FACILITATORS AND BARRIERS TO ADHERENCE TO NUTRITION COUNSELING SESSIONS AMONG PATIENTS WITH TYPE 2 DIABETES AT NAKURU COUNTY REFERRAL HOSPITAL

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A Thesis Submitted to the Institute of Postgraduate Studies of Kabarak University in Partial Fulfilment of the Requirements for the Award of Master of Science in Human Nutrition and Dietetics Degree

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NOVEMBER, 2025

DECLARATION

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The thesis entitled '**Facilitators and Barriers to Adherence to Nutrition Counseling Sessions among Patients with Type 2 Diabetes at Nakuru County Referral Hospital;** written by **Josephine Alungata**, is presented to the Institute of Postgraduate Studies of Kabarak University. We have reviewed the thesis and recommend it be accepted in partial fulfillment of the requirement for the award of the degree of Master of Science in Human Nutrition and Dietetics.

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DEDICATION

It is with my deepest and most sincere gratitude that I dedicate this thesis to my father for his constant encouragement, unconditional love, and support throughout the study.

Lastly, I dedicate this work to all persons living with Type 2 diabetes, their healthcare providers, and primary caregivers. May this work contribute to solutions to the challenging responsibility of ensuring optimal adherence to diabetes treatment.

ABSTRACT

Type 2 diabetes mellitus is a metabolic disorder characterized by elevated blood glucose levels caused by insulin resistance and relative insulin deficiency. Nutrition counseling is an evidence-based nutrition care process provided by a licensed healthcare provider that promotes healthy eating habits, portion control, and informed dietary choices. However, research on adherence to nutrition counseling sessions in Kenya remains limited. The study examined the Facilitators and Barriers to Adherence to Nutrition Counseling Sessions among Patients with Type 2 Diabetes at Nakuru County Referral Hospital. The study applied a mixed-methods research design, an explanatory sequential design, and involved 396 patients with type 2 diabetes and 4 healthcare providers. The study participants were selected through probability and purposive sampling. The study combined cross-sectional and phenomenological approaches. Data was collected using research-administered questionnaires, in-depth interview guides, and key informant interview guides. Quantitative data were analyzed using SPSS (Version 26). Descriptive statistics was used to summarize data. The relationship between selected variables was tested using the chi-square test, and Logistic regression was used to predict outcome variables. Qualitative data were analyzed using inductive thematic analysis and presented based on the high-ranking themes with quotes from the respondents. The study revealed that most respondents were female (62%) and in the 51-70 age bracket, potentially facing challenges in managing diabetes due to comorbidities and physical limitations. Education levels varied, with 43.5% having at least primary education and 13.5% having no formal education. Additionally, 36.1% were not currently employed. This study found that adherence to nutrition counseling sessions was low. Health status data showed that 88.1% had been diagnosed with Type 2 diabetes for over a year, and yet 45.2% had not attended nutrition counseling sessions in the past six months, and 32.7% had attended only once, indicating non-adherence. Chi-square tests revealed no significant association between adherence and socio-demographic factors ($p > 0.05$), while logistic regression revealed health-related factors, such as complications ($p = 0.036$) and regular clinic attendance ($p = 0.001$), as significant predictors of adherence. Barriers to adherence identified included financial constraints, comprehension issues, and logistical challenges, while enablers included positive perceptions of nutrition counselling sessions, positive reception from healthcare providers, and family support. The study recommends strategies to improve patients' access to essential diabetes management services, such as integrating nutrition counseling sessions into diabetic support groups and routine care visits to reduce costs and enhance convenience, which could improve adherence rates and patient health outcomes.

Keywords: *Barriers; Facilitators; Nutrition Counseling Sessions; Adherence Type 2 Diabetes*

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LIST OF ABBREVIATIONS AND ACRONYMS

DSMES:	Diabetes Self-Management Education and Support
IDF:	International Federation of Diabetes
KUSEREC:	Kabarak University Scientific and Ethics Review Committee
KHIS:	Kenya Health Information System
KII:	Key Informant Interview
MOH:	Ministry of Health, Kenya
NACOSTI:	National Commission for Science, Technology and Innovation
NCDs:	Non-communicable diseases
SDT:	Self-determination theory
WHO:	World Health Organization
SPSS:	Statistical Package for the Social Sciences
CVI:	Content Validity Index

CONCEPTUAL AND OPERATIONAL DEFINITION OF TERMS

Adherence - Attendance of at least three nutrition counseling sessions with a registered healthcare provider within the last six months.

Barriers - Factors that hinder, limit, or prevent people from engaging in certain behaviors.

Enablers - Factors that encourage, facilitate, or assist individuals in engaging in certain behaviors.

Non-adherence - The degree to which patients' behavior doesn't concur with the health provider's medical advice or recommendations (Blackburn et al., 2013).

Nutrition - The process of acquiring or providing the necessary food for health and growth.

Nutrition Counseling - A continuous and collaborative process between a healthcare provider and a patient to evaluate their typical dietary habits, pinpoint their nutritional challenges, determine their needs and objectives, explore strategies to achieve these goals, and agree on future actions.

Patient-Provider Relationship - Refers to the caring, professional, and interactive relationship between a healthcare provider and a patient, based on mutual consent and clear boundaries, for the patient's therapeutic benefit (Honavar, 2018).

Perception - Perception refers to how an individual perceives, understands, or interprets something.

Type 2 Diabetes - A chronic disease that results from insufficient insulin production or ineffective insulin usage, leading to high blood sugar levels (WHO, 2022).

CHAPTER ONE

INTRODUCTION

The study is introduced in this section with a discussion of its background information, stating the problem, outlining the purpose and objectives, presenting research questions, justifying the study, and discussing its significance and limitations.

1.1 Background Information

Type 2 diabetes is caused by the body's inability to properly utilize insulin, leading to a chronic health condition that affects individuals over a prolonged period (WHO, 2022). Over time, uncontrolled diabetes can cause damage to the body's nerves and blood vessels due to hyperglycemia, which is high blood glucose. (WHO, 2022). The longer an individual lives with diabetes, with poorly controlled blood glucose levels, the higher their risk of developing complications that develop gradually over time (Olwendo et al., 2020). The consequences arising from diabetes can be severe and have the potential to cause disability or even be life-threatening (Olwendo et al., 2020).

The prevalence of diabetes is rapidly increasing, making it an important global health concern of the 21st century (IDF et al., 2022). Globally, in 2021, it was estimated that the prevalence of diabetes was 537 million people aged between 20 and 79 years of age. This figure is projected to increase to 643 million by 2030 and continue rising to 783 million by 2045 (IDF et al., 2022). In Africa, 1 in 22 adults has diabetes, amounting to 24 million people with diabetes (IDF et al., 2022). By 2045, Africa is projected to have the highest increase in the number of individuals with diabetes among IDF regions, reaching 55 million people, which is a 129% rise (IDF et al., 2022).

The prevalence of diabetes in sub-Saharan Africa (SSA) is acknowledged as a significant health system challenge. (IDF et al., 2022). Current estimates suggest that diabetes

mellitus affects approximately 2.1-6.0% of the population, with predictions indicating that this number will double within the next 25 years (IDF et al., 2022). In Kenya, the current prevalence of diabetes is estimated to be 3.3%, and it is expected to rise to 4.5% by 2025 (Diabetes Statistics in Kenya, 2021). In Nakuru County, the prevalence of diabetes is estimated to be 6.6% (Kones et al., 2016).

Type 2 Diabetes can lead to complications in different body areas, raising the risk of premature death. (Roglic & World Health Organization, 2016). Type 2 diabetes is the fourth leading contributor to non-communicable disease-related deaths globally (Mohamed et al., 2018). The expenses related to diabetes healthcare have already reached almost one trillion dollars in the United States and are projected to surpass this amount by the year 2030 (IDF et al., 2022).

In 2021, diabetes and its complications were responsible for the deaths of around 6.7 million adults globally, making it a significant cause of mortality (IDF et al., 2022). In 2021, diabetes caused 416,000 deaths in Africa (IDF et al., 2022). The number of deaths caused by Diabetes in Kenya was 15,285 in 2021 (IDF et al., 2022). Ninety percent of all diabetes cases are attributed to type 2 diabetes (IDF et al., 2022).

The rise in urbanization has led to changes in lifestyle, particularly in nutrition, which is linked to the rise in diabetes cases (Olwendo et al., 2020). As countries and societies become, on average, wealthier, more urbanized, and more open to global trade, people's diets and lifestyles change (Breewood, 2018). The shift from traditional diets to more westernized diets high in fats and sugars, processed foods, and low fibre, along with more sedentary lifestyles, is driving the rise in diabetes, these changes in diets and lifestyles have been described by a model called the "nutrition transition" (Breewood, 2018; Hawkes et al, 2017). This transition is increasingly associated with diabetes in low- and middle-income countries, driven by poor diets, physical inactivity, and obesity

(Breewood, 2018). According to the "nutrition transition" model, changes in diet and lifestyle have implications for both health and environmental sustainability (Breewood, 2018; Hawkes et al., 2017).

Nutrition counseling is an essential part of managing diabetes. Individuals with diabetes should participate in education, self-care, and treatment planning with their healthcare providers, including collaborating on a personalized diet plan (American Diabetes Association, 2022; Funnell et al., 2011). Essential components of nutrition counseling include assessment, nutrition diagnosis, education and counseling interventions, continuous monitoring, follow-up, and support to promote long-term lifestyle changes, assessing outcomes, and adjusting interventions as necessary (American Diabetes Association, 2022). It is essential to prioritize diet management when controlling type 2 diabetes, which involves seeking nutrition counseling to maintain blood glucose levels within a normal range and minimize the risk of potential complications (Davis et al., 2022; Pastakia et al., 2018; Musee et al., 2016; Mutwiri, 2014).

The American Diabetes Association recommends three to four nutrition counseling sessions with a registered healthcare provider, beginning at diagnosis of type 2 diabetes or first referral, completed within three to six months, and at least one follow-up session every six to twelve months (American *et al*., 2023; Evert *et al.*, 2014; Franz *et al*., 2010). The patients' diets are modified to suit their needs, preferences, socioeconomic status, demographics, cultural practices, and motivation to change dietary and lifestyle habits. (Musee *et al*., 2016; American Diabetes Association, 2016).

Providing appropriate and timely care for all people with diabetes early on reduces the burden on healthcare systems and affected individuals (Kones et al., 2016; IDF et al., 2022; Pastakia et al., 2018). Effective therapy for diabetes requires adherence to nutrition counselling sessions, but it remains a challenge in many developing countries (Jepkemoi

et al., 2021). Non-adherence to nutrition counseling sessions among patients with Type 2 Diabetes in Kenya can be caused by multiple factors, which may originate from the patient or the healthcare provider (Musee et al., 2016). These factors include: the high cost of healthcare, limited understanding of their illness, lack of support from family members in their daily self-care routines, complicated medication schedules, and conflicting advice from healthcare providers (Jepkemoi et al., 2021; Ngari et al., 2020; Waari et al., 2018; Roglic & World Health Organization, 2016).

Extensive evidence exists regarding the value of nutritional counseling for diabetes. However, most studies focus on the effectiveness of counseling rather than the relationship between healthcare providers and patients over time. Effective interactions between patients and healthcare providers are crucial for the success of medical and nutrition treatments (Nagy et al., 2022). In Kenya, there is still an insufficient amount of research conducted on factors influencing adherence to diabetes management, particularly regarding adherence to nutrition counselling sessions and treatment among people who have been diagnosed with type 2 diabetes (Waari et al., 2018). The study examined facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital.

1.2 Statement of the Problem

Kenya is facing challenges due to poor management and a rise in diabetic risk factors (Mohammed & Sharew, 2019; Musee et al., 2016). In a cross-sectional study conducted in Kenya, only 45.5% of patients with type 2 diabetes adhered fully to their prescribed medications and nutrition treatments (Waari et al., 2018). Other studies have revealed that patients who do not follow their recommended clinical regimens, including nutrition counselling session attendance, tend to experience more negative outcomes, including

diabetes-related complications. (Khattab et al., 2010; Wabe et al., 2011; Waari et al., 2018).

Poor adherence to nutrition counselling sessions is associated with high levels of glucose and cholesterol, resulting in chronic complications, increased morbidity and mortality, more frequent hospital admissions, poor health outcomes, decreased productivity, extended hospital stays, and higher healthcare costs, which puts a strain on the already limited healthcare resources (Godman et al., 2020; Mao et al., 2019; Waari et al., 2018; Musee et al., 2016).

Adherence to nutrition counselling sessions is a possible approach to reducing the adverse effects of poorly controlled diabetes (American Diabetes Association, 2022; Jepkemoi et al., 2021). This approach has been shown to reduce the costs of treating complications resulting from poorly controlled type 2 diabetes and improve the quality of life (American Diabetes Association, 2022; Jones, 2013). The findings from this study will help in the development of strategies to optimize nutritional counselling sessions, therefore improving adherence to nutritional care and treatment for patients diagnosed with type 2 diabetes and overall management of the disease.

1.3 Objectives of the Study

1.3.1 General Objective of the Study

This study examined the facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital.

1.3.2 Specific Objectives of the Study

i. To describe the socio-demographic characteristics of patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.

ii. To assess the adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.

iii. To investigate the enablers of adherence to nutrition counselling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.

iv. To investigate the barriers to adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.

v. To determine the association between socio-demographic characteristics and adherence to nutrition counselling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital.

vi. To assess how health-related characteristics influence adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital.

1.4 Research Questions

i. What are the socio-demographic characteristics of patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital?

ii. What is the level of adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital?

iii. What are the Enablers of adherence to nutrition counselling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital?

iv. What are the barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital?

v. What is the association between socio-demographic characteristics and adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital?

vi. How do health-related characteristics influence adherence to nutrition counselling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital?

1.5 Justification for the Study

The healthcare system in Kenya is facing a difficult challenge due to the increasing prevalence of non-communicable diseases (Jepkemoi et al., 2021; Roglic & World Health Organization, 2016). Diabetes negatively impacts Kenya's healthcare system and broader economy due to decreased workforce productivity and high financial burden (Jones, 2013). In Kenya, diabetes poses a significant challenge due to poor management, as it is a major contributor to renal failure, lower limb amputation, and blindness (Diabetes Statistics in Kenya, 2021; Jepkemoi et al., 2021; Roglic & World Health Organization, 2016).

Nutrition counseling is a possible approach to reduce the adverse effects of poorly controlled diabetes (American Diabetes Association, 2022; Jepkemoi et al., 2021). There is also a need to reduce the costs of treating complications resulting from poorly controlled type 2 diabetes (Jones, 2013). It is essential to consider evidence-based methods to improve adherence to nutrition counselling sessions for individuals with type 2 diabetes (Jepkemoi et al., 2021; Nagy et al., 2022). Improving patients' adherence to interventions could potentially impact population health more than advancements in particular medical treatments (Brown & Bussell, 2011).

The study's findings will help improve approaches regarding nutritional counselling sessions, therefore improving adherence to nutritional care and treatment for patients diagnosed with type 2 diabetes and overall management of the disease. The promotion of good health and well-being is a key focus of the study, aligning with the objectives of Sustainable Development Goal 3. The target for 2030 is to reduce premature deaths

caused by non-communicable diseases by one-third through prevention and treatment interventions and promoting mental health and overall well-being (Targets of Sustainable Development Goal 3, 2023).

The study's findings will help inform Nakuru County healthcare providers and health facilities on implementing and evaluating nutrition counselling sessions for managing and controlling type 2 diabetes. The study will be vital in influencing hospital standard operating procedures in diabetes care across the country and will provide information and knowledge to other researchers interested in the related field. The study will influence national health approaches and contribute to achieving universal health coverage (Universal Health Coverage, 2023). Additionally, the study will inform national policy on diabetes care. Finally, the study will guide policymakers in developing policies and guidelines for improving type 2 diabetes management and awareness.

1.6 Scope of the Study

The study examined facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital. The study targeted a population comprising patients with Type 2 diabetes and healthcare providers at the hospital. The accessible population included 5,498 patients actively receiving care from a total of 47,379 registered Type 2 diabetes patients at the facility, along with approximately 1,500 healthcare providers (KHIS, 2022; Kenya Ministry of Health Data, 2023).

The research was conducted over three months, utilizing a mixed-methods approach that combined qualitative and quantitative methodologies. A sample of 396 patients and 4 healthcare providers was selected. For the qualitative component, sampling continued until data saturation was achieved, ensuring no new insights emerged and information became redundant.

