

**SOCIODEMOGRAPHIC AND PSYCHOSOCIAL DETERMINANTS
ASSOCIATED WITH WOMEN CARDIOVASCULAR HEALTH IN THIKA
AND KIAMBU LEVEL FIVE HOSPITALS IN KIAMBU, KENYA.**

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THE REQUIREMENT FOR THE CONFERMENT OF MASTER OF PUBLIC
HEALTH DEGREE OF KENYA METHODIST UNIVERSITY**

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DECLARATION AND RECOMMENDATION

I hereby declare that this thesis is wholly original with no submission for credit toward a degree from any other university.

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DEDICATION

I dedicate this thesis to God without whom I am nothing and can do nothing. To my parents Rael and Samson, your endless sacrifice, support, and love have shaped my journey. My siblings Beatrice, Susan, Christine and Brian for their unwavering support, love, encouragement and prayers. I am indebted to my spouse Jared and children Jayden, Jasmine and Jensen for their moral support and understanding during the entire period of learning.

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ABSTRACT

Cardiovascular disease is the leading cause of death worldwide, with sociodemographic, psychosocial, and socioeconomic risks often under-recognized, particularly among women. In 2019, 35% of all deaths in women were due to cardiovascular disease. In Kenya, cardiovascular disease is a significant public health issue, with women being disproportionately affected due to unique risk factors and limited healthcare access. This study aimed to evaluate the sociodemographic and psychosocial risks associated with cardiovascular health among women in Kiambu, Kenya. The study utilized cross-sectional design and was conducted at Kiambu and Thika Level 5 hospitals. The target population comprised female patients aged 18 years and above residing in Kiambu County. A total of 400 women were included in the sample, determined based on the prevalence rates reported by Wamai et al. (2015) using the formula by William G. Cochran. Participants were selected through random sampling. Data was collected after receiving approval from Kenya Methodist University, NACOSTI, and the Kiambu County Government Department of Health. Data collected was cleaned and coded using Excel. Statistical analysis was performed with SPSS version 27. The results were presented in tables, percentages, and graphical form. Cross-tabulation, as well as linear and logistic regression analyses, was conducted to examine the relationship between predictors and cardiovascular disease (CVD) diagnoses. The sociodemographic analysis of the study revealed that individuals aged 19-43 years had a higher likelihood of being diagnosed with cardiovascular disease (CVD), with a prevalence rate of 19.5%. Hypertension was present in 31.3% of participants, with 33.5% reported having diabetes. Psychosocial factors indicated that 13.8% of participants were diagnosed with depression, and 31.5% experienced high stress levels. Dietary patterns showed 24% consumption of refined and 21% of fried foods. Furthermore, 27.5% of participants were unaware of CVD, and 29.8% had not received nutritional education, as revealed through cross-tabulation with CVD diagnoses. The logistic regression model for sociodemographic factors showed a good fit ($-2 \text{ Log-likelihood} = 512.206$), explaining 9.2% to 12.3% of the variance. Psychological factors exhibited similar results, with 8.8% to 11.8% variance explained. Dietary habits had positive correlation with cardiovascular disease ($R=0.243$), while health literacy showed a weak positive correlation ($R=0.150$). Clinical factors, including diabetes, BMI, and hypertension, had a strong positive correlation ($R=0.811$), explaining 65.8% of the variability. In conclusion, this study highlights the significant role of psychosocial, sociodemographic and clinical factors in predicting cardiovascular disease, suggesting that public health interventions should prioritize these areas to improve women's cardiovascular health in Kiambu.

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ABBREVIATIONS AND ACRONYMS

AMI: Acute Myocardial Infarction

BMI: Body Mass Index

CABGS: Coronary Artery Bypass Graft Surgery

CHD: Coronary Heart Disease

CVD: Cardiovascular Disease

EF: Endothelial Function

FDA: Food and Drug Administration

GDM: Gestational Diabetes Mellitus

HDL: High-density Lipoprotein

LDL: Low-density Lipoprotein

MACE: Major Adverse Cardiovascular Event

MCh: Methacholine

NACOSTI: National Commission for Science, Technology and Innovation

PCI: Percutaneous Coronary Intervention

PCOs: Polycystic Ovarian Syndrome

PIH: Pregnancy Induced Hypertension

PCs: Progenitor Cells

RR: Relative Risk

SNP: Sodium Nitroprusside

SSA: Sub-Saharan Africa

TC: Total Cholesterol

CSM: Common-Sense Model of Self-Regulation

OPERATIONAL DEFINITION OF TERMS

Cardiovascular diseases: cardiovascular diseases (CVDs) affect the heart and blood arteries. These includes hypertension and diabetes.

Coronary heart disease is the accumulation of plaque in the arteries that carry the heart's oxygen-rich blood. A heart attack may occur due to a constriction or blockage caused by plaque.

Percutaneous coronary intervention refers to minimally invasive techniques for clearing blocked coronary arteries (those that deliver blood to the heart). The procedure helps reduce chest pain and shortness of breath, which are signs of arterial blockage, by reestablishing blood flow.

Psychosocial factors: traits that have a psychological or social impact on an individual. These elements characterize people regarding their social surroundings and how they affect their physical and mental health.

Sex-specific: it is characteristic of, or limited to, either males or females.

Socioeconomic factors refer to the many aspects that influence our health and lifespan, including our income, education, employment, community safety, and social support.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The worldwide view suggests that the leading cause of death is cardiovascular disease (CVD), according to Bray et al. (2021). Emerging clinical evidence suggests that women had a higher death rate and a worse prognosis after a cardiovascular incident, while having lower than average cardiovascular disease (CVD) than men (Garcia et al., 2016). Women's risk of cardiovascular disease is sometimes overestimated due to the misconception that they are "shielded" from it more than men, which leads to less aggressive treatment approaches (Nansseu et al., 2016). Moreover, studies show that compared to men, women receive less diagnostic angiography and interventional therapies (Nansseu et al., 2016). Many well-known risk factors, such as diabetes, obesity, dyslipidemia, smoking, high blood pressure, poor nutrition, and sedentary lifestyles, have been linked to ischemic heart disease in numerous studies.

Women's cardiovascular disease is influenced by several important risk factors, including psychological, social, economic, and cultural factors. Women are more prone than men to face depression, intimate partner violence, financial hardship, and social roles (Vogel et al., 2021). Moreover, the development and progression of cardiovascular disease in women is more likely to be caused by these factors. Certain disorders specific to women, such as premature birth, early menopause, polycystic ovarian syndrome, gestational hypertension, gestational diabetes, and obstetric and

gynecological histories, may make them more vulnerable to cardiovascular disease (Burgess et al., 2024).

The socioeconomic fallout and unaffordable medical costs brought on by the rising prevalence of CVD may be the root cause of poverty in many developing nations (Kengne et al., 2013). Non-communicable diseases (NCDs), which account for 2.6 million deaths or nearly 35% of all deaths in sub-Saharan Africa (SSA), are the second-leading cause of mortality after a combination of communicable, maternal, neonatal, and nutritional disorders (CMNNDs) (Kengne et al., 2013). CMNND prevalence, incidence, and mortality rates peaked in the late 1990s and early 2000s. However, they are still extremely prevalent, and their proportion to overall mortality has gradually declined (Lee et al., 2022). Currently, NCDs and infectious diseases carry a twofold burden of disease. However, in a projection scenario, CMNND mortalities continue to decline, while NCDs are now anticipated to account for more than 50% of all fatalities in SSA by 2030 (Xi et al., 2022).

Fortunately, CVDs are mostly avoidable, and once the risk factors are recognized and managed, the harmful effects may be minimized (Bruno et al., 2020). Vogel et al. (2021) proposed that socioeconomic, psychological, and sex-specific factors contribute to the advance of CVD in females. Although most participants in clinical trials in CVD are men, it is well known that some medications have different effects on women than they do on men (Woodward, 2019). Cardiovascular disease-related gender-specific data have been progressively growing, while not being routinely gathered or applied in clinical settings. Women are more likely than men to suffer from cardiovascular conditions including stress-induced cardiomyopathy, spontaneous

coronary artery dissection, quasi-coronary artery-related myocardial infarction, and chronic heart syndrome. Peripheral artery disease, abdominal aortic aneurysms, and coronary failure with intact ejection fraction are other types of cardiovascular illness that are more common or have problems in women (Burgess et al., 2024). For women, the chief reason for morbidity and mortality was cardiovascular disease, which accounted for 35% of all fatalities among females in 2019 (Lee et al., 2022). This plateauing of the overall burden of cardiovascular disease among women is unexpected considering the benefits of increased social, cultural, and awareness. It is crucial to apply several techniques to address differences in women's cardiovascular disease diagnosis, treatment, and prevention in order to lessen the illness's global impact on women. It is also necessary to create new techniques for focused management and early identification, as well as the molecular factors responsible for outcome inequalities between the sexes.

In 2019, global projections estimated that 275 million women would be affected by cardiovascular disease (CVD). Age-standardized data revealed that for every 100,000 cases of CVD, there were 6,403 occurrences among women worldwide (Lee et al., 2022). The highest age-standardized prevalence of CVD was observed in the Middle East, North Africa, Eastern Europe, Central Asia, and affluent regions of North America. Notably, the incidence of CVD increased in several regions, including Oceania (36%), West Sub-Saharan Africa (4.5%), and East Asia (7.2%) (Lee et al., 2022). Research has documented significant disparities in the etiology, clinical manifestations, treatment outcomes, and prognosis of CVD between women and men (Lee et al., 2021). These disparities are attributed to variations in sex hormones, which influence the expression and function of cardiovascular system genes, as well as the

effects of sex chromosomes on gene expression (Poon et al., 2012). Females are more likely than males to be unaware of their cardiovascular risk factors, and 1 in 2 of them could eventually pass away from heart disease or stroke (compared to 1 in 25 whose death may result from breast cancer) (Cushman et al., 2021). Women experience a 7–10-year delay in the development of symptoms compared to men. Despite being a rare cause of death in younger women, coronary heart disease (CHD) overtakes all other causes of death beyond the age of 60, much like it does in men. Compared to breast cancer, which has a lifetime risk of 10% and a lifetime risk of just 3%, coronary heart disease has a lifetime risk of 46% in 50-year-old women and a lifetime risk of 31% in men (Cushman et al., 2021). This study aims to use the women in Kiambu town, Kenya, as a case study to evaluate the sociodemographic and psychosocial risks of cardiovascular disease.

