PREDICTORS OF NON-ADHERENCE TO TYPE II DIABETES MANAGEMENT AMONG ADULT INMATES IN MACHAKOS COUNTY PRISONS, KENYA

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OF

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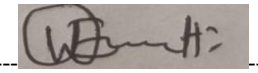
DECLARATION AND APPROVAL

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

Signature----------  ----------Date—09/04/2025----------

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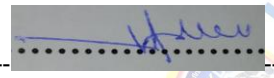
Supervisors

This project has been submitted for review with our approval as university supervisors.

1. **Signature**---------  ----------**Date-09/04/2025**---------

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DEDICATION

I dedicate this project to my husband John Amadadi and my daughters Grace and Peace, for their support during my studies.

ACKNOWLEDGEMENT.

I am greatly indebted to Dr. John Kariuki and Dr. Ken Muna for their necessary corrections and instrumental input in compiling this document. Much appreciation also goes to my research assistants, friends and several individuals who have been actively involved in the discussions which have ended up in the progress of this project. I owe much gratitude to the many authors of books, articles and research materials whose work I have referenced and has formed the basis of my research. For my lecturers and colleagues at Mount Kenya University, I am indebted to you.

ABSTRACT

Global prevalence of type II diabetes has been up surging since the year 2014 with statistics noting a likelihood of recording 693 million people diabetic by the year 2045 as reported by Cho et al., (2018). While the management of Type II diabetes continues to experience progressive changes, non-adherence with medications has emerged as a threat that could jeopardize public health gains. The incarcerated population best captures the 21st-century concern, where the special group is faced with limited decision-making capabilities. The aim of this study was to establish the predictors that influence non-adherence to type II diabetes treatment among adult inmates in Machakos County Prisons. The study specific objectives were to assess how patient- level factors, provider level factors, prison environment factors and barriers of management that influence non-adherence to type II diabetes management among the adult inmates. Medication non-adherence underlies a huge economic burden, with a key concern remaining preventable health care costs. Social-cognitive, planned action and social-ecological theories were employed. The study used a facility-based, descriptive cross-sectional design to achieve the objective. Mixed methods approaches were used for data collection and analysis. The target population was the type II diabetic inmates and staff in Yatta prison and Machakos GK prisons and a sample size of 268 participants. Primary data was collected through face to face interviews using a topic guide for qualitative interviews and a key informant interview to get an expert opinion. Quantitative data was analyzed by the use of SPSS and the presentation of the data was through frequency distribution tables, bar charts, and percentages. Logistic regression analysis was used to establish the associations between independent (Socio-demographic related factors) and dependent variables. The study found that patient-related factors such as inmates' age (p-value=0.000), level of education (p-value=0.000), home location (p-value=0.027), previous occupation (p-value=0.023), duration of hSaving type II diabetes (p-value=0.012), and Facility that provided diagnosis (p-value=0.000) had an influence on non-adherence to type II diabetes management among adult inmates. In addition, provider- related factors such as adequacy of professionals at the prison clinic (p-value=0.000) and provision of guidance and counselling to patients (p-value=0.011) had an influence on non-adherence to type II diabetes management among adult inmates. Also, prison environment factors such as requesting the court to be taken to hospital (p-value=0.015), rating of treatment received in the prison clinic (p-value=0.001), government commitment in addressing Type II diabetes (p-value=0.003) and bribery to receive treatment in a health facility of choice (p-value=0.043) significantly influenced non-adherence to type II diabetes management. Barriers to effective type II management include missing prescribed drugs in the clinic (p-value=0.031), side effects (p-value=0.005), feeling the dose given is high (p-value=0.009) and complexity of drug (p-value=0.008). The study recommends that the Ministry of Health in collaboration with the Kenya Prisons Service should conduct awareness on symptoms, risk factors, consequences of type II diabetes management and conditions associated with type II diabetes.

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LIST OF ABBREVIATIONS AND ACRONYMS

IDF - International Diabetes Federation

DHIS- District Health Information System

IMLU- Independent-Medico Legal Unit

LMICS – Low to middle-income countries

NCD – Non-communicable diseases

SSA - Sub-Sahara Africa

WHO – World Health Organization

OPERATION DEFINITION OF KEY WORDS

Adherence is defined by the WHO as the extent to which an individual's behavior corresponds with the agreed recommendations from a health care provider (WHO, 2017).

Inmates- a person placed in a prison facility for correction purposes after getting a sentence for the offense committed, (IMLU, 2014)

Predictors- are variables that are being manipulated by the researcher to observe their effects on the dependent variable, (WHO, 2012)

Type II diabetes – a chronic (non-communicable disease) condition that affects the way the body processes blood glucose. It's a long-term metabolic disorder that is characterized by high blood glucose, insulin resistance, and a relative lack of insulin, (WHO, 2015).

Type II diabetes management- are the steps taken to help keep the blood glucose level closer to normal (5.6 to 6.9 mmol/L), which delay or prevent complications. They include; weight loss, healthy eating, diabetes medication, and blood sugar monitoring, (ADA, 2017).

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Global prevalence of type II diabetes has been up surging since the year 2014 with statistics noting a likelihood of recording 693 million people diabetic by the year 2045 as reported by Cho et al., (2018). In Africa continent it's estimated the prevalence of 4.2% with the burden of the disorder increasing. Numerous occidental studies reported the increased prevalence and poorer control of type II diabetes among prisoners. However, International diabetes Federation (IDF), 2019 there is no data on the characteristics of inmates with diabetes in sub-Saharan Africa. Recent studies reported increased prevalence in Africa, decrying poor reporting and statistics on prevalence among prisoners. The increased prevalence is contributed to inappropriate diet and sedentary lifestyle in the prison environment. Management of type II diabetes in the prisons have faced intertwined dilemma over the years, as the challenges evolve with time (IDF, 2022).

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While nations have been unrelenting in efforts to manage diabetes because of the associated socioeconomic burden, little achievements have been registered over years (IDF, 2022). One of the setbacks in public health sector has been non-adherence to prescribed management of type II diabetes, where patients are overlooking both pharmacological and non-pharmacological interventions (WHO, 2021). The attitudinal aspect has attracted enormous scholarly attention across the regions, with health care providers, policymakers, and insurers making the trend a focus of current intentions. For instance, the World Health Organization, (WHO), 2013, emphasized the need to improve medication adherence rather than developing new therapies to manage type II diabetes. In response to this, Seabury *et al*, (2018), defined key areas to improve medication compliance whereby predicting non-compliance was highlighted.

Non-adherence has remained the main barrier to optimal health outcomes despite the advocated benefits of compliance to type II diabetes management both to individual patients and the healthcare system as a whole. Non-adherence is a costly and common problem that cuts across all regions. In defining the scope of the problem, the National Centre for Biotechnology Information, (2018) found that between 25%- 50% of patients worldwide did not comply with medication as recommended. Lack of adherence has cost individual patients their good health, increased mortality, and the healthcare system millions, due emergence of type II diabetic-related complications and re-hospitalization. Non-adherence to type II diabetes has led to heightened risks of complications, a development that culminates in decreased quality and length of life. These complications account for negative health, social and psychological implications as observed by Anon (2018). However, many epidemiological studies have given varying factors associated with non-adherence with type II diabetes management which are unique with each subpopulation.

Despite the existence of several pharmacological and non-pharmacological interventions that can control symptoms and thwart complications of type II diabetes, non-compliance to these management therapies remain one of the most burdensome public health concerns, (Kvarnstrom *et al.*, 2021). It has been highlighted as one of the underlying factors in the growing morbidity, mortality, and health care costs associated with the metabolism disorder. Patient compliance with management has been proved to have a strong correlation between compliance, patient outcome, and treatment cost as reported by Brenner *et al.*, (2020). Building on this WHO, (2017) observed that with the high magnitude of non-compliance and the resultant consequences related to it, it was of great importance to improve medication compliance on the existing treatments rather than developing new drug therapy to control complications associated with type II diabetes.

Although a vast collection of predisposing aspects has been acknowledged across the globe, the prediction of non-compliance remains poor. The trend was first captured in a 2003 publication by the World Health Organization, where it highlighted that 50.0% of diabetic patients were not adhering to recommended drugs(Sabaté, 2003). A recent study estimated 10.3% for non-adherence, and 33.0% for partial adherence at the global level, with the proportions being higher in developing nations due to a variety of reasons, including patient literacy and the prescription of complex medications(Karymsakov et al., 2024). This projection is reflected in several studies in Africa, including East Africa, where medication non-compliance is estimated to exceed 50%. For instance, a cross-sectional study among 200 adults' patients seeking care at Medicale la Fraternite clinic in Rwanda confirmed that 53.5% had poor medication adherence(Murwanashyaka et al., 2022). The high prevalence was also reported in an earlier study conducted at diabetic clinics of the Limbe and Bamenda Regional Hospitals in Cameroon, where 54.4% were non-adherents(Aminde et al., 2019). A comparable trend is also reported in a study conducted at Mbarara Regional Referral Hospital, Uganda, where 38.1% of the study participants were non-adherent to antidiabetic medication(Faisal et al., 2022). This trend of non-adherence to anti-diabetic medications was also highlighted at Debre Markos Referral(Mitiku et al., 2022).

Despite the detailed publications, only a few studies have targeted subsets of the population. Such is the case on inmates, where only a handful of them were found at the time of report writing(Cuthbertson et al., 2018)(Kanu et al., 2020)(Hunter Buskey et al., 2015). The predictors identified in these studies do not give clear associations to explain the non-compliance to medication. To overcome this, many researchers recommended the need to have data provided for each subpopulation to explain the magnitude and predictors of non-compliance to facilitate the

development of models and policies to improve compliance to type II diabetes management. Medication compliance has been observed to be affected by multiple and diverse factors, (Adu *et al.*, 2019). A clear understanding of what affects and how it affects each population and addressing these predictors will greatly improve compliance to type II diabetes management especially the inmates, for policies will be tailored according to their needs.

Inmates are the most affected group by non-compliance with reports confirming that there are disproportionately affected by the public health issue. High prevalence levels of type II diabetes are recorded in Ghana prisons this being attributed to high risk of smoking, reduced physical activity, and the inmates have little choices on the food they eat in the prisons. In Kenya, no data is available due to the failure of researchers overlooking the health needs of this subpopulation and the complexity of the prison institution though the situation might be likely the same. The situation is projected to increase as the population serving long sentences are aging and new inmates who are at risk of developing the condition are joining the facilities, (ADA, 2013a). Prison facilities overlook the provision of adequate health care to inmates due to the complexity of the institutional policies. For instance, compulsory rest during confinement renders the inmate physically inactive contradicting the management of type II diabetes, which emphasizes the need to undertake regular physical exercise. Poor and a common diet offered to the prisoners consequently leads to non-compliance to the management, (Pauley *et al*., 2019). The prison settings can offer large obstacles to compliance with medication due to varying reasons as WHO (2015), recommended that there is a need the prison management to consider incorporating outsiders to offer support in the health care delivery system in the prison. The inflexibility of the institutional rules can contribute to patients missing taking drugs or even visiting a doctor for a follow-up clinic.

Prisoners are thus faced with a twin epidemiological challenge of a high risk of type II diabetes as well as poor compliance with its management to both pharmacological and non-pharmacological therapies. Despite the right to health being a pillar in the Kenya constitution, (2010), medical care to inmates is challenging. Inefficiency, lack of resources in terms of drugs and medical staff, and lack of specialized equipment are some of the shortcomings IMLU, (2004) cited as main challenges to effective medical care in Kenyan prisons. In cases where the inmates have to seek medical attention in public hospitals, the prisons lack ambulances hence the patients are transported in prison lorries which at times may worsen the situations. Prison health facilities are faced with a challenge of a clear and proper referral system of the patients due to the logistical challenges including the need for an extra security guard in the hospitals when the patients are hospitalized. Inmates don't have a preference of choice where to get medical attention in case of type II diabetes complications emerge, leading to delayed detection and treatment of the same, (Paulery *et al.,* 2019). The dilemma informs this study, where I will be investigating predictors of non-compliance to type II diabetes management. The inquiry is founded on the need to promote the robustness of the current body of knowledge.

Compliance with treatment has been of great concern in the public health and clinical fields, for it's the key factor between process and outcome in medical care. Patient adherence to treatment regimens is a complex phenomenon, especially for individuals with type II diabetes depressing the benefits of medical care. Non-compliance to type II diabetes management imposes a huge financial burden on the healthcare system as well as individual costs. Rates for non-compliance to type II diabetes in Kenya is estimated to be 80% (WHO, 2017).

Effective type II diabetes requires that a patient adopt new behavior such as blood glucose monitoring, observing a new diet modification, and checking mealtime, taking medications with

some injecting with insulin, practicing physical exercises. The process is complex and needs proper counseling and guidance from a medic and psychosocial support from the family and friends. In a study to improve compliance, Delamater (2010), observed that the type II diabetes management regimen to be complex and needed a well-coordinated plan between the patient and the medic to be effective. Echoing this Ganiyu et al (2013), emphasized the patient's knowledge of the management is essential and this can only be achieved if the medics are also equipped to enable passing the same to the patients whereas even the relationship between the two must be positively enhanced.

One of the key concerns in non-compliance is quality of life, as failing to abide by therapies compromises not only the effectiveness of regiments but also treatment outcomes. Financial consciousness is also another issue, where the cost of the treatment and risk of hospitalizations explains the failure to the effective management of type II diabetes could jeopardize recent public health gains (WHO, 2019). The area has thus enjoyed a growing stock of knowledge, where a myriad of factors has been highlighted as causes of non-adherence to medication among the type II diabetes patients. For example, Adu *et al.*, (2019) identified patient-centered factors, therapy-related factors, social and economic factors, healthcare system factors, and disease factors as the primary causes of medication non-compliance in Ghana. Agatha *et al*, (2019) established that depression, concern about disease medication, use of herbal preparations, formal education, and mode of payment for the medication to be associated with non-compliance among the diabetic patients.

To achieve Sustainable Development Goals (SDG), of improving the wellbeing of all citizens, and to be in line with WHO,(2015), recommendations to improve management of type II diabetes, proper strategies need to be laid down and implemented. This is only possible if accurate data will

be available to inform the development of the policies. Vulnerable groups like inmates should also be factored in, as they are entitled to adequate medical care. It's worth noting medical needs for each subgroup in the population is different. Predictors to non-compliance should inform the decisions for proper mechanisms to be put in place. The Kenya National Strategy (2010-2015) stakeholders cited a lack of population-data to inform during policy formulation, thus the need to carry out this study in Machakos County Prisons to investigate the predictors to non-compliance to type II diabetes management.

1.2 Problem statement

Although the mortality rates associated with non-adherence remain an overlooked issue, the current literature widely estimates that the public health problem attributes to 125,000 deaths every year (Iuga & McGuire, 2014). Disease-specific meta-analyses validate the supposition, citing significantly higher risks of death in non-adherent patients (Wu & Moser, 2018). Medication non-adherence also underlies a huge economic burden, with a key concern remaining preventable health care costs. For instance, avoidable cost-related medication non-adherence has been estimated between $100 and $300 billion every year, a figure that represents 10% of the budgetary allocation to health (Cutler *et al*., 2018). Despite the significant socioeconomic impact and low survival rates among diabetic patients who do not adhere to their medication, the issue of medication non-adherence is often overlooked by patients, their families, the medical profession, and policymakers. This issue remains largely unaddressed as no specific entity or organization has prioritized it. Most healthcare providers are not fully aware of the problem, even though traditional medical models emphasize the importance of accurate diagnosis and appropriate prescriptions, which include efforts to educate and motivate patients. (Allison, 2012).

The adverse health experience is even more glaring among prisoners, as incarceration is linked to multiple negative health outcomes. Despite the right to health being a pillar in the Kenya constitution, (2010), medical care to inmates is challenging. Inefficiency, lack of resources in terms of drugs and medical staff, and lack of specialized equipment are some of the shortcomings IMLU, (2004) cited as main challenges to effective medical care in Kenyan prisons. Inmates have limited food choices, restricted autonomy, tightly regulated physical activities and lack of control over medications. While the prison authorities should be guided by supportive policies and practices in Kenya and Machakos County, the provision of care has been ineffective and inefficient, as behavioral correction is the primary mandate. The Kenya Prison Service is also associated with ill equipped medical facilities and inadequate personnel, a shortfall that is blamed on poor care to the inmates (Osebe, 2011). In conclusion, the failure of the entire universe of health and prison actors has made information associated with non-adherence to treatments for diabetes limited and inconsistent, with critical appraisals of the shallow literature identifying methodological issues that explain differences among reports on non-adherence, (Bosco & Shelton, 2018). The study is founded on the insufficiency, and seeks to investigate the predictors of non-adherence to diabetes management among adult inmates in Machakos County Prisons.

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1.3 Justification of the study

Worldwide inmates have displayed poorer overall health status than the general population. Despite the evidence of the high prevalence of type II diabetes from epidemiological studies, and the impact economically whereby health expenditures of patients with type II diabetes are twice those with other NCD conditions, non-adherence to management has been cited to be high in Kenya. Non-adherence with medication is a critical concern for human service providers. Low adherence has undermined the great efforts to control the metabolic disorder exposing the patients

to escalated health care costs and the healthcare system in totality. Medication adherence deserves attention and much knowledge is required to develop new models of improving it.

Limited studies have been carried out in Kenya to unearth what contributing to high levels of management non-adherence despite the many benefits accrued to compliance and mostly the inmates being a special group has been sidelined. Nonadherence with medication is estimated to be higher than 50% in the general population. However, the figure is based on opinionated views and anecdotal evidence as no study has been done to establish the magnitude of non-adherence among the inmates, (KNDS, 2015). The issue thus remains divisive, with one contested issue being the lack of clarity around convectional approaches used to report associations. The current knowledge of management of type II diabetes in Kenya has been based largely on disease surveillance trends of hospital cases faced with complications. None of the empirical studies have targeted the prison population in Kenya, despite the group being a special group in the management of diabetes due to institutional confinement. An underlying issue in the inaction is a weak body of evidence, as the current literature exhibits many shortfalls on the issues of compliance to type II diabetic treatment regiments and management among inmates. The weak literature has thus affected evidence-based interventions in Machakos prisons, as practitioners rely on anecdotal views. Unavailability of this crucial information hinders the formulation of theories and ideas to improve compliance with the management of type II diabetes. This informed the need to carry out the study in the Machakos County prisons to establish the predictors behind the non-compliance to type II diabetes management and expand the evidence base.

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1.3.1 Significance of the study

The study will add to the body of knowledge on the predictors of non-compliance to type II diabetes management among inmates and sensitize stakeholders in the diabetes management sector

for effective treatment of type II diabetes. The study findings will aid in policy formulation especially in redesigning the management of diabetes in prisons. This information will assist inmates with the management of type II diabetes and their health care providers plan appropriate measures to ensure optimal health outcomes.

1.4 Research objectives

1.4.1 General objective

The general objective of this study was to establish the predictors influencing non-adherence to type II diabetes management among adult inmates in Machakos County Prisons.

1.4.2 Specific objective

1. To determine barriers contributing to nonadherence to management of type II diabetes management among adult inmates in Machakos County prisons in Kenya.
2. To identify patient-level predictors of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya.
3. To identify provider-level predictors of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya.
4. To identify prison-environment predictors of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya.

1.5 Research questions

1. What are the barriers contributing to nonadherence to management of type II diabetes management among adult inmates in Machakos County prisons in Kenya?

2. What is patient-level predictors of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya
3. What is provider-level predictors of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya?
4. What is prison-environment predictors of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya?

1.6 Scope of the study

Although non-adherence to diabetes medication is a complex and wide issue, the study focused on predictors of nonadherence among incarcerated patients living with type II diabetes**.** The target population were the adult inmates in the prisons. The study was a descriptive study and employed mixed methods approach. Study duration was carried out in a period of six months.

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1.7 Limitations of the study

The study limitations anticipated by the researcher included selection biases and recall biases. The researcher strived to ask questions in which the information required was from recent experiences to avoid the participants giving invalid information. The researcher faced lack of documented evidence and statistics on diabetic care in the prison. Future research should be carried out to establish how effective the diabetes preventive programs are in our prisons.

1.8 Delimitation of the study

While the study was based on the need for addressing non-adherence, which is a determinant of treatment success, the research activities were conducted in a naturalistic approach. Although it may have substantive impact on the health outcomes of the inmates, no manipulation was made as

the observational inquiry sought to interfere with care delivery practices and views as little as possible.

1.9 Assumptions of the Study

The study assumed that the respondents would be willing to give responses to all questions in questionnaires. The study also assumed that all the respondents would be available and willing to give true and accurate information to enable credibility of the findings.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter consisted of empirical literature review, theoretical framework, conceptual framework and critical review**.**

2.1 Empirical Literature Review

Diabetes has emerged as one of the most common non-communicable disease, where the prevalence of the endocrine disorder has grown to epidemic status. The current worldwide case burden is presently estimated to be 463 million people, representing a 9.3% proportion of the global population (Saeedi *et al*., 2019). The prevalence is expected to keep soaring to 578 million by 2030 and 700 million by 2045 (Saeedi *et al*., 2019). The prevalence of diabetes varies significantly among different ethno-racial groups due to genetic differences in susceptibility. Early-onset diabetes poses a greater familial risk, with affected fathers having a higher likelihood of passing on the risk to their children. Udler *et al*. (2019) quantify the heritability predisposition to be 6-9% against that of mothers that is estimated at 1-3%. People of European descent are also highly susceptible, with the prevalence being higher in urban (10.8%) than rural regions (7.2%). Both sexes are equally affected, with the cases of affected men rising rapidly in all populations.

Despite the fundamental aspects that explain differences in prevalence across the globe, all regions reporting increase in annual incidence. Africa is experiencing a steady increase across all age groups, with the new dynamics culminating to a huge number of patients with longstanding diabetes and with a risk of serious complications such as heart diseases, high blood pressure, renal failure, and ketoacidosis. While the continent has only 15.9 million adults living with diabetes mellitus, it also has the greatest proportion of undiagnosed cases (Kibirige *et al*. 2019). Global

projections indicate that Africa will face the most significant future increase in the burden of diabetes, with an estimated rise of approximately 156% by 2045 (Dessie *et al*., 2020). The World Health Organization extrapolates that the prevalence of diabetes in Kenya will grow from the current 3.3% to 4.5% by 2025.

While the disease goes undetected for many years among pre-diabetic subjects, early detection in the preclinical period and immunotherapeutic intervention can be effective in preventing destruction of pancreatic beta-cells. The rationale is founded on staged-diabetes management, an emerging body of knowledge that is calling for systematic approach in optimal blood glucose control. The changing perspectives of diabetes care is guided by adjusting initiatives, therapeutic principles that revolves around medical nutrition, oral agents, blood insulin control, patient education, behavioral issues, and management of complications.

The growing burden of diabetes cannot be underestimated, as socio-epidemiological models have highlighted its potential in destabilizing economies and healthcare systems (MOH, 2015). The rapid increase is changing the health and disease profile have serious implication on socio-economic development as observed by Giles-Corti *et al* (2016). The increased type II diabetes prevalence in LMICS has been associated with the economic transition, rapid unplanned urbanization, nutrition transition and obesity, and aging population as reported by Ford *et al* (2016). As the prevalence of type II diabetes is escalating the patients are faced with the consequences of long-term complications, which translates to decreased quality and length of life. This has led to immerse efforts by all nations to develop and design pharmacological and non-pharmacological interventions to control and prevent the emergence of the complications associated with the metabolic disorder. No remarkable achievements have been reported due to the rising rate of non-adherence to the management of type II diabetes jeopardizing the efforts of

the healthcare providers, policymakers to compact the disorder. In the past decade, researchers have been evaluating interventions, strategies, and approaches geared to improve patients' adherence with medication, but little success has been reported. The attitude of non-adherence has called for greater concern in the follow-up of patients' response to diabetic management. In reaction to this, many researchers addressed the situation by recommending that there is a need to highlight the predictors of non-adherence.

While the issue of non-adherence is a well-documented subject, the known predicators are weakly linked by the existing stock of literature on diabetes management. The reality is upsetting considering the expansiveness of scholarly attention in this area. In Kenya, nonadherence with medication is estimated to be higher than 50% in the general population. However, the figure is based on opinionated views and anecdotal evidence as no study has been done to establish the magnitude of non-adherence among the inmates, (KNDS, 2015). The issue thus remains divisive, with one contested issue being the lack of clarity around convectional approaches used to report associations. The current literature describes approaches for addressing non-adherence among patients with chronic conditions and not only type II diabetes, a shortfall has culminated to more than small to modest benefits in specific cases. The concern is evident in Kenya and Machakos County where the existing models to compact the disease have not been helpful.