The study examined key variables, including socio-demographic characteristics, patient-provider interactions, and systemic barriers such as insurance-related challenges. Data collection methods included in-depth interviews, key informant interviews, and quantitative surveys, enabling a comprehensive analysis of the facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital.

1.7 Limitations of the Study

i. The participants might have withheld certain information relevant to the study.

ii. The methodology and research instruments were used to collect information recalled by participants, introducing the potential for recall bias.

iii. Qualitative analysis carries the risk of researcher bias in data interpretation.

1.8 Delimitations of the Study

i. The limitation on participants withholding information was controlled by assuring the participants of confidentiality and that their names would remain anonymous.

ii. Both qualitative and quantitative data were used to triangulate the data.

iii. The study minimized potential researcher bias in qualitative analysis by involving an independent reviewer to validate the accuracy and objectivity of the thematic analysis.

CHAPTER TWO

LITERATURE REVIEW

This chapter summarizes the literature, discusses the theoretical and empirical reviews, presents the conceptual framework, and identifies research gaps.

2.1 Introduction

Conducting theory-based research is crucial for identifying factors that affect health outcomes, including patient motivation and experiences (Deci & Ryan, 2008). Understanding what influences an individual's action is the first critical step in understanding adherence to nutrition counseling sessions in people with type 2 diabetes provided by healthcare providers (Deci & Ryan, 2008).

Several theoretical approaches have been used in nutrition counselling sessions, such as the theory of planned behavior, health belief model, rational emotive behavior therapy, self-determination theory, and social cognitive theory (Hardeman et al., 2010; Journal of Nutrition Information, 1995). This review will discuss the social cognitive approach as one of the most commonly used theories in nutrition counselling sessions (Baranowski et al., 2002; Mimiaga et al., 2009; Ntoumanis et al., 2021).

2.2 Social Cognitive Theory

The social cognitive theory offers principles and predictors for educating, facilitating, advising, and encouraging people to develop habits that improve their health and lessen those that harm it (Benight et al., 2004). For healthy behavior change to be successful, several moderators must be identified as potential Enablers or barriers. These modifiers consist of the degree of one's efficacy, the symbiotic link between one's surroundings and oneself, and the nature and quantity of social influences (Benight et al., 2004).

Social cognitive theory can be organized into five domains: psychological determinants, learning through observation, environmental determinants, self-regulation, and moral disengagement. These domains focus on how outcomes, self-efficacy, role models, motivation, environment, society, individual interaction, self-monitoring, feedback, goal setting, and perception of existing behavior affect behavior change (Benight & Bandura, 2004).

A study investigated the impact of a social cognitive theory-based educational program on the self-care habits of patients with type 2 diabetes (Ghoreishi et al., 2019). The study was conducted in two stages: descriptive and interventional. In the descriptive stage, the influential factors and constructs of the social cognitive theory were identified. In the interventional stage, a total of 120 patients with type 2 diabetes were randomly divided into two groups - an experimental group and a control group- to assess the effects of the intervention. According to the findings, self-care habits were influenced by emotional adaptation, self-efficacy in overcoming obstacles, and self-regulation (Ghoreishi et al., 2019). The social cognitive model suggests that interventions positively affect diabetes self-care in patients (Ghoreishi et al., 2019). Therefore, interventions that use social cognitive theory and focus on personal, mental, environmental, and behavioral factors are more effective in promoting adherence to healthy lifestyle behaviors (Ghoreishi et al., 2019).

The social cognitive theory acknowledges both the influence that the environment and individual characteristics, such as attitude, have on a person and the impact that person has on their surroundings. The three-way relationship between these variables is known as reciprocal determinism. The idea of reciprocal determinism supports the requirement to examine the dynamic process through which the individual, social circumstances, and

environment influence people's responses in a particular circumstance (Bandura, 2002; Glanz et al., 2008).

The Social Cognitive Theory serves as a foundational framework for examining the facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital. The theory posits that behavior change is influenced by the dynamic and reciprocal interaction of personal factors, environmental influences, and behavioural patterns (Benight et al., 2004). This aligns well with the study's objective of exploring how socio-demographic, health-related, and environmental factors, such as social support and physical resources, contribute to adherence to nutrition counselling sessions.

2.3 The Causes and Biological Processes of Type 2 Diabetes

Insufficient insulin production or usage by the body leads to high blood sugar levels in those with type 2 diabetes. This condition disrupts the body's ability to regulate glucose levels, increasing thirst, frequent urination, fatigue, and weight (Elvira et al., 2020; Ginter et al., 2013). Diabetes risk factors that cannot be modified include age, gender, and a family history of diabetes. Modifiable risk factors include hypertension, obesity, overweight, central obesity, tobacco smoking, physical inactivity, and longer sitting times (Leiva et al., 2018). In addition to genetic factors, environmental factors, particularly nutrition and obesity, are major contributors to type 2 diabetes (Ginter et al., 2013). Environmental pollution may also have a role in the recent rise in diabetes cases (Ginter & Simko, 2013; IDF et al., 2022; Nanayakkara et al., 2020).

People diagnosed with type 2 diabetes are at an increased risk of experiencing various short and long-term complications that can lead to premature death (DeFronzo et al., 2015; Olokoba et al., 2012). Diabetes-related complications may include nerve damage, kidney disease, vision issues like retinopathy, heart disease, foot damage, skin

conditions, hearing loss, and depression (DeFronzo et al., 2015; Olokoba et al., 2012). Over time, these complications may develop slowly, and the longer a person lives with diabetes and uncontrolled blood sugar levels, the higher the likelihood of developing complications (Olwendo et al., 2020). Unfortunately, detecting diabetes is often challenging and can be diagnosed late, particularly in resource-limited developing nations like Africa (Olokoba et al., 2012). Furthermore, these complications can be disabling or life-threatening (Olwendo et al., 2020).

Making changes to one's lifestyle, nutrition habits, and weight can help prevent type 2 diabetes (Olokoba et al., 2012). People with type 2 diabetes should receive personalized management to improve their quality of life (Olokoba et al., 2012). Maintaining a healthy weight, consuming fibre and unsaturated fats while avoiding saturated and trans fats, limiting sugar intake, exercising regularly, refraining from smoking, and consuming alcohol in moderation are all essential factors in reducing the risk of developing type 2 diabetes (Chiniwala & Jabbour, 2011).

For effective management of type 2 diabetes in patients, conducting a medical nutrition assessment and providing personalized lifestyle advice that considers their physical and functional abilities is essential (Chiniwala & Jabbour, 2011). Although the goals of diabetes care are similar for both older and younger adults, managing diabetes in older adults requires a customized approach. If an older individual has a life expectancy of over ten years, they should aim for blood glucose level targets similar to those of younger adults. However, frail adults with multiple co-morbidities may have slightly higher goals (Chiniwala & Jabbour, 2011).

2.4 Nutrition Counseling Sessions Adherence

The World Health Organization defines adherence as “the extent to which a person’s behavior - taking medication, following a diet, and/or executing lifestyle changes,

corresponds with agreed recommendations from a health care provider." (WHO et al., 2003). However, Blackburn et al. (2013) State that the best way to define treatment adherence is to simply look at how often people take prescription drugs that are known to have positive effects on their health. (Blackburn et al., 2013) claim that the definition being suggested avoids all mention of the cause of treatment non-adherence and instead focuses on the public health crisis brought on by the underuse of potentially life-saving treatments.

In contrast, the WHO definition specifies a particular problem relating to an agreement between patient and provider when most studies are not able to determine whether such an agreement has ever occurred. As a result, treatment non-adherence needs to be identified and addressed entirely, without making any assumptions about the reason for it or who is to blame (Blackburn et al., 2013). The American Diabetes Association recommends nutrition counseling sessions for all patients with type 2 diabetes as part of their education and treatment (American Diabetes Association, 2023).

According to the American Diabetes Association, no one diet works for everyone when it comes to treating type 2 diabetes. The goal of a nutrition counselling session is for a healthcare provider to work with patients to promote healthy eating, ensure that nutritional requirements are met, and maintain the enjoyment of food through positive reinforcement (American Diabetes Association, 2023). Although the American Diabetes Association recommends nutrition counselling sessions, not everyone attends nutrition counselling sessions, leading to other ways individuals receive dietary education, information, and support (Siopis et al., 2021).

To gain a thorough understanding of type 2 diabetes, it is vital to seek nutritional guidance from a qualified healthcare professional. Typically, this involves consulting with a registered dietitian or nutritionist (Ganiyu et al., 2013). Therefore, healthcare

providers, facilities, and agencies involved in diabetes care should emphasize nutrition's significance to patients to help with disease management and appropriate self-care and ultimately improve patients' quality of life (Sami et al., 2017). By improving awareness of diabetes complications and enhancing dietary knowledge, attitudes, and practices, patients can better control their disease (Sami et al., 2017).

Nutrition guidance can be provided during consultations with healthcare providers or in a more formal education setting (Coppola et al., 2016). The degree of a nutrition counselling session, the healthcare provider, and the format can all affect how closely people adhere to nutrition counselling sessions (Coppola et al., 2016). A study was conducted to help 320 people with type 2 diabetes overcome barriers through a two-year medical nutrition therapy intervention. At baseline, 25% of participants stated they lacked information on a recommended diet (Razo-Olvera et al., 2021).

A study on Dietary Practices and Disease Management in Diabetes Patients at Kenyatta National Hospital, Kenya, examined the dietary practices of Type 2 Diabetes patients and their impact on glycemic control (Mutwiri, 2014). The findings indicated that only 54.7% of patients achieved the recommended blood glucose levels, with poor glycemic control being closely linked to low adherence to nutrition treatment recommendations (Mutwiri, 2014).

The study highlighted the critical role of nutrition in diabetes management, emphasizing that dietary non-adherence contributes to frequent hospital admissions due to complications (Mutwiri, 2014). The research called for strengthened nutritional counselling sessions and culturally relevant dietary interventions to improve adherence and overall disease management (Mutwiri, 2014). Another study on Suboptimal Glycemic Control and Prevalence of Diabetes-Related Complications in Kenya examined glycemic control and diabetes-related complications among patients in Kenya

(Otieno et al., 2021). The study emphasized that poor glycemic control is linked to inadequate treatment adjustments and insufficient patient education (Otieno et al., 2021). Emphasizing personalized treatment approaches, enhancing diabetes education, and improving healthcare policies to support better glycemic management and reduce complications among diabetic patients in Kenya (Otieno et al., 2021).

Further research is needed to develop targeted interventions and refine national diabetes care strategies (Otieno et al., 2021). A study on Dietary Adherence Patterns in Type 2 Diabetes Management assessed nutrition adherence among 240 adult Type 2 Diabetes patients in Kenya, focusing on dietary management patterns (Musee et al., 2016). Findings indicated that despite the availability of dietary advice and affordability, overall adherence remained low. The results align with global studies demonstrating that nutrition adherence remains a significant challenge for diabetes patients, even with proper education (Musinguzi et al., 2018; Sami et al., 2017). Highlighting the importance of reinforcing culturally sensitive nutrition counseling and practical support interventions, such as food samples and meal planning demonstrations, to enhance adherence to nutrition counseling sessions and improve diabetes management outcomes (Musinguzi et al., 2018; Sami et al., 2017).

2.5 Enablers of Nutrition Counseling Sessions Adherence

A study on Dietary Practices and Disease Management in Type 2 Diabetes Patients at Kenyatta National Hospital, Nairobi, Kenya, investigated the dietary practices and glycemic control of Type 2 Diabetes patients at the diabetes outpatient clinic (Mutwiri, 2014). The study underscored the pivotal role of dietary adherence in effective diabetes management and complication prevention. It emphasized the importance of healthcare providers in patient education, while also recognizing the structural challenges, such as

socioeconomic status and healthcare accessibility, which influence dietary habits (Mutwiri, 2014).

2.5.1 Patient Factors

A study assessed the impact of demographic and clinical characteristics, self-efficacy, and illness beliefs on the adherence of individuals with uncontrolled diabetes to self-management recommendations (Abubakari et al., 2016). Validated questionnaires and clinical records from hospitals were used to gather the required data. To examine connections, correlations were employed, while predictors of self-management were identified through the use of multiple regression techniques. The study outcomes indicate that higher educational achievement and a longer duration since diagnosis are significantly associated with a perception of greater personal control, treatment control, and lower concern about the disease due to a better understanding of diabetes (Abubakari et al., 2016).

A study focused on encouraging patients with type 2 diabetes to consume more fruits, vegetables, and berries through primary care. The findings indicated that factors like higher education, strong social support, advanced age, and consistent adherence to recommended dietary guidelines were essential in determining successful nutrition outcomes (Koponen et al., 2019). A study conducted a qualitative analysis of factors affecting patients' treatment adherence and behavior when seeking health care. The study found that the availability of personnel, healthcare providers' perceived abilities and behaviors, overall quality of care, and waiting times were crucial factors influencing patients (Musinguzi et al., 2018). Furthermore, the study revealed that patients' financial and socioeconomic status significantly influenced their adherence and health-seeking behavior. Patients with a higher socioeconomic status were found to exhibit greater compliance and health-seeking behavior (Musinguzi et al., 2018).

2.5.2 Patient-Provider Relationship

Therapeutic interaction is crucial to clinical dietetic practice and advantageous to patients and healthcare providers. The importance of therapeutic interaction was clear from primarily qualitative data highlighting the perspectives of patients and healthcare providers, and it is in line with the concepts of relationship and patient-centred healthcare paradigms (Jo Delaney, 2018; Nundy & Oswald, 2014).

A study that focused on the therapeutic relationship between healthcare providers and patients found that the circumstances of the interaction were impacted by variables such as "rapport," "connection," "collaboration," "partnership," and "interaction." These variables were unique to either the patient or the healthcare provider (Nagy et al., 2022). Collaboration and rapport-building were facilitated by patients' perceptions of the healthcare professionals as approachable and empathetic. The study only mentioned "connection," "rapport," and "therapeutic interaction" as specific contextual variables.

The work environment determined the quantity of consultation time allocated, specifically by providing more time and an environment conducive to patient-centred consultations. For instance, 'neutralizing hierarchy' by eliminating physical barriers like a desk helped rapport-building (Nagy et al., 2022). However, without comprehensive descriptions of how meaningful relationships progress, stand-alone qualities like "trust" were highlighted as essential for relationship development (Sladdin et al., 2017; Søndergaard Jakobsen et al., 2017). There may be fewer descriptions of key relationship components due to the significant impact of nutritional and biological sciences as sources of evidence for practice (Nagy et al., 2022).

The importance of therapeutic relationships was highlighted in a study on patient-centered care in dietetics, and it was stated that this relationship is a crucial component of providing patient-centered healthcare (Sladdin et al., 2017). Although the therapeutic

relationship and patient-centered care are related concepts, the therapeutic relationship must be given adequate attention in the patient-centered care study. The term "relationship" was the only one used in the study; concepts like "alliance," "connection," and "rapport" that are commonly used to describe the phenomenon of therapeutic relationships were omitted. There is still a need for research that covers the therapeutic relationship concept and looks at related ideas (Sladdin et al., 2017). Healthcare practitioners may find it helpful to focus on Bordin's "working alliance," which includes various therapeutic alliance components (Bordin, 1979; Nagy et al., 2022a).

In his definition of the therapeutic alliance, Bordin identifies three key elements: agreement between the patient and healthcare provider on shared objectives, agreement on the necessary activities to achieve those objectives, and a bond between them that is recognized as a crucial aspect of their interaction (Bordin, 1979). However, it is essential to conduct further research to determine whether the nature and significance of therapeutic interactions in dietetics differ from those in clinical psychology for health outcomes (Nagy et al., 2022).

Population health management services are centered on the interactions between patients and their healthcare providers. The necessity to establish and maintain these relationships has led to the rise of relationship-centered care. Relationship-based care can improve population health management since it is a model of integrated, team-based care (Jo Delaney et al., 2018). An 'essential therapeutic aspect' is the therapeutic alliance, a recognized part of patient-healthcare provider relationships (Flückiger et al., 2012). Across therapy approaches and study designs, the therapeutic partnership explains around 7% of the difference in therapy outcomes (Flückiger et al., 2012). The therapeutic alliance is more strongly linked to therapy outcomes than other treatment factors, such as the therapist's adherence to the treatment plan (Flückiger et al., 2012).