1.2. Statement of the problem

CVDs are the leading cause of death worldwide. Estimates from the World Health Organization for 2019 show that 17.9 million fatalities worldwide or 32% of all deaths were related to CVDs. A heart attack or stroke was the cause of 85% of these fatalities. The leading cause of death for women worldwide, in both developed and developing nations, is cardiovascular disease. Congestive heart failure (CHF) is the leading cause of death for women in high-income countries; in low-income countries, it is surpassed only by disorders of the lower respiratory tract, illnesses affecting newborns, malaria, and diarrhea. Stroke ranks third in high-income countries and sixth in low-income ones, making it the second most prevalent cause of death for women worldwide. Not far behind in second position is heart disease (CHD) (Woodward, 2019).

The leading cause of death worldwide is cardiovascular disease, which is linked to sex-specific, psychological, and financial risk factors. The urban poor bear a disproportionately high burden of cardiovascular disease (CVD) as a result of their incapacity to pay for preventive care and healthy lifestyle, as well as their lack of health literacy (Anand et al., 2015). By 2025, it is anticipated that there will be 1.56 billion people worldwide with high blood pressure and CVD, with sub-Saharan Africa having an abnormally high prevalence (Cappuccio & Miller, 2016).

A significant global public health concern, cardiovascular disease (CVD) caused 30% of all fatalities worldwide in 2008 (a total of 57 million deaths), with an alarming 80% of these deaths occurring in low- and middle-income countries (LMICs). Cardiovascular disease (CVD) is anticipated to increase, leading to avoidable fatalities. Nine classic risk factors that can be changed include smoking, having a history of hypertension or diabetes, being obese, eating poorly, lack of exercise, drinking alcohol excessively, having high blood lipid levels, and psychological factors. However, more research (Nansseu et al., 2016; Poon et al., 2012; Van De Beek et al., 2018) is being carried out on gender-specific factors that could additionally be a contributing factor to CVD.

Medical professionals may share the widespread misconception that cardiovascular disease (CVD) predominantly affects males, a belief that is also prevalent among the public. This perspective can lead to an inadvertent gender bias in clinical assessments and decision-making. A survey conducted among American cardiologists utilizing fictitious patient scenarios revealed that male patients were more frequently perceived as having a higher value for angioplasty compared to female patients. The

cardiologists' assumption that women exhibit lower risk tolerance than men contributed to this implicit bias (Woodward, 2019). Consequently, such biases may result in the inadequate utilization of screening procedures for CVD risk among women, reflecting an underlying systemic issue in the approach to cardiovascular health management.

Conventional medical textbooks, predominantly developed using male-centric models of disease, contribute to a diagnostic oversight among healthcare professionals regarding acute myocardial infarction (MI) in women. This oversight arises from the distinct presentation of heart attack in women, which often diverges from that in men. Research indicates that women are more likely to experience atypical symptoms associated with MI, such as nausea, vomiting, anxiety, and pain in the back, shoulders, or jaw. Furthermore, women are more inclined to attribute emotional distress as a precipitating factor for MI rather than physical exertion (Garcia et al., 2016). Individual-level cardiovascular disease (CVD) risk prediction algorithms are designed to optimize clinical care, prevention, and treatment strategies by utilizing data on various risk factors.

The Framingham CVD risk algorithm stands as one of the earliest models developed for this purpose. However, these algorithms frequently exhibit gender bias due to their reliance on non-gender-specific predictions and their foundation in data primarily sourced from Western, high-income populations (Wagner et al., 2021). Additionally, it is anticipated that CVD risk profiles will differ across African populations as various regions undergo distinct phases of epidemiological transition (Wagner et al., 2021). Thus, it becomes imperative to comprehend both established and gender-specific risk

factors. Models that incorporate risk variables facilitate cross-population comparisons to forecast the future burden of CVD events and inform resource allocation for disease prevention and targeted interventions. By integrating sex-specific risk factors at the population level, these models enhance the accuracy of risk assessments.

Given the plethora of existing CVD risk prediction algorithms, selecting the most appropriate one for policy guidance necessitates an understanding of their applicability across diverse African contexts. In Kenya, the early mortality rate due to CVD among individuals aged 30-70 years stands at 8%, with an overall CVD mortality rate of 13.8% reported in 2019. CVD accounted for 6.3% of disability-adjusted life years (DALYs) during this period (Roth et al., 2020). Atrial fibrillation (AF) and atrial flutter were observed in 0.1% of the population, while rheumatic heart disease (RHD) was present in 1.2%, contributing to 0.14% of total deaths. Gender disparities in overall CVD mortality rates were noted, with males at 12.9% and females at 15%, trends that are expected to (Desai et al., 2023). Research initiatives focusing on these disparities aim to mitigate the rising incidence of CVD-related mortality, particularly among women, by examining the sociodemographic and psychosocial factors that influence CVD progression.

1.3. Purpose of the study

By examining sociodemographic and psychosocial variables affecting cardiovascular disease among women residing in Kiambu Town, this study aims to promote the management of cardiovascular disease in women.

1.4 Objectives of the study

This study aim was to evaluate sociodemographic and psychosocial factors associated with cardiovascular disease affecting Women in Kiambu County, Kenya.

1.4.1 Specific objectives

The following specific objectives guided the study.

- i. To assess the effect of socio-demographic factors on cardiovascular disease among women in Kiambu Town, Kenya
- ii. To examine the psychosocial factors effect on cardiovascular disease among women in Kiambu Town, Kenya
- iii. To examine the clinical factors effect on cardiovascular disease among women in Kiambu Town, Kenya.
- iv. To determine the dietary factors effects on cardiovascular disease among women in Kiambu Town, Kenya
- v. To determine the effects of health literacy on cardiovascular disease among women in Kiambu Town, Kenya

1.5. Research questions

The following research questions guided the study.

- i. What is the effect of sociodemographic factors on cardiovascular disease among women in Kiambu Town, Kenya?
- ii. How do the psychosocial factors affect cardiovascular disease among women in Kiambu Town, Kenya?

- iii. What is the effect of dietary habits on cardiovascular disease among women in Kiambu Town, Kenya?
- iv. What is the effect of clinical factors on cardiovascular disease among women in Kiambu Town, Kenya?
- v. What is the effect of health literacy on cardiovascular disease among women in Kiambu Town, Kenya?

1.6. Justification of the Study

To adjust behavior and achieve optimal cardiovascular health, one must first understand the risk contributors for. Patients who are aware of the symptoms of a heart attack are more likely to seek treatment earlier and with better results. People perceive risk as higher when they are more knowledgeable about the risk elements of CHD. According to the health behavior model, those who are believed to have high CVD risk are more inclined to adopt good behaviors like quitting smoking and losing weight. Therefore, assessing the effects of cardiovascular disease risk factors is essential in developing future preventive efforts in Kenya.

1.7 Limitations of the Study

Several limitations were anticipated for the current study undertaking. The targeted participants are patients who are residents of Kiambu County. The researcher anticipated difficulties securing time with the patients targeted to address the questionnaire items. To moderate this shortcoming, the researcher coordinated with the institution and worked closely with counselors at the Centre to help direct patients to respond to the tool. Some targeted participants also needed more time to provide

information about the instrument. The investigator guaranteed the participants that the information provided would be confidential and that no specific information that could map to a particular respondent would be used during the analysis stage. Authorizations from Kenya Methodist University and the National Commission for Science, Technology, and Innovation (NACOSTI) were also attached to reassure respondents of the study's only academic aim.

1.8 Delimitation of the Study

The research focused on cardiovascular disease among women in Kiambu County. The researcher concentrated on sociodemographic, psychosocial, clinical, dietary, and health literacy factors and their effect on cardiovascular disease among women in Kiambu County. In terms of geographical scope, all women diagnosed with cardiovascular disease within Kiambu County were recruited to participate in the study. The researcher targeted patients aged above 18 years.

1.9 Assumptions of the Study

The study assumed that the risk factors for cardiovascular disease differ for men and women. The study also believes that these patients can recognize risk factors distinct to each gender for cardiovascular disease.

1.10. Significance of the Study

This study on the impact of cardiovascular disease risk factors on Kenyan women using Kiambu Town as a case study aimed to evaluate sociodemographic risk factors among cardiovascular disease patients. Clinicians will use this study's findings to gain

insight into gender-specific attributes of cardiovascular disease. Policymakers, such as health committees under the County Government of Kiambu, may also apply the insight generated in this study to improve policy guidelines on promoting effective management of cardiovascular disease and services provided to women with cardiovascular disease. Finally, this study will contribute to the wealth of knowledge on this subject and will form a basis for future scholarly work. The findings from this study will supplement information gathered by other scholars from different institutions.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature related to cardiovascular disease as a strategy for strengthening health systems in fighting cardiovascular disease. Literature is reviewed from books, journals, magazines, the internet, and periodicals.

2.1. Risk of Cardiovascular disease

A person's cardiovascular risk determines their likelihood of experiencing a major adverse cardiovascular event (MACE), which is defined as the confluence of a nonfatal stroke, a nonfatal myocardial infarction, and cardiovascular death. Traditional cardiovascular risk factors include growing older, being a man, having diabetes, elevated blood pressure, hyperlipidemia, being overweight and obese, having a family history of smoking, and having chronic kidney illness (Virani et al., 2020).

These classic risk variables can be used to assess the likelihood of developing cardiovascular disease (CVD). To create a personalized treatment plan, a more accurate method of figuring this out is preferred (Cazares-Manríquez et al., 2020). It is advisable that people between the age of 20 and 79 years have periodic CVD risk assessments, with shorter intervals between examinations for those with greater anticipated 10-year risks. Patients having a risk of less than ten years are re-evaluated every 4 to 6 years (Cazares-Manríquez et al., 2020).

2.2 Gender-specific Factors for cardiovascular Disease

Although traditional risk factors are the same for both sexes, their relative importance and weight vary. According to a study, males were more significantly affected by total cholesterol, age, low-density lipoprotein (LDL) cholesterol, and hypertension. However, smoking, triglyceride levels, diabetes, and high-density lipoprotein (HDL) cholesterol are the primary variables impacting women (Wei et al., 2020).

