | 4.4 | 7.5 |
| **31** | 373 | 5.6 | 6.7 | | **62** | 383 | 4.7 | 8.1 |

**Appendix XIII: Sample Qualitative Codebook**

**Data source:** Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) **Analysis approach:** Thematic analysis

| **A. Institution Factors Influencing Self-care Practices** | | | | | |
|---|---|---|---|---|---|
| | **Code Name** | **Definition** | **Inclusion Criteria** | **Exclusion Criteria** | **Examples** |
| | **Enablers** | | | | |
| 1 | Patient education | Reports of adequate and clear health education on self-care | Mentions adequate explanation and clear instructions | Knowledge gained from family or other patients | "*Yes, education given on diet is very helpful. I was taught on what I should be eating and that is what I am currently doing"*<br><br>(Respondent 1, FGD 2, study group). |
| 2 | Multidisciplinary care | Great collaboration among the healthcare professionals | Mentions similar health education and proper referrals | Patient-family cooperation and effort | "*Every healthcare worker that attends to a patient who is newly diagnosed with T2DM makes sure that they have educated them on the recommended management for diabetes"* (Key informant 3, study group). |
| 3 | Proximity of the health facility | Ease access of the hospital facility | Mentions of adherence to follow up visits due to close proximity to the hospital | Missed appointments for other reasons | "*If there was a diabetes clinic near where I live, I would not have any reasons to miss my clinics since I will just walk there. This will help me save on my transport fee and instead use that money to buy my medicine cause currently, for me to come here I have to use transport"* (Respondent 2, FGD |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | 4, control group). |
| 4 | Mobile phone-based follow-up and appointment reminders | Use of SMS to engage patients | Mentions of receiving mobile phone reminders from the hospital | Phone calls only | *"I have received two messages on my phone asking me: how I am doing, if I am drinking water and if I remembered to take my medicine. This made me feel that someone out there is looking out for me and wishes me well"* (Respondent 3, FGD 2, control group). |
| | **Inhibitors** | | | | |
| 5 | Scheduled diabetes clinic visits | Unclear ways on how to schedule or reschedule the follow-up diabetes clinics dates | Mentions on missed adherence due to missed follow up visits | Informal scheduling of diabetes clinics | *"Myself I wasn't given any clinic date. The day I was called and told to come is when I was informed that I was supposed to go to the records and book my appointment"* (Respondent 2, FGD 1, study group). |
| 6 | Cost of healthcare | Cost of medicines and laboratory tests limits care | Mentions high cost of consultation fee, laboratory tests and medication cost | Transport cost | "*I have a NHIF card that I pay for monthly which I am supposed to use to pay the doctor's fee and also buy my medicine. Unfortunately, I have never found any drugs here, so I have to go buy using cash outside the hospital and it is very expensive"* (Respondent 3, FGD 5, study group). |
| 7 | Patient flow | Delays before seeing the healthcare providers | Mentions late service and long queues | Lateness | "*The hospital should consider having more doctors at the diabetes clinic because the ones who are there do their best but the patients are many so we end up waiting for longer hours*" (Respondent 2, FGD 3, study group). |
| 8 | Follow-up by the | Lack of continued | Mentions of lack | Informal follow- | *"When a patient is seen at the clinic* |

| | | | | | |
|---|---|---|---|---|---|
| | healthcare professionals | communication by the healthcare professional's | of organized tracking system of all patients and defaulter tracing | ups on appointments | *for the first time they are usually discharged through the nutritionist. Unfortunately, we don't strictly follow up on this patient so they either get lost on follow up or they end up going to private clinics out there. So by the time they are coming back to the diabetes clinic they have very high sugar levels or have already developed diabetes related complications*" (Key informant 1, study group.) |
| 9 | Hospital Resource's | Stock-outs on drugs, reference materials and laboratory services | Mentions of non-adherence due to unavailability of essential medicines and shortage of diagnostic materials | Non-adherence to self-care practices | "*"After being seen by the doctor they always tell you to go pick our drugs from the pharmacy. After queuing for an hour or so they will tell you that they have run out of the drugs and this is really frustrating*" (Respondent 2, FGD 1, control group). |
| | | | | | |
| | **B. Patient Factors Influencing Self-Care Practices** | | | | |
| | **Code Name** | **Definition** | **Inclusion Criteria** | **Exclusion Criteria** | **Example Quote** |
| 1 | Knowledge on recommended self-care practices | Understanding of all aspects of the recommended self-care practices for T2DM | Have knowledge on nutrition therapy, anti-diabetes medications, physical activity etc. | Mention of other recommended management | *"Yes, knowledge on diet is very helpful. I was taught what I should be eating, and that is what I am currently doing. I make sure that all my meals have greens and I drink a lot of water. This has helped me control my sugar levels"* (Respondent 4, FGD 1, study |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | group) |
| 2 | Support from the family and community | Family prompting self-care practices and community support in their adherence | Mentions reminders received from their family and community | Reminders received from healthcare professionals | "*As a man it is hard to control what is being cooked at home so you end up eating what the rest of the family members are eating*" (Respondent 2, FGD 1, control group). |
| 3 | Adherence to treatment and follow up visits | Missed medication doses and clinic appointments | Poor adherence to scheduled follow-up visits and medication regime | Late attendance and drug stock-outs. | *"Where I work I am not able to do any physical work and when I get home I am so tired to do anything. Plus, going to the gym is very expensive so you end up never exercising." (Respondent 4, FGD 3, control group).* |
| 4 | Affordability of healthcare services | Personal capacity to buy medicines, afford laboratory services and transport | Mentions inability to afford medicines, laboratory services and transport | Mention of other institution cost | "*I am currently taking four tablets in one day and one tablet costs KES: 70. This to me is very expensive. I always buy alternative drugs that are cheaper than the ones prescribed to me by the doctor*" (Respondent 6, FGD 2, study group). |

**Appendix XIV: Diabetes Education Module for Patients' Newly Diagnosed with Type 2 Diabetes Mellitus.**

**Loise N. Ndirangu**

**(BScN, MScN)**

**Prepared for a Patient Tailored-Activation Intervention Programme of a Research Study conducted in Fulfillment of the Requirements for the Award of Doctor of Philosophy in Nursing of Jomo Kenyatta University of Agriculture and Technology.**

**July, 2023**

## Introduction

Welcome to this module on "empowering adult patients newly diagnosed with T2DM"

This module was informed by a baseline survey that was conducted at Muranga and Kiambu level 5 hospitals among 124 adult patients newly diagnosed with T2DM, 62 in each study site.

The specific objectives for the baseline survey were:

1. To establish self-activation levels among adult patients newly diagnosed with T2DM at Muranga and Kiambu Level 5 Hospitals.
2. To determine self-activation practices among adult patients' newly diagnosed with T2DM at Muranga and Kiambu Level 5 Hospitals.
3. To determine patient factors influencing self-activation practices among adult patients newly diagnosed with T2DM at Muranga and Kiambu Level 5 Hospitals.
4. To determine institutional factors influencing self-activation practices among adult patients newly diagnosed with T2DM at Muranga and Kiambu Level 5 Hospitals.