The study on the therapeutic relationship between healthcare providers and patients identified potential client outcome measures to investigate, including patient engagement, self-perception, and self-management ability (Nagy et al., 2022). The study also emphasized the importance of establishing a positive "relationship," "connection," or "rapport" with patients to promote treatment compliance, attendance, and trust (Nagy et al., 2022). Therefore, exploring the correlation between therapeutic alliance, attendance, and treatment compliance may provide valuable insights (Nagy et al., 2022). Patients' attendance and motivation are essential outcome measures to supplement qualitative data in dietetics (Nagy et al., 2022).

Respectful and supportive healthcare-provider interactions have been shown to improve adherence to nutrition counselling sessions (Smith et al., 2023). Patients who feel heard and valued by their nutritionists are more likely to engage in counseling sessions and follow through with recommendations.

2.5.3 Provider-Related Factors

The healthcare industry now prioritizes patient-centered care, emphasizing collaboration between patients and healthcare providers (Jo Delaney, 2018). This approach considers patients' beliefs and preferences and encourages a more flexible healthcare delivery system by moving away from the traditional authoritative approach (Jo Delaney, 2018). Patient-centered care recognizes the opinions and values of patients regarding their well-being and physical healthcare. However, concerns have recently been expressed about how patient-centered care would affect evidence-based practice since the two methods are competing rather than complementary (Jo Delaney, 2018).

Guidelines for nutrition practice have developed into evidence-based recommendations and toolkits for specific diseases and conditions (Franz et al., 2008). The International Confederation of Dietetic Associations recognizes evidence-based practice as a valuable

skill for healthcare providers to utilize in decision-making (International Confederation of Dietetic Associations, 2022). Effective treatment requires healthcare providers to consider the patient's values and circumstances, as well as their expertise and the evidence's validity, applicability, and importance (International Confederation of Dietetic Associations, 2022). Thus, an evidence-based approach demands critical skills from healthcare providers to comprehend, assess, and implement scientific knowledge to benefit the patient.

Providing tangible support, such as food samples and practical demonstrations, enhances patient understanding and application of nutritional advice (Johnson & Lee, 2022). When patients receive hands-on guidance, they are better equipped to integrate changes into their daily lives. Tailoring counseling to individual needs, considering preferences such as gender, provider consistency, and personalized care, fosters a sense of trust and continuity (Thompson & Miller, 2021).

A study was conducted on the adherence to nutrition recommendations among individuals with diabetes who received follow-up treatment at a Referral Hospital in Northwest Ethiopia. The study found that individuals who received nutritional guidance were 5.88 times more likely to follow the recommended nutrition guidelines than those who did not receive any guidance or only received printed diet information (Tirfie et al., 2017). Individuals who were provided with nutrition guidance in a study on nutrition and dietary supplements in Eastern Ethiopia were found to be 4.47 times more likely to comply with the nutrition recommendations than those who did not receive any guidance (Mesfin et al., 2015). The study yielded similar outcomes to the previous study (Tirfie et al.,2017).

A study on Contributors to Non-Adherence in Type 2 Diabetes Treatment at Thogoto Hospital emphasized that improving healthcare accessibility and strengthening patient

education are essential for enhancing adherence to diabetes treatment (Ongugo, 2022). The study highlighted the need for community-based interventions that address social determinants of health, such as financial constraints, transportation challenges, and social support systems. By integrating holistic strategies that extend beyond clinical treatment, healthcare providers can improve adherence rates and overall diabetes management (Ongugo, 2022).

A study was conducted on *Enhancing Diabetes Self-Management and Patient Satisfaction in a Low-Resource Central Kenyan Hospital* (Muhoma et al., 2020). The quality improvement project evaluated the impact of culturally tailored diabetes education on provider practices and patient self-management in a low-resource hospital in Central Kenya (Muhoma et al., 2020). The intervention led to significant improvements in patient knowledge of diabetes self-care and foot care, although no significant changes were observed in general diabetes or nutrition knowledge.

These findings align with global research demonstrating that culturally sensitive education enhances patient engagement (Nagy et al., 2022). However, the limited impact on nutrition knowledge highlights the need for more targeted nutrition education strategies (Muhoma et al., 2020). The study underscored the importance of integrating culturally appropriate materials and approaches into mainstream diabetes care to improve self-management outcomes.

2.6 Barriers to Nutrition Counseling Sessions Adherence

A study examined Treatment Adherence and Factors Associated with Poor Adherence among Type 2 diabetes patients on Follow-up at Kenyatta National Hospital, Kenya (Waari et al., 2018). Findings revealed that while 45.5% of patients demonstrated high adherence, 28.3% had low adherence. Key factors contributing to poor adherence

included dissatisfaction with healthcare providers, limited drug accessibility, and inadequate family support (Waari et al., 2018).

A systematic review of Determinants of Non-Adherence to Treatment Among Patients with Type 2 Diabetes in Kenya identified key factors contributing to non-adherence to diabetes treatment in Kenya (Masaba et al, 2020). Financial barriers, including medication costs and insurance coverage, were major obstacles. Patient-related factors such as knowledge gaps, misconceptions, and lack of family support further contributed to poor adherence (Masaba et al, 2020). Additionally, healthcare system challenges, including inadequate education, support, and medication availability, exacerbated the issue (Masaba et al, 2020). The study highlights the need for comprehensive interventions that address financial constraints, enhance patient education, and strengthen healthcare infrastructure to improve adherence rates (Masaba et al, 2020).

A study on Dietary Practices and Disease Management in Type 2 Diabetes Patients at Kenyatta National Hospital, Nairobi, Kenya, investigated the dietary practices and glycemic control of Type 2 Diabetes patients at the diabetes outpatient clinic (Mutwiri, 2014). The findings revealed that poor nutrition treatment adherence significantly contributed to uncontrolled blood glucose levels. Major barriers to adherence included financial constraints, limited nutrition knowledge, and restricted access to recommended foods (Mutwiri, 2014).

2.6.1 Patient Factors

A study was conducted on rural patients with diabetes to assess their understanding, beliefs, habits, and adherence using a pre-designed and pre-tested questionnaire. The study was both descriptive and cross-sectional. Findings showed that only 52.3% of the participants had sufficient knowledge about diabetes. Furthermore, the research discovered a discrepancy between the patient's level of knowledge and their actions (El-

Khawaga et al., 2015). Poor adherence to nutrition treatment recommendations can be attributed to a lack of knowledge, diet education, and poor awareness about the benefits of nutrition recommendations by healthcare providers (Ayele et al., 2018a). Therefore, it is crucial to improve the understanding, mindset, and conduct of people with diabetes to better manage the condition (El-Khawaga et al., 2015).

A study on Contributors to Non-Adherence in Type 2 Diabetes Treatment at Thogoto Hospital explored the factors influencing treatment adherence among Type 2Diabetes patients (Ongugo, 2022). The findings revealed that socioeconomic factors, including income and education level, significantly impacted adherence rates. Additionally, geographic barriers, such as distance from healthcare facilities, and social factors, including family support and patient-provider interactions, influenced adherence behaviors.

A study on the Impact of Lifestyle Factors on Type 2 Diabetes Management in Garissa County, Kenya**,** examined the influence of knowledge and lifestyle changes on Type 2 Diabetes Mellitus (T2DM) management at Garissa County Hospital (Abdalla, 2019). Findings revealed that misinformation about diabetes contributed to poor disease management, with 35% of patients defaulting on treatment due to financial and educational barriers (Abdalla, 2019).

Furthermore, the study revealed that transportation, distance, and associated expenses affected patients' adherence to attending nutrition counselling sessions. Higher transportation costs for patients from remote, often rural areas were a major obstacle to receiving care, including keeping planned hospital appointments, compared to individuals from urban areas and those who live close to hospitals (Musinguzi et al., 2018).

A study conducted in Nigeria revealed that individuals with chronic illnesses, like type 2 diabetes, encountered challenges in following treatment plans and seeking healthcare due to factors such as socioeconomic status, unemployment, absence of support systems, unstable living conditions, distance from treatment facilities, and high transportation costs (Akpa et al, 2005). Moreover, education level significantly impacted treatment adherence, with patients with secondary education or higher benefitting more from medical counseling (Akpa et al, 2005).

A study was conducted in Senegal to investigate the cultural viewpoints and daily life encounters of individuals with Type 2 diabetes. The study found that those who visited self-management clinics received helpful and unhelpful influences from their family and acquaintances (Belue et al., 2013). Participants acknowledged receiving positive and negative support from their family and community members in managing their diabetes. Women were more likely than men to discuss their challenges in finding support. Many female participants relied on their adult children, spouses, and community members for financial support related to diabetes diets and healthcare. However, some women required more assistance due to conflicting responsibilities with their family and friends (Belue et al., 2013).

For their diabetic management, men reported varying degrees of familial support. Men also expressed that having diabetes impacts their relationships with their family members because of difficulties and worries about providing for them, claiming that financial difficulties are a common source of diabetes-related stress (Belue et al., 2013). Additionally identified as a source of anxiety for males impacting their adherence to diabetic self-management practices were concerns about manhood and marital relationships (Belue et al., 2013).

A study conducted in Iran aimed to understand the challenges faced by patients with type 2 diabetes when following nutritional treatment plans (Mostafavi-Darani et al., 2020). The study discovered that social factors pose significant challenges; some identified issues include clashing social priorities, insufficient social support, and disagreements (Mostafavi-Darani et al., 2020). Patients reported that their families' lack of emotional, social, and financial assistance and understanding of their condition were the biggest hindrances to following nutritional recommendations (Mostafavi-Darani et al., 2020). In most interviews in the study, participants frequently mentioned obstacles that affected their adherence, such as the need to please others, gain their respect, and prioritize their family's financial problems, their children's illnesses, and their nutritional requirements over their health.

Other barriers that patients faced included busy schedules, negative reactions from others, and a lack of knowledge about diabetes among their relatives and the community. In some cases, patients even received inappropriate reactions (Mostafavi-Darani et al., 2020). How patients with poorly controlled diabetes perceive and feel about their condition significantly impacts their ability to manage it (Abubakari et al., 2016). Understanding these factors is crucial in developing effective therapies and strategies for self-regulation in specific populations (Abubakari et al., 2016). Additional research is needed to pinpoint the factors that can either aid or obstruct self-regulation and effective clinical control of diabetes in populations with high rates of poorly managed diabetes (Abubakari et al., 2016).

2.6.2 Patient-Provider Relationship

The healthcare industry now prioritizes patient-centered care, emphasizing collaboration between patients and healthcare providers (Jo Delaney, 2018). This approach considers patients' beliefs and preferences and encourages a more flexible healthcare delivery

system by moving away from the traditional authoritative approach (Jo Delaney, 2018). Patient-centered care recognizes the opinions and values of patients regarding their well-being and physical healthcare. However, concerns have recently been expressed about how patient-centered care would affect evidence-based practice since the two methods are competing rather than complementary (Jo Delaney, 2018).

Guidelines for nutrition practice have developed into evidence-based recommendations and toolkits for specific diseases and conditions (Franz et al., 2008). The International Confederation of Dietetic Association recognizes evidence-based practice as a valuable skill for healthcare providers to utilize in decision-making (International Confederation of Dietetic Associations, 2022). Effective treatment requires healthcare providers to consider the patient's values and circumstances, as well as their expertise and the evidence's validity, applicability, and importance (International Confederation of Dietetic Associations, 2022). Thus, an evidence-based approach demands critical skills from healthcare providers to comprehend, assess, and implement scientific knowledge to benefit the patient.

In healthcare, enhancing care quality and bridging the gap between knowledge and practice are vital (Soguel et al., 2019). Knowledge translation is imperative, but many healthcare providers lack a basic understanding of this concept (Soguel et al., 2019). A qualitative study exploring healthcare providers' perceptions of evidence-based practice (Soguel et al., 2019) revealed that some healthcare providers did not consider communication skills "evidence-based" and did not need to consult scientific literature to understand the evidence behind them. They believed that scientific literature was only necessary for understanding biological and nutritional knowledge, not communication skills. Instead, they perceived communication skills as something gained through professional development opportunities (Soguel et al., 2019).

According to the study, a significant obstacle for healthcare providers is the belief that searching for and reading scientific research should be done outside of work hours. They also mentioned that participating in educational activities, such as sharing knowledge and making adjustments, helps incorporate evidence into their practice. Finally, healthcare providers found it more difficult to find evidence-based material regarding counseling and communication than biological knowledge, indicating the need for improved education and understanding of knowledge translation in healthcare (Soguel et al., 2019).

Studying the barriers and Enablers of knowledge translation and evidence-based practice in dietetics is essential for a wider population (Soguel et al., 2019). These findings suggest that healthcare providers may not prioritize developing therapeutic relationships based on skills and knowledge within the "evidence-based" reference framework (Soguel et al., 2019). Therefore, gaining a scientific understanding of therapeutic interactions is necessary, which can guide therapy and improve its effectiveness (Nagy et al., 2022).

A qualitative study that explored healthcare providers'/dieticians' perspectives regarding patient care identified that healthcare providers felt under pressure from doctors to prioritize patients' health over building a relationship with them, resulting in less time spent on rapport building (Sladdin et al., 2019). The study also revealed that private practice settings motivated dieticians to connect with patients to maintain their income and professional reputation (Sladdin et al., 2019). Another qualitative study exploring patients’ preferences towards disease management showed that patients preferred to see the same healthcare provider for multiple consultations, which helped build a rapport (Madden et al., 2016).

A study identified three main categories of barriers and enablers to advance care planning: personal beliefs, attitudes, and experiences; access to healthcare providers,

information, and interactions; and the specifics of when, where, and how communication occurs, as well as the quality of the patient-provider relationship (Simon et al., 2015). Providing a framework that healthcare providers may utilize to improve advanced care planning (Simon et al., 2015).

2.6.3 Provider-Related Factors

In a study measuring dietary recall following a visit with a primary physician, only 52% could adequately remember their dietary discussions with the physicians (Richard et al., 2017). In a separate qualitative study, participants with type 2 diabetes expressed that the nutrition information was conflicting, too much was given, there was a lack of ongoing support, they felt rushed during a clinical visit, and diabetes education was better than working with a healthcare provider (Crane et al., 2016).

Participants in a related study who were questioned stated that no one guided them in incorporating dietary recommendations into their daily lives (van Smoorenburg et al., 2019). The high default rate on treatment adherence examined in the study on the influence of knowledge and lifestyle changes on Type 2 Diabetes Mellitus management at Garissa County Hospital highlights systemic challenges, including limited healthcare accessibility and affordability (Abdalla, 2019).

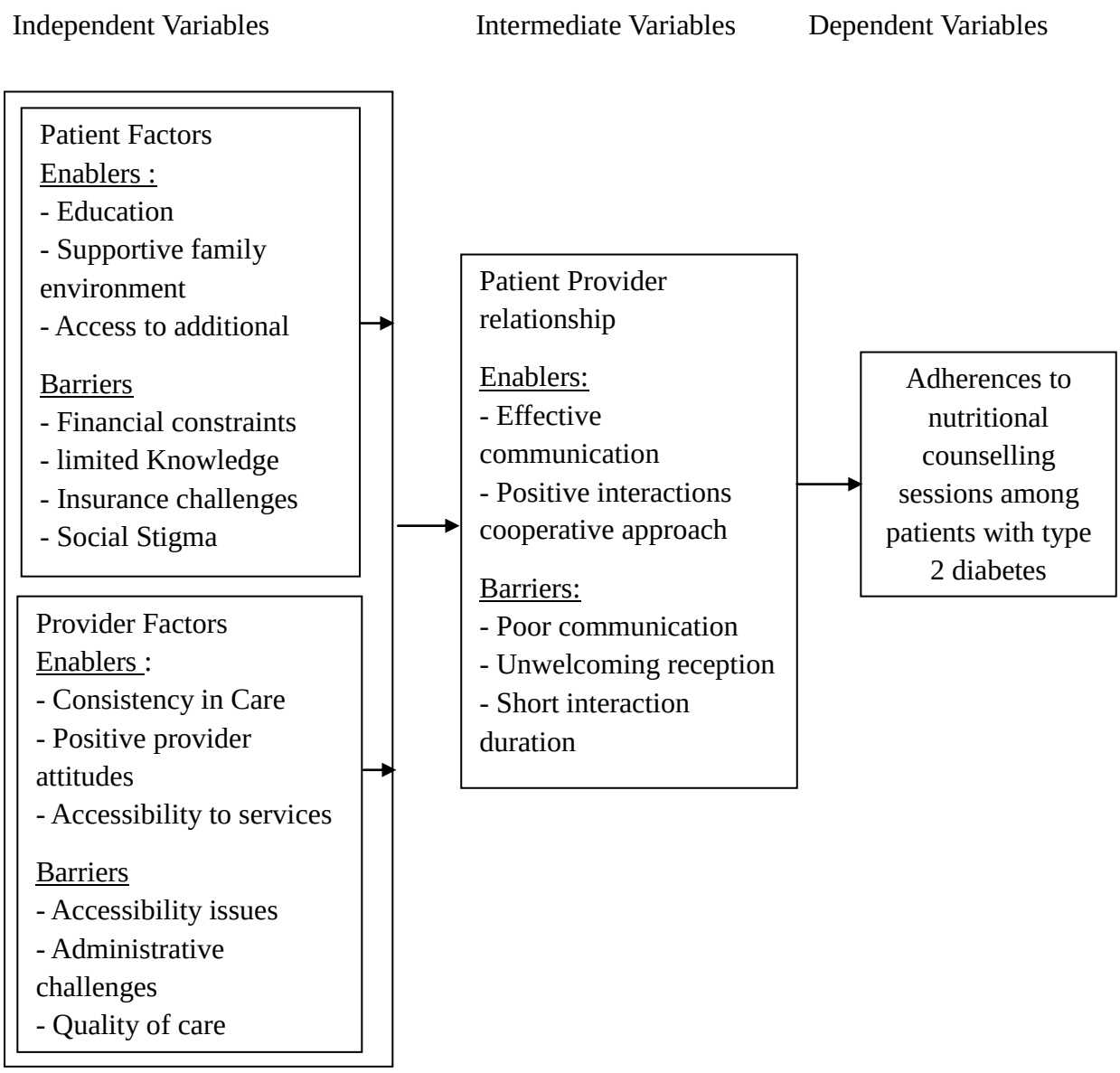
A study conducted a qualitative analysis of factors affecting patients' treatment adherence and behavior when seeking health care. The study found that the availability of personnel, healthcare providers' perceived abilities and behaviors, overall quality of care, and waiting times were crucial factors influencing patient adherence to nutrition treatment (Musinguzi et al., 2018).