Age and cardiovascular disease are significantly correlated; however, gender differences exist. Over time, men's cardiovascular disease risk profiles are linearly growing, and the atherosclerotic process is constantly changing (Wei et al., 2020). On the other hand, estrogen can shield women in their reproductive years against atherosclerosis due to its advantageous effects on the cardiovascular system. However, women over 75 are more likely than males to have high blood pressure, and women going through menopause have a much higher risk of stroke (Stoberock et al., 2016). A major cause of cardiovascular disease, hypertension is intimately linked to conditions including stroke, left ventricular hypertrophy, and diastolic heart failure. Trends in both systolic and diastolic blood pressure (BP) have shown gender disparities (Ciarambino et al., 2018). Young men had higher systolic blood pressure than young women, with isolated systolic hypertension being the most common type of hypertension in young men (Gudmundsdottir et al., 2015).

Even though high levels of HDL-C (high-density lipoprotein cholesterol) mostly affect women, men are more likely to have an increased risk of a cardiovascular event due to low-density lipoprotein cholesterol (LDL-C) levels (Mosca et al., 2011). In both sexes, high total cholesterol is as common as in the other sex. The meta-analysis by Taddei

et al. (2019) has shown that the risk of dying from coronary heart disease mortality can be reduced by half in the early middle age (40–49 years), by a third in the later middle age (50–69 years), and by approximately a sixth in the old age.

LDL-C affects men more than women (Mosca et al., 2011). Women are less likely to have early-life hypercholesterolemia than males (50). Also, during menopause, the LDL-C level increases by 14%. Thus, compared to men, women over 65 have LDL-C levels greater than average. Finding a postmenopausal threshold and re-evaluating the lipid profile after menopause may, therefore, be crucial. Additionally, there is compelling evidence that using statins to lower LDL-C can reduce the risk of later developing coronary heart disease. It is known that women with CHD, both young and old, have low HDL-C values (Laslett et al., 2012).

Nearly 6 million people die annually from cardiovascular disease, with smoking being one of the common reasons. Smoking has proved to be more harmful to women than men at younger ages (under 50), with the same daily cigarette intake having a greater detrimental effect on women. A Danish study showed that women had a higher CVD risk than men when it came to smoking (Regitz-Zagrosek et al., 2015). According to this research, women who smoke are 50% more likely than men to get CHD. Women who smoke are more likely than non-smokers to experience their first acute myocardial infarction (AMI) (Vasiljevic et al., 2021). It could be because smoking prevents estrogen-dependent vasodilation of the endothelial wall. In addition to changes in the societal importance of smoking, women are likely to bear a greater burden of smoking-related illnesses than males (Kim et al., 2019). According to Vasiljevic et al. (2021),

women may have a stronger correlation between ongoing smoking and the risk of cardiovascular disease (CVD) than do males.

Numerous studies have shown a link between cardiac disease and obesity (Powell-Wiley et al., 2021). Numerous studies have shown a similar association between BMI and CHD in both men and women, according to (Powell-Wiley et al., 2021). On the other hand, men are more likely than women to have a stroke because of their greater BMI. For every 5 kg/m² rise in BMI, there is an increase of 1. According to the Prospective Studies Collaboration, the risk of coronary heart disease (CHD) is higher in males by 1% and in women by 35%. The 30% and 1% higher risk of stroke-related death, respectively, is experienced by 42% of men and 1% of women. According to (Deischinger et al., 2020), half of the male population has heart disease, while women with diabetes are three to seven times more likely than men to have the condition . According to a meta-analysis, women with diabetes were 50% more likely than men to die from coronary heart disease. Majidi et al. (2021) have shown that women's death rates are greater due to smaller coronary arteries, higher risk factors, and higher usage of anti-inflammatory drugs.

Heart failure and diabetes are strongly correlated, with diabetes raising the risk of heart failure by 40% (Pop-Busui et al., 2022). In the non-diabetic group, males were twice as likely as women to have heart failure (P 0. 01). Heart failure was five times as common in women than in men. The first study to show that men and women had different risks of heart failure was the Framingham Heart Study. Gender differences in coronary heart disease diagnosis and treatment are more likely to be the reason of

diabetic women's increased risk of heart failure than other variables (Paolocci et al., 2022).

2.3. Clinical factors for cardiovascular diseases

According to studies, hormone disruption is associated with a higher incidence of atherosclerosis and coronary heart disease incidents. The cardiovascular system is substantially impacted by sex hormones (Okwuosa et al., 2021). Menopause and polycystic ovarian syndrome are common conditions that are intimately linked to sex hormone changes.

PCOS, which affects 5–10% of women of reproductive age, is the most common endocrine condition that affects women (Zehravi et al., 2021). In addition to ovarian dysfunction brought on by increased androgen production, PCOS is frequently associated with insulin resistance (Zehravi et al., 2021). In addition, T2DM, chronic hypertension, and dyslipidemia are more common in women with PCOS (Zhu et al., 2020). According to a meta-analysis by Zhu et al. (2020), PCOS increases the risk of metabolic syndrome. Additionally, there is little and conflicting evidence to support PCOS women having a higher risk of cardiovascular disease.

Menopause is the move from a reproductive to a non-reproductive state and is associated with several endocrine system biochemical alterations crucial for cardiovascular health (Schwarz et al., 2023). Changes influence the age of menopause in estrogen and androgen, which are related to variations in CVD risk. In the meta-analysis by Théberge (2024), early menopause brought on by surgical ovarian excision was independently linked with CVD (RR of 1.38) and menopause occurring before the

age of 50. (RR of 4.55). Primary ovarian insufficiency (POI), often known as early onset of menopause (40 years old), affects 1-2 percent of women. Early ovarian follicle deprivation, which causes amenorrhea, infertility, and prolonged estrogen and androgen deprivation, are the hallmarks of POI. According to Mehta et al. (2022), POI was linked to total and CHD-related CVD. However, there is inconsistent evidence linking POI and the long-term risk of stroke.

The circulatory system of the mother experiences significant stress during pregnancy, and pregnancy-related problems frequently occur from the mother's inability to adjust to these vascular and metabolic changes. Preeclampsia and pregnancy-induced hypertension (PIH), which affect 2-10% of expectant women (Berhe et al., 2019), are intimately linked to the risk of future maternal cardiovascular disease (CVD). Preeclampsia has been associated with heart disease in recent studies by (Chourdakis et al., 2021). with a relative risk (RR) of 2.1 compared to pregnant women with normal blood pressure (Lo et al., 2020). The study investigated that women who have had pregnancy-induced hypertension later in life are more likely to develop hypertension and early-onset cardiovascular disease. After 20 weeks of pregnancy, preeclampsia was characterized as hypertension ($>140/90$ mmHg) with proteinuria (0.3 g/24 h). In women who have preeclampsia, the risk of developing coronary heart disease (CHD) in the future is double that of those who had normal blood pressure during pregnancy.

An elevated risk of CVD is also linked to gestational diabetes mellitus (GDM), which affects 3-5% of pregnancies. The onset of type 2 diabetes mellitus [T2 DM] appears to be the primary mediator of this risk (Lo et al., 2020). Compared to women with normal blood sugar levels, women with gestational diabetes have a relative risk of type

2 diabetes that is 7 to 12 times higher (Berhe et al., 2019). Women with gestational diabetes had a 7.4 lifetime relative risk higher than those with normal blood sugar levels, according to the most recent meta-analysis. It's important to remember that having a history of hypertension during pregnancy raises your risk of developing T2DM. 3.1 after PIH, 3.5 after mild hypertension, and 3.7 after severe preeclampsia were the predicted risks for T2DM by Behrens and colleagues in a comprehensive study of hypertension diseases complicating pregnancy in Danish women (Backhouse et al., 2024). Therefore, the severity of pregnancy-related hypertension appears to influence the extended risk of T2DM (Appelman et al., 2015). Pregnancy generally results in short-term vascular and metabolic alterations, but it can also have long-term impacts on the cardiovascular system.

2.4 Psychosocial risk factor for cardiovascular disease

Epidemiologic data gathered in the past shows that depressed symptoms can predict CHD incidence on their own. It has long been known that serious depression typically affects 15% of people with cardiovascular disease (CVD) and that moderate forms of depression can be present in up to two-thirds of individuals hospitalized after an acute myocardial infarction (Pivato et al., 2022). Additionally, etiological research suggests that having depression increases the likelihood of getting a new CVD.

Additionally, the SUPRIM study looked quantitatively at patients' quality of life in the first year following a CVD incident. It showed that these aspects have a substantial bearing on rehabilitation programs. The study also demonstrates how well CBT reduces the chance of developing acute myocardial infarction and recurring cardiovascular disease. The significance of psychosocial risk factors for secondary

prevention was also covered (Tang et al., 2020). Time urgency, achievement striving, hostility, depression, and anxiety were all investigated as long-term psychosocial risk factors for hypertension in young adults as part of the CARDIA prospective observational study. Urgency and hostility were found to be particularly associated with a proportional increase in hypertension over time (Lim et al., 2021).

Moreover, prospective research (Little et al., 2021) has examined the connection between endothelial dysfunction and cardiovascular disease (CVD), examining the relationship between CVD and the degree of brachial artery flow-mediated dilatation (FMD), the degree of circulating endothelial function progenitor cells (EPCs), or the degree of endothelium-dependent vasodilator methacholine (MCh) and endothelium-independent vasodilatation. The vascular endothelial damage is repaired by the immature EPCs, which also aid in neovascularization and reendothelization. The FMD is a popular non-invasive test for evaluating the health of vascular endothelial cells. (Sara et al., 2021) Investigated these variables under conditions of mental stress; their findings showed a significant association between endothelial factors and CVD. The relationship between the brain and the heart can be studied using the intriguing paradigm of mental stress. As a result of a distinct pathway of central nervous system activation, diastolic blood pressure and systemic vascular resistance tend to rise higher during exercise while heart rate and systolic blood pressure increase less. Ischemia brought on by mental stress differs from ischemia brought on by exercise in that it has specific properties.

The link between circulating endothelial progenitor cells, endothelial function, and both depression and stress levels in unstable angina patients with significant

psychiatric illnesses was examined by (Banerjee et al., 2024). Those with acute infarction and unstable angina had larger levels of circulating endothelial progenitor cells, but patients with stable angina had lower levels, like those with major depressive disorder. Patients with unstable angina who did not have significant psychological issues, depression, or stress scores had diminished endothelial function and endothelial progenitor cells. According to data, one of the processes contributing to the development of CVD in people with depression and stress may be endothelial dysfunction (Sher et al., 2020).