Non-adherence to medication is the major barrier to effective type II diabetes management leading to a massive waste of medication, increased use of medical resources due to frequent hospitalization, progress of the disease, reduced functional ability, and lower quality of life. Anon (2015) in an economic study noted non-adherence to medications resulted in serious health consequences. The magnitude of the problem is not vividly clear has many researchers have relied on observational studies.

Predictors to non-adherence are multifactorial and unique in different setting and subpopulations, that's why it's important to understand them. The magnitude of non-adherence and the consequences are so severe and prevent the attainment of the full health benefits of the management therapies in totality by both the individual patient and the healthcare system as a whole. In line with this, WHO, (2015) recommended that nations should strive to improve adherence with existing treatments rather than developing new medical therapies. Appropriate attention should be made to address the factors to effectively improve adherence, as understanding predictors can help in designing individualized strategies as well as follow-up efforts. This is what informs the need for this study in Machakos County prisons has the findings will inform the health care providers and policymakers.

Non-adherence implications go beyond the individual level, ranging from decreased quality of life, the severity of disease and eventually death, and increased societal costs which can be avoided. Many researchers pinpointed various predictors that could be linked with non-adherence to type II diabetes management but clear association not explained. Effective type II diabetes management requires a highly coordinated quality service (Tricco *et al*, 2019). Acknowledging that non-adherence is a complex and dynamic phenomenon, it's worth noting that patients, providers, health systems, and broader socioeconomic and political aspects play a great role in medication adherence, (WHO, 2019).

Most studies on non-adherence on type II diabetes have been greatly carried out in developed countries whereby the health care system is different and advanced compared to the healthcare system of developing countries. This has hindered effective strategies to improve adherence as policymakers cry foul of a lack of data to inform their decisions. In Kenya, the situation is not exceptional as the Ministry of Public Health (2015), raised a concern appealing for researchers to

focus on predictors of disregarding medication. Little has been done on the issue has many researchers have focused on the prevalence of type II diabetes, foregoing non-adherence to the management. However, some studies have been carried out on the predicators of non-adherence, in some factors that would influence medication adherence they concurred with the findings acknowledging non-adherence to medication is a threat to Kenya's' healthcare system.

Non-adherence to type II diabetes management, has resulted to increased development of the complications leading to increased patient morbidity, premature disability, mortality and increased costs to the health care system, WHO, (2017). According to ADA (2017), the total projected cost of diagnosed type II diabetes rose to 327 billion US dollars in 2017 from 245 billion US dollars in 2012 worldwide. In Africa, 7% of health budget is consumed by management of type II diabetes has observed by IDF (2017). These costs are direct and indirect costs incurred. The costs associated with type II diabetes management include hospital admissions, treatment for complications, anti-diabetic medications, diabetes supplies, and physician office visits. Identifying the barriers to effective management of type II diabetes can help develop strategies to improve medication adherence and promote overall health.

2.2 Patient-related factors

Socio-demographic factors in many studies have been reported to have an association with compliance to medication. A study in Ghana reported that senior citizens are more likely to comply with medication than their youthful counterparts as they are not willing to sacrifice health. It has also been found that males with low socioeconomic and education levels are more likely to comply with medication than females with the same status.

Patients with type II diabetes are faced with unending dangers, which can be averted by adherence with the management of the metabolic disorder. The duration of the disease contributes greatly to patients' medication compliance levels. Upon diagnosis one is faced with mixed reactions ranging from acceptance to denial of the results. Some inmates have a personality of being rebellious to authorities, such individuals are likely to refuse medication at all costs. Psychosocial factors have played a great role in compliance with medication by a type II diabetic patient. Proper and intensive counseling is essential to the patient from the time of diagnosis and start of the treatment and should be a continuous process to enable the patient to understand the new spectrum of metabolic derangements affecting him (WHO, 2017).

The complexity of the treatment regimen has been attributed to lower compliance levels. Frequency of dosage, the number of medications, lack of immediate benefit from the therapy, side effects of the pharmacological agents used, change in the individual's lifestyle which some are inconvenient to the patient have played a role to noncompliance to type II diabetes management, (WHO, 2003). Some of the drugs side effects may be severe and unpleasant to the patient, the health care providers must ensure proper guidance and relevant information is conveyed to the patient to improve compliance. Having in mind, that some of the non-pharmacological interventions require lifestyle modification, the provider should emphasize the importance of support group, (ADA, 2015). Studies have reported that patient support groups have greatly improved medication compliance has the patients motivate, support, and encourage each other to adapt to the new lifestyle leading to improved health of the patients.

Patient health literacy has been cited to greatly influence compliance with treatment regimens. In a study by Nutbeam & Muscat DM (2021), he reported that patient empowerment with the right

health information, improved medication adherence. For instance, *Aljassim & Ostini (2020)* in a study to establish the influence of health literacy on adherence with medication he observed that individuals with low health literacy presented advanced illness, delayed diagnosis and treatment thus poor health outcomes. This hinders effective management as the patients are not aware of how to prevent or handle complications when they arise increasing their sufferings. In rural settings, for instance, type II diabetes management awareness is still a great challenge as in the past the disease was associated with urban areas making the patients in the rural areas ignorant of the management practices, Sarray (2021). Antagonistic to this, good adherence is registered among patients who read and understood drug labels and instructions, Fitzpatrick, (2023). Despite the existence of guidelines for proper type II diabetes management, the Ministry of Public health in Kenya observed diabetes education is little known by the populations hence underutilized. Little has been done in Kenya to scrutinize the hindrances to the effective management of type II diabetes despite it being a major contributor to deaths and disabilities to the population including the inmates Kovvuru (2024).

Before joining the prison facilities, the inmates maybe not aware of the type II diabetes status. Inmates with unknown type II diabetes may not receive any education intervention that may help control the condition exposing the inmate to potential complications (("EmeraldInsight", 2019). Screening of type II diabetes helps early detection of the disease thus early treatment and education intervention is provided to control the condition (ADA 2013a). Adherence to correctional clinical diabetes guidelines would be instrumental in promoting patient safety and tackling type II diabetes in the facilities ("SAGE Journals: Your gateway to world-class journal research", 2019).

Patients' attitudes and perceptions about the medication influence compliance to it. A positive attitude and perception about the efficacy of the type II management will improve the uptake

(Horne *et al.,* 2013). When a patients' beliefs that the management is safe and trusts its working well to control the glycemic levels, they get motivated to continue with the management more effectively unlike when the mistrust the management prescribed. Patients' attitudes are driven by the knowledge one has on the type II management practices hence its essential right information and continuous information be offered to the patient during the diagnosis and prescription stage by the health practitioner. Cultural backgrounds often influence patients' attitudes and perceptions. Some cultural beliefs don't support the use of conventional medicines they believe in the use of herbal medicines. This will greatly contribute to non-compliance to the pharmacological agents given to a patient. The perception of the metabolic disorder will affect compliance levels in instances where one perceives the disease is a curse or it's a bad omen, he may tend to refuse management worsening the condition.

Patient- related factors have in various studies shown to influence effective management of type II management. The predicative patient- level factors have been cited to include socio-cultural characteristics of the individual patient such as gender, age, sex, education, socioeconomic status, and level of health literacy. Effective type II diabetes management requires an effective social support mechanism and self-management education, (Kafle *et al.,* 2018). Patients must participate in several activities, such as attending medical appointments, adhering to prescribed medication regimens, practicing self-care including home blood glucose monitoring, maintaining a healthy diet, and engaging in regular physical exercise. Consistently maintaining these diverse health behaviors essential for glycemic control has proven to be challenging for many patients (ADA, 2015). Proper type II diabetes its' wholly dependent on the individual patient adherence. Cooperation and constant negotiation with health providers, environment and social support play a great role in optimal support and encouragement of health behavior. Active combined and

voluntary involvement of the patient is vital to gaining the desired course of health behavior resulting to a positive therapeutic outcome, (Nor *et al.*, 2019).

2.4 Provider- related factors

Responsibility to ensure compliance with type II diabetes must be shared between human service practitioners, patients, and the health system. Good relationships between the patients and the caregivers should be fostered to ensure improved compliance with the management of type II diabetes. Patient-provider relationship is a resilient factor that affects compliance to medication, by Brenner et al.(2020), found that a healthy relationship existing between a patient and a provider increases trust in providers. In support of this, Davoodi and Faraji-Khiavi (2022) mentioned that quality time spent with patients is prospective to hover patients' motivation to medication adherence. Good communication is essential to help the patient understand his condition and therapy hence increasing compliance. Trusting a provider contributes to increased patient satisfaction ensuring a likelihood to comply with medication as observed by Mostafavi, (2021). Mistrust leads to doubting the medical advice given hence non-compliance to medication (Krot & Rudawska, 2016). Many elements that foster patient-provider relationships are greatly influenced by the healthcare delivery system. The setting influences the content and processes of care offered concerning time spent with a patient, and the medication administration process. Defective communication between the patients and the provider is the major cause of non-compliance to type II management. Patient satisfaction and a good understanding of the content given by the provider improves compliance hence it's essential a good relationship be established.

In recent years, reforms have been carried out in the Kenyan prisons to ensure the inmates' human rights have been upheld and treatment conforms to the international legal instruments which Kenya has ratified. In 2005, Brahams spearheaded the training of the prison warders on the rights of the inmates and how to handle sick prisoners. Medical care imbalances were observed by Nancy, 2016 in a study on the access to medical services among inmates in Nairobi prisons where she recommends a strict follow-up on the laid guidelines for enacting policies to remedy the imbalances amongst the inmates. The prison settings may in many occasions be a contributor to non-adherence to medication. The prison is perceived as a closed environment with a lack of openness and communication. This makes the exchange of diabetic education and information difficult. Prison bureaucracies hinder effective management of type II diabetes, Mills 2015, cited a lack of continuity of care and variations in healthcare provision between prisons, resulting in a failure in management. Frequent movement of prisoners to attend court and rotations from one prison to the other led to non-compliance as one may skip an appointment with a healthcare provider or even miss medication.

Proper type II diabetes management among the inmates should be emphasized by all stakeholders has the inmates are a reflection of the general population. The biggest population of the inmates is of productive age and if the type II diabetes is not properly managed during assimilation of the inmates back to the society after they are through with their jail term, they increase the burden of the disease to the whole society. According to ADA, (2016), they gave recommendations intended to improve type II diabetes management in prisons after a legal suit that alleged poor training to medical staff, inadequate access to antidiabetic agents and supplies, and lack of coordinated management. Access to adequate medical care in prisons is challenging, Mills (2022) observed that many prisons have a clinic within them but some health services required have to be sought

outside the premises. This becomes time-consuming and requires extra security to the patient which often results in delayed access to the services.

The provision of health services in the prison is cumbered by a complexity of security considerations (Cosgrave, Hussain & Maple, 2015) posing the inmates in an intertwined epidemiological dilemma. Prison environment settings may influence compliance with medication practices. For instance, inmates have limited access to over the counter medication and are not even allowed to have medication in their possession. A patient keeping his medication is viewed as a mechanism on enhancing personal responsibility and control positively influencing compliance with medication. However, due to security risks to both the inmates, health staff, and prison officers the medication is confined in a safe at the medical clinics. In most developing countries especially in Kenya, pharmacological agents are limited in supply making the patients rely on out-of-pocket to acquire the prescribed drugs which their costs are a limitation to many patients. Focusing on improving the efficiency of the healthcare system mandate to ensure sufficient supply of the drugs, reliable access to the drugs, and proper pharmaceutical management could be made a substantive contribution to compliance to type II diabetes management among inmates with the disease. Medication non-compliance among inmates thus can be voluntary or coerced. Prison management often it's faced with the challenge of effective and efficient referral mechanisms of patients to hospitals due to logistical and security considerations.

Correctional establishments have distinctive circumstances that prerequisite to be well-thought-out so that all standards of care is also achieved. A multifaceted approach to the care will be an efficient mechanism to enhance holistic wellbeing and delay or thwart the development of complications. However, management of type II diabetics in correctional institutions is challenged has many security personnel in police lock-up cells don't know how to detect signs of

hyperglycemia on prisoners. The medical staff in prisons often are not involved during curriculum and program planning to enable the establishment of policies and procedures to the management of diabetes. Gerrard, & Wanjohi, (2019), observed training correctional staff on symptoms of non-adherence and intervention can improve patient's adherence to medication.

The medication administration process in the correctional facilities is complex and requires adequate synchronization to ensure the patients receive their correct doses. The cell guards and nursing staff should strive to adopt an integrated approach to have greater levels of influence and integration of health-hazards protections, Ryan *et.al* (2021).A patient's work schedule can interfere with compliance as NCCHC (2015), argued that the providers should be familiar with the program for many patients forego medication to attend their work assignments. Lack of medical privacy to the patient's affect compliance to medication by raising stigma, deterring the patient take up drugs. Inadequate supervision of the inmate patients has seen many patients not to comply with type II diabetes management. This is contributed to institutional inflexibility thus, contributing to non-compliance to the medication. Proper follow-up of the diabetic patient to take up the management has been reported to improve medication compliance.

Health provider greatly influence medication adherence through the emotional choice in the part of the patient. Factors such as trust, communication, and empathy play crucial roles in enhancing patients' understanding of the benefits of medication, improving access to healthcare, and fostering trust in their healthcare providers and the overall health system. Geared efforts should be in place to allow the provider improve recognition and understanding of the type II diabetic patients' beliefs, fears, and values. Patient- provider relationship greatly influence medication adherence, (Caraballo *et al.*, 2020).

2.5 Prison environment predictors

Currently, majority of inmates have diverse and multiple problems posing a challenging environment to the prison staff to maintain law, guarantee safety, promote health, and decency. Prison management leadership is encouraged to incorporate senior health staff in the top management to ensure they give their contribution on the aspects of life. According to WHO Health in prison, (1999) including health staff in the management helps reducing tension between health and security staff for it enables each to learn and respect other's role. Understanding of the etiology, signs, symptoms and management of type II diabetes by all staffs is a key component to improve medication compliance.

Personal individual characteristic has greatly influenced adherence to type II diabetes. Patients who prior to diagnosis of the disease never engaged with drug/ substance use have a better adherence rate (WHO, 2017). Some inmates do misuse prescribed medicine especially those who have history of substance abuse. Some type II diabetic patients normally they get into denial phase hence influencing management of the condition. The acceptance of the need of treatment is an integral aspect to medication adherence. Researchers have in the recent emphasized the need to offer adequate counselling to increase the probability of medication adherence.

Flexibility of the correction facility can positively improve type II management adherence. Prison environment affects communication of patients' status, medication prescribed, importance of dispensing of the medication as prescribed and support groups. Patients are not allowed to store up their own medication. The medication is stored in a different room whereby the security personnel at a convenient time they handover the medications to the cell in-charge who later issue to the individual patient. This violates patients' privacy as well as the medication not taken at the

prescribed time. Sometime due to security reasons, the medication is not availed at assigned time. Medication availability in the prison has been a great challenge, adversely affecting adherence has arrangements have to be made to transport the affected patients to a nearby hospital to get them which also not effective. Regular contact with a medical practitioner can help improve adherence to type II diabetes management has the patient is continuously updated with information on diabetes management and the healthcare provider can easily detect and monitor the progress and onset of type II diabetes complication. Prison environment limits patients' ability to make medical choices and self-management practices on medication, (Sheton *et al*, 2017).

Prison curriculum should be tailored to allow type II diabetes patients time for physical exercise and meeting the healthcare providers. Facility flexibility to allow more time for patients with the providers. Meals at the prisons are a common meal for all despite your medical condition. Type II diabetes management requires one to check on their diet aiming to control intake of reducing sugars. Prison environment must be created and encouraged to adopt more motivational, educational, and behavioral strategies to improve medication adherence. The rigid schedule of events in the prisons, limits ones' ability for self-care management of type II diabetes. Many inmates do miss their medication where they found the medications have been dispensed while out of there units (Mills *et al*, 2011).

Kenya Prison Service supports the cost of each inmates' health needs from the budget allocation from the government. However, this has been faced with great challenges such as unavailability of the type II diabetes medication among others. This informed the decision of open-door policy which gave an avenue of inmates seeking medical attention from non-governmental hospitals (IMLU, 2005). These often gives room for emerges and growth of a phenomenon named prison politics which is to a disadvantage to a patient. Majority of patients' sell out their drugs either by

will or under duress to fellow inmates who are deemed “powerful” and have money. This jeopardizes the health of the “weak” in the cells.

2.6 Barriers to Effective Management

While awareness of various aspects of diabetes remains an essential component of fighting diabetes, several studies have consistently shown that knowledge attitudes and practice of the general population are very poor. The trend explains why 87.8% of Kenyans have never done a blood sugar test in their lifetime. The situation is counterproductive because providing information can help citizens understand their risk of diabetes, motivate them to seek appropriate treatment and care, and empower them to manage their condition. Several studies have consistently shown that awareness levels are very low, and none of these studies have been conducted in prison settings. The alarming phenomenon of diabetes in the public health systems spillover to inmates, as health investments in prison facilities have been faced with multiple challenges.

One challenge is health inequalities and social exclusion, where inmates are faced with an intertwined epidemiological dilemma resulting to their physical, mental and social health being poorer than the general population. While WHO (2018) insists that the quality and quantity of health care services offered in the prison facilities should be equitant to that of the general population, inequity remains rampant. While prison authorities should strive to exhibit a commitment to heath through supportive efforts, practices and policies guiding the provision of care have been ineffective and inefficient due to lack of proper assessment of health needs. The needs of the inmates should be considered alongside those of the prison staff especially on smoking restrictions and smoking cessation.

The current literature also highlights concerns of undermined human rights in prison environment, a deficient that poses a great challenge to patients with type II diabetes (IMLU, 2014). Prison being a home for the inmates and a workplace for the staff, it is paramount that proper mechanism to promote health especially for those with type II diabetes is necessary unlike the current situation whereby the authorities concentrate most with the primary mandate of behavioral correction. that Ministry of Health 2015 estimated the doctor/patient ratio being 1:6000 and nurse/patient ratio being 1: 1,500. This has made the Kenya Prison Service to outsource healthcare services from Non-Governmental Medical Organizations. Limited studies have been carried out to determine the health needs of prisoners but no efforts have been given to determine the predictors of non-compliance with medication especially type II diabetes management despite the outcries from the prison managements that the prisoners are experiencing increased diabetic complications thus hindering their operations.

Organizational culture of the prison has a potential to influence adherence to type II diabetes management. Generally, prisons have a dominance culture over the inmates. This has led over the years, withholding appropriate care, lack of accessing medical services. It is cumbersome to balance security needs with the timely needs of a type II diabetic patient according to the diabetes treatment plan. For instance, diet considerations are an integral part in type II diabetes. Food for the inmates is procured by the authorities in bulk, and prepared and served by the inmates. Provision of "special diet" is faced with a financial constraint has the budget and funding for the prisons is wholly dependent with the National government, (Bosco & Shelton, 2018).

Inmates' transfers affect greatly type II diabetes management to a greater extent whereby the communication between the facilities is not effective and proper handing over not done. Proper medical documentation and transfer of medical records may be impossible if there was

involvement of an outsider facility or ununiformed medical practitioner leading to a lapse in care. In cases of temporal transfers, medical essentials may not be available much in the temporary facility like in the permanent facility jeopardizing the medical needs of the individual inmate (Kretchy *et al.,* 2020).

Prison politics culture of competing for power and status has over time built hostility between the inmates and staff. This has contributed to the staff being much keen on the security issues over the medical status of the inmates thus inmates resulting to litigation courts ordering they be given medical attention. However its' paramount to foster mutual respect for attainment of improved health care (Pauley et al., 2017).

2.6 Theoretical framework

2.6.1 Social-cognitive theory

The theory is based on the assumption that individual expectations, thoughts, and beliefs influence one behavior. It demonstrates there is a continuous vibrant triadic interaction between the individual and the environment that shapes his social behavior**.** Hallam (2012) observed that personal factors, environmental factors, and cognitive factors determine human behavior. Environmental factors represent situational influences and the environment in which the behavior is performed. Environmental factors such as social norms and influence on others, help the transformation of an individual's attitudes and knowledge. In prisons, the staff is projected to help change the beliefs of individuals and positively impact their practices with efforts geared towards compliance with medication. Personal factors include instincts, beliefs, traits, and other individual motivational forces to the behavior. Self-efficacy and individual expectations play a great role in compliance with medication

The social-cognitive theory brings about change in behavior through the following phases, orientation to the new behavior by creating awareness translating to interest and participation of the patient, giving an understanding of the benefits of compliance with medication, thus developing a positive attitude, motivation to adopt the new practice (adherence) to enjoy the aligned benefits to encourage maintenance of the acquired behavior (adherence). This study used the constructs of this theory to explain non-adherence with type II diabetes management among adult inmates in Machakos county prisons.

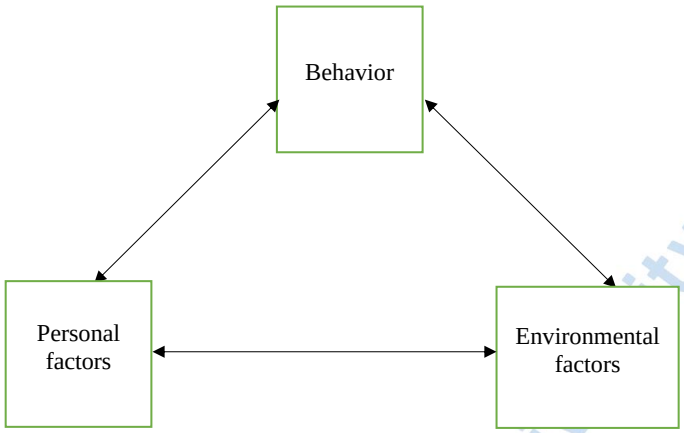

Figure 2. 1: Social cognitive model

Source: Bandura's (1986) Social foundations of Thought and Action.

2.6.2 Theory of planned action

The theory explains that a patient engages in behavior based on their intentions to perform the behavior, subjective norms, and perceived behavioral control. The derived was built by Fishbein and Ajzen's (1980) showing that intentions to engage in behavior can be attributed to the attitude about the behavior and the perception of likely normative reactions to that behavior. Subjective norms give a strong cultural component to predict the behavior of an individual. Perceived behavior control includes the personal and external factors that may influence the behavior. Individual perception of their ability to engage or not engage in the new behavior thus necessities provision of the correct information, opportunities, resources, and support to motivate the compliance to type II diabetes management.

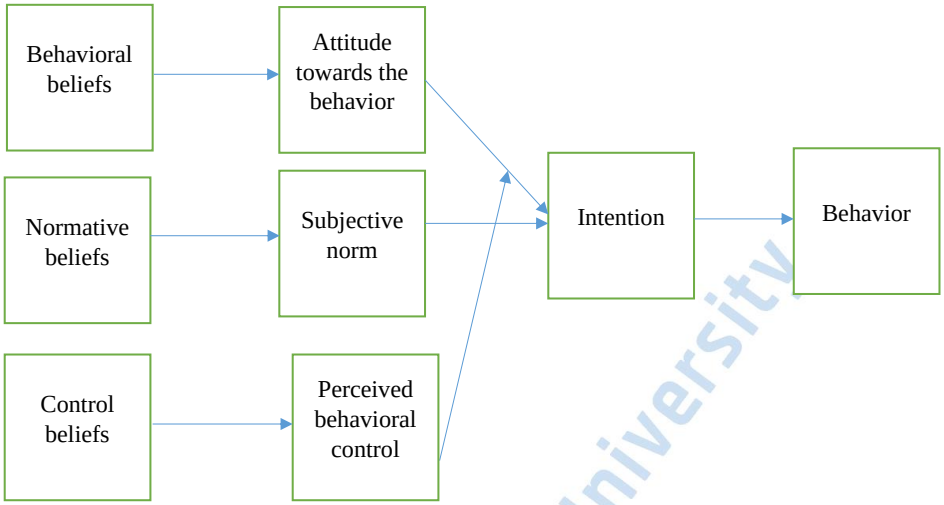

Figure 2. 2: Theory of planned action

Source: Adapted and modified from Icek Ajzen, 2019.

2.6.3 Social-Ecological model

The framework documents factors affecting behavior. This is important to health care providers and policymakers have it suggests how to create a conducive environment for the inmates that make it possible to adopt the healthy behavior of compliance to the management of type II diabetes. The model emphasizes the multiple levels of influences and the ideas that will shape the patient and social environment. The model helps understand how various factors interact with influencing the behavior of an individual. The first level (individual) reflects the biological and personal history factors that predispose an individual to non-compliance to medication. Relationships examine close relationships in the social circle that promotes the behavior of non-adherence to medication. For instance, who are close friends to the inmate patient? Do they comply with their medication if they are sick? Do they offer social support to the patient to encourage adherence

with his medication? Community reflects the policies and rules governing the institutions they are in. Prison policies should avoid social isolation, promote healthy relationships between the healthcare providers and inmates to improve compliance among the type II diabetic patients. Society factors help create an atmosphere that will encourage the patients to comply with the medication. The social and cultural norms influence the beliefs and attitudes of a patient to the disease and compliance levels positively or negatively, Mcleroy, (1988).