2.7 Conceptual Framework

The study examined the facilitators and Barriers to Adherence to Nutrition Counseling Sessions among Patients with Type 2 Diabetes at Nakuru County Referral Hospital. Specifically, the study explored adherence to nutrition counselling sessions, the factors that facilitate or hinder adherence to nutrition counselling sessions, and socio-demographic factors like education level, occupation, gender, and age. In addition, the study also looked into personal influences, such as perceptions and motivation. Emotional factors such as support from family and friends also play a significant role in adherence to nutrition counselling sessions (Ganiyu et al., 2013).

Figure 1

Conceptual Framework of Facilitators and Barriers to Adherence to Nutrition Counselling Sessions



Source: Author (2025)

The conceptual framework for this study was adapted and modified from a holistic model originally developed by Jaam et al. (2018) to describe medication adherence and guide interventions in diabetes mellitus. The adapted framework integrates insights from the literature review to better align with the study's focus on the facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes. The

original model, published in *Research in Social & Administrative Pharmacy* (2017, Elsevier Inc.), provided a comprehensive foundation for understanding adherence behaviors, which was tailored to address the unique context of nutrition counseling sessions in this research.

2.8 Gaps in Literature Review Summary

Despite significant advancements in healthcare technology, achieving long-term behavioral change in diabetes patients remains a challenge (Deci et al., 2008). Current treatment strategies primarily emphasize medication adherence, often overlooking the equally crucial role of a positive mindset, lifestyle modifications, and sustained patient engagement in effective disease management (Polonsky et al.,2016). While pharmacological interventions are essential, the burden of diabetes care extends beyond medication compliance, requiring a more holistic approach that includes education, nutrition counseling, and psychological support.

One of the most significant gaps in diabetes management literature is the limited understanding of the role of nutrition in controlling Type 2 Diabetes (El-Khawaga et al., 2015). Despite the well-documented impact of diet on glycemic control, many patients remain unaware of how their dietary choices affect their condition, leading to suboptimal adherence and increased risk of complications. Moreover, the patient-healthcare provider relationship plays a crucial role in shaping treatment adherence, yet research has not fully explored how the strength of this relationship influences therapeutic outcomes (Nagy et al., 2022). While it is recognized that effective provider-patient communication can enhance adherence, limited empirical data quantify this impact.

Understanding the dynamics of patient-provider interactions is critical for improving adherence to diabetes treatment. However, the literature reveals a lack of observational studies in clinical dietetic practice that assess how these relationships influence patient

outcomes (Nagy et al., 2022). Studies often focus on clinical interventions but fail to incorporate multiple perspectives, particularly those of patients and healthcare providers, which are essential for identifying communication gaps and misconceptions in diabetes care (Nagy et al., 2022). Research that evaluates how different communication strategies affect patient adherence and long-term glycemic control remains scarce, leaving a gap in knowledge regarding the best practices for fostering patient engagement and trust in healthcare settings.

Another significant barrier to effective diabetes management is the lack of adequate patient education and awareness. Although diabetes self-management programs exist, many patients still struggle with basic self-care practices, leading to poor glycemic control and an increased risk of complications (El-Khawaga et al., 2015). The disparity between healthcare provider expectations and patient perceptions of diabetes care further exacerbates adherence challenges. Emphasizing the need to close this gap, strategies should align medical advice with patients' experiences and beliefs, making treatment recommendations more practical and accessible (Sladdin et al., 2018).

Effective communication between healthcare providers and patients is a cornerstone of successful diabetes management, yet inconsistent communication practices hinder adherence (Polonsky et al, 2016). Physicians often focus on prescribing treatment but may neglect to address patients' concerns, discuss potential challenges, or provide collaborative decision-making opportunities. This lack of dialogue can result in patients feeling disengaged or overwhelmed, ultimately affecting their ability to follow medical advice. Improved communication strategies, such as engaging patients in discussions about treatment options, providing clear explanations of the risks and benefits of different therapies, and offering ongoing self-management education, can enhance adherence and empower patients to take an active role in managing their condition.

The management of Type 2 Diabetes in Kenya presents a complex interplay of educational, socioeconomic, and healthcare system barriers, all of which contribute to low adherence rates. A one-size-fits-all approach has proven ineffective, necessitating tailored interventions that are culturally and economically sensitive to meet the diverse needs of patients.

Several key themes emerge from the literature regarding the primary barriers to effective diabetes management in Kenya: Socioeconomic Factors: Financial constraints, lack of health insurance, and limited access to healthcare services significantly impact treatment adherence. Education and Awareness: Many patients lack sufficient knowledge about self-care practices, contributing to poor glycemic control and preventable complications. Healthcare System Challenges: The healthcare infrastructure in Kenya faces numerous challenges, including medication shortages, poor patient-provider communication, and fragmented healthcare services, all of which hinder effective diabetes management. Family and Social Support: A strong support system is crucial for adherence, yet many patients lack family or community encouragement, making it difficult to sustain long-term treatment adherence.

The growing diabetes crisis in Kenya underscores significant gaps in diagnosis, treatment accessibility, and long-term disease management. While some clinics and healthcare providers have made progress, critical barriers remain, particularly in patient education, healthcare communication, and structural support systems. Addressing these challenges requires a multi-pronged approach that includes policy changes, community-based education programs, improved healthcare provider training, and enhanced patient support systems. By integrating these strategies, Kenya can develop a more effective and inclusive diabetes care model, ultimately improving treatment adherence, reducing complications, and enhancing the overall quality of life for diabetes patients.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section discusses the study's approach, including study design, population, sampling methods, number of participants, instrument testing, data authenticity and dependability, data collection process, and data analysis methodology.

3.2 Study Design

The study applied a mixed-method research design - explanatory sequential design. It was the design of choice as it involved collecting and analyzing quantitative and qualitative data, integrating the findings, and drawing inferences using quantitative and qualitative approaches (Creswell et al, 2019; McCrudden et al., 2019). Where quantitative data were collected and analyzed first, followed by qualitative data collection and analysis, this approach provides a deeper and broader understanding of the phenomenon (Creswell et al. 2019). The initial quantitative phase helped identify key patterns and trends, which informed the qualitative phase, offering richer insights and contextualization of the data (Creswell et al, 2019).

3.3 Location of the Study

The location of the study was Nakuru County Referral Hospital. Nakuru County Referral Hospital is a Provincial General Hospital located in Nakuru County, Nakuru town constituency. Nakuru's current metro area population was 422,000 in 2023 (Nakuru County, 2023). The latitude of Nakuru is -0.303099, and the longitude is 36.080026. Nakuru is the fourth largest city in Kenya. Tourism and agriculture are the main economic activities of Nakuru town. Nakuru County Referral Hospital was the location of choice as it offered a wide range of healthcare services and was adequately equipped with diverse medical professionals.

Nakuru County Referral Hospital had a high patient volume who sought health services regularly, which provided a better depiction of people's knowledge and beliefs. Nakuru County Referral Hospital offered patients with type 2 diabetes various health services, including diagnostics, treatment, and health education, followed by specialized clinics. Nakuru County's diverse population and culture offered a comprehensive view of attitudes and behaviors. The various Kenyan ethnic groups made it a cosmopolitan society that adequately represents the people.

3.4 Study Population

The participants of the study were patients with type 2 diabetes undergoing follow-up treatment at the diabetic medical outpatient clinic in Nakuru County Referral Hospital. The healthcare providers involved in the study included a nurse, clinical officers, physicians, and a nutritionist. The mentioned healthcare providers were included because they interacted with patients with type 2 diabetes in the Nakuru County Referral Hospital diabetic clinic, where they were authorized and licensed to offer health services and nutrition counseling sessions.

3.4.1 Inclusion Criteria

Study participants were selected based on the following criteria:

- Patients aged 18 years and above, diagnosed with type 2 diabetes, received care at Nakuru County Referral Hospital and attended follow-up treatment at the medical outpatient clinic
- For qualitative in-depth interviews, Patients who had attended nutrition counseling sessions at least once in the last six months.
- Healthcare providers who had worked in Nakuru County Referral Hospital for at least six months, interacted with patients with type 2 diabetes during diabetic

clinics, and conducted nutrition counseling sessions for patients with type 2 diabetes.

3.4.2 Exclusion Criteria

Participants were excluded based on the following criteria:

- Patients with type 2 diabetes who were pregnant, critically ill, unable to comprehend, or too weak to respond to the questions, and patients who declined to consent.
- Healthcare providers who had worked at Nakuru County Referral Hospital for less than six months did not interact with patients with type 2 diabetes during clinical visits and did not conduct nutrition counselling sessions.

3.5 Sampling Size and Sampling Procedure

3.5.1 Sample Size

Quantitative Sample Size

Nakuru County Referral Hospital had a population of 47,379 patients with type 2 diabetes; the number of type 2 diabetes patients receiving care at the hospital was 5,498, which was the accessible population (KHIS,2023). The study sampled a total of 396 respondents. This was considered to be a representative sample size determined based on the following Cochran's statistical formula (Cochran 1977) as cited by Uakarn et al. (2021).

$n=Z2\ pq\ /e2$

Where;

n was the desired sample size (since the target population is greater than 10,000),

Z was the standard normal deviation (1.96), which corresponds to the 95% confidence interval.

p was the proportion of the target population estimated to have a particular characteristic. The prevalence (p) of patients with type 2 diabetes mellitus in the population, 50% (0.5), was used in this study (Maximum variability)

q was determined by 1-P, which was 0.5

e was the desired level of precision/ margin of error, which was +/- 5%

Therefore: n=Z2 pq /e2 = (1.962) (0.5*0.5/0.052 =**385**

The finite population correction for proportions was 5,498, patients with type 2 diabetes under diabetes care.

n=n/1+(n-1)/N

Where;

n was the reduced sample size

n was the initial sample calculated as per large population criteria – 385

N was the population size

Therefore:

N=385/1(385-1)/5498=**360**

To cater to the non-response rate, the sample size was increased by 10% to give a representative sample size of 396 respondents.

Qualitative Sample Size

The study's In-depth and Key Informant interviews sample size was determined by saturation, which occurs when no new insights emerge from additional data collection, indicating sufficient sample size (M. Hennink & Kaiser, 2022; Rusu Mocănașu, 2020; Bryant & Charmaz, 2017). A systematic review of qualitative studies by Hennink et al

(2022) found that saturation is typically reached with 9 to 17 in-depth interviews, with an average of 12-13 interviews.

This supports the effectiveness of small sample sizes in qualitative research, as they can achieve saturation, the key benchmark for adequacy (Hennink et al, 2022). Saturation should also be confirmed when no new insights arise in two or three consecutive interviews (Coenen et al., 2012; Francis et al., 2009; Morse et al., 2014). The sample size of In-depth and Key Informant interviews was 40 patients with type 2 diabetes, and 4 healthcare providers, respectively. The qualitative sample size was determined based on the principle of data saturation, where sampling continued until no new information emerged, and responses became redundant.

3.5.2 Sampling Procedure

This study used both probability and purposive sampling techniques to select study participants. Systematic sampling is a probability sampling method where sample members from a larger population are selected according to a random starting point but with a fixed, periodic interval (Elfil & Negida, 2017; Etikan, 2017). Systematic sampling allows for an equal chance of selecting participants from the target population (Etikan, 2017). Purposive sampling refers to selecting research participants who could speak to the research aims and had relevant knowledge and experience of the phenomenon under scrutiny (Ritchie et al., 2014). This method determined the limits and narrowed down the study population (Doyle et al., 2020).

Quantitative Sampling Procedure

Systematic probability sampling was used to select consenting participants, who were patients at Nakuru County Referral Hospital, diagnosed with type 2 diabetes, and attending the diabetes outpatient clinic. The participants were included in the sample

based on a systematic rule using a fixed interval. Systematic probability sampling studies include (Jepkemoi et al., 2021) and (Chepkoech Kones, 2012).

The sample was based on a systematic rule using a fixed interval in systematic probability sampling calculation. The fixed periodic interval calculation, known as the sampling interval, was calculated by dividing the population by the desired sample size, 5,498, and the accessible population was divided by 396.

The fixed periodic interval using the formula: K= N/n (Etikan, 2017)

K - Sampling interval

N - 5, 498 (Patients with type 2 diabetes attending the outpatient clinic, which is the accessible population)

n - 396 (Sample size that will be used in the study)

K = 5498/396

= 13.88

= 14 (The fixed periodic interval)

In this case, as it was a hospital in which patients visit regularly, patients with type 2 diabetes were selected from a random starting point and then systematically, choosing the next patient using a fixed, periodic interval during their visit to the diabetic clinic. The rule included the last patient every 14th patient. The study was conducted in Nakuru County Referral Hospital among patients diagnosed with type 2 diabetes; therefore, generalizations were limited to populations with the same characteristics.

Qualitative Sampling Procedure

Extreme case sampling was used to select consenting participants for in-depth interviews. Extreme case sampling involved selecting 'illuminative cases' that illustrated

outstanding successes or failures (Nyimbili & Nyimbili, 2024; Shaheen et al., 2018). The approach focused on cases that had in-depth information. The cases may have been unusual, peculiar, or enlightening (Shaheen et al., 2018). Some extreme case sampling studies include (Ersoy, 2014) and (Lakhan et al., 2017).

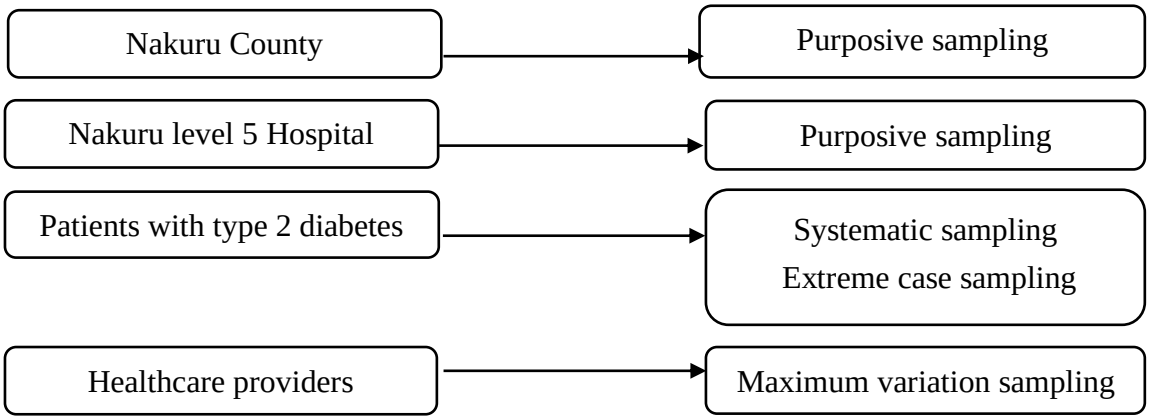
In this case, the participants were patients diagnosed with type 2 diabetes in diabetes care at Nakuru County Referral Hospital who had attended one or three nutrition counseling sessions in the last six months. *Adherence* is defined as attending at least three nutrition counseling sessions in the last six months. Therefore, the extreme sampling helped identify the variance in the number of sessions attended, which helped answer the research questions. Every week during the research period, a list was compiled from the hospital records of patients scheduled to visit the diabetic clinic on Mondays using the Nakuru Diabetes Healthcare Care Services data registry.