The connection that exists among depression, anxiety, and recurrent cardiac episodes in individuals with CVD has been discussed in several publications. According to (Gundugurti et al., 2022), patients with high levels of anxiety or depression had an increased risk of developing cardiovascular disease (CVD) following percutaneous coronary intervention (PCI), and psycho-educational support aimed at addressing these factors helped enhance health outcomes (Kim et al., 2019). An examination of angina patients who also had depression or anxiety revealed that these conditions could decrease the quality of life and cardiac prognosis in addition to increasing the probability of CVD (de Heer et al., 2020). Relationships between socioeconomic status, personality types, stress management, emotional intelligence, and CVD have also been further studied (Peláez-Fernández et al., 2020). People with type D personalities, who frequently experience unpleasant emotions but suppress them out of fear of rejection or being looked down upon, have been known to develop cardiovascular disease (CVD) (DeVon et al., 2016). When compared to the control group, people with type A personalities were thought to be more likely to develop diabetes or hypertension as well as to more commonly present with a history of

smoking (Karpińska-Mirecka et al., 2021). Additionally, people with psychological issues have been thought to be especially vulnerable to developing posttraumatic stress disorder (PTSD). According to other research, mental stress is amplified by low socioeconomic levels, which is a significant CVD risk factor (Lazzarino et al., 2013).

2.5. Social and economic factors for CVD

Understanding the impact of clinical CVD risk conditions is an essential first step in combating the CVD epidemic in SSA. Understanding the supporting and conflicting sociocultural background, associated lifestyle ideologies, and related behavioral patterns is also necessary to fully appreciate the burden of these clinical risk factors and ultimately unfavorable cardiovascular outcomes. SSA has benefited greatly from globalization, including better access to technology, but it has also had detrimental repercussions. The health of persons in SSA has been negatively impacted by the blending of geographical boundaries, urbanization, widening wealth and poverty gaps, better domestic and international transportation, a sedentary lifestyle, and rising costs of drugs and other healthcare (Daran & Levasseur, 2022). Socioeconomic stressors are also becoming more widely acknowledged as important cardiovascular risk factors. Numerous psychological stressors, such as urbanization and poverty, are currently having an impact on communities in SSA, according to the data that is currently available. These variables may be contributing to an increase in the mortality rates and burden of cardiovascular disease in SSA.

A person's perspective of their health is strongly influenced by chronic stressors connected to poverty, such as inadequate housing, water, sanitation, overcrowding, crime, air pollution, environmental conditions, a lack of education, job insecurity,

unemployment, and the need for transportation (Assylbayev et al., 2024). Recent findings are beginning to suggest a link between some of these stressors and worse health outcomes in SSA. For instance, Virani et al. (2020) observed that among young mothers in Khayelitsha, South Africa, chronic poverty-related community stressors and unsupportive relationships are predictors of reported stress. Particularly, it was discovered that the absence of drinkable water, a lack of assistance, and spouses' unemployment were important predictors of experienced stress. According to a study conducted in rural East Cape (Wei et al., 2021), factors such as the population's educational attainment, power availability, clean water, and waste disposal were reliable demographic indicators of poor health.

2.6. Health literacy and cardiovascular among women

According to the American Medical Association (AMA), health literacy is a collection of skills required to work in the healthcare sector, including reading simple texts and doing arithmetic operations. According to the Institute of Medicine in the United States, functional health literacy is acquiring, processing, and grasping the essential health and medical information needed to make wise health decisions. People with basic functional health literacy typically experience better health outcomes (Svendsen et al., 2020). Functional health literacy, which includes knowing how to read leaflets and make appointments, is the social and cognitive abilities that affect a person's motivation and capacity to acquire, understand, and use knowledge to promote and maintain health. This is as defined by the WHO.

Following reinterpretations of the health literacy construct, it has been proposed that handling and acting on health information in all formats requires more than simply the

capacity to read and write (Garpenhag & Dahlman, 2021). It has been more popular to define health literacy based on how service consumers use it and comprehend health literacy in its societal and established context (Liu et al., 2020). According to Edward, a healthcare user's immediate social circle should be considered when distributing their health literacy skills (Frederiksen & Wångdahl, 2022). Others contend that focusing solely on the service user's health literacy skills leaves out the role that health caregivers play in promoting the development of health literacy (Rowlands et al., 2020).

Measures of health literacy have also been scrutinized in terms of their acceptability, applicability, and feasibility. Some measures can take up to 30 minutes to administer (the TOFHLA takes about 22 minutes), and administrators must have specialized training and expertise that must be regularly updated (Gunn et al., 2021). Service users may experience feelings of humiliation and embarrassment if they are forced to read aloud while struggling. For example, the nutritional information on a tub of ice cream was developed in the US and may be unfamiliar to its users in other nations (Singh, 2021). Furthermore, different health services require different essential health literacy skills, such as completing health coverage forms in the US or recognizing the schistosomiasis public health situation in China (Walters et al., 2020). Health literacy assessments must consider local health objectives, cultural norms, and, in the UK, the perspectives of patients who do not speak English as their first language.

2.7. Empirical Review

Although hypertension, diabetes, and hypercholesterolemia had been identified in earlier studies as classic CVD risk factors, multiple researchers have revealed that a

sizable fraction of people who experienced clinical vascular events did not have these conditions. Indeed, established CVD risk factors are absent from up to 50% of people experiencing their first clinical vascular events (Jacobs et al., 2022).

Categorical hypertension is defined by Koracevic et al. (2020) as a systolic blood pressure reading of 140 mmHg or less, a diastolic reading of 90 mmHg or less, or the usage of an antihypertensive drug currently. Numerous observational studies have proved the substantial correlation between high BP and CHD. High blood pressure sufferers occasionally have a higher risk of CHD development (Razo et al., 2022). Individuals having type-1 and type-2 diabetes mellitus stand a higher chance of developing any cardiovascular disease (Chalakova et al., 2020). Compared to diabetic patients who develop CHD, non-diabetic patients had a lower mortality rate (Burgess et al., 2021).

Nearly all cells produce cholesterol, and a sizable amount of it can be absorbed through food. The lipid hypothesis states that the main lipid risk factors are abnormally high cholesterol levels (hypercholesterolemia) or greater concentrations of LDL cholesterol (Mortensen & Nordestgaard, 2020). The relationship between blood TC levels and cardiovascular and total mortality is exponential, with younger people showing it more. Higher cholesterol does have a bigger impact on health in older persons. According to Cleven et al. (2020), an unhealthy diet and physical inactivity increase blood lipid levels and increase the likelihood of obesity and hypertension, which, coupled with cigarette use, account for 75% of new cases of CVD in developing nations.

Studies in many populations show that persons with higher cholesterol levels are more likely than those with lower levels to develop atherosclerosis and CHD (Mortensen & Nordestgaard, 2020). Due to raised LDL cholesterol, there is a significant correlation between the proportion of serum cholesterol and the commencement of the first or subsequent CHD attack; the higher the level, the higher the risk (Alloubani et al., 2020). It is observed that there are multiple steps involved in the relationship between high LDL cholesterol and the beginning of CHD (Liou & Kaptoge, 2020). Atherogenesis, the initial stage, is characterized by a fatty stripe containing macrophages primarily loaded with cholesterol generated from low-density lipoproteins. The second stage comprises a lipid-rich core covered by a fibrous plaque containing scar tissue. The third stage is marked by unstable, prone-to-rupture plaques that release thrombi that lead to myocardial infarction. For most acute coronary syndromes [ACS], plaque rupture is the cause (Liou & Kaptoge, 2020).

2.8. Theoretical Framework

Two theoretical models guided the study. These include the Common-Sense Model of Self-Regulation and the Theory of Planned Behavior (TPB).

2.8.1. Common-Sense Model of Self-Regulation

The Common-Sense Model of Self-Regulation, which is also called the "Common-Sense Model" or CSM, is a widely used theoretical framework. It is the process of patients becoming aware of a health risk, finding out how to react to it, forming opinions about it and the processes involved in pharmacological interventions, making plans to deal with the threat, and keeping in touch with the people who give them

feedback about how well those plans are working and how the threat is changing. The over 50 years of theoretical research and development on the CSM gives a summary of the dynamic foundations, characteristics, and underlying assumptions of the model. The model, which is also known as Leventhal's model after Rajabloo et al. (2021), who was a supporter of the research in this field, was used by Hagger and Orbell (2021) in their paper to study the Self-Regulatory Model, Parallel Process Model, Common Sense Model of Self-Regulation.

The parallel model hypothesized by Moreno et al. (2020) to comprehend how people react to increasing communications is where CSM started. The Cognitive and Emotional Stimulus Model (CSM), which is comparable to the Parallel Model, emphasizes when danger is experienced (such as physical indicators), cognitive and emotional representations of the input are produced simultaneously by individuals (Klinke, 2022). He and his colleagues discovered that various sorts of information were required to change attitudes towards a sense of danger aimed towards health and well-being as well as behaviors, and these effects only persisted for brief periods. Leventhal and his work peers wanted to determine what modifications and coping strategies could be necessary for persons with chronic disease to extend their original model.

Three factors were identified in their proposed hierarchically structured model of a flexible system: a representation of the illness experience that may serve as a guide, transformation initiatives or coping reactions and their execution, and, finally, an assessment or tracking of the success rate of coping efforts (Klinke, 2022). The behavioral perspective of stress and coping (Polizzi et al., 2020), which conceptualizes

sickness as a mentally stressful situation, is one theory of problem-solving behavior that the model shares many parallels. Leventhal's thesis used an inventive method by identifying the active, contemporaneous cognitive processing that determines a person's response to "disease danger" as well as their capacity for "emotional control."

Chronic diseases, such as chronic fatigue syndrome, Addison's disease, psoriasis, multiple sclerosis, and rheumatoid arthritis [RA], research has been particularly interested in understanding how illness representations may affect coping capabilities (April et al., 2021). The underlying idea is that coping mediates sickness perceptions and coping attempts, mediating outcomes. However, research suggests that depictions of sickness may be linked to outcomes "relatively" independently of the coping mechanisms employed (Brand et al., 2021). The direction of links, however, may not always be clear-cut because coping strategies may impact how people perceive their diseases, which in turn may affect the coping strategy they select. Avoidant coping did not appear to be sparked by the idea that RA had major effects in our RA research (Martin et al., 2017), but it did have a modest direct impact on changes in fatigue.

2.8.2. Theory of Planned Behavior (TPB)

The Theory of Reasoned Action (TRA) is expanded upon by the Theory of Planned Behavior (TPB) (Siddiqui & Siddiqui, 2022). Both models are based on the premise that people intentionally and logically select activities by considering the available information. The likelihood that a behavior will be performed depends on the individual's intention to engage in it (which is impacted by the value they place on the activity, how easy it is to perform, and the opinions of significant others), as well as their sense of control over the conduct. A TPB model for RA that considered attitudes,

social support, self-efficacy, and intention had mediocre success in predicting and explaining how to manage arthritis (Brembo, 2020).