Figure 2.3 Social-Ecological Model

Source: Adapted and modified from Grol *et al*, 2007

2.7 Critical literature review

Type II diabetes management involves self-management education, lifestyle changes, anti-diabetes drugs, and glycemic management. According to Azevedo, (2008), poverty, illiteracy, marginalization, and poor access to health care are great hindrances to the effective management of type II diabetes. Poorly managed type II diabetes results in serious and long-term complications such as; stroke, blindness, kidney disease, and amputations (WHO, 2017). With the escalating prevalence rates of type II diabetes recorded, it's imposing more burden to the healthcare system of the developing countries in which they are still battling with infectious diseases. The high

prevalence has led to numerous developments of strategies and approaches to compact the rising rates but have been rendered inconsequential by the high rates of non-compliance to type II diabetes management, (WHO, 2012). The observation led to WHO, (2015) advocating for improved medication compliance rather than changing the existing medication regimens. This has been adopted slowly due to the challenging nature of the associations of the predicators to non-compliance to medication.

More scholars have showered their efforts to explain the effects of non-compliance to type II diabetes management, overlooking the contributing factors to the high rates of non-compliance they have registered. Improving management compliances has been a keen concern, WHO, (2017) reported that improving patients' compliance with the management of type II diabetes will greatly improving the quality of health care and health outcomes. Diverse reasons have been acknowledged to explain the phenomenon ranging from patient perceptions, drug effects, insignificant knowledge of the disease progression, but it's necessary to appreciate that non-compliance is a unique and multifactorial. This calls for a multi-disciplinary approach to be incorporated in compacting it to be effective across all subpopulations.

Prisoners are faced with a twin epidemiological challenge of a high risk of type II diabetes as well as poor compliance with its management to both pharmacological and non-pharmacological therapies. Increased smoking and increased alcohol consumption by this group have consequently led many to commit crimes finding their way into the prisons. This explains why most of the inmates are of productive age, Hodgins S, *et al*, (2008). More prevalence rates of type II diabetes are recorded among the inmates in prison due to an increasingly aging population, inactivity, poor diet adherence, increased smoking. In Kenya, no study has been conducted to establish the predictors of non-compliance to type II diabetes management in the prisons.

Lack of data and information on the predictors of non-adherence to type II diabetes management in developing countries especially in Kenya, has hindered the formulation of effective and efficient strategies and policies to improve medication compliance, WHO, (2017). However, many epidemiological studies have been carried out to investigate the predictors of non-adherence, though little has been done on the inmates despite them being a vulnerable subpopulation. Another shortfall encountered is a lack of clarity on the association of the factors cited and their influence on compliance to medication. This has been attributed to a lack of segmentation of the population groups during the study. To overcome this, ADA, (2017), reported the need to have specific data for each subpopulation, has the issue of non-compliance is unique and complex with each group.

A great concern is the paucity of data, where only a handful number of studies have been done in Kenya. Many reputable bodies such as WHO and ADA have cited a lack of data and information and have given accounts from phenomenological experience on type II diabetes prevalence and magnitude of non-compliance to type II diabetes in the prisons. The current knowledge of management of type II diabetes in Kenya has been based largely on disease surveillance trends of hospital cases faced with complications. None of the empirical studies have targeted the prison population in Kenya, despite the group being a special group in the management of diabetes due to institutional confinement. An underlying issue in the inaction is a weak body of evidence, as the current literature exhibits many shortfalls on the issues of compliance to type II diabetic treatment regiments and management among inmates. The weak literature has thus affected evidence-based interventions in Machakos prisons, as practitioners rely on anecdotal views.

2.8 Conceptual Framework

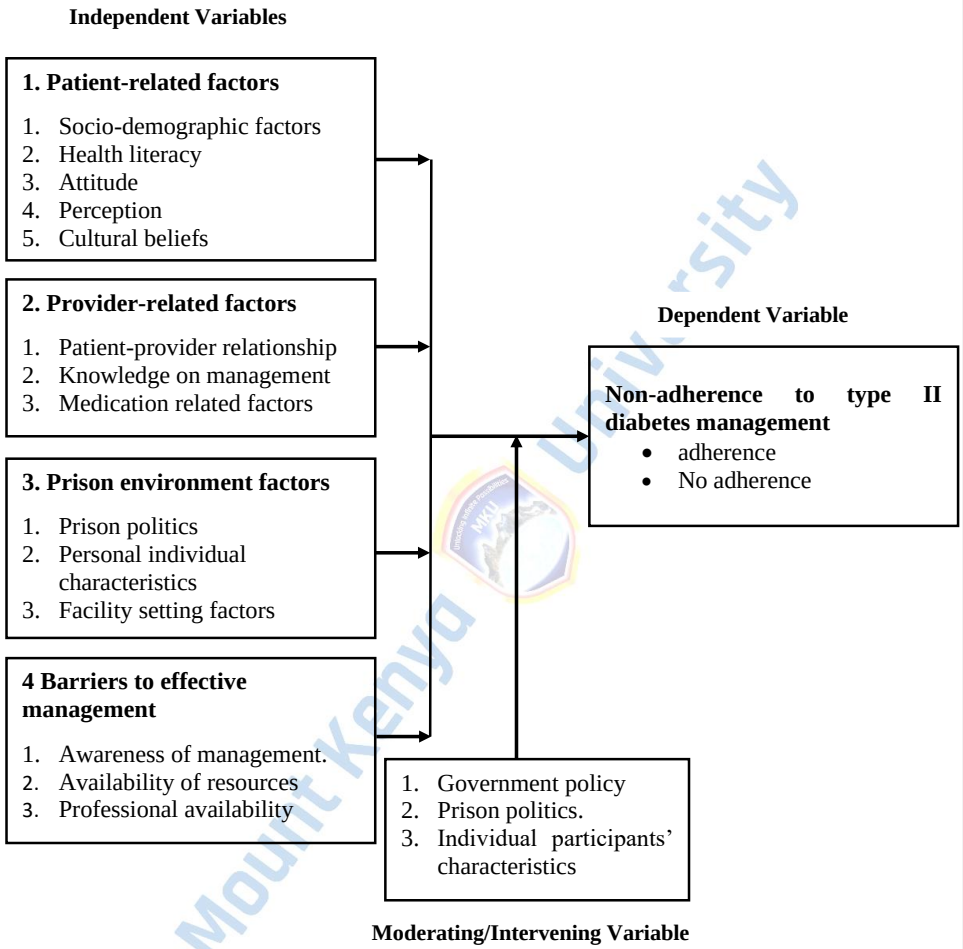

Figure 2. 3: Conceptual Framework

Source: Adapted and adjusted from the literature reviewed

2.9 Summary of the literature review and research gaps

Worldwide inmates have displayed poorer overall health status than the general population. Despite the evidence of the high prevalence of type II diabetes from epidemiological studies, and the impact economically whereby health expenditures of patients with type II diabetes are twice those with other NCD conditions, non-compliance to management has been cited to be high in Kenya. For example in a study at Moi Teaching and referral, noted poor compliance to pharmacological treatment among type II diabetic patients. In Nairobi and Nakuru in Kenya, a study by Muhabuura and Mugo demonstrated low rates of non-pharmacological interventions among the patients.

The magnitude of non-compliance and the consequences are so severe and prevent the attainment of the full health benefits of the management therapies in totality by both the individual patient and the healthcare system as a whole. In line with this, WHO, (2015) recommended that nations should strive to improve compliance with existing treatments rather than developing new medical therapies. Appropriate attention should be made to address the factors to effectively improve compliance, as understanding predictors can help in designing individualized strategies as well as follow-up efforts.

Limited studies have been carried out in Kenya to unearth what contributing to high levels of management non-adherence despite the many benefits accrued to compliance and mostly the inmates being a special group has been sidelined. Medication adherence was observed to have been affected by multiple factors and the predictors for each subpopulation are diverse, (Dilla *et al*, 2013). Despite this, no study has been carried out in the Kenya prisons to establish the predictors that affect them. Unavailability of this crucial information hinders the formulation of theories and

ideas to improve compliance with the management of type II diabetes. This informed the need to carry out the study in the Machakos County prisons to establish the predictors behind the non-compliance to type II diabetes management.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

The chapter covered the approach employed in conducting the inquiry, especially design, approach, target population, sample size determination, sampling techniques, data collection, data analysis, and ethical consideration. The description of the research methods, approaches and designs that will be used throughout the study define the specific details of the research, and how the approach will answer the research questions.

3.1 Study Design

This study employed a facility-based descriptive cross-sectional design to examine the patient-centered and institutional factors affecting type II diabetes management in Machakos County prisons. The cross-sectional approach is efficient and convenient for gathering extensive data from a large group of respondents. This design is suitable as it involves collecting data at a single specified time, as well as incorporating some historical information. It provides a clear "snapshot" of the outcomes and associated characteristics at a specific point in time, covering the three-month data collection period.

3.2 Study approach

The study was a descriptive study that attempted to identify the predictors of nonadherence to diabetes management among incarcerated diabetic cases. The rationale was based on a concurrent strategy, where qualitative and quantitative components were deployed simultaneously and their results discussed together. The mixed-methods approach was employed to allow triangulation,

which facilitates data validation through cross-verification making the findings more valid, reliable, and generalizable.

3.3 Location of Study

The study was conducted in Machakos County prison facilities i.e. Yatta prison and Machakos GK prison. The county stretches from latitudes -1.282° or 1° 16' 55" south, longitudes 37.408° or 37° 24' 29" east. See appendix 1 for the map of the area. Machakos County shares borders with Nairobi and Kiambu counties to the west, Embu County to the north, Kitui County to the east, Makueni County to the south, Kajiado County to the southwest, and Murang'a and Kirinyaga counties to the northwest. The economic activities include livestock farming, food crops grown includes cereals, and sand harvesting. The selection was informed by anecdotal views, where the structured life of prison affects compliance with medications. The county was reported to be among the top leading counties recording higher prevalence of diabetes, DHIS-2. While the rules of conduct have always been considered an opportunity for improving compliance, restricted privileges have been affecting the treatment outcome of incarcerated patients. The prisons don't necessarily serve people of Machakos County but the inmates are drawn from various parts of the country. The general characteristics of the inmates are the same as the general population so they are like a representative of the population.

3.4 Target population

The target population comprised of all inmates with type II diabetes as well as the staff. Type II diabetic inmates who were 18 years and above and gave consent were included in the study.

3.5 Sample Size Determination

A sampling frame of 814 participants was drawn from the study site (258 staff and 556 inmates). The number was used as the material for predetermining the number of participants. Culyer (2014) points out that a sampling frame in getting a desired sample, as it upholds auxiliary information relevant to the study. The sample was determined using the Yamane (1966) formula. The formula was used because it puts into consideration the population of the study.

$$n = \frac{N}{1 + N\ (0.5^2)}$$

Where

n is the desired sample size

N=the estimate of the population size

$$n = \frac{814}{1 + 814\ (0.05^2)}$$

$$268.204, \textit{so this was rounded to } 268 \textit{ as a participant is a discrete variable}$$

3.6 Sampling Techniques

The survey relied on multistage sampling, a process that entailed recruiting participants using smaller sampling units at each stage. The first stage was cluster sampling, a strategy that was based on a proportional rationale of categorizing potential participants in both Yatta and Machakos. The final list of respondents was picked using Research Randomizer, where the internet-based tool was employed in selecting the final list of participants. The selected numbers were circled from the pre-documented list of inmates.

Table 3. 1: Distribution of participants

Prison facility	N	Target Population	Sample size

Yatta	Staff	82	31
	Inmates	131	49
Machakos	Staff	176	68
	Inmates	425	158
Total		**814**	**268**

3.6.1 Inclusion Criteria

Consenting participants above the 18 years who had spent more than 3 months.

3.6.2 Exclusion Criteria

All individuals who could not provide informed consent were not be included as participants. Similarly, newly incarcerated individuals as well as staffs who had not been at the prison facility for more than three months were also excluded.

3.6.3 Pre-testing

A pre-testing study at Thika GK main prison was conducted to pre-test the instruments and tools i.e. semi-questionnaire and key informant interview guide. The pilot study involved 10% of the sample size, (26 inmates patients) with type II diabetes and 2 medical personnel. A pre-test was conducted to evaluate the accuracy of the questionnaire, ensuring that the responses obtained from the study would be valid and precise. Based on the responses, improvement was made to the tools.

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3.6.4 Validity

The study sought to promote internal validity by ensuring randomness in selecting study participants as well as ensuring homogeneity among respondents. The research instrument's

validity was ensured by utilizing a carefully constructed questionnaire. Research assistants were trained to ensure they collect valid data. External validity was observed by seeking an expert opinion from the supervisors. The results obtained from the pre-testing study were used to modify the tools for a layman to understand.

3.6.5 Reliability

Consistency was promoted by utilizing SPSS's Cronbach's alpha coefficient to assess the reliability of the data collection tools and the acceptable range was maintained. The same respondents were subjected to the same tools after a two weeks to assess whether the tools gave consistent findings. Completed questionnaires were checked daily and errors corrected. The collected data was entered into SPSS to check for internal consistency of the semi-structured questionnaire and alpha Cronbach's value of 0.67 was found indicating that the tool was consistent.

3.7 Data collection tool

A mixed-method approach was employed to enable triangulation, allowing for a more comprehensive and synergistic use of data compared to using separate quantitative and qualitative methods. This approach is ideal for gathering rich and thorough data.

Quantitative data was collected using semi-structured questionnaires (appendix 2), whereby they focused on socio-demographic characteristics, family medical history, levels of health literacy, diabetes treatment compliance, or non-compliance. Participants receiving care services were asked to highlight their views on the quality of care, including ratings such as satisfaction and visitation. Perception was measured based on the existing conventional tools, but modifications was allowed

to accommodate knowledge covered by recent literature as well as dynamics of dealing with the incarcerated individuals.

The key informant interviews (KIIs) (appendix 3), were used to seek expert opinion from the medical staff. It gave the researcher a chance to learn more about the contextual factors that govern individual experiences on the management, giving more insight on the predictors of non-compliance to type II diabetes management.

The barriers to management of type II diabetes encountered by inmates were collected by use of semi-structured questionnaire in appendix 2 section A. The respondents were required to recall and report what hinders them from effective type II diabetes managementInformation on sociodemographic factors was collected using a pre-examined semi-structured questionnaire in Appendix 2 section A. Some of the indicators assessed were respondents' gender, age, level of education, the name of the prison, home location, duration of serving the jail term and occupation. The researcher visited the prison facility and conducted face to face interviews with the respondents. Respondents were questioned on indicators on healthy literary, altitudes, perception and cultural beliefs. On healthy literacy (knowledge to symptoms and risk factors to type II diabetes) the results shown, 37.3% (66) of the participants indicated that the symptoms of diabetes included excessive thirst, 35.6% (63) indicated frequent urination at night, 40.7% (72) indicated always feeling hungry, 22.0% (39) indicated feeling tired, 18.6% (33) indicated blurry vision and 20.3% (36) indicated slow healing of cuts and wounds.

Some of the indicators used in the study were patient-provider relationship, knowledge on management, and medication related factors. Information was collected using pre-examined semi-structured questionnaire and pre examined KII tools appendix 2 and 3 respectively. The inmate

patients were specifically asked how they perceive the care they get during the clinic visits, the information they receive, the conduct of caregivers, as well as contentedness with the resources and services. The results portrayed that, 64.4% (114) of the respondents indicated that they do not have good knowledge about the anti-diabetic drugs prescribed to them, 54.2% (96) indicated that the doctors give them information on diabetes and 59.3% (102) indicated that they were not involved in treatment decisions.

A pre-examined semi structured questionnaire was used to measure the following indicators; awareness of management, availability of resources and professional availability. The responses were noted done for analysis.

3.8 Data analysis and Presentation

Quantitative data collected through the use of structured questionnaires was analyzed by SPSS version 20 software. The statistical software aided the study in analyzing both descriptive and inferential statistics. The data was first entered in Microsoft Excel, cleaning was done to detect, correct, or remove corrupt, inaccurate data to ensure quality data. The data was later imported into the SPSS and coded ready for analysis. Descriptive statistics were used to meaningfully describe distributions of scores and measurements. Descriptive analysis was used in exploring both demographic and study variables. Frequency distribution tables, bar charts, and percentages were used to present categorical data. For data that is normally distributed, mean and standard deviation were presented while the median and interquartile range was presented for skewed data. Bivariate analysis was employed to test the relationship between categorical variables, to establish whether there was an association and the strength of the associations and scatterplots was used for

presentation. Chi-square was used to test the relationship between categorical variables for example socio-demographic factors and dependent variables. Logistic regression was used to estimate the association between socio-demographic factors (independent variable) and non-compliance to type II diabetes (dependent variables).

Qualitative data collected was primarily transcribed, themed, and coded in promptness for analysis. The deductive approach using the research questions was used to group the collected data whereby differences and similarities were considered. Thematic analysis was used to generate meaningful information from the data. That allowed the researcher to have a holistic picture of the predictors of non-compliance to type II diabetes management. A phenomenological approach was adopted to understand how the individuals experienced the disease, the management, and reporting the findings.

3.9 Ethical consideration

A letter of introduction was obtained from Mount Kenya University's graduate school and was used to seek authorization from the Ethical Review Committee in Mount Kenya University. The two clearances for the proposal were used to apply for approval from the National Commission for Science, Technology, and Innovation (appendix 4), with the award permitted presented to County Director of Education and County Commissioner in Machakos to be granted permission to carry out the study. Clearance was also sought from the prison administration in Yatta and Machakos establishments.

The prison authorities were informed that participation was on voluntary basis. The purpose of the study was explained and the participants given full information pertaining to the benefits and possible risks of taking part in the study to enable them to give written or oral consent. Participants

were informed that they are at liberty to terminate the interview at their will. The handling of the collected data, analysis, dissemination and use of the results was guided by ethical standards. All responses from the research participants were treated with the confidentiality, and not shared with third parties. Similarly, the identity of the respondents was anonymized by the use of codes instead of their names. The findings of the study were shared with the prison authorities before publication.

CHAPTER FOUR: RESEARCH FINDINGS, RESULTS AND DISCUSSIONS.

Chapter four presents the research findings on non-adherence to Type II diabetes management among adult inmates in Machakos County prisons, Kenya. It covers key aspects such as the response rate, socio-demographic characteristics of the respondents, and various factors influencing non-adherence. The chapter explores barriers to effective diabetes management, patient-level predictors, provider-level factors, and the impact of the prison environment on adherence. Each section presents both descriptive and inferential statistics, followed by discussions that compare the findings with existing literature, offering a comprehensive analysis of the factors contributing to non-adherence within the prison context. The results were presented in tables and figures.

4.1 Response Rate

The sample size of the study was 207 type II diabetic inmates and 99 staff in Yatta and Machakos GK prisons. Out of 207 questionnaires that were administered to the type II diabetic inmates, 177 adequately filled questionnaires were obtained and 65 staff were interviewed. This gives 79.61% response rate. According to Babbie (2017), a response rate of 50% is sufficient for effective analysis and reporting. This implies that the response rate (79.61%) in this study was within acceptable limit for drawing conclusion and making recommendations.

4.2 Socio-Demographic Information

The social demographic factors comprised of the respondents' gender, age, level of education, the name of the prison, home location, duration of serving the jail term and occupation. The study findings were as presented in Table 4.1. In relation to the gender of the respondents, 67.8% (120)

of the respondents indicated that they were male while 32.2% (57) indicated that they were female. Concerning the age of the respondents, 37.3% (66) of the respondents indicated that they had between 41and 45 years, 23.7% (42) indicated between 36and 40 years, 22% (39) indicated between 46 and 50 years, 5.1% (9) indicated between 31 and 35 years, 3.4%(6) indicated between 21and 25 years, the same percent pointed out between 26 and 30 years and between 51 and 55 while 1.7%(3) indicated between 18 and 20 years.

In relation to the name of the prison, 74.6% (132) of the respondents indicated that they were in Machakos GK prison and 25.4% (45) indicated Yatta prison. Regarding highest level of education, 30.5% (54) of the respondents indicated that they had secondary level of education, 22% (39) indicated primary level, 18.6% (33) pointed out College, 16.9% (30) indicated they had no school, 8.5% (15) indicated they had literacy classes only and 3.4% (6) indicated religious schooling.

In relation to the home location, 69.5% (123) of the respondents indicated rural area and 30.5 % (54) indicated urban area. This implies that the home location for the most of the respondents was rural area. The results also showed that 35.6% (63) of the respondents have been in jail for between 2 and 4 years, 30.5% (54) pointed out for one year and below, 16.9% (30) indicated for between 5 and 7 years and the same percent indicated more than 7 years.

Regarding occupation, 45.8% (81) of the respondents indicated they previously were in informal employment, 25.4% (45) indicated that previously they were in business, 8.5% (15) indicated that previously they were in formal employment and 20.3% (36) indicated they were not in employment or business.

In relation to the duration of having type II diabetes, 54.2% (96) of the respondents indicated they have been having type II diabetes for between 3 and 5 years, 30.5% (54) indicated for between 0

and 2 years, 10.2% (18) pointed out for between 9 and 10 years and 5.1% (9) indicated for more than 11 years. In regard to the facility that provided diagnosis, 37.3% (66) of the respondents indicated that diagnosis was provided by the prison clinic, 15.3% (27) pointed out dispensary, 13.6%(24) indicated Sub- county hospital, the same per cent indicated Health centre, 11.9% (21) pointed out informal health care and 8.5% (15) indicated private hospital.

Table 4. 1: Socio-Demographic Information

Gender	Frequency	Percent
Male	120	67.8
Female	57	32.2
Age		
Between 18 and 20 years	3	1.7
Between 21and 25 years	6	3.4
Between 26 and 30 years	6	3.4
Between 31 and 35 years	9	5.1
Between 36 and 40 years	42	23.7
Between 41 and 45 years	66	37.3
Between 46 and 50 years	39	22.0
Between 51 and 55 years	6	3.4
Name of the prison		
Machakos Gk prison	132	74.6
Yatta prison	45	25.4
Highest Level Of Education		
No school	30	16.9
Primary	39	22.0
Secondary	54	30.5
College	33	18.6
Religious schooling	6	3.4
Literacy classes only	15	8.5

Home location		
Urban area	54	30.5
Rural area	123	69.5
Duration of Serving in Jail		
0-1 Year	54	30.5
2-4 years	63	35.6
5-7 years	30	16.9
Above 7 years	30	16.9
Previous Occupation		
Formal employment	15	8.5
Informal employment	81	45.8
Business	45	25.4
None	36	20.3
Duration of having type II diabetes	**Frequency**	**Percent**
0-2 years	54	30.5
3-5 years	96	54.2
9-10 years	18	10.2
Above 11 years	9	5.1
Facility that provided diagnosis		
Dispensary	27	15.3
Health center	24	13.6
Sub- county hospital	24	13.6
Private hospital	15	8.5

Prison clinic	66	37.3
Informal health care	21	11.9

4.3 Barriers to Effective Management and Non-Adherence to Type II Diabetes Management

The first objective of the study was to identify barriers to management of type II diabetes management among adult inmates in Machakos County prisons in Kenya.

4.3.1 Descriptive Statistics

4.3.1.1 Barriers to Effective Management

The respondents were requested to indicate whether they have missed their prescribed drugs in the clinic in the last 3 months. From Figure 4.1, 94.9% (168) of the respondents indicated that they have missed their prescribed drugs from the clinic in the last 3 months while 5.1% (9) indicated that they have not missed their prescribed drugs from the clinic in the last 3 months. This implies that most of the prisoners had missed their prescribed drugs from the clinic in the last 3 months.