Maximum variation purposive sampling was used to select healthcare providers with relevant knowledge and experience, ensuring valuable insights that aligned with research objectives (Bhatt et al., 2021), (Çiçeklioɨlu et al., 2015), and (Demartoto et al., 2016). This method narrowed down the study population and gathered varied perspectives from different angles and viewpoints, leading to a deeper understanding (Ames et al., 2019; Doyle et al., 2020; Palinkas et al., 2015; Ritchie et al., 2014).

Healthcare providers were selected based on their experience and patient interaction at diabetic clinics, as well as their provision of nutrition counseling sessions for type 2 diabetes patients. The healthcare providers recruited as KII respondents included a nurse, clinical officers/physicians, and a nutritionist working at the outpatient diabetic clinic.

Figure 2

A Summary of the Sampling Procedure



3.6 Research Instruments

Data was collected using researcher-administered questionnaires, key informant interview guides, and in-depth interview guides following the objectives of this research.

3.6.1 Researcher-Administered Questionnaire

The questionnaire consisted of two sections: socio-demographic characteristics and health-related questions. It had fifteen questions based on the study's objectives.

3.6.2 Key Informant Guides

The KII guides provided an overview of the study, followed by eight open-ended questions aligned with the study's objectives. The questions progressed from more straightforward to more complex, covering factors affecting nutrition counselling sessions adherence, patient-provider relationships, and motivation to attend counseling sessions. The interview ended with general recommendations.

3.6.3 In-depth Interview Guides

The study used interview guides with eight open-ended questions to gather patient opinions on nutrition counseling sessions for type 2 diabetes. The questions started with more straightforward topics and progressed to more complex ones, ending with general

recommendations. Patients who had attended at least three appointments were asked what motivated them to return for follow-up sessions with healthcare providers.

3.6.4 Pre-Testing of Research Instruments

Forty patients with type 2 diabetes, representing 10% of the total sample size, and two healthcare providers participated in a pre-test of the research instruments at Naivasha Sub-County Hospital. The pre-testing evaluated data collection significance, completeness, simplicity, usability, questionnaire completion time, and interview duration. The process refined instrument content, structure, and clarity and ensured consistency. Trained research assistants administered the instruments, and pre-testing participants were not involved in the final study.

3.6.5 Validity of the Research Instruments

Validity is the degree to which an assessment tool accurately measures what it is intended to measure (Mugenda & Mugenda, 2003). Content validity is a type of measurement validity that evaluates how thoroughly a test or assessment tool addresses all essential elements of a particular construct or concept (Yusoff, 2019).

Content validation was tested through expert judgment. A panel of seven human nutrition and dietetics experts reviewed the research instruments for clarity, relevance, sufficiency, and coherence. The panel included three members from academia, two from public health institutions, and two from private health institutions.

The Content Validity Index (CVI) was employed to assess the instrument's validity. Experts rated each item on a scale from 1 (not relevant) to 4 (highly relevant). A Content Validity Index of 0.78 or higher was considered acceptable, demonstrating that the research instruments met the required standards of validity and accurately reflected the constructs under investigation (Yusoff, 2019). The content validation results showed a

Content Validation Index above 0.78, indicating that the instruments were valid based on expert judgment (Yusoff, 2019).

3.6.6 Reliability of the Research Instruments

Reliability measures the consistency of a research instrument across repeated trials (Mugenda & Mugenda, 2003). Cronbach's Alpha was used to evaluate internal consistency, reflecting how well items correlate to measure the same construct (Havercamp & Mason, 2009). Coefficients between 0.67 and 1 were deemed acceptable (Taan & Hajjar, 2018), with a reliability cut-off of 0.7 set during pretesting.

The measured constructs achieved a Cronbach's Alpha of 0.874, indicating strong internal consistency (Mueller et al., 2018). This reliability score aligns with Mugenda & Mugenda's (2003) recommendation of a coefficient between 0.6 and 1.0, confirming the instrument's consistency and refining the constructs, as shown in Table 1.

Table 1

Cronbach Alpha Coefficient for Internal Reliability

Variable	No of Items	Cronbach's Alpha
Nutrition Counseling Sessions	6	0.874

3.7 Data Collection Procedures

Data collection began after the validity and reliability of questionnaires had been ascertained and necessary corrections made. Data were collected during the diabetes clinic day and completed during each session, as it would have been difficult to trace the respondents later. Data collection from patients was done for three months when they turned up for the clinic check-up. Electronic recording and note-taking were used for data collection.

3.7.1 Recruitment and Training of the Data Collection Team

Before collecting data, two research assistants were recruited and trained on the research and data collection objectives. The assistants were chosen based on their background knowledge of nutrition, experience conducting research interviews, and availability during the data collection period. The assistants were residents of Nakuru County and fluent in either English or Kiswahili. The assistants underwent a one-day training to guarantee reliability and consistency, ensuring everyone understood the questions and content.

3.7.2 Researcher-Administered Questionnaire

Researcher-administered questionnaires were administered to the patients with type 2 diabetes who volunteered to participate in the study, and the questionnaires were filled out as the patients responded. The questionnaire consisted of two sections: socio-demographic characteristics and health-related questions. It had thirteen questions based on the objectives of the study.

3.7.3 Key Informant Interviews

Healthcare providers at Nakuru County Referral Hospital were invited to participate in a KII about type 2 diabetes. The interviewer obtained the respondent's consent and explained the purpose of the interview. Questions were asked in a friendly manner, and respondents were free to express themselves. The interviewer rephrased further and probed with more questions based on the provided responses. Data was collected by note-taking and electronic recording. Respondents were informed about using their information and were thanked for their time.

3.7.4 In-depth Interviews

Participants with type 2 diabetes were interviewed anonymously, with themes related to the study's objectives covered using interview guides. Interviewers obtained informed

consent, expressed gratitude, and answered questions in a friendly manner to build trust. Respondents were allowed to express themselves openly, with interviewers summarizing their answers and generating new questions to explore their views. Data was collected through note-taking and electronic recording, and the interview concluded with thanks to the key informants for their time.

3.8 Data Analysis

Quantitative data was cleaned, edited, coded, and processed for data analysis using the Statistical Package for Social Sciences (SPSS) software version 26. Descriptive statistics was used to summarize data, such as frequencies by use, graphs, pie charts, and frequency tables. The relationship between selected variables was tested using the chi-square test. Logistic regression was used to predict outcome variables.

Qualitative data was organized and analyzed thematically based on the study's objective. Inductive thematic analysis was used for qualitative data. Using an inductive approach permitted themes to be determined by the data (Ames et al., 2019; Maguire & Delahunt, 2017; Braun & Clarke, 2006). This process involved several distinct stages:

Step 1: Familiarization with the data - Understanding the data was aided by thoroughly examining all the data gathered. Making brief notes and transcribing the audio.

Step 2: The data was coded - Every interview transcript was examined, and everything that stood out as significant or possibly fascinating was noted, along with all the words and phrases that fit the codes. The information was then gathered and organized into groups with unique codes and analyzed using NVIVO Software.

Step 3: Generating themes - The themes were constructed using the codes created to identify patterns. A separate analysis of the narratives from each participant group

identified the key themes. Comparing the themes from each group followed the study's primary objective.

Step 4: Reviewing themes - The data sets were compared to the themes to ensure the themes accurately represented the data and were helpful.

Step 5: Defining and naming themes - Defining themes involved explaining their meaning and how they contributed to understanding the data. The themes were named by creating simple names.

Step 6: Write up the final analysis - The data analysis was documented. Each subject was covered individually in the outcomes or findings.

The conclusion followed, summarizing the essential findings and demonstrating how the analysis addressed the study questions and derived recommendations for the study.

3.9 Ethical Consideration

The study was conducted according to ethical procedures involving obtaining a research clearance letter. The letter formalized the study and introduced the Researcher to the respondents. Approval for the study was sought from the Kabarak University Institute of Postgraduate Studies (IPGS). Additionally, ethical clearance was obtained from the Kabarak University Scientific and Ethics Review Committee (KUREC), and a research permit was obtained from NACOSTI. The study also sought approval from the Ministry of Health in Nakuru County and the management of Nakuru County Referral Hospital. Written and signed informed consent was acquired from each respondent.

Furthermore, confidentiality was upheld by providing participants with a detailed explanation of the study's objectives during recruitment, and anonymity was guaranteed. The names of the participants were not used, further enhancing their confidentiality. There were no known risks associated with the study.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the study, which are discussed per the objectives outlined in section 1.3.

4.2 General Information

The study had three hundred and ninety-two completed surveys/questionnaires, representing 99% of the sample size.

4.3 Socio-Demographic Characteristics of Respondents

The first objective was to describe the socio-demographic characteristics of patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital. The study examined the socio-demographic profiles of participants, covering gender, age, religion, education, occupation, and marital status. As shown in Table 1, the study's participant population was predominantly female (62%), with a notable proportion having attained at least a primary education (43.5%). About 13.5% had no formal education. Most respondents were married (76.6%), and at least half of the respondents had a source of daily livelihood, and a significant portion (36.1%) were not currently employed.

The study provided a comprehensive overview of the participants' socio-demographic characteristics, highlighting key aspects such as gender, age, religion, education, occupation, and marital status. The participant population was predominantly female, comprising 62% of the respondents, which may reflect gender-related factors influencing diabetes management and access to nutrition counselling sessions.

The majority of respondents were within the 51-70 age group, representing 56.8% of the total sample. This is expected, as Type 2 diabetes is more prevalent among older individuals. Notably, there was a smaller representation from the younger age groups (only 0.5% for ages 21-30), which could imply that younger people either have a lower prevalence of the disease or are less likely to engage in healthcare services, including nutrition counselling sessions. The predominance of older respondents emphasizes the need for tailored interventions that address the specific health literacy and lifestyle challenges faced by elderly patients.

Educational attainment among the participants varied. Approximately 43.5% of the respondents had completed at least primary education, indicating a foundational level of literacy and education. However, 13.5% of the respondents reported having no formal education, which could impact their ability to understand and implement nutrition counseling sessions effectively.

Table 1

Socio-Demographic Characteristics of Respondents

Respondents' Characteristics	Classification	Frequency (n)	Percent (%)
Gender	Male	149	38.0
	Female	243	62.0
Age (Age group)	21-30 years	2	0.5
	31-40 years	26	6.6
	41-50 years	55	14.0
	51-60 years	110	27.9
	61-70 years	114	28.9
	71-80 years	75	19.0
	81-90 years	11	2.8
	91-100 years	1	0.3
Religion	Catholic	81	20.6
	Protestant	293	74.4
	Islam	7	1.8
	None	13	3.3
Level of education	None	53	13.5
	Primary	171	43.5
	Secondary	123	31.3
	College	33	8.4
	University	13	3.3
Occupation	Not currently employed	143	36.1
	Employed	13	3.3
	Business	118	29.8
	Professional	28	7.1
	Farmer	92	23.2
Marital status	Single	37	9.4
	Married	301	76.6
	Divorced	4	1.0
	Widowed	51	13.0

Most respondents identified as Protestant (74.4%), followed by Catholic (20.6%). The relatively small percentages of respondents identifying with Islam (1.8%) or no religion (3.3%) may reflect the broader religious composition of the region where the study was conducted. Marital status data revealed that most respondents were married, accounting for 76.6% of the study population. This high proportion of married individuals suggests

that family dynamics might significantly influence adherence to nutrition counselling sessions and diabetes management. Occupational status showed a mixed picture. More than half of the respondents had a source of daily livelihood, reflecting some level of economic stability. However, a significant portion of the participants (36.1%) were not currently employed, which may influence their financial capacity to afford recommended foods and counseling services.

These socio-demographic characteristics were crucial for understanding the context within which the participants engage with nutrition counseling sessions and diabetes management. They offered insights into the potential challenges and resources available to different segments of the study population, informing targeted interventions and support strategies to improve adherence and overall health outcomes.

4.4 Health Status and Diabetes-Related Characteristics

Additional parameters on health status and diabetes-related characteristics were collected in this study and are presented in Table 2. To assess the adherence to nutrition counselling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital. The majority of respondents (88.1%) had been diagnosed with Type 2 diabetes for over a year. Complications related to diabetes were reported by 59.6% of participants. Although 74.7% of patients frequently attend diabetic clinic sessions, there is a disconnect with adherence to nutrition counselling sessions. Despite a high rate of attendance at diabetic clinic sessions (74.7% attending more than three times in the past six months), only 23.0% reported attending frequent nutrition counselling sessions.

The study also found that while a high percentage (94.2%) attended nutrition counselling sessions, only 23.0% had it frequently, and 45.2% had none in the past six months, indicating a gap between initial counseling and regular engagement. Most counseling sessions were under 45 minutes, and most of the counseling came from nutritionists

(84.4%). Additionally, many patients seek nutritional advice from informal sources like friends, family, and the Internet (39.8%).

Table 2

Health Status and Diabetes-Related Characteristics of Respondents

Health-Related Questions	Classification	Frequency (n)	Percentage (%)
Duration since being diagnosed with type 2 diabetes	Less than six months	26	6.6
	Less than one year	12	3.0
	One year ago	9	2.3
	More than one year ago	348	88.1
Complications	Presence of Complications	236	59.6
	Without complications	160	40.4
Diabetic clinic attendance in the last six months	Once	29	7.4
	Twice	40	10.2
	Three times	30	7.7
	More than three times	292	74.7
Nutrition Counseling Sessions	Attended nutrition counseling	371	94.2
	Not attended nutrition counseling	23	5.8
Number of nutrition counseling sessions attended since diagnosis	None	27	6.9
	Once	111	28.2
	Twice	70	17.8
	Three times	39	9.9
	More than three times	146	37.2
Number of nutrition counseling sessions attended in the last six months	None	177	45.2
	Once	128	32.7
	Twice	35	8.9
	Three times	23	5.9
	More than three times	29	7.4
Frequency of attendance at nutrition counseling	Frequent attendance	90	23.0
	Irregular attendance	302	77.0
Duration of nutrition counseling sessions	Less than 45 minutes	281	74.7
	45 minutes	14	3.7
	More than 45 minutes	81	21.5
A healthcare provider who conducts nutrition counseling Sessions	Nurse	15	4.0
	Nutritionist	314	84.4
	Doctor/Physician	39	10.5
Other sources of nutrition information	Friends	39	17.3
	Family	65	28.8
	Internet/media	90	39.8
	Other	32	14.2

4.5 Adherence to Nutrition Counseling Sessions

The study's third objective was to investigate the Enablers of adherence to nutrition counseling Sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital. The current research referred to adherence as attending at least three nutrition counseling sessions with a registered healthcare provider within the last six months. To assess the participants' adherence to nutrition counseling Sessions in Nakuru County Referral Hospital, participants were asked about the frequency of their attendance at these sessions over the last six months. The results are reflected in Table 3 below:

Table 3

Number of Nutrition Counseling Sessions Attended in the Last Six Months

Number of counseling sessions (6 months)	Frequency (n)	Percent (%)
None	177	45.2
Once	128	32.7
Twice	35	8.9
Three times	23	5.9
More than three times	29	7.4

The analysis of adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital reveals a concerning pattern. Adherence, defined as attending at least three nutrition counseling sessions within the last six months, was notably low among the study participants. According to the data presented in Table 4.3, 45.2% of respondents had not attended any nutrition counseling sessions in the last six months, and 32.7% had attended only once. This indicates that over three-quarters of the participants did not meet the adherence criterion of attending at least three sessions.

The distribution of counseling session attendance shows that a small proportion of patients attended the recommended sessions. Specifically, 5.9% attended three sessions, 7.4% attended more than three times, and 8.9% attended twice. The relatively low percentages of frequent attendance highlight a significant gap in adherence. This gap suggests that while some patients are engaged in their nutritional care, a large portion of the population is either not accessing or not consistently participating in nutrition counselling sessions. Several factors may contribute to this low level of adherence.