TPB is generally responsible for 25% and 50% of the variation in intention and adherence behavior, respectively. Although the TPB could be improved by adding additional adherence-related features, it has been argued that doing so will prevent the model's development from progressing (Khan et al., 2020). Adherence to prescribed prescriptions is affected by social and economic, therapy-related, and health-system factors, in addition to those related to the patient (Konstantinou et al., 2020). Therefore, a theory that tries to improve drug adherence must consider these complex factors. Although it appears to have some limits for predicting medication adherence in those with chronic diseases, the TPB is useful for several health behaviors. Additionally, patients with schizophrenia who were Mexican Americans saw improved drug adherence attributed to the TPB (Liddelow et al., 2020). The research showed that the TPB constructs can be utilized to design a successful intervention that promotes the medication adherence in these +people.

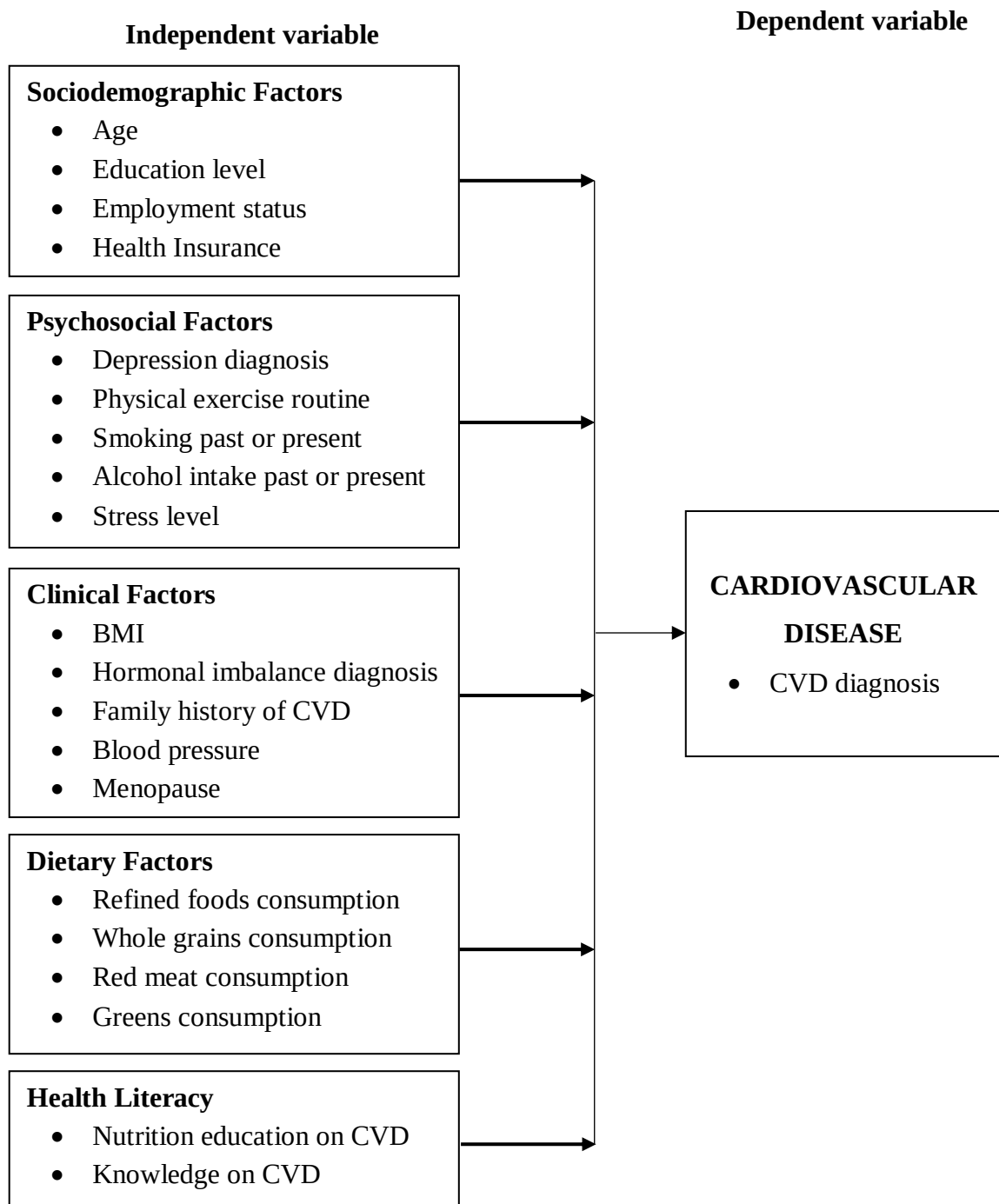
2.9. Conceptual Framework

The conceptual framework describes the relationships between the study's variables. According to King (2024), a variable is a quantifiable characteristic that takes on different values depending on the subject. The direction of the investigation is determined by the investigator's perspective on the issue. A posited model describing the constructs employed in a study and their associations is known as a conceptual framework. The fundamentals of a conceptual framework are examined by Konstantinou et al. (2020) as a guide for the reader to quickly comprehend the

anticipated link between the independent (predicting) and dependent (predicted) variables. The relationship between the variables in the study is shown in figure 2.1

Figure 2.1

Conceptual Framework



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

A thorough summary of the research methodology for the study is provided in this chapter. The first section describes the research methodology that was used. The target population from which the sample was obtained is then described, along with the sampling technique used to choose the patients included in the study. The chapter also describes the models and data analysis techniques that were employed.

3.2. Research Design

According to Creswell and Creswell (2017), "research design" is a word that stands for the structure and methods of an inquiry that are used to control the variance and to solve the research problems. This investigation employed a cross-sectional study method. The cross-sectional studies, as Mugenda and Mugenda (2013) has pointed out, are useful for the researchers to find out if there is a significant correlation between the variables at a particular moment in time. Since no other data were found and all the data were collected at the same time, the research used a cross-sectional study design.

3.3. Target Population

The target population involved female patients registered in Kiambu Level 5 and Thika Level 5 hospitals (the main referral hospitals in Kiambu County).

3.4 Sample Size Determination

Simple random sampling technique was used in this investigation. Since the number of individuals with cardiovascular risk factors in Kenya is unknown, but the prevalence of the major risk factor, hypertension, is known, this study used the country's prevalence of 24.5%.

$$n = \frac{Z^2 \cdot P \cdot q}{e^2}$$

Where:

n = required sample size.

Z = Z-value (1.96 for a 95% confidence level).

P = estimated prevalence of hypertension (24.5% or 0.245).

$$q = 1 - P = 0.755$$

$e = 0.05$ = margin of error.

3.4.1 Sample Size Calculation:

Substituting the values into the formula:

$$n = \frac{1.96^2 \cdot 0.245 \cdot 0.755}{0.05^2}$$

$$n = \frac{3.8416 \cdot 0.184475}{0.0025}$$

$$n = \frac{0.708594}{0.0025} = 283.44$$

After rounding up, the sample size for this study is **284 women**.

3.4.2 Sampling Procedure

A **simple random sampling technique** was employed to select participants for this study. The following steps were taken to ensure unbiased selection:

- i. A comprehensive list of eligible women from Kiambu County was created using local health records and community data.
- ii. Random numbers were generated using a computerized random number generator to select participants from this list.
- iii. Each woman had an equal chance of being selected to ensure that the sample represented the larger population.

A total of **284 women** were selected for participation in this study.

Inclusion Criteria

The following inclusion criteria were used to select participants:

- i. Women aged **18 years and above**.
- ii. Women who are **permanent residents of Kiambu County**.

Exclusion Criteria

Participants were excluded from the study if they met any of the following criteria:

- i. Women **under the age of 18** years.
- ii. Women who **do not reside in Kiambu County**.
- iii. Women who were **unavailable or unwilling** to provide informed consent.

3.5 Data Collection

This study utilized cross sectional design, in which a questionnaire was administered to participants by the researcher with the assistance of trained research assistants. According to Yeomans and McCrickerd (2017), questionnaires are particularly effective in descriptive studies as they facilitate the identification and characterization of variables across different scenarios. This method was selected for its cost-effectiveness, especially when dealing with large populations.

3.6. Pre-test Study

The researcher evaluated the tools' usability and clarity through a pilot study. According to (Richey et al., 2017), the pilot research sample should range from 1 percent to 10 percent, with the percentage decreasing as the sample size increases. To check the validity and relevance of the instrument, 10% of the sample will pre-test the questionnaire in this study. By conducting a pilot study, the researcher can find any limitations or other issues with the research instrument's design and make the necessary adjustments before the survey is implemented (Poon et al., 2012). The questionnaire was tested, targeting 40 women patients in Mama Lucy Kibaki Hospital in Nairobi County.

3.6.1. Validity of the Research Instrument

The scientific validity of the research tool used ensures the scientific relevance of the study's conclusions. For differences in individual scores to be interpreted as actual references in the traits under investigation, an instrument must successfully measure the attributes it is intended to assess. According to Bernard (2013), validity is the

degree to which instruments measure what they claim to. The validity of an instrument is crucial in all sorts of reserves, according to Ayre and Scally (2014), and the acceptability level mostly depends on the researcher's logical reasoning skills, professionalism, and familiarity with the various quality control approaches. Construct validity and content validity were both be used in this investigation. Construct validity is the degree to which the measuring questions accurately reflect the presence of the constructs being studied, according to Kitagawa (2015).

The degree to which a measuring instrument fulfills the research's investigative objectives is referred to as its content validity. Therefore, validating the research instruments before distributing them to the sample group would be crucial to ensure they acquire the needed data. The supervisors' and practitioners' comments were used to make the necessary changes to the instrument, such as deleting unclear items, spelling errors, and other typographical problems that may have been created during the study tool's development.

3.6.2. Reliability of the Research Instrument

According to Mugenda and Mugenda (2013), the ability of a research tool to consistently measure problematic traits across time. The reliability of an instrument increases with how little variation it produces in repeated measurements of a property. The obtained response was independently recorded and used to evaluate the reliability of the study questionnaire. The reliability and internal consistency were determined using Cronbach's alpha, rated at 0.7 (Panayides, 2013).

3.7. Data Collection Procedure

The researcher administered the questionnaires to the study participants together with the assistance of trained research assistants.