The study found that

1. Regarding self-activation levels, majority of the study participants scored level 2 with 33 (53.2%) in the control group and 32 (51.6%) in the study group.
    - This means that the participants had some knowledge but were still struggling with their self-care practices
2. Regarding self-activation practices majority 39(62.9%) in the study group had poor self-activation practices. In the control group, only half 32(51.6%) of the participants scored high self-activation practices.
    - This means that the self-care was suboptimal
3. Patient factors found to have a high influence on self-activation practices were age, gender, level of education, family support and self-confidence.
4. Institutional factors found to have a high influence on self-activation practices were counselling and motivation by healthcare professionals, cost of healthcare and team-based management at the hospital.

**Rationale**

The baseline findings indicated that adult patients newly diagnosed with T2DM had poor self-activation practices. Further, they believed that their role in self-care was crucial in attaining good health outcome but did not initiate the needed action into achieving the recommended self-activation practices. It is on this basis that the module was designed in order to empower these patients and enhance their self-care practices.

Several studies have shown that empowerment of patients newly diagnosed with T2DM through education intervention leads to an increase in their activation levels and this eventually improves their self-efficacy in managing their condition at home (Miller et al., 2019).

**Module goal**

To ensure that patients newly diagnosed with T2DM receive the information they need to self-manage their disease and the support they need to apply this knowledge.

**Learning outcomes**

Upon the completion of the training, participants will be able to:

- Demonstrate good understanding of type 2 diabetes mellitus management.
- Show improved undertaking of recommended self-care behaviours.
- Express confidence in their self-care practices
- Achieve optimum blood glucose levels

**Teaching/learning methods**

- Presentations and discussions
- Demonstration

All participants will receive weekly text messages via SMS reminding them on the recommended self-care practices taught during the training. Materials for goal setting will also be provided at the end of the session.

**Duration**

The health education session will take three hours. The last one hour will be for questions and answers.

**120-minute Health Education Session**

| **Session 1:** | **Session 2:** | **Session 3:** |
|---|---|---|
| ✓ What is diabetes?<br>✓ What happens to the body with diabetes?<br>✓ Normal blood sugar levels<br>✓ Risk factors<br>✓ Uncontrolled diabetes can lead to complications<br>✓ Medication | ✓ Healthy eating<br>✓ Meal planning<br>✓ Exercise or physical activity<br>✓ Self-monitoring<br>✓ Foot care | ✓ Diabetes and alcohol<br>✓ Diabetes and smoking<br>✓ Evaluation<br>✓ Goal Setting |

**Table of Contents**

## Unit 1: Pathophysiology of Type 2 Diabetes Mellitus

### Introduction

The goal of this unit is to enable all individuals newly diagnosed with type 2 diabetes mellitus understand the etiology, pathophysiology and diagnosis of T2DM.

### What is Diabetes Mellitus?

Diabetes Mellitus is a chronic disease characterized by hyperglycemia. The hyperglycemia results from defects in the insulin secretion, insulin action, or both. There are several types of diabetes mellitus. The most common ones include T1DM *(the body does not produce any insulin),* T2DM *(the body has a resistant response to insulin)* and gestational diabetes mellitus. As a result chronic hyperglycemia develops.

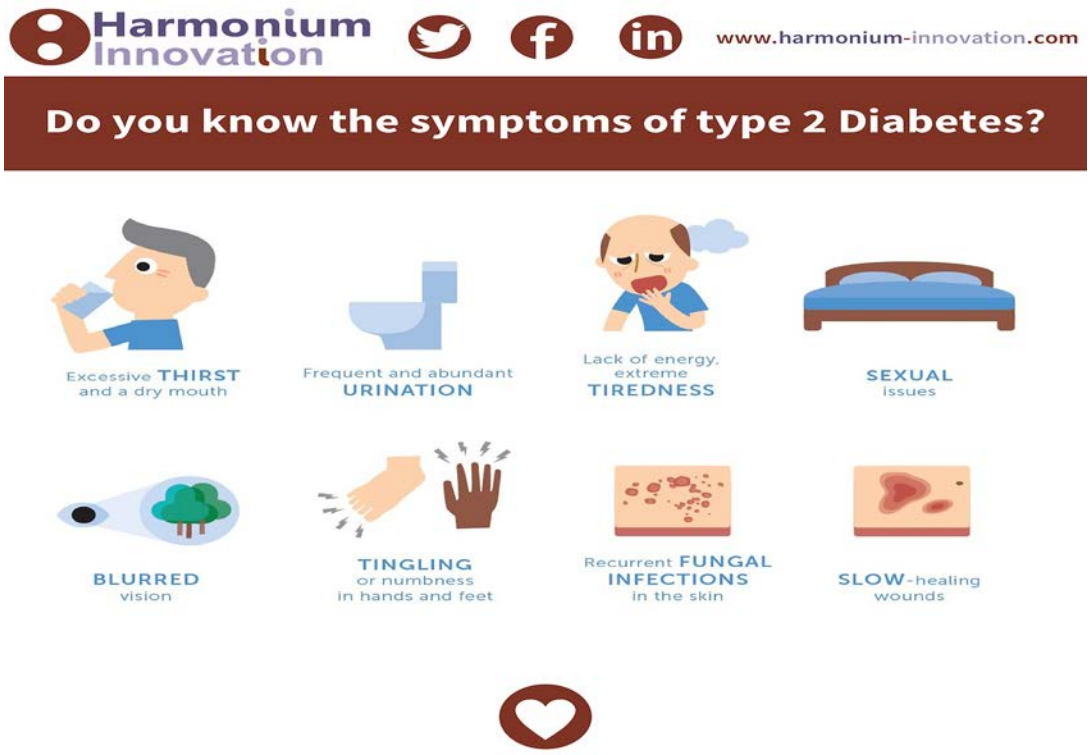
### What is the disease Process?

Diabetes means that your body does not use the food you eat effectively. The food that we eat is broken down by insulin into simple forms of glucose. Therefore, without insulin glucose does not enter the cells of the body instead it remains in the bloodstream.

Common risk factors for T2DM include, obesity, 45 years of age or older, history of gestational diabetes or genetics

**How does T2DM present?**

Due to the high glucose levels, the body usually attempts to get rid of it through urine and in the process pulls water along with it (polyuria). Polyuria is the frequent urination. Other symptoms due to T2DM include polydipsia (increase in thirst), Polyphagia (excessive hunger), weight loss, malaise, tiredness, blurred vision or poor wound healing.




**How is T2DM diagnosed?**

Majority of individuals do not complain of any signs and symptoms of T2DM instead they present to the hospital with complains of diabetes related infections (urinary tract infections) or having already developed diabetes related complications. There are several laboratory investigations used in confirming a diagnosis of type 2 diabetes mellitus as listed below,

- Random Plasma Glucose - ≥ 11.1 mmol/l (200 mg/dl)
  - *(Measures your blood glucose levels at any time).*
- Fasting Plasma Glucose - ≥ 7.0 mmol/l (126 mg/dl)

- *(Measures your blood glucose levels after you have not eaten for at least 8 hours).*

- Glycated haemoglobin (HbA1C) ≥ 6.5%
  - *(Reflects average blood glucose levels over the previous 2–3 months).*

**For people with T2DM blood sugar level targets are as follows:**

- RBS – 4.0 to 8.5mmol/L
- FBS – 4.4 to 7.2 mmol/L
- After meals (post prandial) – under 8.5mmol/L

**How is T2DM managed?**

The first line of management in all persons newly diagnosed with T2DM is lifestyle modification, which includes nutrition therapy and physical activity. When this first line of management fails to achieve optimal glycemic control, the person is commenced on glucose lowering drugs (oral hypoglycaemic agents). In some cases, the oral hypoglycaemia agents seize to be effective in obtaining good metabolic control and the person is put on insulin, this is referred to as secondary failure.