Further analysis was conducted to determine the association between socio-demographic characteristics and adherence to nutrition counselling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital. To determine the association between socio-demographic characteristics and adherence to nutrition counselling sessions, as shown in Table 4. Chi-square tests were conducted to explore potential associations between the number of nutrition counseling sessions attended in the last six months and various socio-demographic characteristics of patients with type 2 diabetes at Nakuru Referral Hospital. The socio-demographic factors examined included gender, age, religion, highest level of education, occupation, and marital status. The primary aim was to identify whether these socio-demographic factors significantly influenced adherence to nutrition counseling sessions.

Table 4

Associations of Socio-Demographic Characteristics and Adherence to Nutrition Counselling Sessions

Socio-Demographic Characteristics	Pearson Chi-Square	Significance
Gender	5.180	p=0.269
Age (Age group)	10.407	p=0.845
Religion	6.934	p = 0.540
Level of education	19.060	p=0.266
Occupation	10.407	p=0.845
Marital Status	5.676	P= 0.922

The Chi-Square tests indicated no significant associations between the number of nutrition counseling sessions attended and the socio-demographic factors studied (gender, age, religion, highest level of education, occupation, and marital status), making logistic regression analysis unnecessary for these variables.

However, binary logistic regression analysis was conducted to assess how health-related characteristics influence adherence to nutrition counseling Sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital, as shown in Table 5:

Table 5

Health-Related Characteristics' Significance on Adherence to Nutrition Counselling Sessions

Variable	B	S.E.	Wald	df	Sig.
Duration of diagnosis	1.190	0.290	16.822	1	0.000
Presence of Complications (Yes)	0.851	0.405	4.420	1	0.036
Diabetic Clinic Attendance	1.154	0.358	10.381	1	0.001
Duration of nutrition counseling sessions	-0.734	0.217	11.387	1	0.001
Healthcare providers conducting nutrition counseling	0.958	1.410	0.462	1	0.497
Other sources of information	-1.083	0.684	2.512	1	0.113

B: The Beta coefficient, **S.E.:** The standard error, **Wald**: The Wald statistic, **df:** Degrees of freedom, **Sig.:** The significance (p-value)

The duration of diagnosis, the presence of complications, diabetic clinic attendance, and the duration of nutrition counseling sessions were significant predictors of attendance at nutrition counseling sessions. Patients with longer periods of diagnosis and the presence of complications were more likely to attend nutrition counseling sessions often. Patients attending the diabetic clinic were less likely to attend nutrition counseling sessions, and the longer the sessions, the less likely they were to attend.

4.6 Enablers of Nutrition Counseling Adherence Sessions

The study sought to investigate the Enablers of adherence to nutrition counselling Sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital, as reported by respondents. The study revealed a multifaceted view of adherence to nutrition counseling among patients with type 2 diabetes, influenced by patient- and healthcare system-level factors. This study synthesizes these factors, integrating patient experiences and quotes to provide a comprehensive understanding.

4.6.1 Patient Factors

The study revealed that a range of patient factors significantly influences adherence to nutrition counseling sessions among patients with type 2 diabetes. A key finding is the generally positive perception patients have of nutrition counselling sessions. Patients view nutrition counselling sessions positively, recognizing its critical role in managing diabetes and improving overall well-being. The study highlights that many patients have observed tangible physical benefits from adhering to dietary recommendations. For instance, one patient shared, *"When I follow, it's good. I even feel like my body is improving. I have more energy since I started following." This statement underscores the*

importance of experiencing visible health improvements, reinforcing the motivation to adhere to nutrition counselling sessions.

The effectiveness of the counseling itself also plays a role in this positive perception. Patients frequently mentioned that the food recommendations they received were practical and beneficial. One participant commented, *"The advice we get about what to eat and what not to eat helps. I've noticed changes in my sugar levels when I stick to it."* This feedback illustrates that when patients see direct results from following dietary advice, it strengthens their commitment to continue adhering to the recommendations.

The motivation to adhere to nutrition counseling sessions often stems from the desire to improve health and potentially reduce medication dependency. One patient highlighted this motivation: *"I want to reduce the amount of medication I have to take, so I try to follow the diet they give me."* Another patient mentioned, *"I have seen how my blood sugar levels drop when I eat right, so I keep doing it."* These quotes illustrate how the prospect of better health and reduced medical interventions can drive patients to stick to their nutritional plans.

Family support is crucial in helping patients adhere to nutrition counselling sessions. The family's involvement in meal preparation, attending sessions, and reinforcing dietary practice impacts adherence. One patient described how their family supports them: *"My wife comes with me to the sessions, and she helps me with meal preparation according to the advice we receive."* This involvement makes it easier for patients to follow through with recommendations and creates a shared responsibility within the household.

Another patient highlighted their daughters' role in supporting their adherence: *"My daughters...we usually agree with them when I come, we meet at the hospital so they can follow up with me."* This quote reflects how family involvement extends beyond meal

preparation to active participation in the patient's healthcare journey, which can be a significant motivator for adherence.

Type 2 diabetes support groups provide some patients with an alternative source of nutrition counselling sessions. They offer additional counseling and support, sometimes serving as a preferred option for patients who have attended multiple sessions or who find support groups more accessible. One patient noted, *"I get much useful information from the support group meetings, which helps me manage my diabetes better."*

Support groups provide another avenue for receiving nutrition advice as an alternative form of counseling. Patients who attend these groups might rely less on formal counseling sessions. Another patient stated, *"I attend a diabetes support group monthly where I get a lot of useful nutrition advice."*

4.6.2 Provider-Related Factors

Despite the financial and administrative barriers, patients generally express satisfaction with the nutrition counseling sessions they attend. They appreciate the time allocated for these sessions, finding it sufficient to discuss their dietary needs and receive personalized advice. One patient remarked, *"The time they give us during the nutrition counseling sessions is enough; I don't feel rushed."* This positive feedback indicates that giving patients adequate time and attention enhances their willingness to adhere to the advice provided. Another expressed satisfaction with the time allocated for nutrition counseling sessions: *"The time is enough."*

4.6.3 Patient-Provider Relationship

The relationship between patients and healthcare providers is crucial in influencing adherence to nutrition counselling sessions. Most participants reported positive experiences with their healthcare providers, highlighting the professionalism and support

they receive. One patient expressed satisfaction, saying, *"Yes, they are good. I have no problem with the doctors."* Another patient emphasized the importance of feeling understood and respected during consultations: *"The doctors listen to me and understand my concerns. That makes me more willing to attend nutrition counseling sessions and follow their advice."* Positive interactions and respectful communication with healthcare providers contribute to higher adherence levels.

Healthcare providers acknowledge the importance of the patient-provider relationship. One noted, *"The patient-provider relationship is important. I try to ensure that the patients feel heard and understood so they feel comfortable opening up about their issues and needs.*" Another noted, *"Most patients are my friends; we get along pretty well."*

Consistency in seeing the same healthcare provider also played a vital role in building trust and ensuring continuity of care. However, some patients reported negative experiences due to rough interactions or inconsistencies in care. One participant noted, *"An example for me, there is a healthcare provider I would rather wait for; if I come and do not find the doctor I like, I leave and wait for the one who is concerned and caring enough to follow up and find out my progress."* This preference for consistent care underscores the importance of building a stable patient-provider relationship, which can significantly impact adherence.

4.7 Barriers to Nutrition Counseling Adherence Sessions

The study also sought to investigate the barriers to adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital, as reported by respondents.

4.7.1 Patient Factors

The cost of recommended foods is a significant barrier for many patients. One participant said, "*The food they tell us to eat is expensive, and sometimes I can't afford*

it." Another patient shared, *"And you know I stay with family, buying food such as arrow roots is expensive when I would rather buy bread, which is cheaper and enough for the whole family."* These quotes highlight the financial strain the prescribed diet can place on patients, making it challenging to adhere to the recommendations consistently.

A healthcare provider countered the high cost of recommended foods, noting, "*A common myth is that foods recommended during nutrition counselling sessions are not expensive, because I recommend foods easily accessible by the patients. Any patient who says that the foods recommended during nutrition counseling sessions are expensive has not attended a nutrition counseling session."*

Understanding nutritional advice during nutrition counseling sessions can be challenging for some patients. This lack of understanding can lead to poor adherence, as patients may not fully grasp what is required. One patient remarked, *"I often find it hard to understand some dietary terms and recommendations. I nod and leave without fully grasping what I must do."*

Similarly, a healthcare provider commented, "*Patients feel that the information provided is overwhelming. Breaking nutrition information into a coursework-style format, starting with the most basic concepts, would likely enhance understanding and improve adherence to nutrition counselling sessions."*

However, not all patients experience this difficulty. As another patient stated, *"My opinion/views on the food we are supposed to eat are good. We are told to eat food with a lot of greens or brown foods like millet, but we are not supposed to eat white foods like bread, ugali, rice, and mandazi."* This contrast in experiences highlights the importance of clear communication and patient education during counseling sessions.

Patients also face practical challenges related to geographic limitations, job-related pressures, and the availability of recommended foods that impact adherence. One patient explained the difficulty of accessing specific foods due to geographic barriers: *"The special diet is like millet, and to get the millet, you cannot get it from Nakuru; you have to get it from far, like Busia."* Patients with demanding work schedules often struggle to adhere to the recommended dietary practices. One patient described how their work impacted their ability to adhere: *"There was no sleeping or resting. That is where the problem came about."* These quotes illustrate how external factors beyond the patient's control can significantly impede adherence to dietary recommendations.

While most patients find the hospital accessible, logistical and environmental challenges, such as geographic limitations, are further compounded by some areas' inadequate infrastructure, including electricity. These challenges pose significant barriers to adherence. The lack of infrastructure, such as electricity for food storage, further complicates adherence for some patients. These logistical challenges underscore the need for more flexible and accessible support systems to accommodate patients' circumstances.

4.7.2 Provider-Related Factors

The financial aspect of nutrition counselling sessions, particularly related to insurance coverage, plays a substantial role in adherence. Many patients expressed dissatisfaction with the National Hospital Insurance Fund (NHIF) due to its limited coverage and administrative delays. One patient expressed frustration, saying, *"I use NHIF, which does not cover everything, like not all drugs."* Another patient echoed this sentiment, who remarked, *"Yes, that is a problem because if I have paid for it, why should it not be covered?"* These quotes highlight the financial burden that inadequate insurance coverage places on patients, which can deter them from adhering to their treatment plans.

Administrative delays at NHIF stations further compound these challenges. Patients frequently reported long waiting periods, which exhaust them and discourage them from attending nutrition counseling sessions. One patient described their experience: *"The queues at the NHIF station are always so long. I am too tired to wait for my nutrition counseling session by the time I finish."* Another patient added, *"Waiting in those long queues at NHIF is exhausting. By the time I get to my appointment, I do not have the energy for nutrition counseling sessions."* These administrative inefficiencies contribute to patient fatigue and frustration, ultimately affecting their adherence to nutrition counselling sessions.

Despite the financial and administrative barriers, patients generally express satisfaction with the nutrition counseling sessions they attend. They appreciate the time allocated for these sessions, finding it sufficient to discuss their dietary needs and receive personalized advice. One patient remarked, *"The time they give us during the nutrition counseling session is enough; I don't feel rushed."* This positive feedback indicates that giving patients adequate time and attention enhances their willingness to adhere to the advice provided. Another expressed satisfaction with the time allocated for the nutrition counseling session: *"The time is enough."*

4.6.3 Patient-Provider Relationship

There were also instances where patients felt disrespected or poorly treated by some healthcare providers. One patient shared, *"But you know, there are others when you go, they are very rough."* Such negative experiences can undermine the trust and rapport necessary for effective adherence to nutrition counselling sessions. Consistent and experienced healthcare providers are preferred, as patients value continuity and personalized care. Additionally, inconsistencies in seeing the same healthcare provider affected the continuity of care.

There was often a gap in communication between patients and healthcare providers regarding the challenges patients face in accessing the recommended foods. This lack of communication can hinder adherence, as patients may not receive the necessary support or alternatives for overcoming these barriers.

A significant communication gap exists between patients and healthcare providers regarding the challenges patients face in accessing recommended foods. This lack of communication can hinder adherence, as patients may not receive the necessary support or alternative recommendations to overcome these barriers. One patient expressed this frustration, stating, *"Sometimes I wish they understood how hard it is to get the food they recommend. They should ask us more about what we can get."* Addressing this communication gap could improve adherence by ensuring patients' dietary recommendations are realistic and achievable.

The thematic analysis reveals a complex interplay of factors influencing adherence to nutrition counseling sessions among patients with type 2 diabetes. Positive patient perceptions, family support, and effective patient-provider interactions are key factors that enhance adherence. Conversely, comprehension issues, logistical and environmental challenges, insurance coverage limitations, and administrative inefficiencies pose significant barriers.

Overall, while many patients report positive interactions and adherence, there are notable areas for improvement; patients acknowledge that there are areas where nutrition counseling sessions can be improved, including addressing insurance limitations, reducing administrative delays, and ensuring consistent and supportive provider interactions. Enhancing these aspects could further support adherence to nutrition counseling sessions and improve overall diabetes management.

4.8 Discussion

This study examined facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital. This section discusses the study's findings in the context of existing literature, highlighting implications for practice and policy.

4.8.1 Socio-demographic Characteristics and Their Impact on Adherence

The study found no significant association between socio-demographic characteristics (e.g., age, gender, education) and adherence to nutrition counselling sessions, suggesting that adherence to nutrition counseling sessions may be more strongly influenced by health-related factors (e.g., disease duration, complications). This finding contrasts with earlier studies that identified socio-demographic factors such as age and gender as predictors of adherence (Coughlin et al., 2020; Guo et al., 2023; Polis et al., 2024; Pradeepa et al., 2023).

The difference in findings could be due to the specific context of the Nakuru Referral Hospital or other unmeasured factors, such as cultural beliefs. Furthermore, this finding aligns with studies in other sub-Saharan African regions that reported socio-demographic factors as less predictive of adherence compared to health status and patient-provider interaction quality (de Terline et al., 2019; Heestermans et al., 2016).

4.8.2 Health Status and Diabetes-Related Factors

The study identified significant predictors of adherence, such as the duration since diagnosis, complications, and frequency of diabetic clinic visits. Most participants had been living with Type 2 diabetes for over a year, highlighting the chronic nature of the condition. Patients who had been diagnosed with Type 2 diabetes for longer periods and those with complications were more likely to seek nutrition counselling sessions. Long-

term diabetes management requires continuous and effective dietary interventions (American Diabetes Association, 2023).

The high prevalence of diabetes-related complications (59.6%) underscores the critical need for effective dietary management. This finding suggests that as the disease progresses and complications arise, patients may become more aware of the importance of dietary advice in managing their health and, therefore, more motivated to attend nutrition counselling sessions, which could also be due to increased interactions with healthcare providers who emphasize the importance of diet in managing complications.

This finding is consistent with previous research indicating that patients with more advanced disease stages or complications are more likely to adhere to recommended care, including nutrition counselling sessions (Oluma et al., 2020). On the other hand, despite regular clinic visits, only 23% of patients attend frequent nutrition counselling sessions, pointing to a disconnect between patients diabetic clinic attendance and nutrition counselling sessions. The observed gap indicates a need for integrating nutrition counseling sessions more effectively into routine diabetes care.

The low frequency of nutrition counseling session attendance (45.2%) and short duration of the counseling sessions (less than 45 minutes) may contribute to inadequate dietary guidance. Research indicates that longer and more frequent nutrition counseling sessions are associated with better adherence and improved health outcomes (Laranjeira et al., 2023). Extending session times and increasing the frequency of counseling could address the current deficiencies and enhance patient engagement.

The reliance on informal sources of nutritional advice (39.8%) highlights a gap in professional guidance. While informal advice can be supportive, it may lack the accuracy and specificity needed for effective diabetes management (Adu et al., 2019). Ensuring

patients receive accurate, professional dietary advice and addressing any misconceptions from informal sources is crucial for improving adherence.

4.8.3 Adherence to Nutrition Counseling Sessions

Nutrition counseling is a cornerstone of diabetes management, helping to regulate blood sugar levels and prevent complications among patients with type 2 diabetes (Reynolds & Mitri, 2024). The study found that 45.2% of the participants did not attend any nutrition counseling sessions in the last six months, while only a small minority met the recommended frequency of three or more sessions. This low level of adherence is concerning, given the critical role nutrition counseling sessions play in managing Type 2 diabetes.

The low adherence rates indicate a need for targeted interventions to increase participation. Research suggests that regular attendance is crucial for the effectiveness of nutrition counselling sessions (Dewidar et al., 2023). The low adherence rate suggests that many patients may lack the necessary support to manage their condition effectively, potentially resulting in poorer health outcomes. Several factors could influence the low adherence observed. Moreover, patients might prioritize medical appointments over nutrition counselling sessions, especially if the benefits of nutrition counseling sessions are not immediately apparent.