3.8. Data Organization and Analysis

The collected quantitative data was subjected to a descriptive statistical analysis. Using Pearson R correlation, the degree and direction of the linear relationship between the variables were evaluated. Multiple regression models were used to fit the data to ascertain how the independent factors affected the dependent variable. The researcher examined the impact of cardiovascular education on health behaviors using various regression models. The study used the regression model (Keith, 2019).

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where:

Y= cardiovascular disease among women.

X₁ = sociodemographic factors,

X₂ = psychosocial factors

X₃ = clinical factors

X₄= health literacy

X₅=dietary factors

B₀ = Constant; **B**₁, **β**₂, **β**₃= predictor variable coefficients; **ε**=Error term of the model.

The study results were presented through tables and figures. All ethical concerns were observed in undertaking the current analysis

3.9. Ethical Considerations

Prior to beginning a data collection procedure, the investigator and the respondent signed a contract that specified all their respective obligations and responsibilities via informed consent. As a result, all ethical norms such as informed permission, do no harm, anonymity, and confidentiality were adhered to. The participants are entities who need to be aware of their fundamental human rights that need to be safeguarded during the study process. Approval to perform this study was acquired from the Kenya Methodist University Research Ethics Board and the National Council of Science, Technology and Innovation as a key aspect of adhering to the ethical standards. The researcher also obtained permission from County government of Kiambu.

To conduct the research in accordance with sound standards, a variety of ethical issues were considered during this study. The researcher respected the respondents' privacy, confidentiality, and anonymity. The respondents voluntarily took part in the study. The goal of the study and the procedures for gathering data were properly explained to the respondents by the researcher. The respondent signed a formal consent as they decided to take part in the study. The researcher explained to them their right to leave the study at any point, even before it is finished, and that doing so had no negative effects on them. To prevent offending the participants or posing improper questions to them, consideration for their culture and custom was made.

The researcher also avoided providing participants with false information and respected their dignity and sense of fairness. To maintain confidentiality, the researcher substituted coded numbers for the names of the survivors. The respondents' anonymity was protected during the entire study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

In this study, data were collected from 400 women aged between 19 and 94 years to assess the association between sociodemographic, psychosocial, health literacy, dietary, and clinical factors and cardiovascular health in Kiambu, Kenya. The research employed multiple linear and logistic regression analyses to explore the relationships between dependent and independent variables. The primary objective of this research was to enhance understanding and promote cardiovascular health among women in the region. In the research all the respondent's respondent to all the Questions.

4.1 Social Demographic Characteristics of the Study Population

Table 4.1

Social Demographic characteristics of the study participants

Characteristics	% (n= 400)
Age (Years)	
19-43	52 (208)
44-68	38.25 (153)
69-94	9.75 (39)
Education Level	
Non formal education	13.50 (54)
Primary	19.25 (77)
Secondary	32.75 (131)
Tertiary	34.50 (138)

Employment Type	
Formally employed	19.5 (78)
Self employed	46.25 (185)
Unemployed	34.25 (137)
Average Income	
500-1000	34.50 (138)
Above 1000	25.25 (101)
Below500	40.25 (161)
Have Health Insurance?	
No	21.50 (86)
Yes	78.50 (314)
Marital Status	
Married	42.75 (171)
Separated/divorced	19.50(78)
Single	22.00 (88)
Widow	15.75 (63)

In this study, 52% of participants were women aged 19 to 43 years. In terms of education, 32.75% of respondents had completed secondary education, while 34.50% had attained tertiary education. Regarding employment status, 34.25% of participants were unemployed, and 40.25% reported an income of Ksh. 500 or less. Research into sociodemographic factors and cardiovascular disease reveals significant associations between demographic characteristics and cardiovascular conditions. For instance, Johnson et al. (2022) demonstrated that income level, education, and ethnicity are strongly correlated with cardiovascular disease incidence and outcomes. Additionally, Gupta et al. (2014) identified disparities in acute myocardial infarction rates among younger patients, with notable variations based on sex and race. These studies highlight the critical role of sociodemographic factors in cardiovascular risk

assessment and management, emphasizing the need for targeted strategies to address health disparities and enhance cardiovascular health outcomes.

4.1.2 Socio-demographic characteristics and their Relationship to Cardiovascular disease

The findings indicated that individuals aged between 19 and 43 years accounted for 19.5% of the cardiovascular disease (CVD) cases. Among those diagnosed with CVD, 14.8% had achieved a secondary school level of education. Additionally, 22% of participants with CVD were self-employed, and 19.5% reported an income ranging between Ksh. 500 and 1,000.

Table 4.2

Cross Tabulation Table between Social Demographics and Cardiovascular Diagnosis

Characteristics	Diagnosed with Cardiovascular Disease (CVD)		% (n=400)
Age Group	no	Yes	
19-43	130	78	52 (208)
44-68	80	73	38.25 (153)
69-94	9	30	9.75 (39)
Highest Level of Education			
Tertiary	83	55	34.5 (138)
secondary	72	59	32.75 (131)
primary	43	34	19.25 (77)
Non formal education	21	33	13.5 (54)
Employment Status			
Self employed	97	88	46.25 (185)
Unemployed	74	63	34.25 (137)
Formally employed	48	30	19.5 (78)

Average Daily Income			
500-1000	83	78	49.25 (161)
Below 500	80	58	34.5(138)
above1000	56	45	25.25 (101)
Do you have Health Insurance?			
No	49	37	21.5 (86)
yes	170	144	78.5 (314)
Marital Status			
married	94	77	42.75 (171)
Single	63	25	22 (88)
Separated/divorced	44	34	19.5 (78)
widow	18	45	15.75 (63)

4.1.3 Correlation between Social Demographic Factors and Cardiovascular

The results presented in Table 4.3 reveal several correlations between sociodemographic factors and cardiovascular disease (CVD). A negative correlation was observed between age and CVD diagnosis ($r = -0.230$), indicating that younger individuals are more likely to be diagnosed with CVD. Conversely, a weak positive correlation between the highest level of education and CVD diagnosis ($r = 0.116$) suggests only a slight increase in risk for those with higher education levels. Employment status also showed a negative correlation with CVD diagnosis ($r = -0.044$), implying that formally employed individuals are less likely to have CVD compared to their self-employed or unemployed counterparts. These results underscore the complex relationship between sociodemographic factors and CVD risk, highlighting the necessity of incorporating these variables into public health strategies aimed at reducing CVD incidence. Smith and Brown (2020) conducted a systematic review that reinforced the influence of socioeconomic status, educational attainment,

race/ethnicity, and healthcare access on CVD prevalence and outcomes, emphasizing the need for these factors to be considered in public health interventions.

Table 4.3

Correlations between Social Demographics and Cardiovascular Disease Diagnosis

	H1. Diagnosed with any cardiovascular disease?	A1. Age	A2. highest level of education	A3. employ ment status	A4. Average daily income level?	A5. Do you have health insurance?	A6. marital status
H1. Diagnosed with any cardiovascular disease?	1	-0.23	0.116	-0.044	0.037	0.023	-0.083

4.1.4. Influence of Sociodemographic Factors in cardiovascular disease diagnosis.

Table 4.4

Logistic Regression Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	512.206 ^a	.092	.123

Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The logistic regression model yielded a -2 Log-likelihood value of 512.206, indicating a good fit to the data. The Cox & Snell R-Square of 0.092 suggests that 9.2% of the variance in cardiovascular disease diagnosis can be explained by the sociodemographic factors included. The Nagelkerke R-Square, adjusted for the predictors, was 0.123, indicating that approximately 12.3% of the variation in CVD diagnosis is explained by these factors. Overall, the model shows that sociodemographic factors moderately predict cardiovascular disease diagnosis.

Table 4.5*Accuracy of the Logistic Regression model*

Observed		Predicted		
		Yes	No	Percentage Correct
H1. Have you been diagnosed with any	Yes	77	104	42.5
cardiovascular disease in the past or presently?	No	50	169	77.2
Overall Percentage				61.5

The classification table 5 presents the outcomes of the logistic regression analysis examining the relationship between psychosocial factors and cardiovascular disease diagnosis. The model yielded an accuracy rate of 42.5% for positive diagnoses and an accuracy of 77.2% for negative CVD diagnosis. Overall, the model achieved a prediction accuracy of 61.5% for cardiovascular disease using psychosocial predictors.

4.2 Clinical Characteristics of the study population.

Table 4.6*Clinical Factor Characteristics of the study participants.*

Characteristics	% (n= 400)
Blood Pressure Level	
Normal Blood pressure ($\leq 120/80$)	25.0 (100)
Elevated Blood Pressure (120-129/80)	11.0 (44)
Hypertension stage 1 (130-139/80-89)	14.5 (58)
Hypertension stage 2 (140-179/90)	46.8 (187)
Hypertension crisis (above 180/120)	2.8 (11)

Are You in Menopause	
Yes	32.5(130)
No	67.3(269)
Diagnosed With Hormonal Imbalance	
Yes	14.3(57)
No	85.8(343)
BMI Range	
Normal Range (18.5-24.9)	135 (33.75)
Overweight (25.0- 29.9)	117 (29.25)
Obese Class 1 (30.0-34.9)	83 (20.75)
Obese Class 11 (35.0-39.9)	33 (8.25)
Underweight (<18.5)	22 (5.5)
Obese Class 111(>= 40)	10 (2.5)
Pregnancy Disorder experienced	
gestational diabetes	4.8 (19)
gestational diabetes and preterm delivery	0.3 (1)
gestational hypertensive disorder:	6.0 (24)
gestational hypertensive disorder and gestational diabetes:	1.0 (4)
gestational hypertensive disorder and preterm delivery:	0.5 (2)
preterm delivery	3.5 (14)
None	84.0 (336)
Experienced a Pregnancy Disorder?	
No	83.75(336)
Yes	16.25(64)
CVD Family History	
No	62.25(249)
Yes	37.75 (151)
Ever Diagnosed with Hypertension?	
No	66.00(264)
Yes	34.00(136)

Ever had a heart attack?	
No	76.50(306)
Yes	23.50(94)
Diagnosed with Diabetes?	
No	66.50 (266)
Yes	33.50 (134)

The study found that 46.8% of respondents had stage 2 hypertension (140-179/90), highlighting the critical need for hypertension management interventions, as supported by Roth et al. (2020), who linked stage 2 hypertension with an elevated risk of cardiovascular disease. Among the respondents 32.5% were premenopausal, with 14.3% reporting hormonal imbalance. This finding is consistent with Liu et al. (2020), who identified hormonal imbalance as a significant factor affecting cardiovascular health, underscoring the necessity for targeted interventions. Family history of cardiovascular disease was noted in 37.75% of respondents, aligning with Khera and Ajufo (2022), who emphasized on the role of genetic predisposition in CVD risk assessment and prevention strategies.