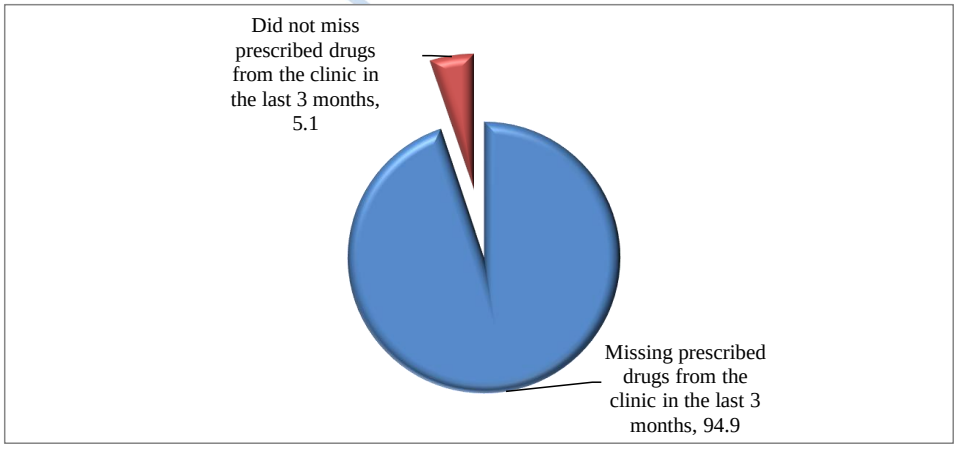

Figure 4. 1: Missing Prescribed Drugs in the Clinic

The respondents were asked to specify the action they take after missing supply of the drugs. According to the study findings 76.3% (135) of the respondents indicated that after missing supply of the drugs, they wait till they are available while 23.7% (42) indicated that they buy their own drugs. This means that after missing supply of the drugs, most of the respondents wait till they are available.

Table 4. 2: Action Taken After Missing Supply of the Drugs

Action taken after missing supply of the drugs	Frequency	Percent
Wait till they are available	135	76.3
Buy my own	42	23.7

The respondents were asked to specify what prevents them from exercising. From the study findings, 27.1% (48) of the respondents indicated that lack of free time prevent them from exercising, 25.4% (45) indicated that the programs in the prison are so many, 16.9% (30) indicated that they fear exercising, 15.3% (27) indicated that they do not know which exercise to do and the same percent indicated that there is no schedule for games and sports. This implies that lack of free time prevents most of the respondents from exercising.

Table 4. 3: Hindrances from Exercising

Hindrances from exercising	Frequency	Percent
The programs here are many	45	25.4
No free time in prison	48	27.1
I fear exercising	30	16.9

I don't know which exercise to do	27	15.3
No schedule for games and sports here	27	15.3

The respondents were requested to indicate whether the programs and activities they engage with are helpful in managing type II diabetes. According to the findings, 50.8% (90) of the respondents were not sure whether the programs and activities they engage with are helpful in managing type II diabetes, 23.6% (42) agreed, 10.2% (18) strongly disagreed, 8.5% (15) disagreed and 6.8% (12) strongly agreed. This means that most of the respondents were not sure whether the programs and activities they engage with are helpful in managing type II diabetes.

Table 4. 4: **Usefulness of the Programs and Activities in Managing Type II Diabetes**

	Frequency	Percent
Strongly agree	12	6.8
Agree	42	23.7
Not sure	90	50.8
Disagree	15	8.5
Strongly disagree	18	10.2

The respondents were requested to give the reasons as to why they will not take the drugs as prescribed. According to Table 4.5, 94.9% (168) of the respondents indicated that they will not take the drugs as prescribed due to unavailability in the clinic, 79.7% (141) indicated due to lack of money to buy drugs, 25.4% (45) indicated they forget, 10.2% (18) pointed out multiple medication, 8.5% (15) indicated that they feel the dose given is high and the same percent indicated complexity of drug regimen. Moreover, 6.8% (12) of the respondents indicated that they have been taking them for many years, 3.4% (6) indicated that they feel drugs are ineffective and the same percent indicated that they are no longer interested in taking them. This means that most of the respondents will not take the drugs as prescribed due to the unavailability in the clinic.

Table 4. 5: Reasons for not taking the Drugs as Prescribed

	Frequency		Percent	
	Yes	No	Yes	No
Unavailability in the clinic	168	9	94.9	5.1
Lack of money to buy drugs	141	36	79.7	20.3
No longer interested in taking them	6	171	3.4	96.6

Feeling drugs are ineffective	6	171	3.4	96.6
side effects	12	165	6.8	93.2
Feeling the dose given is high	15	162	8.5	91.5
Complexity of drug regimen	15	162	8.5	91.5
Multiple medication	18	159	10.2	89.8
I forget	45	132	25.4	74.6
I have been taking them for many years	12	165	6.8	93.2

The respondents were asked to specify whether they are willing to use the anti-diabetic drugs regularly to control blood sugar levels. As indicated in Figure 4.2, 79.7% (141) of the participants indicated that they are not willing to use the anti-diabetic drugs regularly to control blood sugar levels and 20.3% (36) revealed that they were willing to use the anti-diabetic drugs regularly to control blood sugar levels.

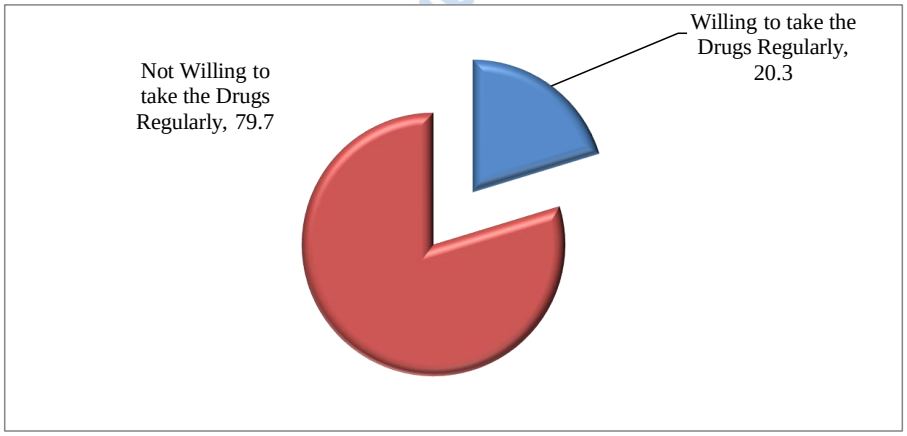

Figure 4. 2: Willingness to Use the Anti-diabetic Drugs Regularly to Control Blood Sugar Levels

The respondents were further asked to indicate whether they will stop using the Anti-diabetic drugs if clinical symptoms of Type II Diabetes disappear. According to the results, 66.1%(117) of the respondents indicated that they will stop using the anti-diabetic drugs if clinical symptoms of type II Diabetes disappear while 33.9% (60) indicated they will not stop using the anti-diabetic drugs if Clinical Symptoms of Type II Diabetes disappear.

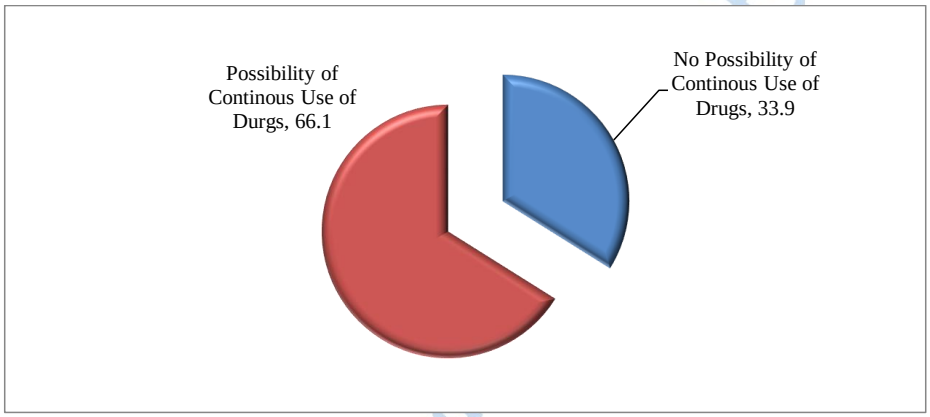

Figure 4. 3: Possibility of Continuous Use of Anti-diabetic Drugs

The respondents were asked to indicate whether they have a blood glucose meter. From the results in Figure 4.4, 94.9% (168) of the respondents indicated that they do not have blood glucose meter while 5.1% (9) indicated that they have a blood glucose meter.

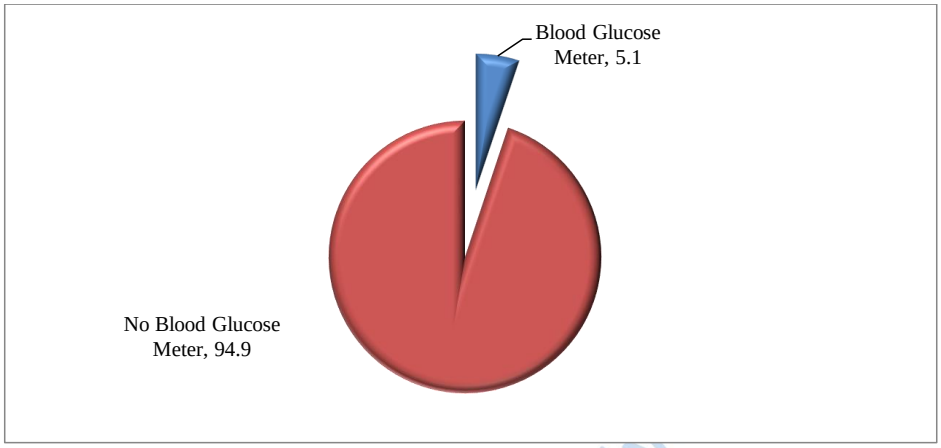

Figure 4. 4: Possession of Blood Glucose Meter

The respondents were requested to indicate whether they monitor blood glucose level on regular basis. As shown in Figure 4.5, 52.5% (93) of the respondents indicated that they rarely monitor blood glucose level while 47.5% (84) indicated that they regularly monitor blood glucose level. This finding suggests that a significant portion of the respondents may not be consistently managing their Type II diabetes, which is essential for preventing complications associated with the condition. The high percentage of individuals who rarely monitor their blood glucose levels raises concerns about the adherence to proper diabetes management practices in the prison environment.

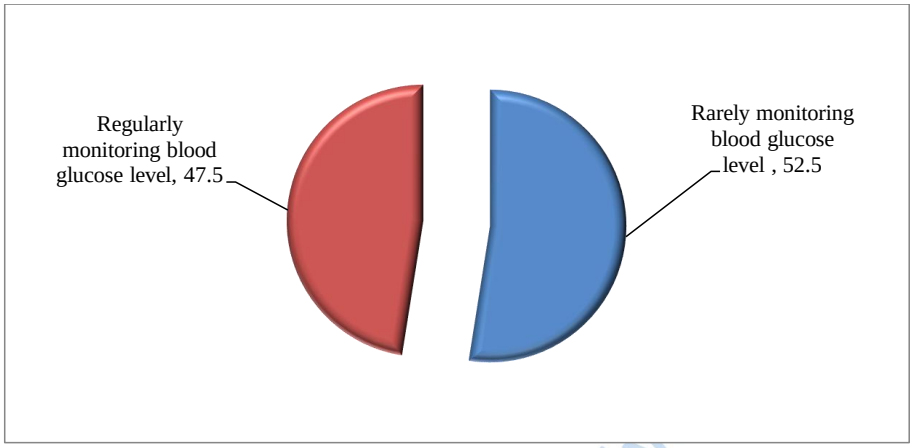

Figure 4. 5: Regularly Monitoring of Blood Glucose Level

4.3.1.2 Non-Adherence to Type II Diabetes Management

Non-adherence to type II diabetes management among adult inmates in Machakos County prisons was measured in terms of adherence or non-adherence to oral medication, insulin injection, physical exercises and recommended dietary intake. From the results, as shown in Figure 4.6, 62.1% (110) of the adult inmates in Machakos GK prison and Yatta prison were non-adherent to Type II diabetes management, but 37.9% (67) were adherent to Type II diabetes management. The findings concur with WHO (2019) observation that the prevalence of non-compliance to type II diabetes management in developing countries is at 50%.

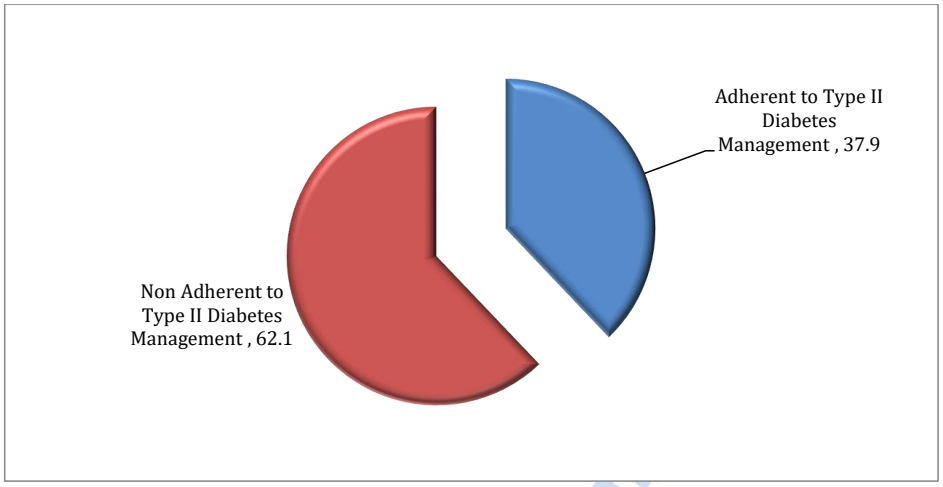

Figure 4. 6: Adherence to Type II Diabetes Management among Adult Inmates

The respondents were asked to indicate adherence to oral medications among adult inmates. From the results, as shown in Figure 4.7, 65% (115) of the adult inmates in Machakos County prisons (Machakos GK prison and Yatta prison) were non-adherent to oral medications, but 35% (62) were adherent to oral medications.

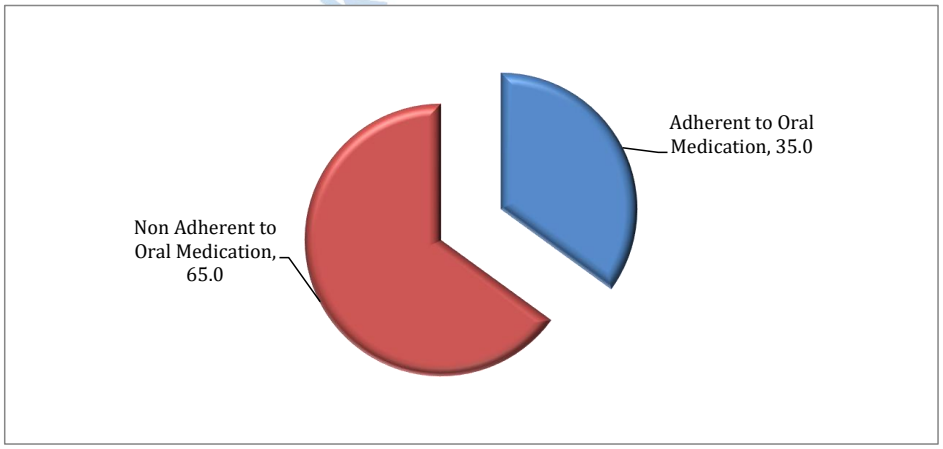

Figure 4. 7: Adherence to Oral Medications

The respondents were asked to indicate adherence to insulin injection among adult inmates. From the results, as shown in Figure 4.8, 67.2% (119) of the adult inmates in Machakos County prisons (Machakos GK prison and Yatta prison) were non-adherent to insulin injection, but 32.8% (58) were adherent to insulin injection.

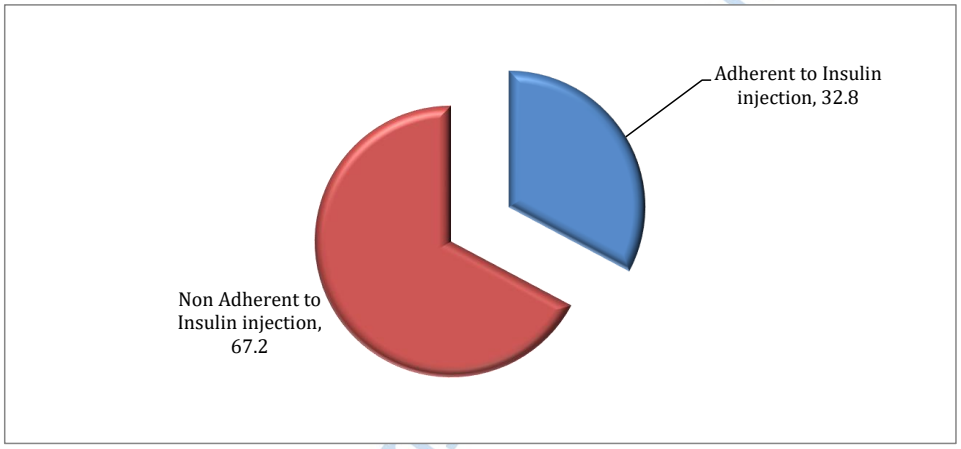

Figure 4. 8: Adherent to Insulin injection

The respondents were further requested to specify how often they do physical exercise. According to the findings, 28.8% (51) of the respondents indicated that they do physical exercises on weekly basis, the same percent indicated that they do not know, 22% (39) indicated on monthly basis and 20.3% (36) indicated on daily basis. This implies that most of the respondents do physical exercises on weekly basis.

Table 4. 6: Frequency of doing physical exercises

Frequency of doing physical exercises	Frequency	Percent

Daily	36	20.3
Weekly	51	28.8
Monthly	39	22.0
I don't	51	28.8

The respondents were requested to indicate whether they have reduced sugar consumption to control blood sugar levels. From the study findings, 59.3% (105) of the respondents indicated that they have not reduced sugar consumption to control blood sugar levels while 40.7% (72) indicated that they had reduced sugar consumption to control blood sugar levels.

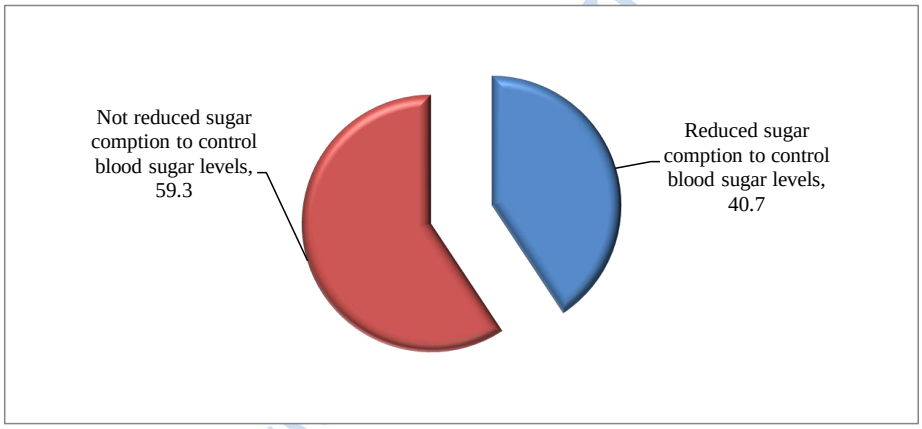

Figure 4. 9: **Reducing Consumption to Control Blood Sugar Levels**

The respondents were requested to specify whether they observe the recommended dietary intake. From the results, 91.5% (162) of the respondents indicated that they do not observe the recommended dietary intake while 8.5% (15) indicated that they observe the recommended dietary intake. This means that most of the respondents do not observe the recommended dietary intake.

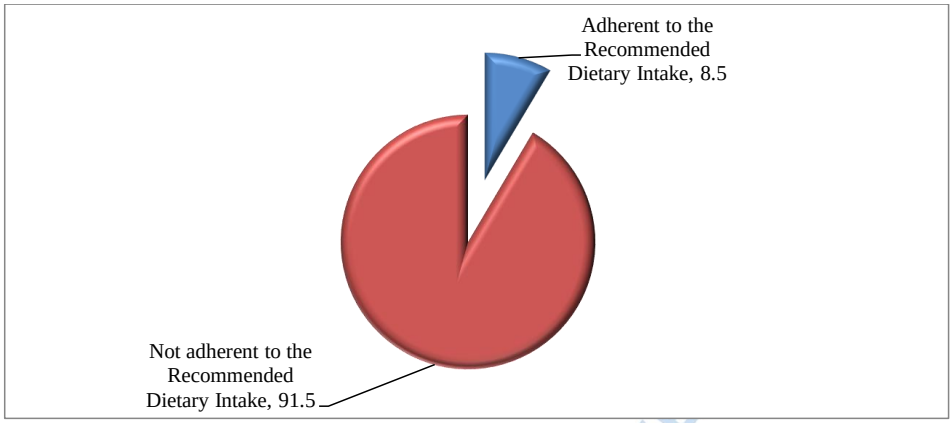

Figure 4. 10: Adherence to the Recommended Dietary Intake

The respondents were requested to specify how often they visit a diabetic clinic. From the Table 4.3, 55.9% (99) of the respondents indicated that they visit a diabetic clinic when they are sick, 23.7% (42) indicated as prescribed, 16.9% (30) indicated when they remember and 3.4% (6) indicated that they do not visit the clinic. This implies that most of the respondents visit a diabetic clinic when they are sick.

Table 4. 7: Frequency of Visiting a Diabetic Clinic

Frequency of visiting a diabetic clinic	Frequency	Percent
As prescribed	42	23.7
When I am sick	99	55.9
When I remember	30	16.9
I don't visit the clinic	6	3.4

The respondents were asked to indicate how often they take prescribed drugs. As shown in Table 4.8, 42.4% (75) of the respondents indicated they take prescribed drugs as prescribed, 37.3% (66) indicated sometimes when they remember to take and 20.3% (36) indicated when feeling sick.

Table 4. 8: Frequency of Taking Prescribed Drugs

Frequency of taking prescribed drugs	Frequency	Percent
As prescribed	75	42.4
When feeling sick	36	20.3
Sometimes when I remember to take	66	37.3

The respondents were requested to indicate the place where they measure their blood glucose. As shown in Table 4.9, 61% (108) of the respondents indicated that they measure their blood glucose at the prison clinic, 35.6% (63) indicated that they measure themselves and 3.4% (6) indicated that they do not measure.

Table 4. 9: Place for Measuring Blood Glucose

Place for measuring blood glucose	Frequency	Percent
At the prison clinic	108	61.0
I measure myself	6	3.4
I don't measure	63	35.6

4.3.2 Inferential Statistics

The study sought to establish the influence of barriers to effective management on non-adherence to type II diabetes management. The results show that missing prescribed drugs in the clinic had significant influence on non-adherence to type II diabetes management (p=0.031). The respondents who did not miss prescribed drugs in the clinic (OR= 2.881, 95%CI [1.104-7.518], p = 0.031), were more likely to be non-adherence to type II diabetes management as compared to those who did not.

The results shows that hindrances from exercising has no significant influence on non-adherence to type II diabetes management (p=0.114). The participants who had no free time in prison were more likely to be non-adherence to type II diabetes management (OR = 1.200, 95%CI [1.116-4.176], p = 0.114) as compared to those who don't know which exercise to do (OR = 0.800, 95%CI [0.282-2.271], p = 0.675) and those who have no schedule for games and sports in prison (OR = 0.640, 95%CI [0.219-1.872], p = 0.415).

The results show that knowledge on usefulness of the programs and activities in managing Type II Diabetes has significant influence on non-adherence to type II diabetes management (p=0.007). The participants who strongly disagreed with the statement were more likely to be non-adherence

to type II diabetes management (OR =0.125, 95%CI 0.025-0.619], p = 0.011) as compared to those who agreed (OR = 0.500, 95%CI [0112-2.234], p = 0.364) and those who were not sure (OR = 1.250, 95%CI [0.381-4.096], p = 0.712).

The results also indicates that unavailability of drugs in the clinic has no significant influence on non-adherence to type II diabetes management (p=0.090). The participants who found that the drugs are unavailable in the clinic (OR= 0.193, 95%CI [0.024-1.580], (p = 0.090) were more likely to be non-adherence to type II diabetes management as compared to those who found that the drugs are available in the clinic.

The study indicates that lack of money to buy drugs has no significant influence on non-adherence to type II diabetes management (p=0.809). The respondents who had money to buy drugs (OR= 0.911, 95%CI [0.426-1.947], p = 0.809) were more likely to be non-adherence to type II diabetes management as compared to those who lacked money to buy drugs.

The results show that lack of interest in taking drugs has no significant influence on non-adherence to type II diabetes management (p=0.398). The results show that the respondents who were interested in taking drugs were more likely to be non-adherence to type II diabetes management (OR=0.718, 95%CI [0.334-1.547], p = 0.398) as compared to those no longer interested in taking them.

The results indicates that feeling that drugs are ineffective has no significant influence on non-adherence to type II diabetes management (p=0.398). The respondents who did not feel drugs are ineffective (OR=0.718, 95%CI [0.334-1.547], p = 0.398) were more likely to be non-adherence to type II diabetes management as compared to those who feel drugs are ineffective.