The low adherence to nutrition counseling sessions observed in this study is consistent with findings from other studies in similar contexts; a study in Sub-Saharan Africa similarly reported low adherence rates to nutrition counseling Sessions among patients with Type 2 diabetes (Iwelomen et al., 2024). Another study by Baral et al. (2022) found that adherence to nutrition counselling sessions in patients with type 2 diabetes was low, with barriers including lack of knowledge, low motivation, and economic constraints. Addressing barriers to attendance and implementing strategies to increase patient

engagement, such as flexible scheduling and reminder systems, could improve adherence.

4.8.4 Enablers of Nutrition Counselling Sessions Adherence

Patient Factors

Patients who recognized the benefits of nutrition counseling sessions exhibited higher adherence, motivated by the perceived positive impact on their health. This intrinsic motivation aligns with (Vrkatić et al., 2022), who found that patients' awareness of the advantages of dietary changes is a significant driver of adherence. Reinforcing the benefits of nutrition counseling sessions with practical examples may further enhance patient motivation, ensuring patients see the tangible health outcomes of their efforts.

Support from family and friends played an essential role in motivating patients to attend sessions and adhere to dietary advice. This finding is consistent with Gilliss et al. (2019), who highlighted the influence of family support on managing chronic conditions. Family-inclusive counseling approaches could leverage existing support networks, facilitating adherence and improved health outcomes by engaging family members in the patient's care journey.

Patients with diabetes complications adhered more consistently to nutrition counseling sessions, possibly as a reactive measure in response to deteriorating health. While this reactivity may lead to short-term engagement, it underscores the need for preventive adherence strategies to avoid complications. Proactive engagement could be fostered by emphasizing the preventive benefits of dietary changes and encouraging adherence before complications arise.

Provider Factors

Respectful and empathetic communication from providers was associated with higher adherence to nutrition counseling sessions, as patients valued clear, supportive guidance. This finding aligns with studies showing that empathetic communication improves patient engagement (Heisler et al., 2002). Training healthcare providers on empathetic communication could improve patient engagement, making patients more likely to adhere to nutrition counseling sessions.

Patient-Provider Relationship

Positive relationships between patients and providers are characterized by trust, consistent care, and respectful communication. Trust and respect in the patient-provider relationship were fundamental Enablers of adherence to nutrition counseling sessions. Patients who felt respected and valued by their providers reported higher adherence rates, consistent with findings by Birkhäuer et al. (2017). Regular, respectful engagement with patients builds trust, a critical factor for adherence to nutrition counseling sessions, especially for patients facing multiple barriers.

Patients valued consistent engagement with the same healthcare providers, which contributed to building trust and facilitated adherence to nutrition counseling sessions. Studies by Kwame & Petruck (2021) and Heisler et al. (2002) echo this finding, showing that continuity in care strengthens the patient-provider bond. Ensuring patients see the same provider consistently could enhance adherence by reinforcing a supportive, reliable relationship.

Patients appreciated healthcare providers who managed disagreements constructively, contributing to a supportive environment as suggested by Ronquillo et al. (2023). (Ronquillo et al., 2023), emphasize that constructive conflict resolution in healthcare settings enhances patient satisfaction and adherence. Healthcare providers trained in

cooperative conflict resolution may foster adherence by maintaining positive relationships even when disagreements arise, ensuring patients feel heard and understood.

4.8.5 Barriers to Adherence to Nutrition Counseling Sessions

Patient Factors

Financial constraints emerged as a key barrier, limiting patients' ability to afford recommended foods and cover transportation costs to attend nutrition counseling sessions. This is particularly challenging for lower-income patients, as highlighted in studies by Omotosho & Senghore (2024), Pourhabibi et al (2022), Xu et al. (2021), which identified financial challenges as major obstacles to accessing healthcare services. Economic constraints not only affect patients' ability to make necessary dietary changes but also limit their attendance at nutrition counseling sessions, impacting long-term health outcomes (Ayele et al., 2018). Subsidies for recommended foods or transportation assistance could alleviate some of these burdens, potentially improving adherence rates and patient outcomes.

Logistical challenges, including time constraints and limited transportation options, further reduced attendance at nutrition counseling sessions. Logistic challenges, especially for patients with work or family responsibilities, made it difficult to prioritize healthcare. Studies by Xu et al. (2021) and Pourhabibi et al. (2022) emphasize that logistical difficulties, including scheduling conflicts and transportation issues, are prevalent challenges to healthcare access. Implementing solutions such as flexible scheduling, transportation support, or telehealth options could offer greater accessibility, allowing more patients to engage consistently in nutrition counseling sessions.

Additionally, limited health literacy, especially among patients with lower education levels, made dietary recommendations harder to understand and implement. Health

literacy has been widely documented as a determinant of healthcare adherence; studies by Ahmed et al (2023) and Coughlin et al. (2020) show that patients with a limited understanding of health-related information struggle to implement dietary changes effectively. Addressing this through simplified language and practical examples during nutrition counseling sessions could empower patients to adhere to nutrition counseling sessions and make informed choices.

Patients noted that prescribed dietary changes often conflicted with their cultural nutrition practices. The need for culturally sensitive dietary advice is well-recognized (Endevelt et al., 2014, and Goyan et al., 2015), emphasizing that without accounting for cultural food practices, patients may struggle to adhere to recommendations. For example, certain foods may be a staple in a patient's culture, making it challenging to adopt alternative dietary suggestions. Incorporating culturally tailored nutrition counseling sessions, where providers respect and incorporate traditional diets and cultural preferences into dietary advice, could enhance adherence by making recommendations more relatable and achievable.

Provider Factors

Ineffective communication from healthcare providers, including insufficient explanations and overly technical language, hindered adherence, as patients expressed difficulty in understanding complex dietary guidance without sufficient explanation or support. The importance of communication quality is emphasized in a study by Heisler et al. (002), who revealed that effective communication fosters adherence through clarity and support. Investing in communication training for providers may enhance patient engagement by ensuring that information is delivered empathetically and is patient-centered.

The study highlighted significant challenges related to health insurance. Long wait times and inefficiencies at NHIF stations discouraged patients from attending counseling sessions, with many patients reporting fatigue with the process. The challenges with health insurance could also be linked to broader systemic issues, such as underfunding or understaffing of insurance services, which contribute to delays and inefficiencies. Patients' lack of understanding of insurance processes also exacerbates these challenges.

The study's findings echo those of Bourgeois et al. (2024), Coleman et al. (2002), and Allen et al. (2017), who documented how administrative delays and bureaucratic hurdles in health insurance systems hinder timely care, affecting patients' motivation to seek regular counseling. Administrative challenges with health insurance are a common barrier to healthcare access (Allen et al., 2017). Administrative barriers and inefficiencies in the health insurance system can create significant obstacles for patients, leading to frustration and disengagement from healthcare services, including nutrition counseling sessions (Allen et al., 2017). Addressing administrative inefficiencies in NHIF processes could improve patient experience and engagement, facilitating greater adherence by reducing frustrations related to healthcare access.

Patient-Provider Relationship

Negative experiences by patients with healthcare providers undermine the patient-provider relationship. The study found that when communication lacked clarity and consistency, patient trust was compromised, reducing their adherence to nutrition counseling sessions. Trust between patients and providers is critical (Panahi et al., 2022; Kwame & Petrucka, 2021). Patients who trust their providers are more likely to follow through on the recommendations from nutrition counseling sessions. Regular, respectful communication can strengthen trust and foster a supportive environment for patients, which is key to promoting adherence.

Inconsistent provider-patient interactions limit the ability to build strong, trust-based relationships, essential for adherence. Patients noted a lack of continuity in care due to frequently seeing different providers, disrupting the trust and rapport necessary for open communication. Consistency in care by healthcare providers fosters a stronger patient-provider relationship, which improves adherence. (Kwame & Petrucka, 2021), and (Heisler et al., 2002). Structuring care to allow patients regular access to the same healthcare provider could enhance continuity and reinforce trust.

Occasional conflicts with healthcare providers over dietary recommendations or healthcare decisions affected patient adherence, particularly when conflicts were poorly managed. Unresolved conflicts during nutrition counseling sessions can negatively impact patient satisfaction and adherence (Ronquillo et al., 2023). Training providers in conflict resolution and encouraging open dialogue may reduce misunderstandings and foster a cooperative environment, ultimately enhancing adherence.

4.8.6 Implications for Practice and Policy

The study found that frequent attendance at diabetic clinics did not necessarily translate into regular participation in nutrition counseling sessions, suggesting a disconnect between clinical care and nutrition counseling sessions. The disconnect could be due to a lack of coordination among healthcare providers or inadequate resources to provide comprehensive nutrition counseling during clinic visits.

Integrating nutrition counseling sessions into routine care and increasing session duration may improve adherence. Previous research has highlighted the importance of integrating nutrition counseling sessions into routine care to improve adherence (Powers et al., 2020). (Powers et al., 2015) emphasized the need for structured education programs, including nutrition counseling sessions, to be part of regular diabetes care to enhance patient outcomes.

Policies that address financial and administrative barriers, such as improved insurance coverage and reduced administrative delays, are essential to support patient engagement. Tailored interventions that consider financial, literacy, and logistical barriers can further enhance adherence.

4.9 Conclusion

The findings of the study underscore the need to improve adherence to nutrition counseling sessions among patients with Type 2 diabetes. While patient-level factors such as the duration since diagnosis and the presence of complications play a role in adherence, healthcare system factors are equally important, particularly the integration of counseling into routine care. Addressing the barriers such as economic constraints, comprehension issues, and practical challenges will be essential for enhancing adherence. Interventions should focus on increasing patient engagement, addressing barriers, and improving the overall quality of nutrition counseling sessions. Moreover, future efforts should consider the cultural context of nutrition advice to ensure that it is both accessible and relevant to patients' lives.

This study has several limitations that should be acknowledged. First, the study was conducted in a single hospital, which may limit the generalizability of the findings to other regions or healthcare settings. Second, reliance on self-reported data for assessing adherence could have introduced recall bias, as patients may have overestimated or underestimated their adherence to and engagement with nutrition counseling sessions.

Additionally, the differences between quantitative and qualitative measures restrict direct comparisons. While the qualitative data provided detailed insights into enablers and barriers to adherence, the quantitative analysis did not measure these aspects. As a result, the qualitative findings supplemented rather than directly enhanced the quantitative data.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter is a summary of all the findings from the study.

5.2 Summary of Findings

The study on type 2 diabetes patients in Nakuru County Referral Hospital reveals key insights into socio-demographic factors, health status, and adherence to nutrition counseling sessions. Most respondents were female (62%) and older (51-70 years), with varying education levels; 43.5% had at least primary education, while 13.5% had no formal education, indicating a need for tailored educational interventions. Employment status varied, with 36.1% unemployed, potentially impacting access to healthcare resources.

While 88.1% had been diagnosed with diabetes for over a year, adherence to nutrition counseling sessions was low; 45.2% had not attended any sessions in the past six months. Despite 94.2% having received counseling, adherence was hindered by financial constraints, limited access to quality food, insufficient awareness, busy schedules, and long waiting times. Positive factors included supportive healthcare providers, support groups, NHIF insurance coverage, and access to nutritious food.

These findings highlight the need for targeted interventions, such as integrating counseling costs into clinic fees, offering free services, and enhancing education and support systems to improve adherence and manage type 2 diabetes effectively.

5.3 Conclusions

This study highlights critical barriers to adherence in nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital. Financial

limitations, compounded by economic challenges, emerged as a major obstacle, alongside limited access to nutritious food in low-income areas. Inadequate awareness about counseling benefits further hinders adherence, highlighting a need for targeted educational initiatives. Enablers such as support groups and adequate insurance coverage can significantly improve adherence.

Addressing barriers like financial constraints and limited food access while leveraging Enablers such as support groups and insurance is essential for better adherence and diabetes management outcomes. Tailoring interventions to address the specific challenges and enhancing nutrition counseling sessions are key to achieving improved health outcomes.

5.4 Recommendations

The following recommendations are based on respondents' feedback, addressing the barriers identified:

5.4.1 Recommendations for Practice

To improve adherence to nutrition counseling sessions, integrating nutrition counseling sessions into existing diabetic support groups can enhance convenience and reduce costs. Group settings offer peer support, and since 74.7% of patients attended more than three diabetic clinic appointments in the past six months, incorporating nutrition counseling sessions into these visits can maximize participation and adherence.

To reduce financial strain, combining nutrition counseling sessions with routine diabetic care visits is recommended, especially since 36.1% of patients are unemployed. This approach minimizes costs associated with separate appointments and optimizes healthcare resources. Additionally, implementing follow-up procedures, such as SMS

reminders, can help sustain engagement, while a robust referral system ensures access to specialized healthcare providers.

Strengthening patient-provider relationships through effective communication fosters trust, encouraging adherence. Community outreach through local centers, health workers, and media can broaden awareness, counter myths, and make education efforts culturally relevant. Emphasizing the role of nutrition counseling sessions in diabetes management, along with educational materials in local languages and visual aids, can help overcome language and literacy barriers.

Lastly, offering free nutrition counseling sessions and diabetes management services, such as subsidizing the Social Health Authority, can eliminate financial barriers, ensuring all patients receive essential support, enhancing adherence, and improving health outcomes.

5.4.2 Policy Recommendations

Providing free nutrition counseling sessions and diabetes management services, for example, by subsidizing the Social Health Authority, can reduce financial obstacles, ensuring equitable access to care and leading to better health outcomes, reduced complications, and lower healthcare costs.

5.4.3 Recommendations for Further Research

Future studies should investigate targeted strategies to overcome identified adherence barriers and evaluate their effectiveness in improving adherence rates through longitudinal research. This approach will help understand adherence dynamics over time and allow for a closer examination of the counseling process, including the specific nutrition recommendations provided.

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APPENDICES

Appendix I: Adult Informed Consent Form

(The form is written in English but can be translated to Kiswahili or any other appropriate language.)

STUDY TITLE: FACILITATORS AND BARRIERS TO ADHERENCE TO NUTRITION COUNSELING SESSIONS AMONG PATIENTS WITH TYPE 2 DIABETES AT NAKURU COUNTY REFERRAL HOSPITAL

PI: Alungata Josephine Affiliated Institution: Kabarak University

Introduction

You are invited to participate in this research study by the above-listed investigator. This form will help you gather information about the study to decide whether you want to participate voluntarily. You are encouraged to ask any questions regarding the research process and any benefit or risk you may accrue by participating. After adequately informing you about the study, you will be requested to agree or decline to participate. Upon agreeing to participate in the study, you will be further asked to affirm that by appending your signature/thumbprint on this form. Accepting or declining to participate in this study does not in any way waive the following rights, which you're entitled to:

a) Voluntary participation in the study;

b) Withdrawing from the study at any time without the obligation of having to explain and;

c) Access to services which you're entitled to

A copy of this form will be provided to you for your records.

Should I continue with YES/NO? _____

This study has been reviewed and approved by the Kabarak University Research Ethics Committee (KUREC).

What is the Purpose of the Study?

The main reason(s) for conducting this study are to answer the following questions:

1. What are the socio-demographic characteristics of patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital?
2. What is the level of adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital?
3. What are the Enablers of adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital?
4. What are the barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital?
5. What is the association between socio-demographic characteristics and adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital?
6. How do health-related characteristics influence adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital?

(To answer these research questions, you are requested to voluntarily answer the question(s) and accept some procedures performed on you.)

Who can Take Part in the study?

You can only partake in the study:

Patient

i. Above 18 years of age.
ii. Diagnosed with type 2 diabetes.
iii. A patient at Nakuru Referral Hospital is on follow-up treatment in the medical outpatient clinic.
iv. A patient on health care services for type 2 diabetes, and you have attended nutrition counseling sessions at least once.

Healthcare provider

i. A Healthcare provider who has worked in Nakuru Referral Hospital for at least one year.
ii. You interact with patients with type 2 diabetes during diabetic clinics.
iii. You conduct nutrition counseling sessions for patients with type 2 diabetes and in diabetic support groups.

In Case You Agree to Participate in the Study, What Will Happen?

Once you agree to participate in the study, this is what will happen:

- The interview and filling of research-administered questionnaires will take about 50 minutes.
- A qualified and well-trained interviewer will ask you questions privately in a setting where you feel comfortable. You will not be coerced into responding if you feel uncomfortable responding to any question. The questions will be on the following areas:

- Socio-demographic characteristics
- Health-related factors
- Perceptions on adherence to nutrition counseling sessions.
- Factors associated with adherence to nutrition counseling sessions among patients with type 2 diabetes.