4.2.1 Cross Tabulation between clinical Factors and Cardiovascular Disease

Diagnosis

Table 4.7

Cross Validation between Clinical Factors and Cardiovascular Disease Diagnosis

Characteristics	Diagnosed with (CVD)	
	% (n=400) No	% (n=400) Yes
BMI Range		
Normal Range (18.5-24.9)	21(84)	12.8(51)
Overweight (25.0- 29.9)	16.3(65)	13(52)
Obese Class 1 (30.0-34.9)	8.6(35)	12(48)
Obese Class 11 (35.0-39.9)	3.3(13)	5(20)
Underweight (<18.5)	4.3(17)	1.3(5)
Obese Class 111(>= 40)	1.3(5)	1.3(50)
Blood Pressure Level		
Hypertension stage 2 (140-179/90)	20.5(82)	24.5(98)
Normal Blood pressure (<=120/80)	17.8(71)	10.3(41)
Hypertension stage 1 (130-139/80-89)	8.8(35)	5.5(22)
Elevated Blood Pressure (120-129/80)	6.3(25)	3.3(13)
Hypertension crisis (above 180/120)	1.5(6)	1.8(7)
Are you in menopause?		
No	40.5(162)	27(108)
yes	14.3(57)	18.3(73)
Hormonal Imbalance Diagnosis		
No	50.3(201)	35.5(142)
yes	4.5(18)	9.8(39)
Experienced a Pregnancy Disorder?		
No	51(204)	32.8(131)
Yes	3.8(15)	12.5(5)

Pregnancy disorder diagnosed		
None	51(204)	32.8(131)
Gestational hypertensive disorder	1.5(6)	4.5(18)
Gestational diabetes	0.8(3)	4(16)
Preterm delivery	1.5(6)	2(8)
Gestational hypertensive disorder and gestational diabetes		1(4)
Gestational hypertensive disorder and preterm delivery		0.8(3)
Gestational diabetes and preterm delivery		0.3(1)
CVD Family History		
No	45.3(181)	17(68)
Yes	9.5(38)	28.3(113)
Diagnosed with Hypertension?		
No	52(208)	14(56)
Yes	2.8(11)	31.3(125)
Diagnosed with Diabetes		
No	52.3(209)	14.3(57)
Yes	2.5(10)	31(124)
Diagnosed with a heart attack?		
No	54(216)	22.5(90)
Yes	0.8(3)	22.8(91)

Cross-tabulation results presented in Table 4.7 reveal that 13% of individuals diagnosed with cardiovascular disease (CVD) were classified as overweight, with a BMI ranging from 25 to 29.9. Additionally, 24.5% of those with CVD had stage 2 hypertension (140-179/90), and 31% of participants with a history of gestational hypertension were also diagnosed with CVD. These findings underscore the intricate relationship between obesity, hypertension, and cardiovascular health, emphasizing the need for effective preventive measures and management strategies to mitigate the risk of further complications in individuals with existing cardiovascular conditions.

4.2.3. Correlation Analysis between Clinical Factors and Cardiovascular

Table 4.8

Correlations between Clinical Factors and Cardiovascular disease diagnosis

	H1. Diagnosed with any cardiovascular disease?	F1. BMI	F1 Blood pressure	F2. Are you in the menopause stage?	F3 b. Hormonal imbalance diagnosis	F5.1Diagnosed with Pregnancy Disorder?	G3.1.1 Diagnosed with Hypertension?	G3.2.2Diagnosed With Diabetes	Diagnosed with Heart Attack?
H1. Diagnosed with any cardiovascular disease?	1	0.456	0.356	0.151	0.189	0.274	0.672	0.678	0.574

Table 4.8 reveals that higher BMI ($r=0.456$), elevated blood pressure ($r=0.356$), and pregnancy disorders ($r=0.247$) moderately increase the likelihood of cardiovascular disease diagnosis. Menopause ($r=0.151$) and hormonal imbalance ($r=0.189$) show weak positive correlations with CVD, indicating a marginally elevated risk. In contrast, stronger positive correlations are observed for hypertension ($r=0.672$), diabetes ($r=0.678$), and heart attack ($r=0.574$), suggesting these conditions significantly heighten CVD risk. Gray et al. (2024) highlight the importance of targeted screening and preventive measures for women with these clinical conditions to reduce CVD incidence and improve health outcomes.

4.2.4 Influence of Clinical Factors in Cardiovascular Disease Diagnosis.

Table 4.9

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.811 ^a	0.658	0.651	0.295	0.658	89.484	8	372	0

Table 4.9 presents a regression model showing a strong positive correlation ($R=0.811$) between clinical factors and cardiovascular disease. The R-Squared value of 0.658 indicates that 65.8% of the variability in cardiovascular disease likelihood is explained by the clinical factors included. The adjusted R-Squared score of 0.651 reflects a 65.1% explanatory power after accounting for clinical factors. The model's standard error is 0.295, representing the average distance between observed and predicted values. With an F-Change statistic of 89.484 and a P-value of 0.000, the model is statistically significant. Overall, these results underscore the significant role of clinical factors in predicting cardiovascular disease.

4.3 Psycho-Social Characteristics of the Study Population

4.3.1 Psycho-Social descriptive Characteristics of the study Participant

Table 4.10

Psychosocial Characteristics of the study participants

Characteristics	% (N= 400)
Depression Diagnosis	
NO	78.5 (314)
Yes	21.5 (86)

Frequency of Routine Physical Exercise	
Rarely or never	69.25(277)
1-2 times a week	11.75 (47)
daily	10.00 (40)
3-6timesaweek	8.75 (35)
1-2timesaday	0.25 (1)
Smoked Past or Present	
No	84.25(337)
Yes	15.75 (63)
Taken Alcohol Past or Present	
No	86.43(344)
yes	13.57 (54)
Stress Level	
6-15	16.50(66)
16-25	75.50(302)
26-35	8.00(32)

Table 4.10 presents the descriptive statistics, revealing that 21.5% of respondents were diagnosed with depression. Additionally, only 10% of participants engaged in daily routine physical exercise with 75.50% of respondents reporting experiencing moderate levels of stress.

4.3.2 Psycho-Social Characteristics in Relation to Cardiovascular Disease Diagnosis

Table 4.11

Psychosocial Characteristics of the study participants.

Characteristics	% (N= 400)
Depression Diagnosis	
NO	78.5 (314)
Yes	21.5 (86)

Frequency of Routine Physical Exercise	
Rarely or never	69.25 (277)
1-2 times a week	11.75 (47)
daily	10.00 (40)
3-6timesaweek	8.75 (35)
1-2timesaday	0.25 (1)
Smoked Past or Present	
No	84.25 (337)
Yes	15.75 (63)
Taken Alcohol Past or Present	
No	86.43 (344)
yes	13.57 (54)
Stress Level	
6-15	16.50(66)
16-25	75.50(302)
26-35	8.00(32)

Cross-tabulation results indicate that 13.8% of participants diagnosed with cardiovascular disease (CVD) also had depression, while 10.8% of individuals who smoked and 7% who consumed alcohol were similarly affected. Additionally, 4.5% of those with severe stress levels and 34.3% of individuals who rarely exercised had CVD. These findings are consistent with Harshfield et al. (2020), who emphasized the bidirectional relationship between depression and CVD, underscoring the need for integrated mental health interventions in cardiovascular disease management. Dempsey et al. (2020) also identified a link between sedentary lifestyles and increased CVD risk, while Jeong et al. (2021) highlighted a strong association between smoking and both heart disease and stroke, further emphasizing the critical need for smoking cessation efforts.

4.3.3. Correlation between Psycho-Social Factors and Cardiovascular Disease

Diagnosis

Table 4.12

Correlations between Psycho-Social and Cardiovascular Disease Diagnosis

	H1. Diagnosed With any cardiovascular disease?	B1. Diagnosed with depression?	B3. Frequency of Physical Exercise?	B4. Smoking History	B5. Alcohol Intake History	B6. Stress Level
H1. Diagnosed With any cardiovascular disease?	1	0.194	-0.094	0.203	0.055	0.016

The correlation coefficient between depression and cardiovascular disease diagnosis was 0.194, indicating a weak positive relationship. The correlation between cardiovascular disease diagnosis and the frequency of physical exercise was -0.094, reflecting a weak negative association. There was a moderately positive correlation ($R=0.203$) between smoking and cardiovascular disease diagnosis. The correlation coefficient between a history of alcohol intake and cardiovascular disease diagnosis was 0.055, suggesting a very weak positive relationship. Additionally, the correlation between stress levels and cardiovascular disease diagnosis was 0.016, indicating an almost negligible association.

4.3.4 Influence of Psychosocial Factors on Cardiovascular disease diagnosis

Table 4.13

Logistic Regression Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	511.106 ^a	.088	.118

Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found

Table 4.13 presents the logistic regression model with a -2-log likelihood value of 511.106, indicating a reasonable fit to the data. The Cox & Snell R-Square value is 0.088, suggesting that the model accounts for approximately 8.8% of the variation in cardiovascular disease diagnosis. The Cox & Snell R-Square is a pseudo-R² metric that estimates the proportion of variance explained by the model, with 0 indicating weak explanatory power and 1 indicating high precision. The Nagelkerke R-Square, which adjusts the Cox & Snell R-Square for the number of predictors, is 0.118, indicating that approximately 11.8% of the variation in cardiovascular disease diagnosis is explained by the psychosocial factors included in the model.

4.3.5. Classification Table (Accuracy of the model)

Table 4.14

Classification Table (Accuracy of the model)

		Predicted		
		Yes	No	Percentage Correct
H1. Have you been diagnosed	Yes	68	111	38.0
with any cardiovascular disease	No	37	182	83.1
in the past or presently?				
Overall Percentage				62.8

a. The Cut Value is .500

Table 4.14 shows that the model predicted 68 cases of cardiovascular disease (“Yes”) correctly but misclassified 111 cases, resulting in an accuracy rate of 38% for positive diagnoses. For cases where cardiovascular disease was not reported, the model accurately predicted 182 cases but incorrectly identified 37 cases, yielding an accuracy rate of 83.1%. Overall, the model achieved an accuracy score of 62.8% in predicting cardiovascular disease based on psychosocial predictors.