**Glucose Lowering Drugs**

- Metformin
- Glibenclamide
- Insulin *(Humulin 70/30, NPH, Soluble insulin)*

**Common Side effects of OHAs**

- Gastrointestinal upset.
- Hypoglycaemia.
- Weight gain.

**Side effects of human insulin:** redness, swelling and itchiness at the injection site, weight gain and/or constipation.

## Complications due to Type 2 Diabetes Mellitus

Extreme low or high blood sugar levels can lead to major health problems. Chronic unmanaged hyperglycemia can result to acute or chronic complications.

**Acute complications include** *Hypoglycemia and Hyperglycemia*

### Symptoms of Hypoglycemia

Early signs of low blood sugar may include, sweating, trembling, hunger fast heart rate and dizziness. Blood sugar will go lower if you don't take action. Eat or drink something that has sugar. If blood sugar goes lower, things can get worse very fast; you can have confusion, loss of consciousness, or coma.

### *How to avoid hypoglycemia*

Monitor what you eat. Take meals at regular intervals and ensures that her portions don’t vary much. Ensure you take all nutrients from the foods eaten. Stay active on a regular scheduled routine. Self-monitoring of blood sugar levels. If found low take a snack right away. Take prescribed medication on time.

### Symptoms of hyperglycemia.

Hyperglycemia does not pose the same immediate symptoms like hypoglycemia. High sugar levels may make you not think as fast as normal, you may make more mistakes, feel nervous or have less energy. If blood sugar stays high, you are more at risk for heart disease, stroke, kidney disease, loss of vision and other long term problems.

### *How to avoid high blood sugar levels*

Keep your blood sugar control before meals. Test your blood sugar just before a meal and two hours after. Pay attention and limit foods rich in starches and sugars since these foods contribute the most to post-meal sugar spikes. Keep a record of your sugar levels and bring it with you during your follow up visits. Know your blood sugar trends this will help you and your doctor make an informed decision regarding

your medicine, diet or physical activity. Have a routine schedule for your meals and exercises and stick to it. Know your symptoms during hypoglycemia and hyperglycemia and describe them to family and friends so that they can help you.

## Long-term Complications

When blood sugar stays high for long it leads to long term problems from diabetes like, damage to the eyes which can cause blindness, damage to the nerves which can cause numbness, tingling and pain in your feet, legs, and arms. Usually people feel it in the feet first. It can also lead to damage to the kidneys. You are also more likely to get heart disease. The trouble comes on when your arteries get narrow (atherosclerosis). Then, blood does not flow well to parts of the body. This can happen in different parts of the body: heart, brain, legs. And, it leads to different problems like coronary heart disease (heart), cerebrovascular disease (brain) and peripheral artery disease (legs).

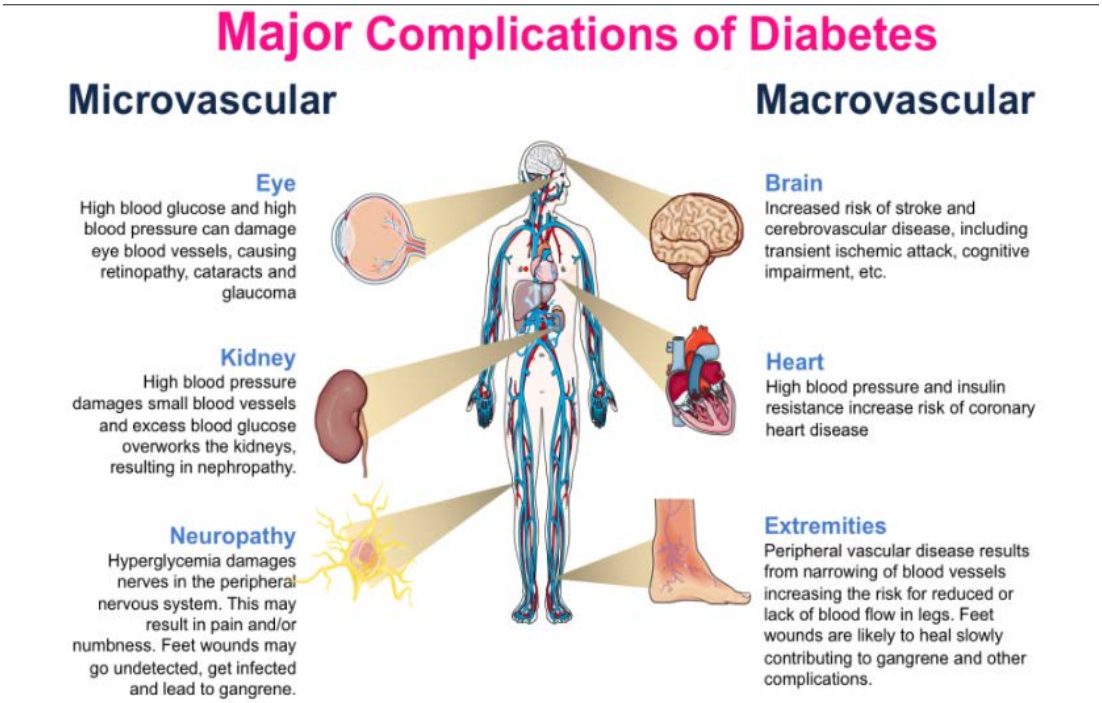
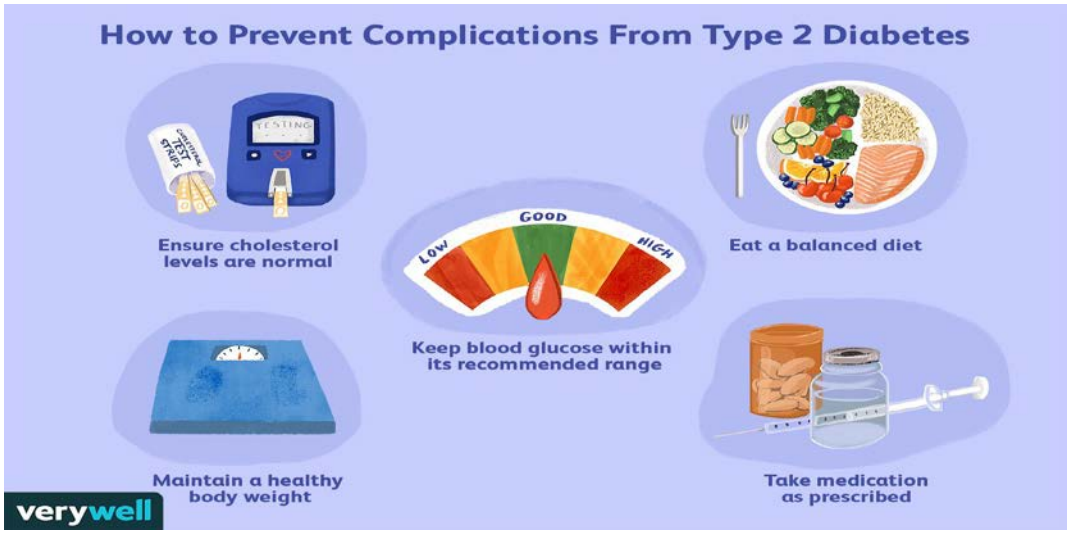



Figure 1. Major microvascular and macrovascular complications associated with diabetes mellitus. Parts of the image were adapted from Servier Medical Art.