The findings indicates that side effects has a significant influence on non-adherence to type II diabetes management (p=0.005). The participants who had side effects (OR= 0.106, 95%CI [0.022-0.498], p = 0.005) were more likely to be non-adherence to type II diabetes management as compared to those who had no side effects.

The findings shows that feeling the dose given is high has a significant influence on non-adherence to type II diabetes management (p=0.009). The respondents who feel the dose given is high (OR= 3.199, 95%CI [1.330-7.695], p = 0.009) were more likely to be non-adherence to type II diabetes management as compared to those who did not feel the dose given is high.

The results show that complexity of drug regimen has a significant influence on non-adherence to type II diabetes management (p=0.008). The results show that the respondents with complex drug regimen were more likely to be non-adherence to type II diabetes management (OR= 3.704, 95%CI [1.405-9.763], p = 0.008) as compared to those who had no complex drug regimen.

The results also indicates that multiple medication has no significant influence on non-adherence to type II diabetes management (p=0.102). The participants with no multiple medication (OR= 0.447, 95%CI [0.167-1.197], p = 0.102) were more likely to be non-adherence to type II diabetes management as compared to those with multiple medication.

The study show that forgetting has no significant influence on non-adherence to type II diabetes management (p=0.484). The respondents who forget (OR= 0.782, 95%CI [0.392-1.559], p = 0.484) were more likely to be non-adherence to type II diabetes management as compared to those who don't forget.

The results show that taking the drugs for many years has no significant influence on non-adherence to type II diabetes management (p=0.342). The results show that the respondents who have not been taking the drugs for many years were more likely to be non-adherence to type II diabetes management (OR= 0.526, 95%CI [0.137-2.016], p = 0.342) as compared to those who have been taking the drugs for many years. According to Mills *et al.* (2011), many inmates do miss their medication where they found the medications have been dispensed while out of there units.

The results indicates that willingness to use the Anti-diabetic drugs regularly to control blood sugar levels has no significant influence on non-adherence to type II diabetes management (p=0.531). The respondents who were not willing to use the Anti-diabetic drugs regularly to control blood sugar levels (OR= 1.279, 95%CI [0.592-2.766], p = 0.531) were more likely to be non-adherence to type II diabetes management as compared to those who were willing to use the Anti-diabetic drugs regularly to control blood sugar levels.

The findings indicates that possibility of continuous use of Anti-diabetic Drugs if clinical symptoms disappear has no significant influence on non-adherence to type II diabetes management (p=0.224). The participants who were not likely to continue using Anti-diabetic Drugs if clinical symptoms disappear (OR= 1.501, 95%CI [0.778-2.896], p = 0.224) were more likely to be non-adherence to type II diabetes management as compared to those who were likely to continue using Anti-diabetic Drugs if clinical symptoms disappear.

The findings shows that possession of blood glucose meter has no significant influence on non-adherence to type II diabetes management (p=0.067). The respondents who did not possess blood glucose meter (OR= 0.285, 95%CI [0.069-1.181], p = 0.067) were more likely to be non-adherence to type II diabetes management as compared to those who possessed blood glucose meter.

The results show that regular monitoring of Blood Glucose Level has no significant influence on non-adherence to type II diabetes management (p=0.557). The participants who did not monitor their blood glucose level regularly (OR= 0.841, 95%CI [0.457-1.547], p = 0.557) were more likely to be non-adherence to type II diabetes management as compared to those who monitor their blood glucose level regularly.

Table 4. 10: Barriers to Effective Management and Non-Adherence to Type II Diabetes Management

	Non-Adherence to Type II Diabetes Management	**OR(95%CI)**	***p* value**
Missing Prescribed Drugs in the Clinic			**.031**
Yes	83(61.5)		
No	27(64.3)	2.881(1.104-7.518)	.031
Hindrances from exercising			**.114**
The programs here are many	36(80.0)	*Ref.*	
No free time in prison	32(66.7)	1.200(1.116-4.176)	.114
I fear exercising	15(50.0)	1.600(0.608-4.211)	.341
I don't know which exercise to do	12(44.4)	0.800(0.282-2.271)	.675
No schedule for games and sports here	15(55.6)	0.640(0.219-1.872)	.415

Knowledge on Usefulness of the			**.007**
Programs and Activities in			
Managing Type II Diabetes			
Strongly agree	6(50.0)		
Agree	30(71.4)	0.500(0112-2.234)	.364
Not sure	59(65.6)	1.250(0.381-4.096)	.712
Disagree	3(20.0)	0.952(0.326-2.780)	.928
Strongly disagree	12(66.7)	0.125(0.025-0.619)	.011
Reasons for not taking the Drugs			
as Prescribed			
Unavailability in the clinic			**.090**
No	8(88.9)		
Yes	102(60.7)	0.193(0.024-1.580)	.090
Lack of money to buy drugs			**.809**
Yes	87(61.7)		
No	23(63.9)	0.911(0.426-1.947)	.809
No longer interested in taking			**.398**
them			
Yes	6(100)		
No	104(60.8)	.718(0.334-1.547)	.398
Feeling drugs are ineffective			
Yes	6(100)		
No	104(60.8)	.718(0.334-1.547)	.398

Side effects			**.005**
No	108(65.5)		
Yes	2(16.7)	0.106 (0.022-0.498)	.005
Feeling the dose given is high			**.009**
No	104(64.2)		
Yes	6(40.0)	3.199(1.330-7.695)	.009
Complexity of drug regimen			**.008**
No	104(64.2)		
Yes	6(40.0)	3.704(1.405-9.763)	.008
Multiple medication			**.102**
Yes	8(44.4)		
No	102(64.2)	0.447(0.167-1.197)	.102
Forgetting			**.484**
No	84(63.6)		
Yes	26(57.8)	0.782(0.392-1.559)	.484
Taking the drugs for many years			
Yes	9(75.0)		
No	101(61.2)	0.526(0.137-2.016)	.342
Willingness to Use the Anti-diabetic Drugs Regularly To Control Blood Sugar Levels			**.531**
Yes	24(66.7)		
No	86(61.0)	1.279(0.592-2.766)	.531

Possibility of Continuous Use of Anti-diabetic Drugs if clinical symptoms disappear			**.224**
Yes	41(68.3)		
No	69(59.0)	1.501(0.778-2.896)	.224
Possession of Blood Glucose Meter			**.067**
Yes	3(33.3)		
No	107(63.7)	0.285(0.069-1.181)	.067
Regular Monitoring of Blood Glucose Level			**.577**
Yes	56(60.2)		
No	54(64.3)	0.841(0.457-1.547)	.577

4.3.3 Discussion of the Findings

One of the most notable findings of this study was that a large proportion of inmates did not adhere to their prescribed medications, with drug availability being a significant barrier. Many inmates reported waiting for the medications to be delivered or had to purchase drugs from external sources. This aligns with the findings of Pourhabibi (2022), who identified that inadequate access to essential medications in prison settings is a common cause of non-adherence to diabetes treatment. Similarly, Mostafavi (2021) highlighted that inconsistent access to medications in correctional facilities often leads to poor diabetes management, increasing the risk of complications. The issue of financial constraints preventing inmates from purchasing their own medication also supports the conclusions of Sarray (2021), who found that financial barriers are prevalent in prison populations, hindering proper medication adherence and overall health

management.

Physical activity is a cornerstone of Type II diabetes management, yet the study found that inmates had limited opportunities to engage in exercise due to overcrowded schedules and restricted access to space. This finding mirrors Davoodi and Faraji-Khiavi (2022), who reported that limited physical activity opportunities are common in prison environments, especially in facilities with high population densities and limited recreational areas. Additionally, Masaba and Mmusi-Phetoe (2021) emphasized that lack of time and institutional restrictions on physical activity programs contribute to the failure of diabetes management programs in prisons. Inmates' reluctance to engage in exercise due to fear of ridicule or physical exhaustion was also identified in the study, which supports Sarray (2021**)**, who noted that prisoners often face stigma or are not motivated to exercise because of the harsh realities of prison life.

The study found that many inmates were unsure of the effectiveness of the diabetes management programs available to them, with some reporting that they did not find them helpful. Mostafavi (2021) similarly found that a lack of understanding of treatment programs, particularly in the context of chronic diseases like diabetes, leads to poor engagement and non-compliance. The perception of ineffectiveness of prison-based healthcare programs can result from poor communication between healthcare providers and inmates or a lack of individualized care plans. Pourhabibi (2022) found that tailored, culturally sensitive interventions in prisons were more successful in improving health outcomes, including diabetes management, as they addressed the unique challenges faced by incarcerated individuals.

The issue of non-adherence to medication regimens due to the perception that symptoms have disappeared or due to dissatisfaction with the treatment plan is supported by Kovvuru (2024). This

study found that many prisoners stop taking diabetes medications once they feel better or when they no longer experience symptoms. In this study, inmates expressed a lack of interest in taking medication regularly, a trend that aligns with Njoka and Muna (2024), who concluded that prisoners, like the general population, may mistakenly assume that discontinuing medication is acceptable once their condition appears to be under control. The misconception that diabetes management is only necessary when symptoms are present can be detrimental to long-term health, as Alkaiyat (2020) emphasized that continuous adherence is crucial for managing chronic conditions like diabetes.

Non-adherence to dietary recommendations was another significant barrier identified in this study. The inmates reported difficulties in adhering to dietary guidelines due to limited access to proper nutrition and the lack of structured meal plans. This issue was also highlighted in the work of Brenner, Oberaigner and Stummer (2020), who found that prison populations often face dietary challenges that compromise the effectiveness of diabetes management. In their study, many prisoners reported receiving unhealthy meals that do not support the dietary needs of individuals with Type II diabetes. Furthermore, Brenner et al. (2020**)** found that the lack of nutrition education and the reliance on institutional meal plans that do not cater to diabetic needs is a major barrier to dietary adherence in correctional settings. The challenges outlined in this study reflect a broader issue of inadequate nutrition in prison systems globally.

Inmates' lack of personal blood glucose meters and irregular blood glucose monitoring was another significant issue identified. Lewing and Sansgiry (2022) highlighted that inmates often have limited access to self-monitoring tools, which impedes their ability to manage their blood sugar levels effectively. This issue is further compounded by the infrequent monitoring of blood glucose levels in correctional facilities, as Mostafavi (2021) observed that many prisons lack the

resources to provide consistent glucose testing. The lack of self-monitoring was identified as a significant barrier to diabetes management, which is consistent with the findings of Pourhabibi (2022), who argued that regular blood glucose monitoring is essential for adjusting treatment plans and maintaining optimal health outcomes.

4.4 Patient-Level Predictors and Non-Adherence to Type II Diabetes Management

The second objective of the study was to identify patient-level predictors that influence non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya. Socio-demographic aspects are crucial forces that their impact on health outcomes is a notable impact (WHO, 2010).

4.4.1 Descriptive Statistics

The respondents were requested to indicate the risk factors and symptoms of diabetes. The findings were as shown in Table 4.11. From the results, 37.3% (66) of the participants indicated that the symptoms of diabetes included excessive thirst, 35.6% (63) indicated frequent urination at night, 40.7% (72) indicated always feeling hungry, 22.0% (39) indicated feeling tired, 18.6% (33) indicated blurry vision and 20.3% (36) indicated slow healing of cuts and wounds. As shown in Table 4.4., 54.2% (96) of the participants indicated that smoking was a risk factor of diabetes, 27.1% (48) indicated that eating junky foods was a risk factor, 44.1% (78) indicated that lack of exercise was a risk factor, 16.9% (30) indicated that curses were a risk factor and 3.4% (6) indicated that heredity was a risk factor of diabetes.

Table 4. 11: Knowledge on Symptoms and Risk Factors of Diabetes

	Frequency	Percent

	Yes	No	Yes	No
Symptoms of Diabetes				
Excessive thirst	66	111	37.3	62.7
Frequent urination at night	63	114	35.6	64.4
Always feeling hungry	72	105	40.7	59.3
Feeling tired	39	138	22.0	78.0
Blurry vision	33	144	18.6	81.4
Slow healing of cuts and wounds	36	141	20.3	79.7
Risk factors				
Smoking	96	81	54.2	45.8
Eating junky foods	48	129	27.1	72.9
Lack of exercise	78	99	44.1	55.9
Curses	30	147	16.9	83.1
Heredity	6	171	3.4	96.6

The respondents were asked to indicate whether type II diabetes can be cured. The study findings were as shown in Figure 4.11. As shown in Figure 4.11, 81.4% (144), of the respondents revealed that type II diabetes cannot be cured and 18.6% (33) indicated that type II diabetes can be cured.

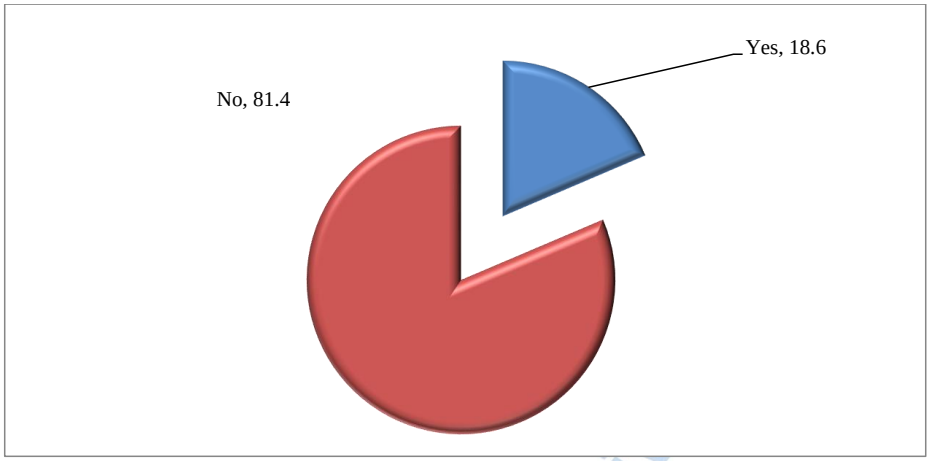

Figure 4. 11: Curing Type II Diabetes

The respondents were asked specify whether using anti-diabetic drugs can control blood sugar levels. As shown in Figure 4.12, 86.4% (153) of the respondents indicated that using antidiabetic drugs can control blood sugar levels while 13.6% (24) revealed that using antidiabetic drugs cannot control blood sugar levels.

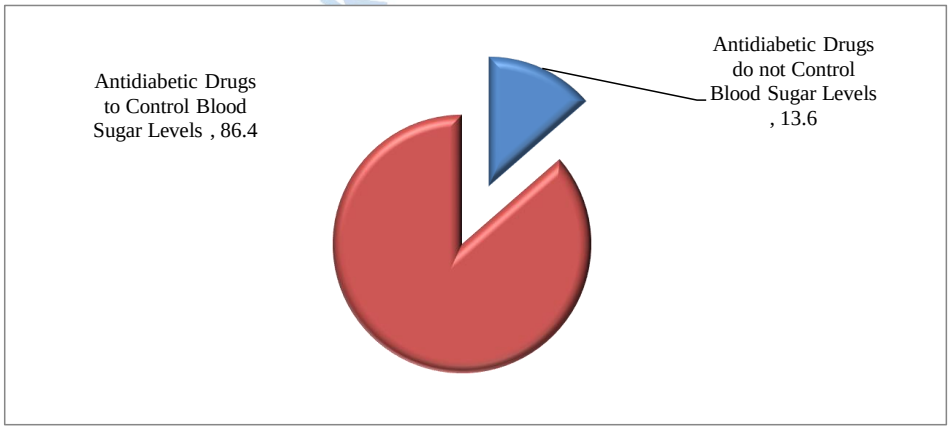

Figure 4. 12: Using Anti-diabetic Drugs To Control Blood Sugar Levels

The respondents were further requested to specify whether they know the consequences of uncontrolled type II diabetes. As shown in Figure 4.13, 96.6% (171) of the respondents indicated that they know the consequences of uncontrolled type II diabetes while 3.4% (6) indicated that they do not know the consequences of uncontrolled type II diabetes. This implies that most of the respondents know the consequences of uncontrolled type II diabetes.

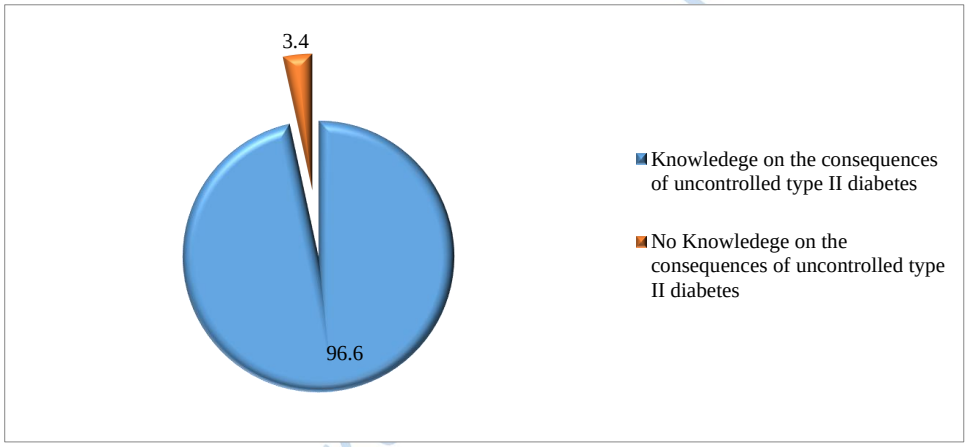

Figure 4. 13: Knowledge of Consequences of Uncontrolled Type II Diabetes

The respondents were also requested to specify whether they know the advantages of daily exercising with diabetes. From the findings, 59% (105) of the respondents indicated that they did not know the advantages of daily exercising with diabetes and 41% (72) indicated that they know the advantages of daily exercising with diabetes. This implies that means that most of the respondents did not know the advantages of daily exercising with diabetes.

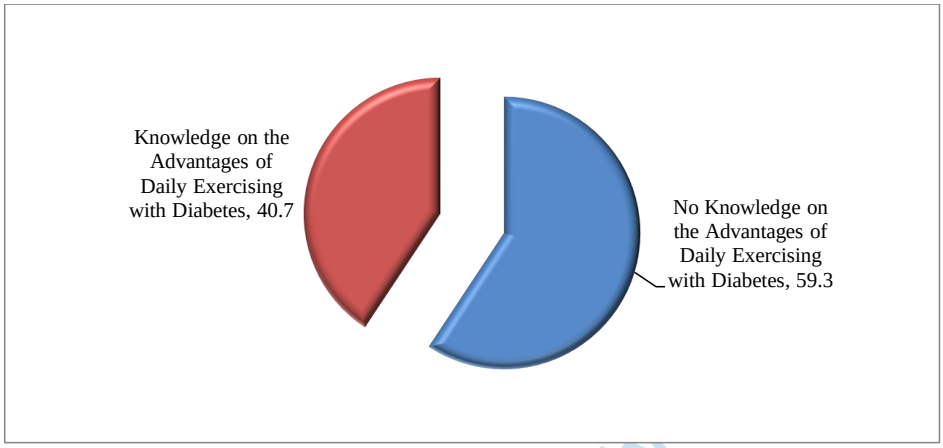

Figure 4. 14: Knowledge on the Advantages of Daily Exercising with Diabetes

The respondents were requested to specify the conditions which they may get from having type II diabetes. According to the findings, 25.4% (45) of the participants indicated that an individual can get heart/ hypertension as a result of having type II diabetes is not kidney disease, 27.1% (48) indicated blindness, 13.6% (24) indicated kidney disease and 27.1% (48) indicated amputation of the foot, toe, or leg.

Table 4. 12: Conditions Associated with Type II Diabetes

	Frequency		Percent	
Conditions	**Yes**	**No**	**Yes**	**No**
Heart/ hypertension	45	132	25.4	74.6
Blindness	48	129	27.1	72.9
Kidney disease	24	153	13.6	86.4
Amputation of the foot, toe, or leg	48	129	27.1	72.9

The respondents were requested to specify the best method for testing blood glucose. According to the results, 88.1% (156) of the respondents revealed that the best method for testing blood glucose is blood testing, 8.5% (15) indicated that they do not know and 3.4% (6) indicated urine testing.

Table 4. 13: The Best Method for Testing Blood Glucose

The best method for testing blood glucose	Frequency	Percent
Blood testing	156	88.1
Urine testing	6	3.4
I don't know	15	8.5

4.4.2 Inferential Statistics

4.4.2.1 Socio-Demographic Factors and Non-Adherence to Type II Diabetes Management

The study sought to establish the influence of socio demographic factors on non-adherence to type II diabetes management. The results show that gender has no significant influence on non-adherence to type II diabetes management (p=0.393). The female gender (OR= 0.750, 95%CI [0.387-1.452], p = 0.393), were more likely to be non-adherence to type II diabetes management as compared to the male gender.

The results also indicated that age has a significant influence on non-adherence to type II diabetes management (p=0.000). The participants who had between 46 and 50 years (OR= 27.368, 95%CI [7.496-99.929], p = 0.000) were more likely to be non-adherence to type II diabetes management as compared to those who had between 21and 25 years (OR= 0.000, 95%CI [0.000-0.000], p = 0.999) and between 18 and 20 years.

The results also indicate that name of the prison has a significant influence on non-adherence to type II diabetes management (p=0.004). The results show that the respondents who were in Yatta Prison were more likely to be non-adherence to type II diabetes management (OR= 0.319, 95%CI

[0.142-0.715], p = 0.006) as compared to those in Machakos GK Prison. The findings are contrary to expectations was prisons menu is a preset menu and no food is acceptable into the prisons from friends and family members. The diet at the prison is a set menu whereby the only cereals consumed were maize, rice and millet which are served to few prisoners who are diabetic. These provide high fiber for they are used in the three meals.

The results also indicated that highest level of education has a significant influence on non-adherence to type II diabetes management (p=0.004). The participants who had primary level of education (OR= 4.421, 95%CI [1.898-10.298], p = 0.001 were more likely to be non-adherence to type II diabetes management as compared to those who had secondary level of education (OR= 0.958, 95%CI [0.285-3.227], p = 0.945) and those with no school.

The study found that home location has a significant influence on non-adherence to type II diabetes management (p=0.027). The respondents whose home location was rural area (OR= 0.482, 95%CI [0.251-0.926], p = 0.029) were more likely to be non-adherence to type II diabetes management as compared to those whose home location was urban area.

The results also indicate that duration of serving in jail has no significant influence on non-adherence to type II diabetes management (p=0.085). The results show that the respondents who have served in jailed for between 5 and 7 years were more likely to be non-adherence to type II diabetes management (OR= 0.442, 95%CI [0.176-1.115], p = 0.084) as compared to those who have served in jail for between 2 and 4 years (OR= 1.114, 95%CI [0.417-2.975], p = 0.829) and between 0 and1 Year.

The results show that previous occupation has a significant influence on non-adherence to type II diabetes management (p=0.023). The participants who had no previous occupation (OR= 0.209,

95%CI [0.073-0.600], p = 0.004) were more likely to be non-adherence to type II diabetes management as compared to those who had informal employment (OR= 0.300, 95%CI [0.077-1.163], p = 0.082) and those who had formal employment.

The findings indicate that duration of having type II diabetes has a significant influence on non-adherence to type II diabetes management (p=0.012). The participants who have been having type II diabetes for more than 11 years (OR= 10.000, 95%CI [1.558-64.198], p = 0.015) were more likely to be non-adherence to type II diabetes management as compared to those have been having type II diabetes for between 3 and 5 years (OR= 2.465, 95%CI [0.582-10.437], p = 0.220) and between 0-2 years. These findings agree with WHO (2017) report that the duration of the disease contributes greatly to patients' medication compliance levels.

The findings indicate that facility that provided diagnosis has a significant influence on non-adherence to type II diabetes management (p=0.000). The findings indicate that Sub- county hospital (OR= 0.036, 95%CI [0.006-0.205], p = 0.000) was more likely to be non-adherence to type II diabetes management as compared to health center (OR= 1.400, 95%CI [0.377-5.195], p = 0.615) and dispensary.