- The information will be stored for analysis and documented after the interview.

Kindly share your contact details, including phone number and email, so we can update you if there is any new information related to the study.

What Potential Risks are Associated with Participation in this Study?

There are no known risks if you participate in this research study.

Privacy & Confidentiality

Your participation in this study is voluntary, and it will be confidential. The interviews and questionnaires will be completed privately in a designated area. The researcher-administered questionnaires will not ask for information about your name. Your name will remain anonymous. The data will be handled with complete care and discarded after analysis. The tape recorder will be cleared; all information will be deleted after the study. The researcher-administered questionnaires will be burnt or shredded. The contact details you will provide shall remain confidential to the lead researcher.

Suppose you aren't comfortable answering any of the questions during the interview because of feeling embarrassed or uncomfortable. In that case, it will be within your

rights to decline. Otherwise, every measure has been taken to ensure that the interview is conducted in a private area with minimal interference so that you feel comfortable.

What Benefits Are You Going to Accrue by Participating in the Study?

Your input will assist me in comprehending how to effectively meet the requirements of organizations and individuals with type 2 diabetes. While the information gathered may not have direct advantages for you, the knowledge I gain from this research will benefit healthcare providers, patients with type 2 diabetes, health departments, and researchers in enhancing approaches to nutritional guidance and managing the disease overall.

This study will address Sustainable Development Goal 3, which is to ensure the health and well-being of all. The target is to reduce premature death caused by non-communicable diseases by a third through preventative measures and treatment, and to encourage mental health and well-being by 2030.

What Will It Cost You to Participate in the Study?

There are no costs for participating in the study.

In Case I Have Any Further Questions/ Concerns in the Future, Whom Should I Contact?

If you need further clarification or have questions regarding your continued participation in the study, please get in touch with the PI (Phone number: 0715301727/Email address: jossyalungata@gmail.com). In case of concerns regarding your rights and obligations as a research participant, do not hesitate to contact the secretary, KUREC.

What Alternative Options Are Available to Me?

The decision on whether to participate or not is voluntary. You will be free to withdraw from the study at any point during the study without providing any explanation.

How Will the Findings of this Study be Communicated or Shared?

Feedback regarding study findings will be shared with Nakuru Referral Hospital and published online for accessibility.

Statement of Consent

I have comprehensively read the consent form, and/the information has been comprehensively read to me by the researcher. I have understood the study and received clear and concise responses to all of my questions and concerns. The study benefits and foreseeable risks have been explained to me. I understand that my decision to participate in this study is voluntary, and I have the right to withdraw at any point during the study.

I freely consent to participate in this study.

Signing this form does not imply that I have given up the rights I am entitled to as a participant.

I agree to participate in this research.

YES _____NO._____

I agree to provide my contact details for follow-up

YES _____NO_____

Participant's

Name. _____

Participant's Signature/Thumbprint _____Date _____

Appendix II: Data Collecting Tools

Administered to patients with type 2 diabetes

Researcher Administered Questionnaire

The study Facilitators and Barriers to Adherence to Nutrition Counseling Sessions Among Patients with Type 2 Diabetes at Nakuru County Referral Hospital.

Study objectives:

- To describe the socio-demographic characteristics of patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.
- To assess the adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.
- To assess how health-related characteristics influence adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital.

INterview Details		
1	Name of the Interviewer:	
2	Date	dd/mm/yy
3	Patient's ID	

Socio-Demographic Characteristics		
NO	Question	Response
1	Gender	Male Female
2	Age	In years
3	Religion	1. Catholic 2. Protestant 3. Islam 4. Hindu 5. None 6. Other (specify)

4	Highest level of education	1. None 2. Primary 3. Secondary 4. College 5. University 6. Other (specify)
5	Occupation	1. Not currently employed 2. Business 3. Professional 4. Student 5. Other (specify)
6	Marital status?	1. Single 2. Married 3. Divorced 4. Widowed
	Health-Related Questions	
7	When were you diagnosed with type 2 diabetes?	1. One year ago? 2. More than one year ago?
8	Have you had any complications since you were diagnosed with type 2 diabetes?	1. Yes 2. No
9	How many Diabetic clinic sessions have you attended in the last six months?	1. Once 2. Twice 3. Three times 4. More than three times
10	Have you been counseled on nutrition?	1. Yes 2. No
11	Do you attend nutrition counseling sessions often?	1. yes 2. No
12	How many nutrition counseling sessions have you attended in the last six months?	1. Once 2. Twice 3. More than three times
13	How long does the nutrition	1. less than 45 minutes

	counseling session take?	2. 45 minutes 3. More than 45 minutes
14	Who conducted the nutrition counseling sessions?	1. Nurse 2. Nutritionist 3. Physician 4. Other …… specify
15	Other sources of nutrition information?	1.Friends 2.Family 3.Internet/media 4.Other

Key Informant Interview Guides

The study examines the facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital.

Date of the interview: …….....

Interviewer ID: …….

Start time: …….

End time: …….

The objectives of the KII:

- To investigate the Enablers of adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.
- To investigate the barriers to adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.
- To determine the association between socio-demographic characteristics and adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital.

- To assess how health-related characteristics influence adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital.

Thank you for taking the time for this interview. The interview will take about 45 minutes, but you can let me know if you want to take a break or stop the interview.

i. What is your profession?

ii. From your experience, how do you think patients with type 2 diabetes perceive nutrition counseling sessions?

iii. From your experience, what factors do you think encourage/enhance adherence to nutrition counseling sessions among patients with type 2 diabetes?

iv. In the same light, from your experience, what factors do you think hinder patients with type 2 diabetes from adhering to nutrition counseling sessions?

v. What challenges do you encounter when offering nutrition counseling sessions to patients with type 2 diabetes?

vi. How would you describe your interaction with patients during nutrition counseling sessions?

vii. What is your view on the patient-provider relationship and its influence on nutrition counseling sessions?

viii. As we finish this discussion, is there anything you think we might have omitted but that is important in influencing adherence to nutrition counseling sessions?

In-depth interviews

The study examines the facilitators and barriers to adherence to nutrition counseling sessions among patients with type 2 diabetes at Nakuru County Referral Hospital.

Date of the interview: …….....

Interviewer ID: …….

Start time: …….

End time: …….

The objective of the in-depth interviews:

- To investigate the Enablers of adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.
- To investigate the barriers to adherence to nutrition counseling sessions among patients diagnosed with type 2 diabetes at Nakuru County Referral Hospital.
- To determine the association between socio-demographic characteristics and adherence to nutrition counseling sessions among patients with Type 2 diabetes at Nakuru County Referral Hospital.

Thank you for taking the time for this interview. The interview will take about 45 minutes, but you can let me know if you want to take a break or stop the interview.

i. What are your views about nutrition counseling sessions?

ii. How is your interaction/experience with healthcare providers during nutrition counseling sessions?

iii. What is your view of healthcare providers offering nutrition counseling sessions?

iv. What from your experience should healthcare providers consider when conducting nutrition counseling sessions?

v. Do you think the time allocated for nutrition counseling sessions is adequate?

vi. In your experience, what aspects of the nutrition counseling sessions process would encourage you to adhere to nutrition counseling?

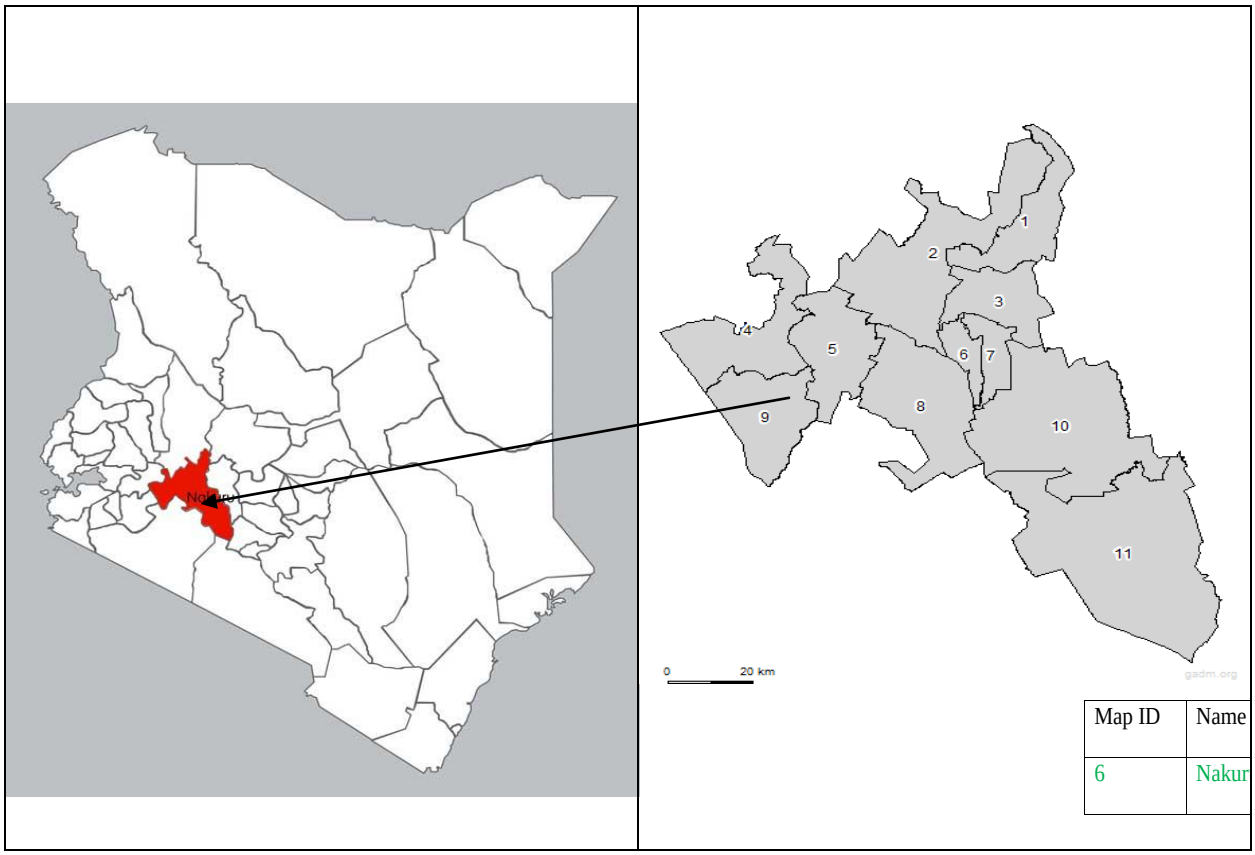
vii. In your experience, what aspects of the nutrition counseling sessions process would discourage you from adhering to nutrition counseling?

viii. What can be done differently to enhance adherence to nutrition counseling sessions for you?

ix. As we finish this discussion, is there anything you think we might have omitted that is important in influencing adherence to nutrition counseling sessions?

(Follow-up questions will be generated based on the participants' responses.)

Appendix III: Map Study Location



Source: Global Administrative Areas (GADM, 2018).

Appendix IV: KUREC Clearance Letter

KABARAK UNIVERSITY RESEARCH ETHICS COMMITTEE

Private Bag - 20157
KABARAK, KENYA
Email: kurec@kabarak.ac.ke

Tel: 254-51-343234/5
Fax: 254-051-343529
www.kabarak.ac.ke

OUR REF: KABU01/KUREC/001//111/03/24 **Date:26th March, 2024**

ALUNGATA JOSEPHINE
GMND/M/3236/09/21
Kabarak University

Dear Josephine,

RE: NUTRITION COUNSELING ADHERENCE AND ASSOCIATED FACTORS AMONG PATIENTS WITH TYPE 2 DIABETES AT NAKURU REFERRAL HOSPITAL, NAKURU COUNTY, KENYA.

This is to inform you that ***KUREC*** has reviewed and approved your above research proposal. Your application approval number is ***KUREC-110324.*** The approval period is ***26/03/2024 – 25/03/ 2025.***
This approval is subject to compliance with the following requirements:

i. All researchers shall obtain an introduction letter to NACOSTI from the relevant head of institutions (Institute of postgraduate, School dean or Directorate of research)
ii. The researcher shall further obtain a RESEARCH PERMIT from NACOSTI before commencement of data collection & submit a copy of the permit to **KUREC.**
iii. Only approved documents including (informed consents, study instruments, MTA (Material Transfer Agreement) will be used.
iv. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KUREC***:
v. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KUREC*** within 72 hours of notification.
vi. Any changes anticipated or otherwise that may increase the risk(s) or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KUREC*** within 72 hours.
vii. Clearance for export of biological specimens must be obtained from relevant institutions and submit a copy of the permit to KUREC.
viii. 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.
ix. Submission of an executive summary report within 90 days upon completion of the study to ***KUREC***

Sincerely,

KABARAK UNIVERSITY INSTITUTIONAL RESEARCH ETHICS COMMITTEE
APPROVED
P. O. PRIVATE BAG - 20157, KABARAK

Prof. Jackson Kitetu PhD.
KUREC-Chairman

Cc Vice Chancellor
DVC-Academic & Research
Registrar-Academic & Research
Director-Research Innovation & Outreach
Institute of Post Graduate Studies

Appendix V: NACOSTI Research Permit

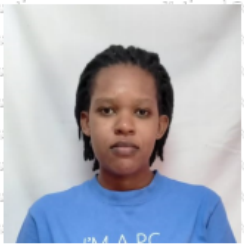
REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **895961**

Date of Issue: **11/April/2024**

RESEARCH LICENSE



This is to Certify that Miss.. Alungata Josephine of Kabarak University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: NUTRITION COUNSELING ADHERENCE AND ASSOCIATED FACTORS AMONG PATIENTS WITH TYPE 2 DIABETES AT NAKURU REFERRAL HOSPITAL, NAKURU COUNTY, KENYA for the period ending : 11/April/2025.

License No: **NACOSTI/P/24/34598**

895961

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix VI: Evidence of Conference Participation

Appendix VII: List of Publication

AFRICAN JOURNAL OF NUTRITION AND DIETETICS

Open Access

https://doi.org/10.58460/ajnd.v4i01.125

RESEARCH ARTICLE

MJM BIOLABS

Facilitators and Barriers of Adherence to Nutrition Counseling Sessions of Patients with Type 2 Diabetes at Nakuru County Referral and Teaching Hospital

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Authors' Affiliation

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Article History

Submitted: 05th December 2024

Accepted: 21st May 2025

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To read this paper online, please scan the QR code below:

ABSTRACT

The prevalence of diabetes is rapidly increasing, making it a major global health concern. Nutrition counseling sessions are essential for promoting healthy eating habits and dietary choices among patients with type 2 diabetes. However, adherence to these sessions remains low in Kenya. This study examined facilitators and barriers to nutrition counseling session adherence among patients with type 2 diabetes at Nakuru County Referral and Teaching Hospital. A mixed-method explanatory sequential design involved 396 patients and 4 healthcare providers. Participants were selected through probability and purposive sampling. Data collection combined cross-sectional and phenomenological approaches using questionnaires, in-depth interviews, and key informant interviews. Quantitative data were analyzed using SPSS (Version 26) for descriptive statistics, chi-square tests, and logistic regression, while qualitative data were analyzed through inductive thematic analysis. A total of 392 patients aged 51–70 years participated in the quantitative phase, and 40 patients in the qualitative in-depth interviews. Adherence to nutrition counseling sessions, defined by attending more than three sessions per year, was low, with 45.2% not attending any session in the past six months and 32.7% attending only once. Sociodemographic factors showed no significant associations with session adherence ($p > 0.05$), while health-related factors such as diabetic complications ($p = 0.036$) and regular clinic attendance ($p = 0.001$) were significant predictors. Key facilitators included positive perceptions of sessions, supportive healthcare providers, and family support, while barriers were financial constraints, comprehension issues, and logistical challenges. Health-related factors and regular clinic attendance significantly predict nutrition counseling session adherence, suggesting areas for intervention.

Keywords: Barriers, facilitators, nutrition counseling sessions, adherence, type 2 diabetes

How to Cite this paper: Alungata, J., Chege, P., & Mokaya, M. (2025). Facilitators And Barriers to Nutrition Counseling Adherence Among Patients with Type 2 Diabetes, At Nakuru County Referral and Teaching Hospital. African Journal of Nutrition and Dietetics, 4(01). https://doi.org/10.58460/ajnd.v4i01.125

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