**Unit 2: Self-Management of Type 2 Diabetes Mellitus**

## Introduction

The goal of this unit is to enable all individuals diagnosed with T2DM understand what is self-care management and the recommended self-care management for T2DM.

## What is self-Management?

Self-Management is the ability of an individual to manage their behavior, emotions, thoughts and actions. Persons diagnosed with T2DM are required to make lifelong commitment in changing their behaviors and lifestyle habits. It is the cornerstone for achieving good clinical outcome.

According to the American Diabetes Association (ADA) and International Diabetes Federation (IDF), management of T2DM is based on the following self-care principles: change in diet, regular exercise, feet examination, medication adherence and self-monitoring of blood glucose. In the next sessions we will discuss each of the self-care aspects in details.


**Unit 3: Nutrition Therapy**

## Introduction

In this unit we will discuss what is nutrition therapy and the crucial role it plays in diabetes self-care management.

## What is Nutrition Therapy?

Nutrition therapy in type 2 diabetes mellitus management is a healthy eating planning that aims to strike a balance between an individual's food intake and energy expenditure.

***Goals of Nutrition Therapy in T2DM management.***

- To maintain ideal body weight and body mass index.
- To achieve ideal individual glycaemic control
- To prevent development of diabetes related complications.

**Making a healthy meal Plan.**

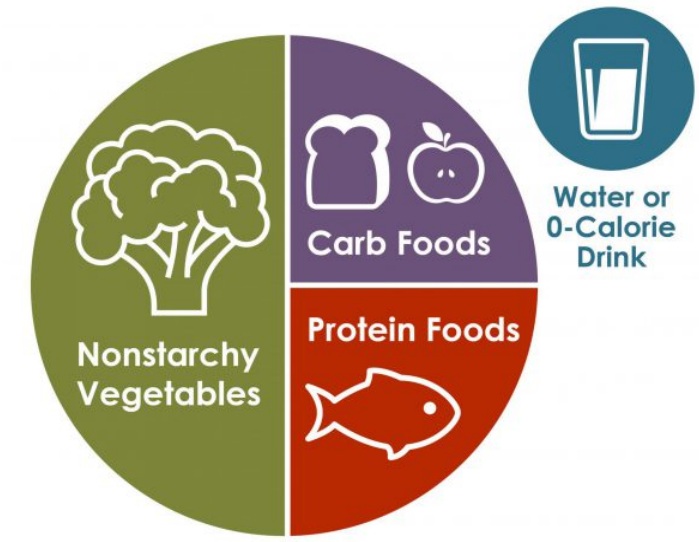
Together with your healthcare provider you should work together to make a meal plan made up of all the nutrients. A nutrition assessment is done before making a healthy meal plan. This ensures that nutrition therapy is individualized and your health-care provider is able to note your readiness for change.

**Components of a Healthy Diet for T2DM**

- **Carbohydrates -** Sources of carbohydrates include fruits, daily products, vegetables, grains and cereals. Foods rich in fiber are encouraged. It is recommended that 60% of calories should come from carbohydrates. Fresh fruit is preferred to fruit juice. If drinking fruit juice one should dilute half juice and half water.
- **Proteins -** Sources of proteins is mostly from meat. E.g. lean meat, chicken meat (minus the skin), fish, eggs,
- **Vegetable –** non starchy e.g. carrots, greens,
- **Daily- Nonfat or Low fat** – e.g. milk,
- **Fruits –** e.g. oranges, grapes etc.
- **Grains –** at least half of your grains for the day should be whole grains e.g. cereals, rice etc.
- **Water –** drink at least 8 glasses or 2 liters of water daily.

**Foods and drinks to limit**

- Foods high in salt
- Sweets such as baked foods, ice cream
- Beverages with added sugars




*Diabetes Meal planning |CDC*

*https://www.myhlms.com/blog/2016/12/20/create-a-healthy-plate-with-more-freedom*

**Unit 4: Physical Activity**

## Introduction

In this unit we will discuss the recommended physical activity among individuals diagnosed with T2DM and the required monitoring. Exercise is a very crucial component of T2DM management because it helps maintain an individual's ideal body weight.

Before commencing physical activity people with type 2 diabetes mellitus are advised to do the following;

- Have your physician conduct a medical examination to rule out any underlying diseases e.g. cardiovascular disorders. If any of the disorders is diagnosed or its risks identified the physician should guide the patient on the best physical activity to carry out.
- Always monitor blood glucose level before and after exercise. The aim of this to help an individual understand their exercise response pattern.
- Demonstrate knowledge on the mechanism of action of insulin and avoid exercise during the peak of insulin action→ there is increased risk to severe hypoglycemia. Therefore, schedule exercise time.
- Always ensure the site of insulin injection is away from the work out limb.

## What are the targets of Exercise?

An individual should target to achieve the following metabolic targets, HbA1C < 7%, blood glucose within the individuals acceptable range, total cholesterol < 5 mmol/l and achievement of an individual's ideal body weight.

## Recommended exercise requirements for people with T2DM

Simple and regular is recommended such as walking for 30 minutes. Other type of exercise include, climbing stairs and perform daily house chores. Frequency of exercise should be at least 3 days per week while duration per exercise should be

individualized with moderate intensity. According to International Diabetes Federation physical activity should be done in phases:

- Phase 1- Warm up phase and should last 10-15 minutes.
- Phase 2 - The actual exercise phase should last 20-45 minutes and
- Phase 3 - The cool down phase lasting 5-10 minutes.

During the actual exercise phase one should ensure that they drink adequate fluid, ensure proper foot wear, examine feet after every exercise session and avoid exercising in extreme temperatures (cold or heat).

**Physical Activity risks among people with Type 2 Diabetes Mellitus.**

During exercise people diagnosed with type 2 diabetes mellitus are at a risk of developing the following complications,

- Hypoglycaemia – risk is high among people on insulin therapy
- Hyperglycaemia – risk is high among individuals with poorly controlled blood glucose and/or insulin under-dose, with other co-morbid (HF), worsening microvascular complications of diabetes (retinopathy) or peripheral neuropathy with soft tissue injuries or foot ulcer.

**Benefits of physical activity in diabetes**

There are a lot of good things about exercise. Exercise helps your heart and lowers your blood pressure. It helps your body fight disease, helps you lose weight, and keeps your spirits up. Keeping fit is good for your diabetes. Your body's insulin use is better if you keep fit.


**Unit 5: Foot Care**

**Introduction**

In this unit we will discuss foot care in type 2 diabetes mellitus, the recommended practices and its importance.