Table 4. 14: Socio-Demographic Factors and Non-Adherence to Type II Diabetes Management

	Non-Adherence to Type II Diabetes Management	**OR(95%CI)**	***p* value**
Gender			**.393**
Male	72(60.0)	*Ref.*	

Female	38(66.7)	.750(0.387-1.452)	.393
Age			**.000**
Between 18 and 20 years	3(100.0)	*Ref.*	
Between 21and 25 years	0(0.0)	.0(0.000-0.000)	.999
Between 26 and 30 years	0(0.0)	.0(0.000-0.000)	.999
Between 31 and 35 years	6(66.7)	.831(0.422-1.636)	.592
Between 36 and 40 years	14(33.3)	1.080(0.421-2.771)	.872
Between 41 and 45 years	51(77.3)	3.864(1.729-8.635)	.001
Between 46 and 50 years	30(76.9)	27.368(7.496-99.929)	.000
Between 51 and 55 years	6(100.0)	3.864(1.729-8.635)	.001
Name of the prison			**.004**
Machakos GK Prison	74(56.1)	*Ref.*	
Yatta Prison	36(80.0)	.319(0.142-0.715)	.006
Highest Level of Education			**.000**
No school	10(100.0)	*Ref.*	
Primary	23(59.0)	4.421(1.898-10.298)	.001
Secondary	27(50.0)	0.958(0.285-3.227)	.945
College	18(54.5)	0.667(0.208-2.132)	.494
Religious schooling	3(50.0)	0.800(0.232-2.763)	.800
Literacy classes only	9(60.0)	0.667(0.099-4.478)	.677
Home location			**.027**
Urban area	27(50.0)	*Ref.*	
Rural area	83(67.5)	.482(0.251-0.926)	.029

Duration of Serving in Jail			**.085**
0-1 Year	39(72.2)	*Ref.*	
2-4 years	32(50.8)	1.114(0.417-2.975)	.829
5-7 years	18(60.0)	0.442(0.176-1.115)	.084
Above 7 years	21(70.0)	0.643(0.221-1.873)	.418
Previous Occupation			**.023**
Formal employment	6(60.0)	*Ref.*	
Informal employment	48(59.3)	0.300(0.077-1.163)	.082
Business	23(51.1)	0.291(0.109-0.777)	.014
None	30(83.3)	0.209(0.073-0.600)	.004
Duration of having type II diabetes			**.012**
0-2 years	39(72.2)	*Ref.*	
3-5 years	53(55.2)	2.465(.582-10.437)	.220
9-10 years	15(83.3)	5.200(1.151-23.502)	.032
Above 11 years	3(33.3)	10.000(1.558-64.198)	.015
Facility that provided diagnosis			.000
Dispensary	21(77.8)		
Health center	2(8.3)	1.400 (0.377-5.195)	.615
Sub- county hospital	12(50.0)	0.036(0.006-0.205)	.000
Private hospital	6(40.0)	0.400(0.116-1.382)	.147
Prison clinic	54(81.8)	0.267 (0.066-1.083)	.064

Informal health care	15(71.4)	1.800(0.579-5.599)	.310

4.4.2.2 Patients Knowledge Level and Non-Adherence to Type II Diabetes Management

The study sought to establish the influence of patients' knowledge level on non-adherence to type II diabetes management. The study found that symptoms of diabetes has no significant influence on non-adherence to type II diabetes management (p=0.334). The respondents who had excessive thirst (OR= 0.735, 95%CI [0.394-1.373], p = 0.334), were more likely to be non-adherence to type II diabetes management as compared to those who did not.

The results shows that frequent urination at night has a significant influence on non-adherence to type II diabetes management (p=0.011). The participants who had no frequent urination at night (OR= 0.421, 95%CI [0.214-0.827], p = 0.012) were more likely to be non-adherence to type II diabetes management as compared to those who had frequent urination at night.

The results show that always feeling hungry has no significant influence on non-adherence to type II diabetes management (p=0.936). The results show that the respondents who were not always feeling hungry were more likely to be non-adherence to type II diabetes management (OR= 0.975, 95%CI [0.525-1.810], p = 0.936) as compared to those who were always feeling hungry.

The results also indicated that feeling tired has a significant influence on non-adherence to type II diabetes management (p=0.000). The participants who were not feeling tired (OR= 9.099, 95%CI [3.949-20.966], p = 0.000 were more likely to be non-adherence to type II diabetes management as compared to those who were feeling tired.

The study indicates that blurry vision has no significant influence on non-adherence to type II diabetes management (p=0.165). The respondents who had no blurry vision (OR= 0.556, 95%CI

[0.241-1.282], p = 0.168) were more likely to be non-adherence to type II diabetes management as compared to those who had blurry vision.

The results show that slow healing of cuts and wounds has a significant influence on non-adherence to type II diabetes management (p=0.011). The results show that the respondents with no slow healing of cuts and wounds were more likely to be non-adherence to type II diabetes management (OR= 0.326, 95%CI [0.134-0.794], p = 0.014) as compared to those with slow healing of cuts and wounds.

The results indicates that smoking has no significant influence on non-adherence to type II diabetes management (p=0.837). The respondents who were not smoking (OR= 1.066, 95%CI [0.579-1.962], p = 0.837) were more likely to be non-adherence to type II diabetes management as compared to those who were smoking.

The findings indicates that eating junky foods has no significant influence on non-adherence to type II diabetes management (p=0.269). The participants who have not been eating junky foods (OR= 0.673, 95%CI [0.333-1.361], p = 0.271) were more likely to be non-adherence to type II diabetes management as compared to those have been eating junky foods.

The findings shows that lack of exercise has no significant influence on non-adherence to type II diabetes management (p=0.882). The respondents who fail to do exercise (OR= 1.047, 95%CI [0.568-1.930], p = 0.882) were more likely to be non-adherence to type II diabetes management as compared to those who do exercise.

The results show that curses have no significant influence on non-adherence to type II diabetes management (p=0.790). The results show that the respondents with no curses were more likely to

be non-adherence to type II diabetes management (OR= 1.115, 95%CI [0.499-2.490], p = 0.790) as compared to those who with curses.

The results also indicates that heredity has no significant influence on non-adherence to type II diabetes management (p=0.999). The participants with no heredity (OR= 2912, 95%CI [0.000-0.000], p = 0.999 were more likely to be non-adherence to type II diabetes management as compared to those with heredity.

The study show that curing of Type II Diabetes has a significant influence on non-adherence to type II diabetes management (p=0.001). The respondents who had not been cured of Type II Diabetes (OR= 3.728, 95%CI [1.690-8.223], p = 0.001) were more likely to be non-adherence to type II diabetes management as compared to those who had been cured of Type II Diabetes.

The results show that using control anti-diabetic drugs to lower Blood Sugar Levels has no significant influence on non-adherence to type II diabetes management (p=0.191). The results show that the respondents who have no knowledge regarding using Control Anti-Diabetic Drugs to lower Blood Sugar Levels were more likely to be non-adherence to type II diabetes management (OR= 0.561, 95%CI [0.236-1.134], p = 0.191) as compared to those who had knowledge regarding using Control Anti-Diabetic Drugs to lower Blood Sugar Levels.

The results indicates that knowledge on the consequences of uncontrolled Type II Diabetes has a significant influence on non-adherence to type II diabetes management (p=0.046). The respondents who had no knowledge on the consequences of uncontrolled Type II Diabetes (OR= 2.849, 95%CI [0.931-3.674], p = 0.046) were more likely to be non-adherence to type II diabetes management as compared to those who had knowledge on the consequences of uncontrolled Type II Diabetes.

The findings indicates that knowledge on advantages of daily exercising with diabetes has a significant influence on non-adherence to type II diabetes management (p=0.009). The participants who have no knowledge on advantages of daily exercising with diabetes (OR= 0.426, 95%CI [0.222-0.815], p = 0.009) were more likely to be non-adherence to type II diabetes management as compared to those who have no knowledge on advantages of daily exercising with diabetes.

The findings shows that knowledge on conditions associated with Type II Diabetes has no significant influence on non-adherence to type II diabetes management (p=0.052). The respondents who have no knowledge on conditions associated with Type II Diabetes (OR= 0.903, 95%CI [0.329-2.480], p = 0.052) were more likely to be non-adherence to type II diabetes management as compared to those who have knowledge on conditions associated with Type II Diabetes.

Table 4. 15: Patients Knowledge Level and Non-Adherence to Type II Diabetes Management

	Non-Adherence to Type II Diabetes Management	**OR(95%CI)**	***p* value**
Symptoms of Diabetes			.334
Excessive thirst	38(57.6)		
Yes	72(64.9)	.735(0.394-1.373)	.334
No			
Frequent urination at night			.011

Yes	47(74.6)		
No	63(55.3)	0.421(0.214-0.827)	.012
Always feeling hungry			.936
Yes	45(62.5)		
No	65(61.9)	.975(0.525-1.810)	.936
Feeling tired			.000
Yes	9(23.1)		
No	101(73.2)	9.099(3.949-20.966)	.000
Blurry vision			**.165**
Yes	24(72.7)		
No	86(59.7)	.556(0.241-1.282)	.168
Slow healing of cuts and wounds			.011
Yes	29(80.6)		
No	81(57.4)	0.326(0.134-0.794)	.014
Risk factors			
Smoking			**. 837**
Yes	59(61.5)		
No	51(63.0)	1.066(0.579-1.962)	.837
Eating junky foods			**.269**
Yes	33(68.8)		
No	77(59.7)	0.673(0.333-1.361)	.271
Lack of exercise			**.882**
Yes	48(61.5)		

No	62(62.6)	1.047(0.568-1.930)	.882
Curses			**.790**
Yes	18(60.0)		
No	92(62.6)	1.115(0.499-2.490)	.790
Heredity			**.999**
Yes	0(0.0)		
No	110(64.3)	2912(0.000-0.000)	.999
Curing of Type II Diabetes			**.001**
Yes	12(36.4)		
No	98(68.1)	3.728(1.690-8.223)	.001
Using Control Anti-Diabetic Drugs can lower Blood Sugar Levels			**.191**
Yes	12(50.0)		
No	98(64.1)	0.561(0.236-1.134)	.191
Knowledge on Consequences of Uncontrolled Type II Diabetes			**.046**
Yes	23(51.1)		
No	87(65.9)	2.849(0.931-3.674)	.046
Advantages of Daily Exercising with Diabetes			**.009**
Yes	53(73.6)		
No	57(54.3)	0.426(0.222-0.815)	.009

Knowledge on Conditions Associated with Type II Diabetes			**.052**
Yes	104(60.8)		
No	6(100.0)	0.903(0.329-2.480)	.052

4.4.3 Discussion of the Findings

The results indicate that older inmates (especially those aged 46-50 years) were more likely to be non-adherent to diabetes management. This contrasts with the findings by Pourhabibi (2022), which suggested that older individuals tend to be more adherent to their medication. This difference may be due to the context of the prison environment, where older inmates may face additional barriers to adherence, such as limited access to healthcare, discomfort with treatment regimens, or co-existing health conditions that hinder management. The study found that individuals with lower levels of education (particularly those who only completed primary school) were more likely to be non-adherent. This finding aligns with several studies, including Mostafavi (2021), which have suggested that lower educational levels can hinder health literacy and reduce patients' understanding of their health conditions and treatment options. Lack of proper education can contribute to misunderstandings about the chronic nature of Type II diabetes and the importance of consistent management.

Participants living in rural areas were more likely to be non-adherent compared to those from urban areas. This supports findings from Sarray (2021), who noted that rural residents tend to have less access to healthcare services and a lower level of awareness about diabetes management. In rural settings, healthcare resources are often limited, and diabetes management may be seen as less of a priority. Those who had been living with diabetes for longer periods (more than 11 years) were significantly more likely to be non-adherent. This is in line with research from Davoodi and Faraji-

Khiavi (2022), which suggested that the longer the duration of a disease, the more likely patients are to experience "treatment fatigue," leading to non-adherence. In addition, participants diagnosed in Sub-county hospitals were more likely to be non-adherent compared to those diagnosed in health centers or dispensaries. This suggests that the quality of healthcare and follow-up care in different facilities may play a role in encouraging or discouraging adherence. The study concurs with existing literature that highlights the importance of ongoing, personalized care in promoting adherence (Masaba & Mmusi-Phetoe, 2021).

Patient knowledge about Type II diabetes was another critical factor in adherence to treatment. The study revealed that knowledge of symptoms, risk factors, and consequences of uncontrolled diabetes can influence adherence behavior. Knowledge about the symptoms of diabetes (e.g., excessive thirst, frequent urination, tiredness) and the risk factors (e.g., smoking, lack of exercise) had little impact on adherence, as many inmates were aware of these but still failed to manage their condition properly. Similar findings have been reported by Sarray (2021), where patients, despite understanding the risks, still struggled with adherence due to factors like stigma, limited access to medication, or social determinants of health. In contrast, the study found that knowledge about the severe consequences of uncontrolled Type II diabetes (such as heart disease, kidney failure, and amputations) significantly influenced adherence. This is consistent with the findings of Mostafavi (2021), who observed that when patients are informed of the potential complications, they are more motivated to adhere to treatment protocols. The participants' awareness that Type II diabetes cannot be cured, but can be controlled with anti-diabetic drugs, was an important factor. This finding aligns with Pourhabibi (2022) findings that suggest patients who believe in the effectiveness of their treatment are more likely to adhere to prescribed regimens.

4.5 Provider-Level Factors and Non-Adherence to Type II Diabetes Management

The third objective of the study was to identify provider-level predictors that influence non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya

4.5.1 Descriptive Statistics

The respondents were requested to specify the amount of money they spend in 3 months to get prescribed drugs. As shown in Table 4.16, 84.7% (150) of the respondents indicated that they spend between kshs. 1001 and 5000, 13.6% (24) indicated more than Kshs. 6000 and 1.7% (3) indicated between below Kshs. 1000.

Table 4. 16: The Amount Spent to Get Prescribed Drugs

Amount spend in 3 months to get your prescribed drugs	Frequency	Percent
kshs 0- 1000	3	1.7
kshs 1001- 5000	150	84.7
kshs Above 6000	24	13.6

According to the study findings, 100% (177) of the respondents indicated that there no enough physicians at the prison clinic to serve those with type II diabetes, 72.9% (129) pointed out that they were served satisfactory lastly when they visited the clinic, 64.4% (114) indicated that they receive guidance and counseling at the clinic, 61% (108) indicated that the physicians are friendly at the clinic and 57.6% (102) indicated that they do not get screening and testing services at the prison.

Table 4. 17: Physicians at the Prison Facility

	Frequency		Percent	
	Yes	**No**	**Yes**	**No**
Enough physicians at the prison clinic to serve those with type II diabetes	0.00	177	0.00	100.0
Satisfaction with service when they last visited the clinic	129	48	72.9	27.1
Friendliness of the physicians at the clinic	108	69	61.0	39.0
Receiving guidance and counseling at the clinic	114	63	64.4	35.6
Getting screening and testing services at the prison	75	102	42.4	57.6

The respondents were also asked to specify whether they have the ability to access health information. As shown in Figure 4.15, 40.7% (72) of the participants indicated that they the ability to access health information while 59.3% (105) indicated that they had no ability to to access health information.

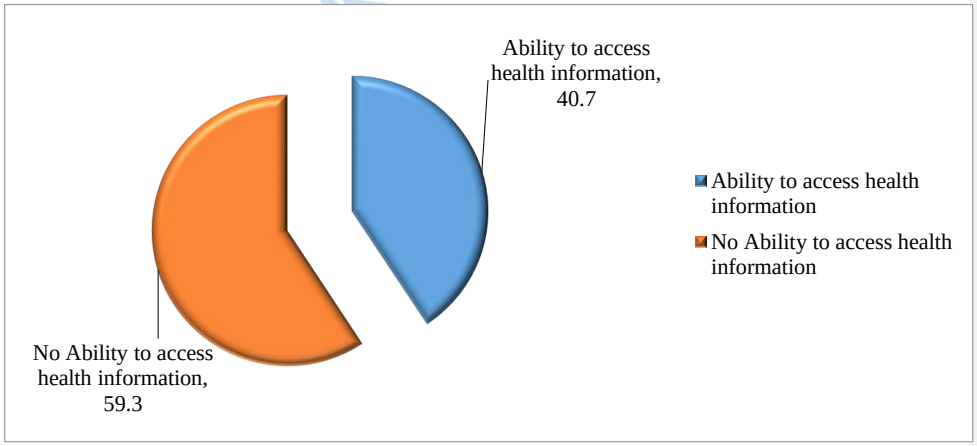

Figure 4. 15: Ability to Access Health Information

The respondents were asked to indicate whether they understand health information. From the results, 28.8% (51) of the participants indicated that they had understood health information while 71.2% (126) indicated that they do not understand health information.

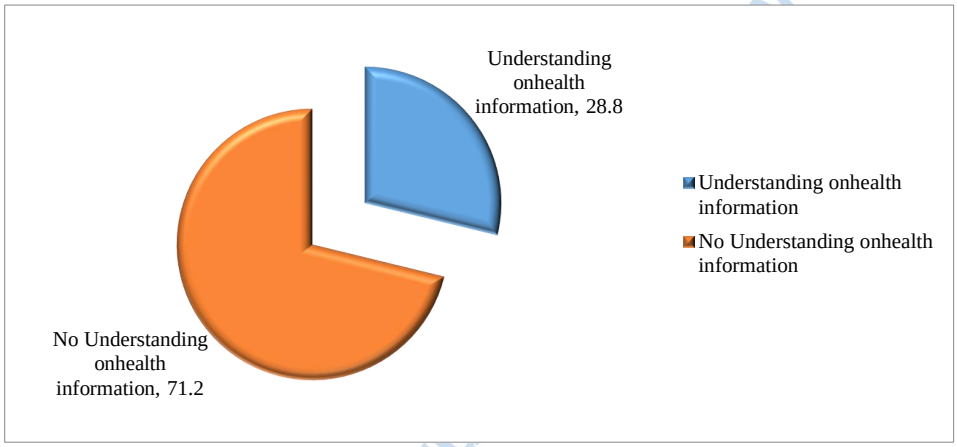

Figure 4. 16: Understanding Health Information

The respondents were requested to respond to various statements concerning diabetes. From the findings, 64.4% (114) of the respondents indicated that they do not have good knowledge about the anti-diabetic drugs prescribed to them, 54.2% (96) indicated that the doctors give them information on diabetes and 59.3% (102) indicated that they were not involved in treatment decisions.

Table 4. 18: Knowledge on Diabetes

	Frequency	Percent

Knowledge on Diabetes	Yes	No	Yes	No
Good knowledge about the anti-diabetic drugs prescribed	63	114	35.6	64.4
Doctors giving prisoners information on diabetes	96	81	54.2	45.8
Involvement in treatment decisions	72	105	40.7	59.3

The respondents were asked to specify what prevented them from getting medicines in the last 6 months. From the results as shown in Table 4.19, 64.4% (114) of the respondents indicated that they have not been able to get medicines in the last 6 months because of the lack of funds to pay for them, 27.1% (48) indicated they had no one to help me get them, 5.1% (9) pointed out that no doctor or other professional was available at the clinic and 3.4% (6) indicated that they were not available at the prison clinic. This study concurred with the findings of Ataur *et al* (2012)

Table 4. 19: Reasons for Not Getting Medicines in the Last 6 Months

Reasons for not getting medicines in the last 6 months	Frequency	Percent
Lack of funds to pay for them	114	64.4
No one to help me get them	48	27.1
No doctor or other professional was available at the clinic	9	5.1
They were not available at the prison clinic	6	3.4

The respondents were requested to indicate whether they face discrimination and harassment when seeking medical attention. According to the findings of the study, 50.8% (90) of the respondents indicated that they face discrimination and harassment when seeking medical attention while

49.2% (87) indicated that they do not face discrimination and harassment when seeking medical attention.

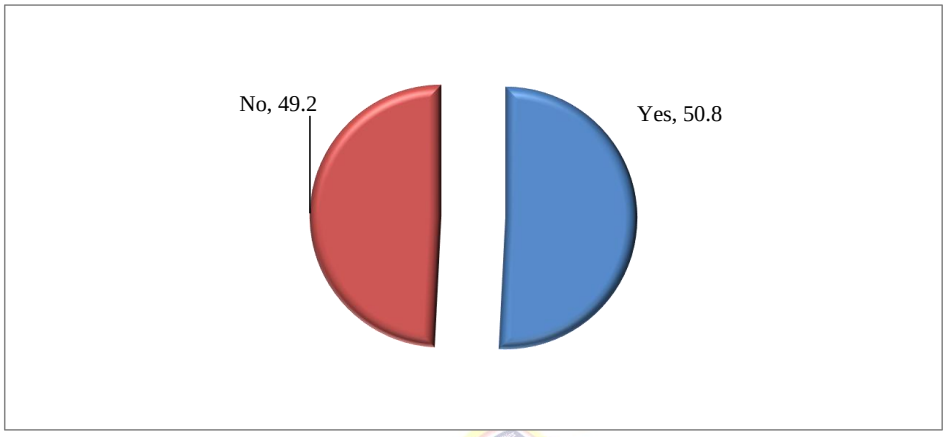

Figure 4. 17: Discrimination and Harassment When Seeking Medical Attention

The respondents were asked to specify whether they feel comfortable to ask questions to the doctor. According to the findings in Table 4.18, 30.5% (54) of the respondents indicated that they are not sure whether they feel comfortable to ask questions to their doctor, 23.7% (42) agreed, 16.9% (30) disagreed, 15.3% (27) strongly agreed and 13.6% (24) strongly disagreed. This implies that most of the respondents were not sure whether they feel comfortable to ask questions to their doctor.

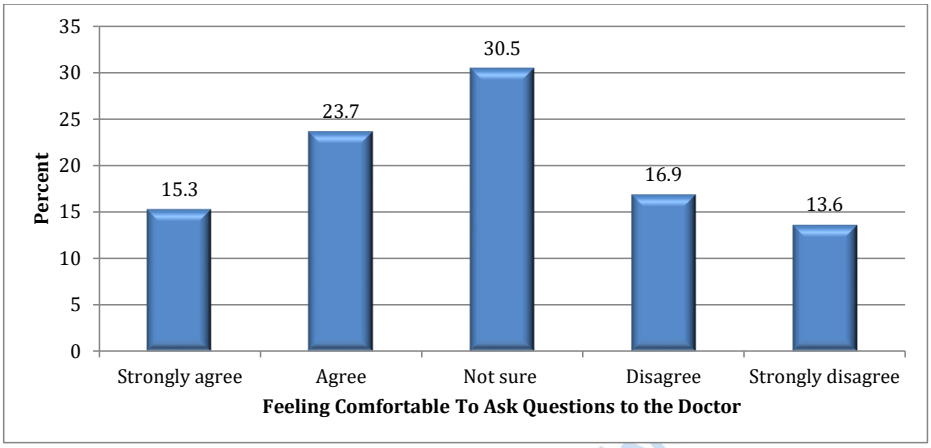

Figure 4. 18: Feeling Comfortable To Ask Questions to the Doctor

4.5.2 Inferential Statistics

The study sought to establish the influence of provider-level factors on non-adherence to type II diabetes management. The results show that the amount spent to get prescribed drugs has no significant influence on non-adherence to type II diabetes management (p=0.893). The respondents who spend more than kshs 6000 to get prescribed drugs (OR= 0.488, 95%CI [0.150-1.590], p = 0.234), were more likely to be non-adherence to type II diabetes management as compared to those who spend between kshs 0 and 1000 (OR=0.990, 95%CI [0.546-1.796], p = 0.974) and between kshs 1001- 5000.

The results shows that adequacy of physicians at the prison clinic to serve those with type II diabetes has no significant influence on non-adherence to type II diabetes management (p=0.694). The participants who had no adequacy of physicians at the prison clinic to serve those with type II diabetes (OR= 1.124, 95%CI [0.627-2.015], p = 0.694) were more likely to be non-adherence to

type II diabetes management as compared to those who have adequacy of physicians at the prison clinic to serve those with type II diabetes.

The results show that satisfaction with service when they last visited the clinic has no significant influence on non-adherence to type II diabetes management (p=0.183). The results show that the respondents who are not satisfied with service when they last visited the clinic were more likely to be non-adherence to type II diabetes management (OR= 1.579, 95%CI [0.805-3.097], p = 0.183) as compared to those who are satisfied with service when they last visited the clinic.

The results also indicates that friendliness of the physicians at the clinic has no significant influence on non-adherence to type II diabetes management (p=0.779). The physicians who are not friendly at the clinic (OR= 0.915, 95%CI [0.491-1.704], (p = 0.779) were more likely to be non-adherence to type II diabetes management as compared to physicians who are friendly at the clinic.

The study indicates that receiving guidance and counseling at the clinic has significant influence on non-adherence to type II diabetes management (p=0.011). The respondents who do not receive guidance and counseling at the clinic (OR= 0.421, 95%CI [0.214-0.827], p = 0.110) were more likely to be non-adherence to type II diabetes management as compared to those who receive guidance and counseling at the clinic.

The results show that getting screening and testing services at the prison has no significant influence on non-adherence to type II diabetes management (p=0.614). The results show that the respondents with don't get screening and testing services at the prison were more likely to be non-adherence to type II diabetes management (OR= 0.864, 95%CI [0.462-1.577], p = 0.614) as compared to those who get screening and testing services at the prison.