**Why is foot care important in T2DM?**

The feet of individuals diagnosed with diabetes mellitus are at risk for several health problems. This is because of two key risk factors, poor circulation of blood to the feet (peripheral vascular disease) and loss of feeling in the feet (peripheral neuropathy.

**How to perform foot care**

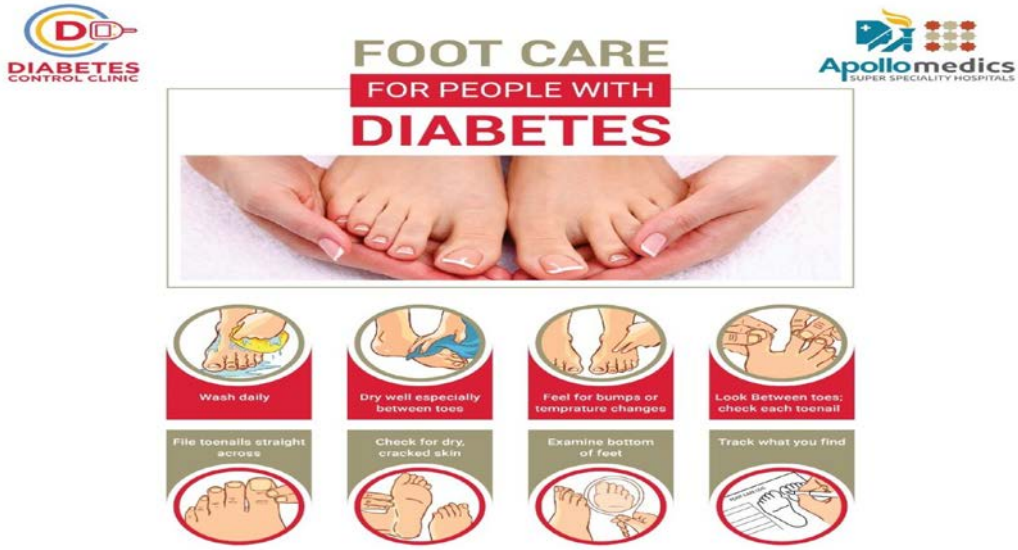
Examine your feet daily – Check for any changes in your skin or nails, any soft tissue injuries, sores or swelling. Have your feet examined during each visit at the clinic and annual appointment with a physician is recommended to have the blood flow and sensation of your foot examined.

Washing your feet – Wash your feet in warm water daily and do not soak them. Ensure you completely dry them and apply lotion avoiding the areas between the toes as this could lead to infections.

Foot wear – Wear shoes with socks and avoid walking barefoot. Buy shoes that fit you well and for the first day wear them for an hour or two until they are completely comfortable to you. The goal is to avoid any injuries. If not wearing shoes wear slippers and avoid walking barefoot.

Foot care – Toenails should be trimmed and sharp edges should be left smooth. Do not attempt to remove cones on your own or use over the counter drugs- have your physician prescribe appropriate management.

Maintaining your feet healthy – when sitting put your feet up and wiggle toes frequent times in a day. Choose exercise that are feet friendly e.g. walking, swimming or bicycle riding.




**Unit 6: Self-Monitoring of blood Glucose**

## Introduction

In this unit we will discuss the importance of monitoring your blood glucose levels and its significance.

## What is self-monitoring of blood glucose?

Self-monitoring can be done using a tiny needle (called a “lancet”) to get a small bit of blood. The fingertip is usually the place that is used. The testing meter will tell you how much sugar is in your blood. You should know the “target ranges” for your blood sugar, ≥7.0 mmol/l before you have had anything to eat or drink (FBS) or 6.7-10.0 mmol/l after meals.

If you know your blood sugar level you can choose types and amounts of food and get to choose how to keep active. If your blood sugar is always in the target range, you are not “cured”, it means that you are doing a good job of managing your diabetes. You will have a better chance at a good quality of life. It is less likely that you will have long term problems from diabetes.

**How often do you monitor your sugar levels?**

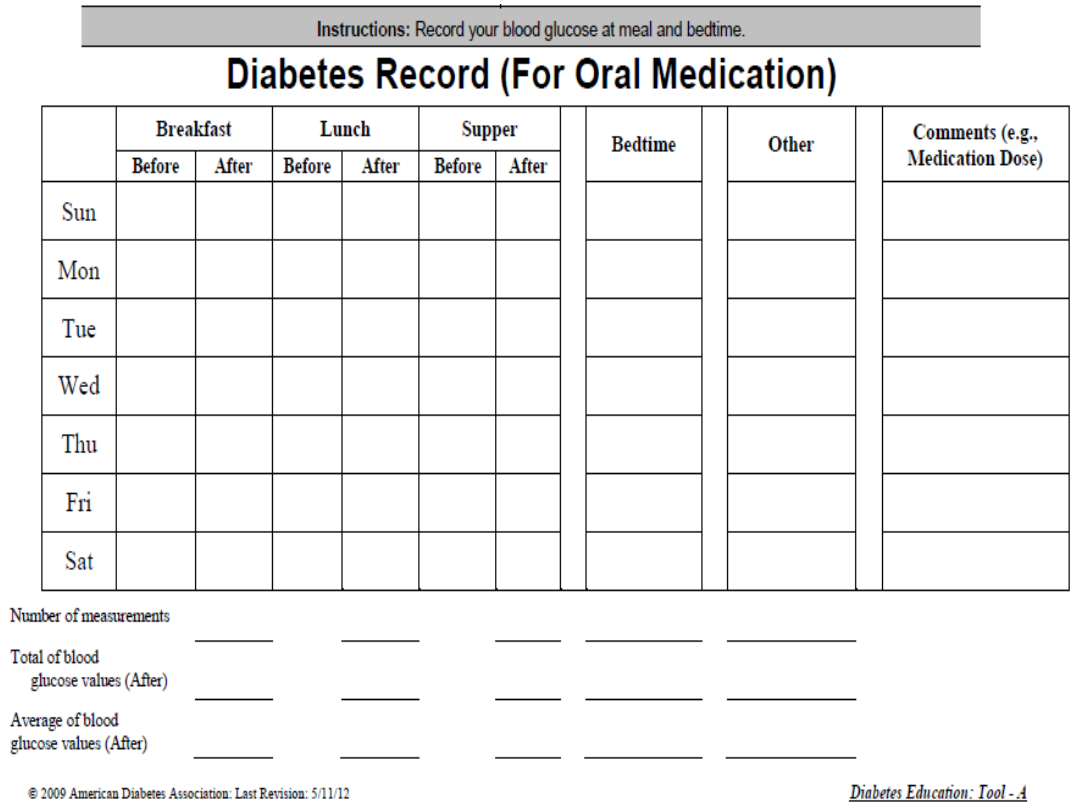
How often to test depends on whether you have type 1 or type 2 diabetes. Also on whether you are on insulin or oral hypoglycemic agents. The American Diabetes Association (ADA) recommends that patients on insulin should monitor their sugar levels each day or more often while those on oral agents should test enough to know if they are achieving their target levels, the ADA does not say how often to test. It is also recommended to monitor your sugar levels before and after exercise. Also, monitor the sugar levels two hours after any meal that is out of your routine e.g. a party.