The results indicates that the ability to access health information has a significant influence on non-adherence to type II diabetes management (p=0.000). The respondents who are not able to access health information (OR= 0.074, 95%CI [0.035-1.55], p = 0.000) were more likely to be non-adherence to type II diabetes management as compared to those who are able to access health information.

The findings indicates that doctors giving prisoners information on diabetes has no significant influence on non-adherence to type II diabetes management (p=0.408). The prisoners who don't receive information on diabetes (OR= 0.772, 95%CI [0.418-1.425], p = 0.408) were more likely to be non-adherence to type II diabetes management as compared to prisoners who receive information on diabetes.

The findings shows that involvement in treatment decisions has no significant influence on non-adherence to type II diabetes management (p=0.882). The respondents who are not involved in treatment decisions (OR= 1.253, 95%CI [0.672-2.336], p = 0.477) were more likely to be non-adherence to type II diabetes management as compared to those who are involved in treatment decisions.

The results show that facing discrimination and harassment when seeking medical attention has no significant influence on non-adherence to type II diabetes management (p=0.790). The results show that the respondents with don't face discrimination and harassment when seeking medical attention were more likely to be non-adherence to type II diabetes management (OR= 1.108, 95%CI [0.603-2.035], p = 0.741) as compared to those who face discrimination and harassment when seeking medical attention.

The results indicates that feeling comfortable to ask questions to the doctor has no significant

influence on non-adherence to type II diabetes management (p=0.423). The participants who agreed with the statement (OR = 0.359, 95%CI [0.109-1.184], p = 0.092) were more likely to be non-adherence to type II diabetes management as compared to those who were not sure (OR = 0.444, 95%CI [0.147-1.346], p = 0.151) and those who strongly disagreed (OR = 0.500, 95%CI [0.154-1.624], p = 0.259).

Table 4. 20: Provider-Level Factors and Non-Adherence to Type II Diabetes Management

	Non-Adherence to Type II Diabetes Management	**OR(95%CI)**	***p* value**
Amount Spent to Get Prescribed Drugs			**.893**
kshs 0- 1000	3(100)	.990(0.546-1.796)	.974
kshs 1001- 5000	101(67.3)	1.207(0.438-3.331)	.716
kshs Above 6000	6(25.0)	.488(0.150-1.590)	.234
Adequacy of physicians at the prison clinic to serve those with type II diabetes			**.694**
Yes	110(62.1)		
No	110(62.1)	1.124 (0.627-2.015)	.694
Satisfaction with service when they last visited the clinic			**.183**

Yes	84(65.1)		
No	26(54.2)	1.579(0.805-3.097)	.183
Friendliness of the physicians at the clinic			**.779**
Yes	68(63.0)		
No	42(60.9)	0.915(0.491-1.704)	.779
Receiving guidance and counseling at the clinic			**.011**
Yes	63(55.3)		
No	47(74.6)	0.421(0.214-0.827)	.011
Getting screening and testing services at the prison			**.614**
Yes	45(60.0)		
No	65(63.7)	0.864(0.462-1.577)	.614
Ability to access health information			**.000**
Yes	21(29.2)		
No	89(84.8)	0.074(0.035-1.55)	.000
Doctors giving prisoners information on diabetes			**.408**
Yes	57(59.4)		
No	53(65.4)	0.772(0.418-1.425)	.408

Involvement in treatment decisions			**.477**
Yes	47(65.3)		
No	63(60.0)	1.253(0.672-2.336)	.477
Facing discrimination and harassment when seeking medical attention			**.741**
Yes	57(63.3)		
No	53(60.9)	1.108(0.603-2.035)	.741
Feeling Comfortable To Ask Questions to the Doctor			**.423**
Strongly agree	14(51.9)		
Agree	24(57.1)	0.359(0.109-1.184)	.092
Not sure	36(66.7)	0.444(0.147-1.346)	.151
Disagree	18(60.0)	0.667(0.226-1.970)	.463
Strongly disagree	18(75.0)	0.500(0.154-1.624)	.259

4.5.3 Discussion of the Findings

The study found that the amount spent on prescribed drugs did not significantly influence non-adherence, a finding that contrasts with some previous studies. Research by Njoka and Muna (2024) has shown that financial constraints are a major barrier to adherence, especially in low-resource settings where patients may struggle to afford medication. In this study, however, despite a majority of respondents reporting spending significant amounts on medication (between Kshs 1001 and 5000), financial barriers did not appear to be a critical factor in non-adherence. This

could be attributed to the fact that the prison system may provide some form of subsidized or provided care, reducing the financial burden on inmates, although other structural and personal factors may play a more significant role in their adherence behavior.

The results indicated that the adequacy of physicians at the prison clinic did not have a significant impact on non-adherence, which is in contrast to findings from studies in other prison settings. Kovvuru (2024) suggests that inadequate healthcare staffing can hinder diabetes management in correctional facilities, leading to worse health outcomes. Similarly, a study by Njoka and Muna (2024) highlighted that limited access to healthcare professionals, particularly in prisons, can reduce the quality of diabetes care, ultimately influencing adherence. Despite the fact that 100% of respondents indicated insufficient physicians, this study's findings suggest that other factors, such as the quality of the interaction with the available staff or the structural limitations within the prison healthcare system, might mitigate the expected negative impact of physician shortages on adherence.

The study found no significant correlation between satisfaction with service and non-adherence, which contrasts with the findings of Alkaiyat (2020), who found that patient satisfaction is an important determinant of medication adherence. Their research indicated that when patients are satisfied with their care, they are more likely to follow prescribed regimens. This discrepancy may be due to the unique context of prisons, where inmates may have limited expectations of healthcare services, or it could be influenced by other barriers like the lack of timely and comprehensive diabetes care, which goes beyond satisfaction with service alone.

While studies such as those by Brenner, Oberaigner and Stummer (2020) highlight the importance of a good patient-provider relationship in improving treatment adherence, this study found no

significant influence of physician friendliness on non-adherence. It may be that while physician friendliness is important, it does not significantly outweigh other factors, such as the availability of diabetes-related education, medication, and monitoring services. A more significant influence might come from how well the physician is able to educate and support the inmate, rather than simply the demeanor of the healthcare provider. In addition, the study found that receiving guidance and counseling significantly influenced adherence to type II diabetes management. This is consistent with previous research, such as the study by Brenner et al. (2020), which emphasizes the importance of counseling and educational interventions in improving patient adherence, particularly for chronic conditions like diabetes. The findings of this study support the argument that providing patients with the knowledge and emotional support they need can lead to better self-management and improved adherence to prescribed treatment.

The study found that the ability to access health information had a significant impact on non-adherence, supporting the findings of Lewing and Sansgiry (2022), which indicated that good communication and access to information are crucial to improving diabetes management. Lack of access to health information was shown to be a strong predictor of non-adherence, aligning with previous studies which emphasize the importance of patient education in promoting long-term adherence to treatment plans. This suggests that a lack of health literacy and access to relevant medical information in prisons may lead to poorer health outcomes for inmates with diabetes. Despite previous research suggesting that providing patients with information on their condition is essential for improving adherence (Mostafavi, 2021), this study found no significant effect of doctors providing diabetes information on non-adherence. While 54.2% of respondents indicated that doctors provided them with information about diabetes, this did not appear to have a significant impact on adherence. This may suggest that while information is being provided, the

quality, comprehensiveness, or the method of delivery might be insufficient for it to positively influence adherence.

This study revealed that involvement in treatment decisions did not significantly affect non-adherence, which contrasts with other studies that highlight the role of shared decision-making in enhancing patient adherence. A study by Pourhabibi (2022) emphasized that when patients are involved in making decisions about their treatment, they are more likely to adhere to their prescribed regimens. However, in the prison context, inmates may feel a lack of agency in their healthcare decisions due to the structure of the correctional system, which could explain why this factor did not have a significant influence on adherence. The study found no significant impact of facing discrimination and harassment on non-adherence, which contrasts with research by Sarray (2021), which showed that patients experiencing discrimination are less likely to adhere to medical advice. This discrepancy could reflect a complex relationship between perceived discrimination, healthcare delivery, and patient trust. Finally, the study found no significant correlation between feeling comfortable to ask questions and non-adherence, which contrasts with the findings of other studies that link effective patient-provider communication to improved treatment adherence. Studies by Davoodi and Faraji-Khiavi (2022) have found that when patients feel comfortable communicating with their providers, they are more likely to follow through with treatment plans.

4.6 Prison Environment Factors and Non-Adherence to Type II Diabetes Management

The fourth objective of the study was to identify prison-environment predictors that influence non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya.

4.6.1 Descriptive Statistics

The respondents were further asked to indicate whether they have ever requested the court to be taken to hospital. From the study findings, 79.7% (141) of the respondents indicated that they have never requested the court to be taken to hospital while 20.3% (36) indicated that they have ever requested the court to be taken to hospital. This suggests that the majority of inmates either do not seek or do not have the opportunity to seek external medical care through the court system. The low percentage of inmates requesting hospital visits might reflect barriers such as fear of authority, lack of awareness about the legal procedures, or perceptions of healthcare adequacy within the prison system.

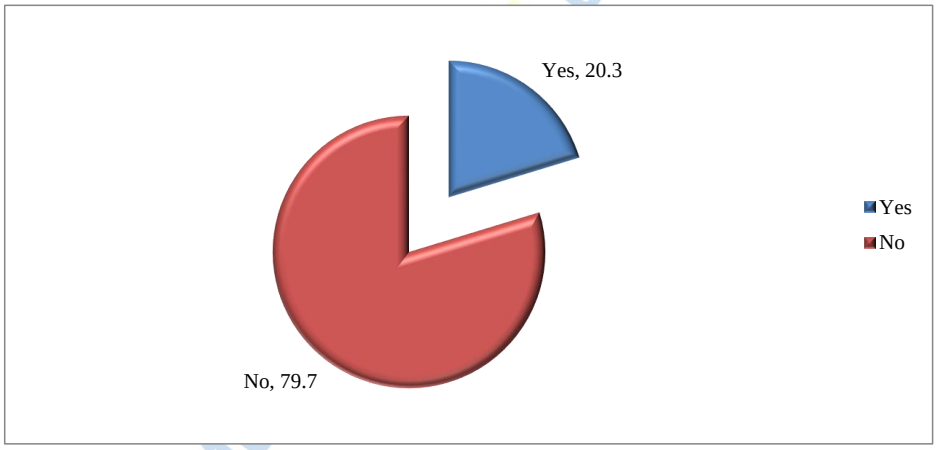

Figure 4. 19: Requesting the Court to be taken to Hospital

The respondents who indicated that they have ever requested the court to be taken to hospital, were requested to specify whether the court orders were complied with. The findings were as presented in Figure 4.20. According to the findings, 58.3% (21) of the respondents indicated that the court orders were complied with and 41.7% (15) indicated that court orders were not complied with.

This finding suggests that although a majority of inmates who requested hospital visits received the court-mandated treatment, a significant proportion did not. The lack of compliance with court orders could be indicative of systemic issues, such as insufficient resources, administrative delays, or lack of effective communication between the courts and prison authorities.

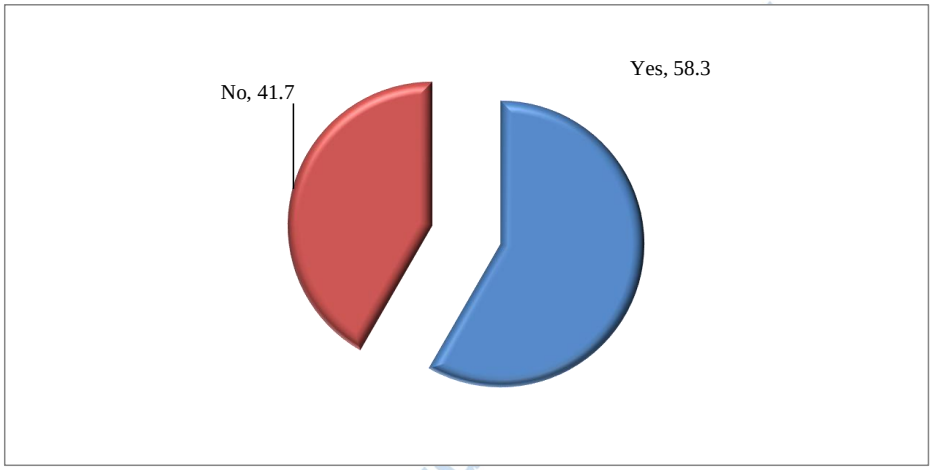

Figure 4. 20: Complying with Court Orders

The respondents who indicated that they did not take any action were requested to give the reason of what prevented them from doing so. From the study findings, the 100% (12) of the respondents indicated that they did not take any action for fear of authorities and 75% (9) indicated that they did not know the procedure to follow. This suggests that fear of retaliation or punitive consequences within the prison environment may significantly hinder inmates from advocating for their healthcare needs. Additionally, the lack of awareness regarding the proper procedures to follow may further exacerbate non-adherence to treatment, highlighting the need for better education and support systems to empower inmates in addressing their health concerns.

Table 4. 21: Reasons for not taking any Action against Non Compliance

Reasons for not taking any action	Frequency		Percent	
	Yes	No	Yes	No
Fear of authorities	12	0.00	100.0	0.00
I did not know the procedure to follow	9	3	75.0	25.0

The respondents were requested to rate other medical facilities that they were taken for treatment. As shown in Table 4.22, 39% (69) of the respondents indicated that other medical facilities that they were taken for treatment were good, 25.4% (45) indicated very good, 22% (39) indicated fair and 13.6% (24) indicated excellent. These results suggest that while a majority of respondents felt the medical facilities provided reasonable care, a significant portion rated the treatment quality as only good or fair. This indicates that while some facilities may meet the basic healthcare needs of inmates, there remains considerable room for improvement in the quality of care provided, especially for managing chronic conditions like Type II diabetes.

Table 4. 22: Other Medical Facilities

Other Medical Facilities taken for Treatment	Frequency	Percent
Excellent	24	13.6
Very good	45	25.4
Good	69	39.0
Fair	39	22.0

The respondents were also requested to specify whether the government is committed in addressing the health concerns especially of type II diabetes. According to the study findings, 83.1% (147) of the respondents indicated that the government is not committed in addressing the

health concerns especially of type II diabetes while 16.9% (30) indicated that the government is committed in addressing the health concerns especially of type II diabetes. This suggests a widespread perception of government neglect regarding the health needs of inmates with Type II diabetes. The high percentage of respondents indicating a lack of government commitment reflects a potential gap in policy implementation or resource allocation for healthcare in prisons. This perception could contribute to non-adherence to diabetes management, as inmates may feel that their health concerns are not adequately addressed, leading to a lack of trust in available medical services and a diminished motivation to manage their condition.

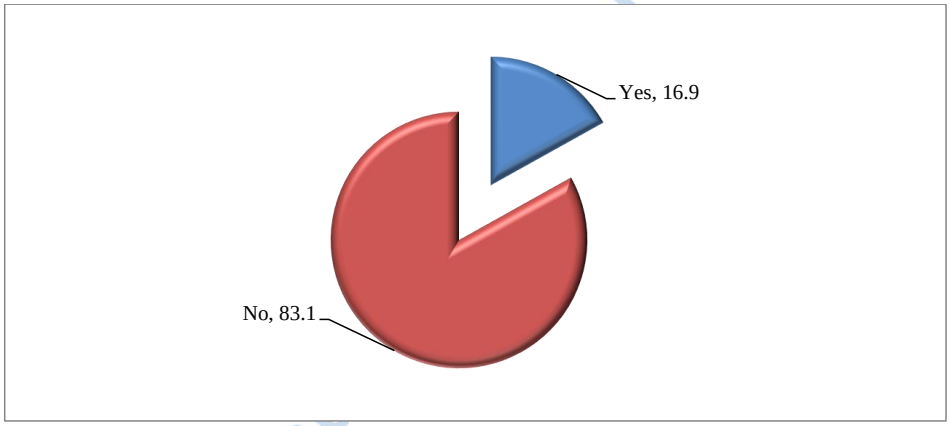

Figure 4. 21: Government Commitment in Addressing Type II Diabetes

The respondents were asked to specify whether while in confinement they have ever been forced to bribe to receive treatment in a health facility of their choice. As shown in Figure 4.22, 76.3% (135) of the respondents pointed out that while in confinement they have never been forced to bribe to receive treatment in a health facility of their choice while 23.7% (42) indicated that while in confinement they have ever been forced to bribe to receive treatment in a health facility of their

choice. This means that while in confinement most of the respondents have never been forced to bribe to receive treatment in a health facility of their choice.

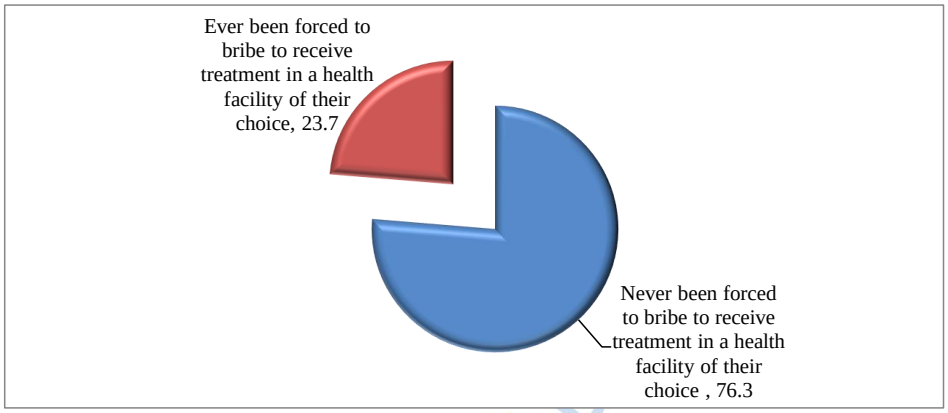

Figure 4. 22: Bribery to Receive Treatment in a Health Facility of Choice

The respondents were requested to indicate whether jail limit the management of type II diabetes capabilities. From the results all the participants, 100% (177), indicated that jail limits the management of type II diabetes capabilities. This unanimous response underscores a significant concern about the prison environment's impact on healthcare. The restrictive nature of the prison system, including limited access to proper medical care, inadequate healthcare staff, and insufficient resources, appears to severely hinder the effective management of chronic health conditions like Type II diabetes. This finding points to the need for comprehensive reforms in the prison healthcare system to ensure that inmates receive adequate medical attention and support for managing such conditions.

4.6.2 Inferential Statistics

The study sought to establish the influence of prison environment factors on non-adherence to type

II diabetes management. The study shows that requesting the court to be taken to the hospital has a significant influence on non-adherence to type II diabetes management (p=0.015). The respondents who did not request the court to be taken to hospital (OR= 0.500, 95%CI [0.238-1.051], p = 0.015) were more likely to be non-adherence to type II diabetes management as compared to those who requested the court to be taken to hospital.

The results indicates that prison management compliance with court orders has no significant influence on non-adherence to type II diabetes management (p=0.313). The results show that the prison management which did not comply with court orders was more likely to be non-adherence to type II diabetes management (OR= 0.500, 95%CI [0.500], p = 0.130) as compared to the prison management which complied with court orders.

The results indicates that rating of treatment received in the prison clinic has a significant influence on non-adherence to type II diabetes management (p=0.001). The participants who indicated that the treatment received in the prison clinic is very poor (OR = 0.246, 95%CI [0.106-0.571], p = 0.001) were more likely to be non-adherence to type II diabetes management as compared to those who indicated fair (OR = 1.026, 95%CI [0.382-2.751], p = 0.960) and those who indicated good (OR = 0.615, 95%CI [0.133-2.841], p = 0.534).

The findings indicates that government commitment in addressing Type II Diabetes has a significant influence on non-adherence to type II diabetes management (p=0.003). The government that is not committed in addressing Type II Diabetes (OR= 3.704, 95%CI [1.405-9.763], p = 0.003) is more likely to be non-adherence to type II diabetes management as compared to the government that is committed in addressing Type II Diabetes.

The findings shows that bribery to receive treatment in a health facility of choice has a significant

influence on non-adherence to type II diabetes management (p=0.043). The respondents who don't bribe to receive treatment in a health facility of choice (OR= 0.517, 95%CI [0.256-1.043], p = 0.043) were more likely to be non-adherence to type II diabetes management as compared to those who bribe to receive treatment in a health facility of choice.

Table 4. 23: Prison Environment Factors and Non-Adherence to Type II Diabetes Management

	Non-Adherence to Type II Diabetes Management	**OR(95%CI)**	***p* value**
Requesting the Court to be Taken to Hospital			**.015**
Yes	18(50.0)		
No	92(66.7)	0.500(0.238-1.051)	.015
Prison management Compliance with Court Orders			**.313**
Yes	12(57.1)		
No	6(40.0)	0.500(0.130-1.923)	.130
Rating of Treatment Received in the Prison Clinic			.001
Very Good	6(66.7)		
Good	11(45.8)	0.615(0.133-2.841)	.534

Fair	30(76.9)	1.026(0.382-2.751)	.960
Poor	24(44.4)	0.260(0.093-0.730)	.011
Very Poor	39(76.5)	0.246(0.106-0.571)	.001
Government Commitment in Addressing Type II Diabetes			**.003**
Yes	18(60.0)		
No	92(62.6)	3.704(1.405-9.763)	.003
Bribery to Receive Treatment in a Health Facility of Choice			**.043**
Yes	21(50.0)		
No	89(65.9)	0.517(0.256-1.043)	.043

4.6.3 Discussion of the Findings

The study found that inmates who requested the court to facilitate hospital visits were less likely to be non-adherent to diabetes management. This finding suggests that when inmates have the opportunity to seek external medical care through legal processes, they are more likely to receive the necessary treatment and manage their condition effectively. Previous research supports this conclusion, highlighting the positive effects of external healthcare access on chronic disease management in prison settings. Studies have shown that when inmates are allowed to seek care outside the prison system, particularly for specialized conditions like Type II diabetes, health outcomes tend to improve due to better medical resources and expertise available outside the prison environment (Abate & Endalamaw, 2021).

The study found no significant relationship between prison management's compliance with court orders and non-adherence to diabetes management. This is somewhat surprising given previous literature, which suggests that failure to comply with court orders regarding healthcare can exacerbate health problems and undermine trust in the prison system. Research has indicated that when prisons fail to comply with court-mandated healthcare provisions, it often leads to delays in treatment and inadequate care, which can contribute to poor management of chronic conditions (Boshe, 2021). However, the lack of a significant relationship in this study may reflect the broader challenges within the prison healthcare system, where compliance with court orders does not necessarily equate to improvements in care quality or access.

In this study, inmates who reported poor or very poor treatment at the prison clinic were more likely to be non-adherent to diabetes management. This finding is consistent with Al-Qerem (2021) findings, which emphasizes the critical role of healthcare quality in promoting adherence to treatment, particularly for chronic conditions. Inadequate healthcare services within correctional facilities, such as insufficient medical staff, poor treatment protocols, and limited access to specialized care, have been linked to poor health outcomes and non-adherence in prison populations.

The study found that inmates who believed the government was not committed to addressing health concerns related to Type II diabetes were more likely to be non-adherent to diabetes management. This finding echoes Afaya (2020) findings that have criticized the lack of government action in addressing healthcare needs in prisons. The sense of neglect among inmates regarding government commitment to healthcare may contribute to feelings of hopelessness and disengagement with treatment programs. In contrast, when inmates perceive that their health

concerns are taken seriously and addressed appropriately, they are more likely to comply with treatment and manage their conditions effectively.

This study found that inmates who were required to bribe for treatment in a health facility of their choice were more likely to exhibit non-adherence to diabetes management. This is consistent with Kovvuru (2024) findings that have highlighted the role of corruption and informal practices such as bribery in limiting access to quality healthcare in correctional facilities. Previous research has shown that bribery for medical services creates an inequitable healthcare environment where only certain individuals can access treatment, while others are left without necessary care. The prevalence of bribery within the prison system often undermines trust in healthcare services, discourages inmates from seeking medical help, and can prevent them from adhering to prescribed treatments.

The study's finding that all respondents agreed that the jail environment limits the ability to manage Type II diabetes reflects the broader systemic challenges in correctional healthcare. Overcrowding, lack of specialized medical care, and limited access to necessary resources are common issues in many prison systems, particularly in resource-constrained settings like Kenya. Previous studies have consistently highlighted that correctional facilities often face significant barriers in managing chronic diseases, including Type II diabetes. These barriers include a lack of sufficient healthcare staff, inadequate training for medical personnel, limited access to medications and necessary tests, and the overall constrained environment of prisons (Suglo & Evans, 2020). The agreement among all respondents in this study further emphasizes the urgent need for structural reforms in the prison healthcare system, including improvements in the physical and medical resources available for managing chronic conditions.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 introduction

This chapter presents the summary of the results findings as per the objectives of the study, which include Barriers to management of type II diabetes management; patient-level predictors that influence non-adherence to type II diabetes management; prison-environment predictors that influence non-adherence to type II diabetes management; and provider-level predictors that influence non-adherence to type II diabetes management.

5.2 Summary of Results Findings

The study found that 62.1% of the adult inmates in Machakos GK prison and Yatta prison were non-adherent to Type II diabetes management. Moreover, 65% of the adult inmates in Machakos County prisons (Machakos GK prison and Yatta prison) were non-adherent to oral medications. In addition, 67.2% of the adult inmates in Machakos County prisons (Machakos GK prison and Yatta prison) were non-adherent to insulin injection. The study further established that adult inmates do physical exercises on weekly basis and they have not reduced sugar consumption to control blood sugar levels.

5.2.1 Barriers to management of type II diabetes management

A lack of specialized medical personnel and essential medications was identified as a key barrier to effective Type II diabetes management in prisons. Respondents highlighted that financial constraints were a significant reason for the shortage of necessary medications and balanced diets. Inmates expressed frustration over the lack of guidance on appropriate exercises, which hindered

their ability to manage their condition effectively. Additionally, the shortage of medical staff, with only two nurses at Machakos GK prison and one nurse at Yatta prison, led to overcrowded clinics and long waiting times. Many inmates were unable to receive medical attention due to the limited operational hours of the clinic (8 AM to 5 PM), conflicting with their other obligations. Despite court orders compelling referrals to external hospitals, the lack of resources, personnel, and time were persistent challenges in the management of Type II diabetes.

The study also revealed multiple barriers affecting adherence to diabetes management, including complex medication regimens, side effects, and the perception that medications were ineffective. Inmates often forgot to take their medications, felt uninterested in adhering to treatment, or struggled with the unavailability of prescribed drugs. Missing prescribed drugs at the clinic significantly influenced non-adherence. Additionally, although knowledge about the usefulness of diabetes management programs was found to have a significant impact on adherence, willingness to regularly use anti-diabetic drugs and the possibility of discontinuing medication if symptoms improved did not significantly affect adherence. Interestingly, possessing a blood glucose meter and regularly monitoring blood glucose levels were significant factors in improving adherence, suggesting that self-monitoring played an important role in encouraging compliance with diabetes management among inmates.

5.2.2 Patient-level predictors that influence non-adherence to type II diabetes management

The study sought to determine the influence of patient-level predictors on adherence to type II diabetes management among adult inmates in Machakos county prisons. The study found that gender has no significant influence on non-adherence to type II diabetes management. In addition, age had a significant influence on non-adherence to type II diabetes management. The participants who had between 46 and 50 years as well as above 50 years were more likely to be non-adherence

to type II diabetes management as compared to those show had between 21and 25 years and between 18 and 20 years. The study found that the prison has a significant influence on non-adherence to type II diabetes management. The results show that the respondents who were in Yatta Prison were more likely to be non-adherence to type II diabetes management as compared to those in Machakos GK Prison.

The study also found that highest level of education has a significant influence on non-adherence to type II diabetes management. In addition, home location had a significant influence on non-adherence to type II diabetes management. The study found that previous occupation had a significant influence on non-adherence to type II diabetes management. However, the duration of serving in jail has no significant influence on non-adherence to type II diabetes management. The study established that knowledge on consequences of uncontrolled Type II Diabetes and advantages of daily exercising with diabetes had a significant influence on non-adherence to type II diabetes management among adult inmates. In addition, patients' knowledge on symptoms of diabetes, risk factors, and conditions associated with Type II Diabetes, control anti-diabetic drugs to lower Blood Sugar Levels had no significant influence on non-adherence to type II diabetes management among adult inmates.

5.2.3 Provider-level predictors that influence non-adherence to type II diabetes management

The communication between healthcare providers and inmates significantly contributed to non-adherence to Type II diabetes management, with 30% of respondents reporting feelings of neglect due to hurried interactions. This lack of personalized care led to a breakdown in trust and confidence, discouraging inmates from taking their prescribed medications. Many prisoners felt that healthcare providers were more focused on treating communicable diseases than addressing

chronic conditions like Type II diabetes. However, inmates who felt understood by their healthcare providers were more likely to adhere to their treatment plans and maintain better glycemic control. Irregular follow-up clinic visits were also a key factor in the increased levels of non-adherence among inmates.

Despite various factors impacting adherence, the study found that the cost of medications did not significantly influence non-adherence. A shortage of qualified healthcare professionals at the prison clinic further compounded the problem, leading to inadequate care for inmates with Type II diabetes. Satisfaction with the clinic's services had a noticeable effect on adherence, while the perceived friendliness of physicians did not significantly impact treatment compliance. The study revealed that receiving guidance and counseling at the clinic significantly influenced adherence. Additionally, access to health information and involvement in treatment decisions were key factors in improving adherence. Conversely, discrimination and harassment when seeking medical attention were found to deter inmates from adhering to their diabetes management plans.

5.2.4 Prison-environment predictors that influence non-adherence to type II diabetes management

The prison environment plays a significant role in the non-compliance of Type II diabetes management among inmates. The closed and restrictive nature of the prison setting limits the open exchange of health information and diabetic education. Inmates expressed a preference for seeking treatment outside the prison clinic, with 67% favoring facilities of their choice over the prison clinic. The quality of healthcare in the prison was deemed unsatisfactory, with nurses citing time constraints due to security issues, which hindered their ability to provide proper care, especially for managing complications of diabetes. Additionally, the lack of time for meaningful communication between inmates and healthcare providers further exacerbated non-adherence, as

inmates were unable to share new developments or receive adequate advice. Discrimination and the need for bribes to receive medical attention also undermined trust in the system, creating further barriers to proper diabetes management.

Furthermore, psychosocial factors such as emotional wellbeing, personal responsibility, and cognitive aspects also influenced adherence to Type II diabetes management. Inmates often faced difficulties when transferred between prisons, leading to the loss of treatment records and disrupting their medication regimen. This interruption, combined with the stress and emotional strain of adjusting to new environments, contributed to non-adherence to treatment. Inmates expressed frustration with the lack of flexibility in the prison system, particularly regarding the limited access to in-possession medication, which negatively impacted their health. The absence of a support system for patients, such as peer education or family visits, left many inmates without the necessary external support to continue managing their condition, further compounding the challenges of adhering to their treatment plan.

5.3 Conclusions

The study concludes that barriers to effective management have a statistically significant influence on non-adherence to type II diabetes management among adult inmates in Machakos County prisons. Specifically, missing prescribed drugs in the clinic, side effects, feeling the dose given is high, complexity of drug regimen and knowledge on usefulness of the programs and activities in managing Type II diabetes had a significant influence on non-adherence to type II diabetes management among adult inmates.

The study concludes that patient-related factors that statistically influence non-adherence to type II diabetes management among adult inmates in Machakos County prisons include inmates' age,

prison where they were jailed, level of education, home location, previous occupation, Duration of having type II diabetes, and Facility that provided diagnosis. However, gender and the duration of serving in jail had statistically insignificant influence on non-adherence to type II diabetes management among adult inmates. In addition, the patients knowledge on symptoms of diabetes, knowledge that type II diabetes is curable and knowledge on consequences of uncontrolled type II diabetes and advantages of daily exercising with diabetes.

The study concludes that provider- related factors statistically influence non-adherence to type II diabetes management among adult inmates in Machakos County prisons. Specially, lack of provision of guidance and counselling to patients had an influence on non-adherence to type II diabetes management among adult inmates. Nonetheless, Adequacy of physicians at the prison clinic to serve those with type II diabetes, satisfaction with service when they last visited the clinic, friendliness of the physicians at the clinic, getting screening and testing services at the prison and doctors giving prisoners information on diabetes had no significant influence on non-adherence to type II diabetes management. Additionally, experiencing discrimination and harassment while seeking medical attention did not have a significant impact on non-adherence to Type II diabetes management.

The study concludes that prison environment factors had a significant influence on non-adherence to type II diabetes management among adult inmates in Machakos County prisons. Specially, the study found that requesting the court to be taken to hospital, rating of treatment received in the prison clinic, government commitment in addressing Type II diabetes and bribery to receive treatment in a health facility of choice significantly influenced non-adherence to type II diabetes management.

5.4 Recommendations

1. The study found that the management of Type II diabetes in prisons is hindered by a shortage of specialized medical staff, essential medications, and limited clinic hours. To address these barriers, it is crucial to increase medical personnel and extend clinic operational hours to accommodate inmates' needs. Ensuring a consistent supply of medications and providing inmates with blood glucose meters for self-monitoring can improve adherence. Additionally, offering guidance on appropriate exercise routines and access to balanced diets will support effective diabetes management. Educating inmates on the importance of consistent medication use and facilitating timely referrals to external healthcare facilities are also essential steps.
2. The study found that the patients' low level of knowledge had an effect on non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya. The study recommends that the Ministry of Health in collaboration with the Kenya Prisons Service should conduct awareness on symptoms, risk factors, consequences of type II diabetes management and conditions associated with type II diabetes. In addition, the patients need to be trained on the need for physical exercises, monitoring of dietary intake, adherence to oral medication, adherence to insulin injection. Also, diabetic patients should be provided with blood glucose meter so that they can regularly monitor the level of blood glucose in their bodies.
3. The study found that there are no enough physicians at the prison clinic to serve those with type II diabetes. This study therefore recommends that the government should increase the number of health experts at the prison clinics to enhance close contact between inmates and medical practitioner. Employing adequate physicians will help improve adherence to

type II diabetes management as the patients will continuously get updated with information on diabetes management and the healthcare providers will be in a position to easily detect and monitor the progress and onset of type II diabetes complication.

4. The study found that most of the adult inmates have missed their prescribed drugs from the clinic in the last 3 months and have to wait till they are available. This study therefore recommends that the government should set up proper policies and strategies on the supply of diabetes drugs in all the prisons to ensure that no single prison runs out of stock. In addition, the management of Kenya prisons should develop proper strategies to monitor the stock diabetic drugs in prison clinics.

5.5 Area of Further Research

This study was only conducted among adult inmates in Machakos County Prisons. The study therefore recommends that similar studies should be conducted among adult inmates in other prisons located in various Counties in Kenya. Further, the study focused on patient-level predictors, provider-level predictors, prison-environment predictors and barriers to effective management of type II diabetes on adherence to type II diabetes management among adult inmates. As such, further studies should be conducted to assess other determinants of non-adherence to type II diabetes management among adult inmates in Machakos County prisons in Kenya.

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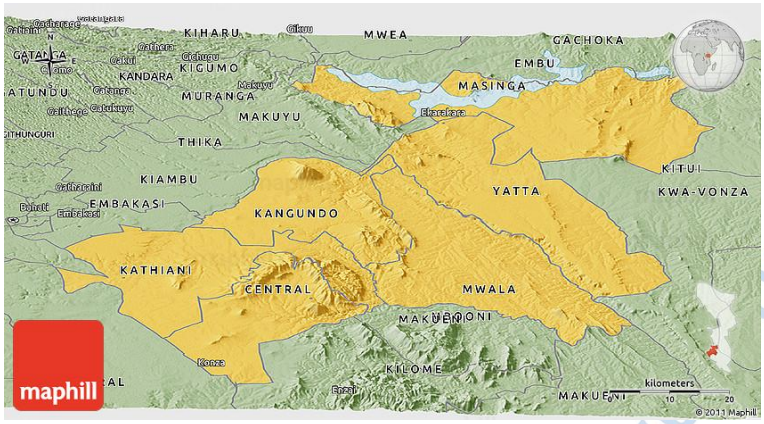
APPENDICES

APPENDIX 1: MAP OF MACHAKOS COUNTY



MAP OF MACHAKOS COUNTY, DHS, 2009

APPENDIX 2: CONSENT FORM

PREDICTORS OF NON-ADHERENCE TO TYPE II DIABETES MANAGEMENT AMONG ADULT INMATES IN MACHAKOS COUNTY PRISONS, KENYA

Dear Participant,

I invite you to participate in a research study titled "Predictors of Non-Adherence to Type II Diabetes Management among Adult Inmates in Machakos County Prisons, Kenya." I am currently pursuing a Master's in Public Health (Monitoring and Evaluation Option) at Mount Kenya University and am in the process of completing my Master's project. The aim of this research is to identify the factors influencing non-adherence to type II diabetes management among adult inmates in Machakos County Prisons.

The enclosed questionnaire has been designed to gather information on the predictors of non-adherence to type II diabetes management among adult inmates in Machakos County Prisons.

Your participation in this research is entirely voluntary. You may choose not to participate or skip any questions you prefer not to answer. There are no known risks associated with participating beyond those encountered in everyday life. Your responses will be kept confidential and anonymous. Data from this research will be securely stored and reported only in aggregate form. Only the researchers will have access to your individual responses. While there are no direct benefits to you for participating, discussing the issues addressed in this research may be of interest to you and beneficial to the field and to future individuals with similar concerns.

If you agree to participate in this project, please complete the questionnaire to the best of your ability. It should take approximately 30 minutes to complete. Please return the questionnaire as soon as possible to help me complete my project report.

If you have any questions about this project, please contact the investigator, Evabeatrice Njoka. For questions about your rights as a research participant, you may contact the Chairman, Mount Kenya University Ethical Review Committee, P.O Box 342-01000, Thika.

Thank you for your assistance with this important endeavor.

CONSENT

I have read and understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time without providing a reason and without any cost. I understand that I will be given a copy of this consent form. I voluntarily agree to participate in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

APPENDEX 3: QUESTIONNAIRE

FORM SERIAL NUMBER	
DATE OF INTERVIEW	
RESEARCH ASSISTANTS' NAME	

Introduction.

I am……I have come today to discuss with you about type II diabetes management. That's why you saw me first came and talked with the office then to the prison clinic. This discussion is voluntary if you are willing kindly you will sign for me this form as a sign of consent to go on with the discussion.

PART A: PATIENT RELATED FACTORS

1. How old are you?
2. What is your gender?
    1. Male
    2. Female
    3. Other
3. Which prison are you in?
    1. Machakos Gk prison
    2. Yatta prison
4. What is your highest level of education you have completed?
    I. No school
    II. Primary school
    III. Secondary school
    IV. College
    V. Higher education (post- graduate)
    VI. Religious schooling
    VII. Literacy classes only.
5. Where is your home?
    I. Urban (Town) area
    II. Rural area
6. How long have you served your jail term?
7. What was your occupation?
    I. Formal employment
    II. Informal employment.
    III. Business
    IV. None
8. How long have you had type II diabetes?
    I. 0-2 years
    II. 3-5 years
    III. 6-8 years
    IV. 9-10 years
    V. Above 11 years
9. How did you know you have type II diabetes condition?

1. Through formal health care
2. Through informal care

10. Which facility gave you this diagnosis?
    I. Dispensary
    II. Health center
    III. Sub-county hospital
    IV. Private hospital
    V. Prison clinic
    VI. Informal health care
11. Which symptoms did you exhibit that indicated you could be having diabetes?
    1. Excessive thirst
    2. Frequent urination at night
    3. Always feeling hungry
    4. Feeling tired
    5. Blurry vision
    6. Slow healing of cuts and wounds
12. What do you think were your risk factors?
    1. Smoking
    2. Eating junky foods
    3. Lack of exercise
    4. Curses
    5. Heredity
13. Is type II diabetes hereditary?
    I. Yes
    II. No
    III. I don't know
14. Can type II diabetes be cured?
    I. Yes
    II. No
    III. I don't know
15. Do you read health information?
    0. No
    1. Yes

16. Do you have the ability to access health information?
    0. No
    1. Yes
17. Do you understand health information?
    0. No
    1. Yes
18. Does being in jail limit your management of type II diabetes capabilities?
    I. Yes (if yes go to question 10)
    II. No (if no jump to question 11)
19. If yes how does it?.....

20. Do you know the importance of foot care?

1. No
2. Yes

21. Provider-level factors What do you use to control blood sugar levels?
    1. Following the recommended diet
    2. Doing exercises
    3. Taking tablets
    4. Getting insulin injection

22. How often do you take the prescribed drugs?
    I. Has prescribed
    II. When feeling sick
    III. Sometimes when I remember to take

23. Why don't you take the drugs as prescribed? (tick Yes or No)

Item	No	Yes
Unavailability in the clinic		
Lack of money to buy the drugs		
No longer interested in taking them		
Feeling drugs are not effective		
Side effects		
Feeling the dose given is high		
Complexity of drug regimen		
Multiple medications		
I forget		
Have been taking them for many years		

24. Do you have the willingness to use the antidiabetic drugs regularly to control blood sugar levels?
    1. No
    2. Yes

25. Do you believe that using antidiabetic drugs can control blood sugar levels?
    1. No
    2. Yes
26. Will you stop using the antidiabetic drugs if the clinical symptoms of type II diabetes disappear?
    1. No
    2. Yes
27. Have you reduced sugar consumption to control blood sugar levels
    1. No
    2. Yes
28. Do you observe the recommended dietary intake?

    I. Yes
    II. No
    III. Sometimes
29. How often do you visit a diabetic clinic?
    I. As prescribed
    II. When I am sick
    III. When I remember
    IV. I don't visit the clinic.
30. Do you know the consequences of uncontrolled type II diabetes?
    1. No
    2. Yes
31. From the following list of conditions which did a doctor say you may get from having type II diabetes? **(Tick Yes or No)**

CONDITION	Yes	No
Heart/ hypertension		
Blindness		
Kidney disease		
Amputation of the foot, toe, or leg		
None of the above		

32. Which is the best method for testing blood glucose
    I. Blood testing
    II. Urine testing
    III. I don't know.
33. Do you have a blood glucose meter?
    I. No
    II. Yes
34. Do you regularly monitor your blood glucose level?
    1. No
    2. Yes

35. Where do you measure your blood glucose?
    I. At the prison clinic
    II. I measure myself
    III. I don't measure
36. Barriers to effective management In the last 3 months have you missed your prescribed drugs from the clinic?
    I. Yes
    II. No
37. When you miss your supply of the drugs what do you do?
    I. Wait till they are available
    II. Buy my own
38. How much do you spend in 3 months to get your prescribed drugs?
    I. 0 – 1000 Kshs
    II. 1001- 5000Kshs
    III. Above 6000 Kshs.

39. Which of the following prevented you from getting medicines in the last 6 months?
    I. Lack of funds to pay for them.
    II. No one to help me get them.
    III. No doctor or other professional was available at the clinic.
    IV. They were not available at the prison clinic.
40. **Please tick NO or YES in the following statements on how you have been doing**.

	NO	YES
1. Are there enough professionals at the prison clinic to serve those with type II diabetes?		
2. How were you served satisfactory lastly when you visited the clinic?		
3. Are the professionals friendly at the clinic?		
4. Did you receive guidance and counseling at the clinic?		
5. Do you get screening and testing services here at the prison?		

41. Do you know the advantages of daily exercising with diabetes?
    1. No

2. Yes

42. How often do you do physical exercises?
    I. daily
    II. weekly
    III. monthly
    IV. I don't
43. What prevents you from exercising?
    I. The programs here are many.
    II. No free time here
    III. I fear exercising
    IV. I don't know which exercise to do
    V. No schedule for games and sports here
44. Are the programs and activities you engage with here helpful in managing type II diabetes?
    I. Strongly agree
    II. Agree
    III. ot sure
    IV. Disagree
    V. Strongly disagree

45. Do you feel comfortable to ask questions to your doctor?

    I. Strongly agree
    II. Agree
    III. Not sure
    IV. Disagree
    V. Strongly disagree

46. Pick Yes or No

Item	No	Yes
Do you have good knowledge about the antidiabetic drugs prescribed to you?		
Do your doctor give you information on diabetes?		
Were you involved in treatment decisions		

Prison environment factors

47. While in confinement have you ever been forced to bribe to receive treatment in a health facility of your choice?
    1. No
    2. Yes
48. Do you face discrimination and harassment when seeking medical attention?
    1. No
    2. Yes

49. Have you ever requested the court to be taken to hospital?
    a. No
    b. Yes
50. If yes, were the court orders complied with?
    a. No
    b. Yes
51. If not, what action did you take?
52. If you did not take any action what prevented you from doing so?
    a. Fear of authorities
    b. I did not now the procedure to follow

53. How would you rate the treatment you receive at the prison clinic?
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor
    f. Very poor
54. How would you rate other medical facilities that you were taken for treatment?
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor
    f. Very poor
55. Do you think the government is committed in addressing the health concerns especially of type II diabetes?
    a. No
    b. Yes
56. Non-compliance to type II diabetes management Kindly tick what you are compliant with in managing type II diabetes.

ITEM	NO	YES
Oral medication		
Insulin injection		
Following the recommended diet		
Doing physical exercises		

APPENDEX 4: KEY INFORMANT INTERVIEW.

Introduction.

This interview guide will help data collectors to assess the predictors to noncompliance to type II diabetes among the inmates in Machakos county prisons.

Informed consent.

In this discussion, I would like to ask you about how diabetic patients take up the management of the condition, the challenges the facility administration faces in regards to the metabolic condition management and the solutions that may be applied. We aim to learn from your experiences and knowledge. The study is for the purpose of learning, we cannot promise to give you support but we shall share with you our findings and conclusion to inform on areas that can be addressed at your levels.

You can stop the discussion at any time. Do you have any questions? Would you like to take part in the study? Yes/ No.

The interview will focus on the following themes:

- Availability, accessibility and use of services by the inmates.
- What is working well? Challenges in providing services?
- Changing dynamics of type II diabetes managements in the recent era of COVID- 19.

Analysed data will be presented in themes, conclusions and recommendations made for future actions.

1. What type II diabetes management services that are available in the prison facility?
2. What is working well for the patients inmates?
3. What are the challenges you face in providing both pharmacological and non-pharmacological interventions in the facility?
4. Have you encountered a patient with type II diabetes related complications that need referral? How was the process?
5. Do you receive support from the ministry of health in relation to type II diabetes management?
6. What needs to be improved to attained good standards of management

APPENDIX 5: PROPOSAL APPROVAL LETTER

MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION
STATE DEPARTMENT FOR CORRECTIONAL SERVICES
KENYA PRISONS SERVICE

Telegrams: "OCPRISONS," YATTA.
Telephone: YATTA 0120800084
Email: yattaprison@prisons.go.ke
When replying please quote

THE OFFICE OF THE OFFICER IN-CHARGE,
G.K PRISON, YATTA,
P.O BOX 95,
KITHIMANI.

YAT/MED/24/VOL.II/146 DATE: 21/10/2022

TO WHOM IT MAY CONCERN

RE: EVABEATRICE NJOKA MPH/2018/79586 ID 24032933

The above student of Mount Kenya University has been granted permission to collect data in our facility for the purpose of education on her thesis topic '***predictors of non-compliance to type II diabetes management among the adult inmates'***
She is tasked by the facility to:

1. Observe Covid 19 Protocols
2. Work closely with the facility medics for safety and confidentiality
3. Share her study finding with us

We shall accord her the necessary assistance

.....
Stephen Chacha (SP)
For: Officer in-charge
YATTA G.K PRISON.

Mount Kenya University

REF: **MKU/ERC/1864**
TO: **EVABEATRICE NJOKA**

Date: 28 July 2021

REG: **MPH/79586/2018**

Dear Sir/Madam,

RE: PREDICTORS OF NON-ADHERENCE TO TYPE II DIABETES MANAGEMENT AMONG ADULT INMATES IN MACHAKOS COUNTY PRISONS, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **937.** The approval period is **28/07/2021 - 27/07/2022.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

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

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Peter G. Kirira
Chairman, Mount Kenya University IERC

APPENDIX 6: NACOSTI PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **561387**

Date of Issue: **06/January/2022**

RESEARCH LICENSE

This is to Certify that Miss.. EVABEATRICE WANGITHI NJOKA of Mount Kenya University, has been licensed to conduct research in Machakos on the topic: PREDICTORS OF NON-ADHERENCE TO TYPE II DIABETES MANAGEMENT AMONG ADULT INMATES IN MACHAKOS PRISONS, KENYA. for the period ending : 06/January/2023.

License No: **NACOSTI/P/22/14923**

561387

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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APPENDIX 7: SIMILARITY INDEX

PREDICTORS OF NON-ADHERENCE TO TYPE II DIABETES MANAGEMENT AMONG ADULT INMATES IN MACHAKOS COUNTY PRISONS, KENYA

by EVABEATRICE NJOKA

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