**Benefits of monitoring your blood sugar levels**

It is the only way you can tell if the lifestyle changes you are making are working such us, health eating, exercise or your medicine. Also, through testing patients are able to spot the signs and symptoms that may accompany hyperglycemia or hypoglycemia. Through self-monitoring patients are involved in their management and are tuned on how best to control their sugar levels. There is a link between the frequency of monitoring blood sugar levels and HbA1c levels in that through monitoring one can know high or low sugar levels and is able to intervene early.

**Helpful tips for monitoring blood sugar levels**

Keep record of all your blood sugar monitoring and always bring it to your doctor during your hospital visits. Be able to interpret your findings. If your sugar levels are too high or too low be able to determine the cause e.g. have you eaten too little or too much? Have you been active than usual?



Instructions: Record your blood glucose at meal and bedtime.

## Diabetes Record (For Oral Medication)

| | Breakfast | | Lunch | | Supper | | Bedtime | Other | Comments (e.g., Medication Dose) |
|---|---|---|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After | | | |
| Sun | | | | | | | | | |
| Mon | | | | | | | | | |
| Tue | | | | | | | | | |
| Wed | | | | | | | | | |
| Thu | | | | | | | | | |
| Fri | | | | | | | | | |
| Sat | | | | | | | | | |
| Number of measurements | | | | | | | | | |
| Total of blood glucose values (After) | | | | | | | | | |
| Average of blood glucose values (After) | | | | | | | | | |



*Diabetes Education: Tool - A*

**Unit 7: Diabetes and Alcohol**

## Introduction

According to American Diabetes Association before taking alcohol, an individual diagnosed with diabetes should ask themselves the following three questions:

- Is my diabetes in good control?
- Does my health care team agree that I can have alcohol?
- Do I know how alcohol can affect me and my blood sugar?

## What happens when you drink alcohol?

Between meals and while sleeping, the liver makes new glucose (sugar). The liver then sends this sugar into the bloodstream. Here, it helps to prevent or slow down a low blood sugar reaction. When you drink alcohol, it disrupts the process. Substances

form when alcohol breaks down in the liver. These substances block the liver from making new glucose. Blood sugars fall and this can quickly become too low.

**Hypoglycemia can mimic effects of alcohol**

Some symptoms of low blood sugar can look the same as being drunk. The ones that are most common to both are feeling dizzy, light headed, or confused; and getting sleepy. Your friends may think your signs of low blood sugar are due to drinking. They may not realize you need help. Make sure your friends know that low blood sugar can look like being drunk. Wear or carry some form of ID that says you have diabetes.

**When to avoid alcohol**

Having one drink at a party is not a problem for most people. For some people, it is best to avoid alcohol. This is true if you have long term problems from diabetes. You have to be cautious if you have the conditions below. Drinking can make these worse:

- Burning or tingling in your hands and feet if you have nerve damage (diabetic neuropathy)
- Damage to your eyes damage (diabetic retinopathy)
- Blood pressure that is not controlled
- High triglycerides
- Damage to your kidneys.

## Unit 8: Diabetes and Smoking

**Introduction**

Smoking narrows blood vessels, reduces amount of oxygen carried in the body, causes damage to blood vessels and raises blood sugar

**How smoking hurts people diagnosed with T2DM**

People with diabetes who smoke are putting their lives at risk. Smoking raises an individual's risk for heart attack, lung cancer and stroke. People with diabetes are more likely to have a heart attack or stroke. Four times more likely! If an individual is a smoker and have diabetes, there risk goes up. They are 11 times more likely to have a heart attack or stroke.

Smoking hurts more than just the heart. It also raises an individual's blood sugar levels and their risk for other health problems that diabetes may cause. Example of these health problems are more damage to nerves and blood vessels, more serious foot problems like slow-healing wounds and more kidney damage.

**Way Forward**

- Staying off cigarettes

**Unit 9: Diabetes and Infections**

## Introduction

Diabetes increases your risk for all kind of infections this is because when blood sugar remains high, the stage is set for germs and fungi to grow.

## Why are people with diabetes more prone to infections?

High blood sugar levels can weaken a person's immune system defenses. People who have had diabetes for a long time may have peripheral nerve damage and reduced blood flow to their extremities, which increases the chance for infection. Some of the most common areas in the body that are prone to infection in people living with diabetes are, yeast infection, urinary tract infection, gums, feet and wounds.

## What is the way forward?

In case of an infection, one should see a doctor sooner than later and have the infection treated right away.

## Unit 9: Diabetes and Stress

### Introduction

As human beings we do our best to balance work, family and everything around us. Now, when you get diagnosed with diabetes your life becomes more stressful, because diabetes is with you all the time.

### What are the immediate effects of stress?

Stress can hurt your body because it can contribute to high blood pressure, heart disease and stroke. Stress can also have a quick and powerful effect on your blood sugar level. When you are stressed, your body releases stress hormones. This happens if you have diabetes or not. We call this “fight or flight” hormones and they help your body prepare to deal with the source of stress. These hormones raise your blood sugar levels that is meant to give the body extra fuel you need to fight or flee from stress. In people without diabetes extra blood sugar doesn’t cause much of a problem. But it presents a big problem if you have diabetes because your pancreas does not work well and it can’t give you enough insulin to get your blood sugars back down. Your blood sugars may stay high unless you take action to bring them back down.

### What are the long-term effects of stress?

It is a lot of work to take care of diabetes and the rest of your life. That effort can be too much and you may feel a lot of stress. Too much stress drains a person’s drive for diabetes care. Less active care leads to higher blood sugars. Your body may feel worse. You may feel guilty and scared. This creates more stress. It can feel like you are in a hole, and you are going deeper and deeper. You know things aren’t right; you want to turn them around, but the cycle of stress has got you down.

### What can you do to manage stress?

Stress is a big problem for many with diabetes. But, there are things you can do to manage it. First, you should try to figure out what things cause you the most stress.

You should at least think of one thing that's bothering you a lot, if you can spot what makes you stressed, you can pick the best way to get your stress down.

**Common sources of stress in diabetic patients**

- Watching what you eat every day
- Taking your medicine every day
- Testing your blood sugar as you should
- Feeling bad from blood sugar levels that go up and down
- Fear of diabetes health problems
- Dealing with diabetes health problems

**How to manage stress**

- Change your situation when you can→ Change how you think about your situation

  E.g. keep foods that tempt you out of the house.
- Change your response→ when you cannot change your situation then try to change how you respond to stressful times.

**Unit 10: Goal Setting**

**Introduction:**

In this unit we all study participants will be guided on how to set goals on their self-care practices based on the health education they have just received. The goal is to help them achieve good clinical outcome.

**Goal Setting**

Each participant will develop an individual action plan which will include adherence to prescribed treatment, monitoring of blood sugar levels, foot care, physical activity and diet. Each participant will be taught on how to interpret the clinical parameters and make informed decision to improve any of the results. After the counselling sessions, text messages will be sent regularly to each participants with the aim of

activating them to carry out the recommended self-care practices. Checklists will be provided and all the participants will be required to keep a record of their self-activation practices.

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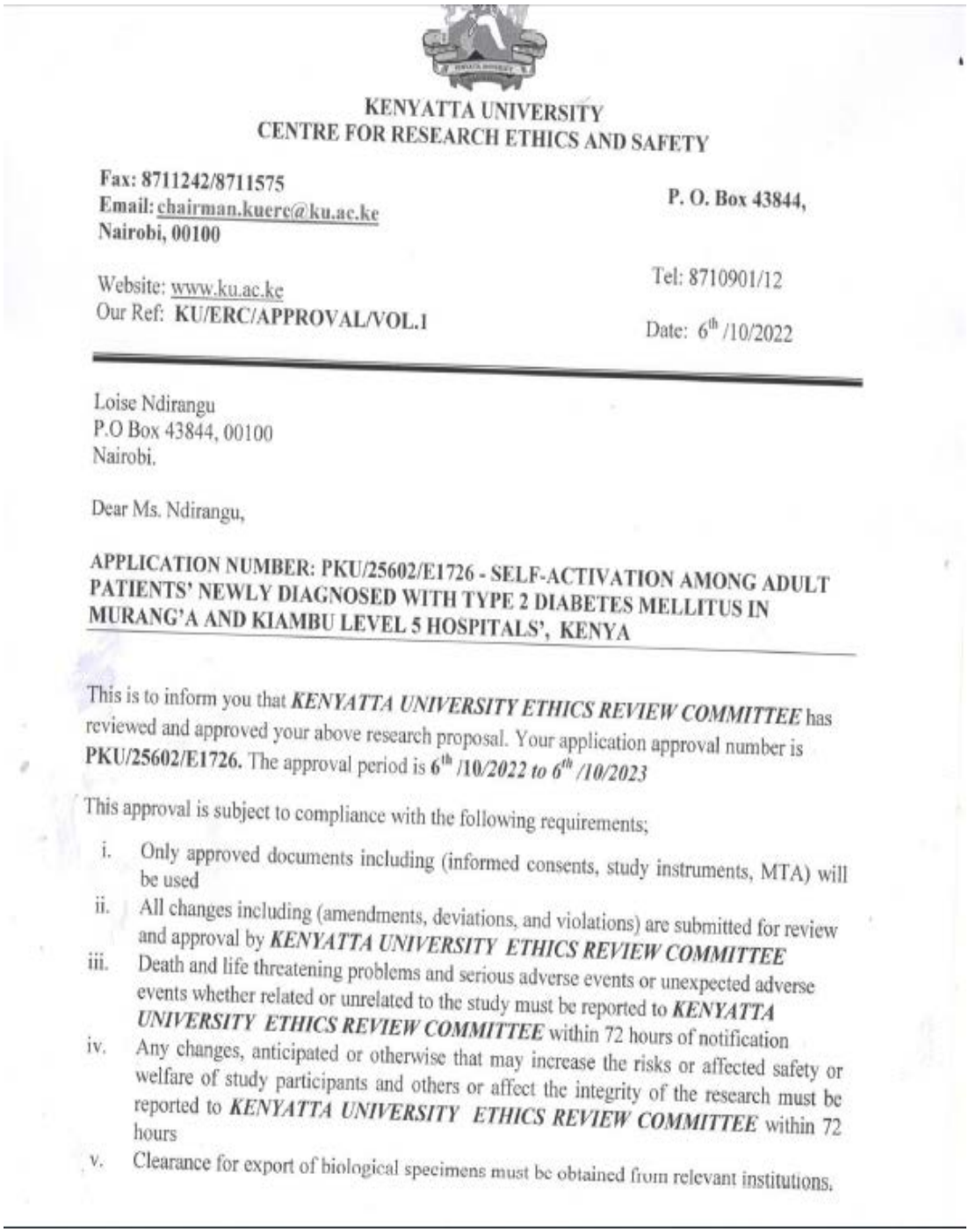
## Appendix XV: Ethics Review Committee Approval



KENYATTA UNIVERSITY
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Our Ref: KU/ERC/APPROVAL/VOL.1

Tel: 8710901/12

Date: 6th /10/2022

Loise Ndirangu
P.O Box 43844, 00100
Nairobi.

Dear Ms. Ndirangu,

**APPLICATION NUMBER: PKU/25602/E1726 - SELF-ACTIVATION AMONG ADULT PATIENTS' NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN MURANG'A AND KIAMBU LEVEL 5 HOSPITALS', KENYA**

This is to inform you that ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** has reviewed and approved your above research proposal. Your application approval number is **PKU/25602/E1726.** The approval period is ***6th /10/2022 to 6th /10/2023***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY 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 ***KENYATTA UNIVERSITY 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 ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.

vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***

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

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following website link; ;(https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_VIn0xbxg3uGdlDzMXFWNDsMrRPQ/edit?usp=sharing

Yours sincerely

KENYATTA UNIVERSITY
OFFICE OF THE CHAIRMAN
06 OCT 2022
ETHICS REVIEW COMMITTEE
P.O. BOX 43844 - 00100 NAIROBI

**Prof. Judith Kimiywe**

**Director: Centre for Research Ethics and Safety**

## Appendix XVI: NACOSTI License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 848983

Date of Issue: 07/November/2022

RESEARCH LICENSE

This is to Certify that Miss. Loise Nyambura Ndirangu of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kiambu, Muranga on the topic: SELF-ACTIVATION AMONG ADULT PATIENTS' NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN MURANGA AND KIAMBU LEVEL 5 HOSPITALS', KENYA for the period ending : 07/November/2023.

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## Appendix XVII: Publications



East African Medical Journal Vol. 101 No. 4 April 2024

ACTIVATION LEVELS AMONG ADULT PATIENTS NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN SELECTED LEVEL FIVE HOSPITALS, KENYA

Loise Ndirangu, School of Nursing, Jomo Kenyatta University of Agriculture and Technology (JKUAT) P.O BOX 6200-00200, Nairobi, Kenya, Bernard Mbithi, School of Nursing, Jomo Kenyatta University of Agriculture and Technology (JKUAT) P.O BOX 6200-00200, Nairobi, Kenya, Wallace Karuguti, School of Medicine, Jomo Kenyatta University of Agriculture and Technology (JKUAT) P.O BOX 6200-00200, Nairobi, Kenya, Lister Onsongo, School of Nursing, Kenyatta University, P.O BOX 43844 Nairobi, Kenya.

Corresponding author: Loise Ndirangu, School of Nursing Sciences, Jomo Kenyatta University of Agriculture and Technology, (JKUAT), PO BOX 6200-00200, Nairobi, Kenya. Email: nndirangu35@gmail.com

# ACTIVATION LEVELS AMONG ADULT PATIENTS NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN SELECTED LEVEL FIVE HOSPITALS, KENYA

L. Ndirangu, B. Mbithi, W. Karuguti and L. Onsongo

## ABSTRACT

***Background*: Globally, prevalence of diabetes related complications has been on the rise and linked to poor skills and knowledge on the recommended self-care practices.**

***Objective*: To establish activation levels among adult patients newly diagnosed with Type 2 Diabetes Mellitus (T2DM).**

***Method*: Descriptive cross-sectional design was utilized to collect data from 124 randomly selected patients who were newly diagnosed with T2DM in the selected health care facilities. Data was collected using a closed ended questionnaire and the Patient Activation Measure® then analyzed using SPSS version 26. Descriptive analysis was done to generate frequencies while chi-square was done to assess association between the independent and dependent variables using a confidence interval of 95%.**

***Results*: Females were the majority 70 (56.5%) with most participants 35 (28.3%) being between 60-69 years. Regarding duration of T2DM since diagnosis majority 45 (36.3%) reported four months. Only 45 (36.3%) had normal Body Mass Index (BMI) while 42 (33.9%) were obese. Low patient activation levels were noted in 88 (71.0%) of the study participants. The mean (SD) for the patient activation levels was 53.28 (±7.27) corresponding to activation level 2. Variables found to have a statistically significant association were religion (p=0.024) and clinical duration of T2DM (P=0.031).**

***Conclusion*: Activation levels were found to be low indicating low levels of confidence, knowledge and skills among adult patients newly diagnosed with T2DM. Therefore, clinicians need to adopt evidence-based strategies aimed at empowering newly diagnosed patients so as to activate them in adjusting their self-care practices.**

East African Medical Journal Vol. 101 No. 11 November 2024
SELF-CARE PRACTICES AMONG ADULT PATIENTS NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN SELECTED LEVEL FIVE HOSPITALS IN KENYA
Loise Ndirangu, School of Nursing, Jomo Kenyatta University of Agriculture and Technology, (JKUAT), PO BOX 62000-00200 Nairobi, Kenya, Bernard Mbithi, School of Nursing, Jomo Kenyatta University of Agriculture and Technology, (JKUAT), PO BOX 62000-00200, Nairobi, Kenya, Wallace Karuguti, School of Medicine, Jomo Kenyatta University of Agriculture and Technology (JKUAT) P.O BOX 62000-00200, Nairobi, Kenya, Lister Onsongo, School of Nursing, Kenyatta University, P. O BOX 43844-00100 Nairobi, Kenya.

Corresponding author: Loise Ndirangu, School of Nursing Sciences, Jomo Kenyatta University of Agriculture and Technology, (JKUAT), PO BOX 62000-00200, Nairobi, Kenya. Email: nndirangu35@gmail.com

# SELF-CARE PRACTICES AMONG ADULT PATIENTS NEWLY DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN SELECTED LEVEL FIVE HOSPITALS IN KENYA

L. Ndirangu, B. Mbithi, W. Karuguti and L. Onsongo

## ABSTRACT

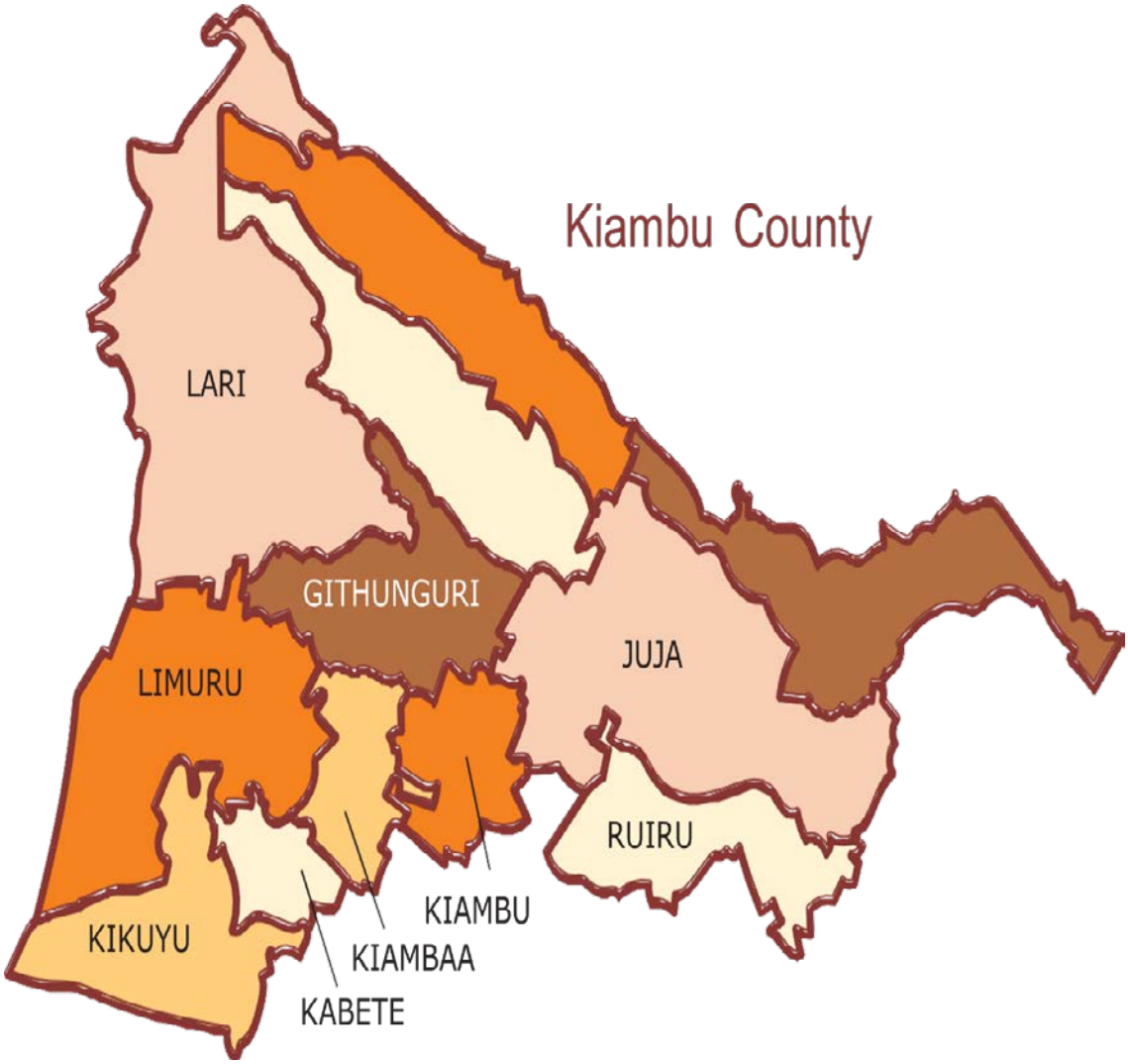
***Background*: Self-care practices refers to patient's real-life application of the knowledge acquired on diabetes management. In Kenya, the prevalence of diabetes related complications has been on the rise and this has been linked to poor self-care practices.**

***Objective*: To determine the self-care practices among adult patients newly diagnosed with Type 2 Diabetes Mellitus (T2DM).**

***Materials and Methods*: Descriptive cross-sectional design was adopted. A total of 124 patients newly diagnosed with T2DM were randomly recruited from the selected hospitals. Data was collected using a questionnaire modified from the Diabetes Self-Management Questionnaire (DSMQ). Descriptive analysis was done to generate frequencies while chi-square was used to assess association between variables ($p \leq 0.05$ at 95% CI).**

***Results*: Of 124 respondents, 70 (56.5%) were females with most 35 (28.2%) belonging to the age group between 60-69 years. Regarding the duration of T2DM since diagnosis, 45 (36.3%) reported that they were diagnosed at least four months ago. Poor self-care practices were noted in 69 (55.6%) of the respondents, with the**

**Appendix XVIII: Map of the Study Area**


Kiambu County
LARI
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LIMURU
JUJA
RUIRU
KIAMBU
KIAMBAA
KIKUYU
KABETE