4.4 Dietary and Cooking Habits

4.4.1. Descriptive Statistics of Dietary and Cooking Habits

Table 4.15

Dietary and Cooking Habit Characteristics of the study participants.

Characteristics	% (N= 400)
Source of Energy for Cooking	
Gaseous Fuels (Gas):	41.3 (165)
Mixed Fuels (Combination of Gas and Solid Fuels):	10.3(41)
Other Fuels (Electricity and Kerosene):	7.5 (30)
Solid Fuels (Firewood, Charcoal, Biomass):	41.0(164)
Cooking Space Ventilation	
Both	24.25 (97)
closed space with limited ventilation	24.25 (97)
neither	15.50 (62)
open flame	36.00 (144)
How Often Do You Consume Refined Food	
At least once a day	52.50(210)
At least once a week	33.50(134)
Never	9.75(39)
At least once a month	4.25(17)

How Often Do You Consume Whole Grains	
at least once a day	40.85(163)
at least once a week	37.59(150)
never	13.03(52)
At least once a month	8.52(34)
How Often Do You Consume Red Meat	
at least once a week	34.26(136)
at least once a day	28.21(112)
at least once a month	24.18(96)
never	13.35 (53)
How Often Do You Take Greens	
at least once a day	79.75 (319)
at least once a week	15.50 (62)
never	3.00 (12)
at least once a month	1.75 (7)
How Often Do You Take Fried Foods	
at least once a day	43.36 (173)
at least once a week	34.84 (139)
at least once a month	12.53 (50)
never	9.27 (37)

Among the respondents, 41.0% reported using solid fuels, such as firewood, charcoal, and biomass, as their primary energy source for cooking. Regarding dietary habits, 52.50% of respondents consume refined foods at least once daily, while 33.50% include refined foods in their diet at least once a week. Additionally, 43.36% of the participants eat fried foods daily, and 34.84% consume fried foods at least once a week

4.4.2. Cross tabulation between Dietary and Cooking Habits and Cardiovascular Disease Diagnosis

Table 4.16

Cross Tabulation between CVD, Dietary Factors and Cooking Habits

Characteristics	Diagnosed with Cardiovascular Disease (CVD)		% (n=400)
Source of Energy for Cooking	No	Yes	
Gaseous Fuels (Gas):	113	54	41.75 (167)
Mixed Fuels (Combination of Gas and Solid Fuels):	23	17	10 (40)
Other Fuels (Electricity and Kerosene):	6	23	7.25 (29)
Solid Fuels (Firewood, Charcoal, Biomass):	77	87	41 (164)
Cooking Space Ventilation			
Both	50	48	24.5 (98)
closed space with limited ventilation	52	45	24.25 (97)
neither	36	26	15.5 (62)
open flame	80	63	35.75 (143)
How Often Do You Consume Refined Food			
at least once a day	112	98	52.5 (210)
at least once a month	8	9	4.25 (17)
at least once a week	81	53	33.5 (134)
never	18	21	9.75 (39)
How Often Do You Consume Whole Grains			
at least once a day	85	79	41 (164)
at least once a month	19	15	8.5 (34)
at least once a week	89	61	37.5 (150)
never	26	26	13(52)
How Often Do You Consume Red Meat			
at least once a day	60	52	41 (112)
at least once a month	51	45	24 (96)
at least once a week	78	61	34.75 (139)
never	29	24	13.25 (53)

How Often Do You Take Greens

at least once a day	181	138	79.75 (319)
at least once a month	5	2	1.75 (7)
at least once a week	29	33	15.5 (62)
never	4	8	3 (12)

How Often Do You Take Fried Foods

at least once a day	87	86	43.25 (173)
at least once a month	26	24	12.5 (50)
at least once a week	87	52	34.75 (139)
never	19	19	9.5 (38)

How often Do You Take Legumes

At least once a day	107	86	48.25 (193)
At least once a month	14	16	7.5 (30)
At least once a week	46	21	16.75 (67)
never	52	58	27.5 (110)

Figure 4.1

Types and Frequency of Foods Consumed

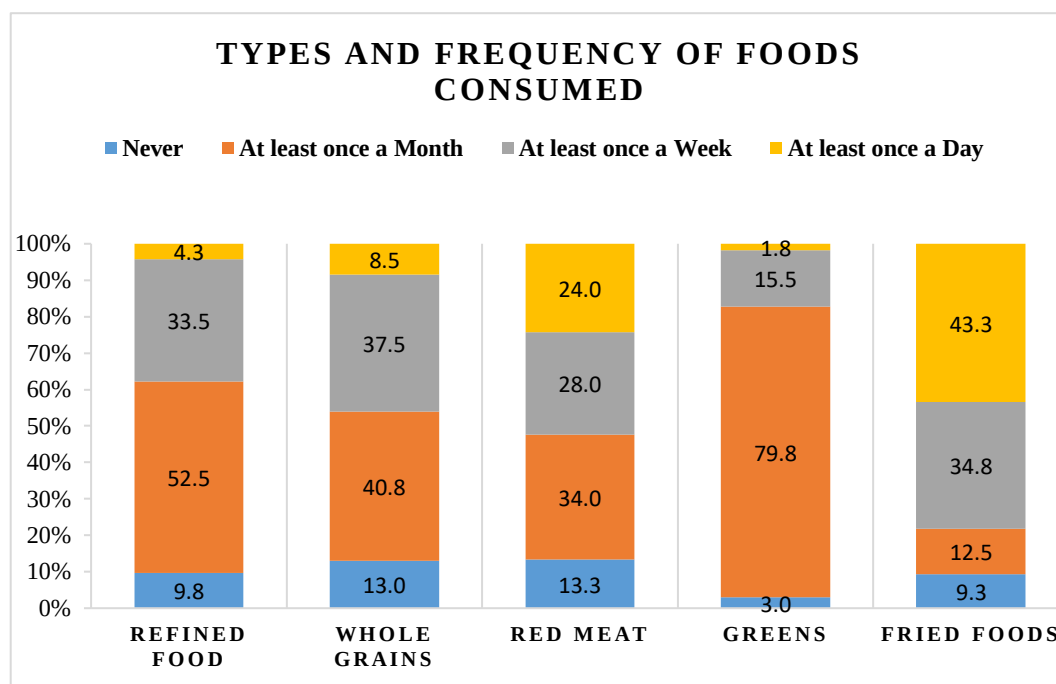
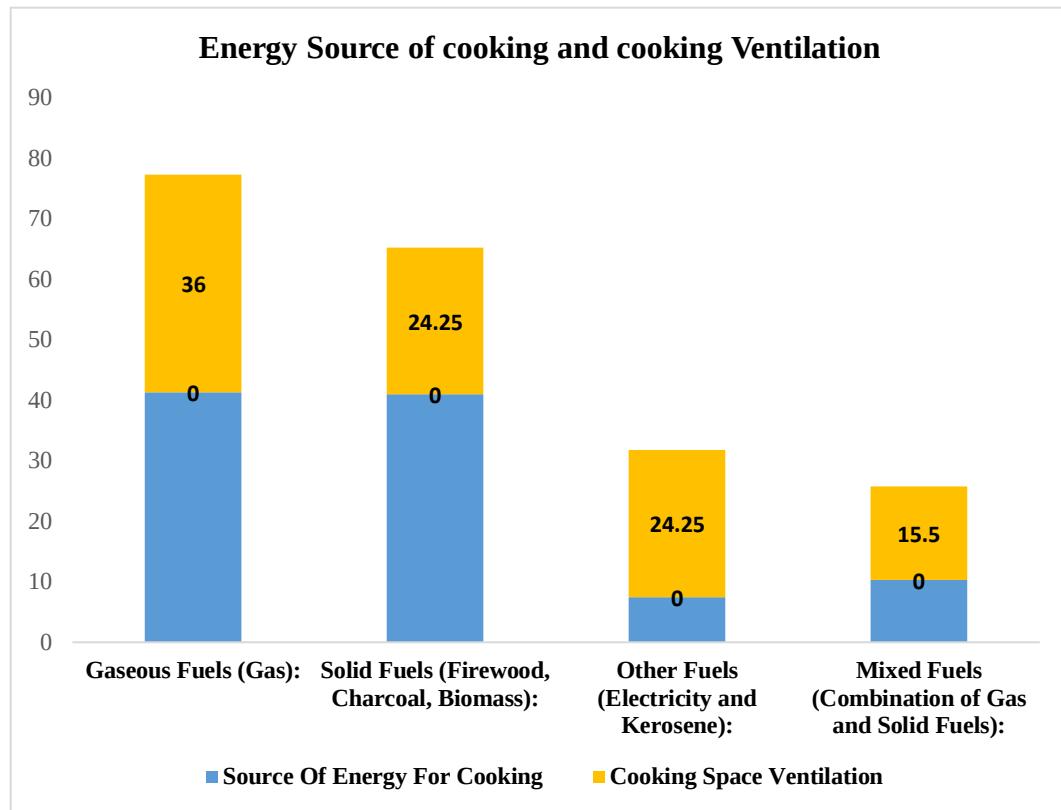


Figure 4.2

Energy Source of cooking and cooking Ventilation



Cross-tabulation analysis reveals that 22% of participants diagnosed with cardiovascular disease (CVD) used solid fuels for cooking. Additionally, 13% of those who consumed red meat daily were diagnosed with CVD. Notably, 43% of participants who ate fried foods daily were diagnosed with CVD. Li et al. (2015) highlights the complex relationship between dietary habits and CVD, emphasizing that dietary patterns, rather than individual foods, play a crucial role in cardiovascular risk. This study underscores the need for promoting overall healthy dietary patterns to reduce cardiovascular risk, rather than focusing solely on specific nutrients or foods.

4.4.3. Correlation between Dietary and cooking Habits and Cardiovascular Disease Diagnosis

Table 4.17

Correlations Between Dietary and Cooking Habit and Cardiovascular Disease Diagnosis

	H1. Diagnosed With any cardiovascular disease?	D5.4 I take Refined grains	D5.8 I take red meat	D5.10 I take Greens	C1. Energy Source For cooking?	C2. Cooking Ventilation Used	D5.5 I take Wholegrains	D5.11 I take Fried foods	D5.1 I take Legumes
H1. Diagnosed With any cardiovascular disease?	1	-0.03	0.005	-0.086	-0.206	0.039	-0.004	0.017	-0.078

The analysis of dietary factors in relation to cardiovascular disease diagnosis revealed the following correlations: Refined food consumption had a correlation coefficient of -0.030, indicating a weak negative relationship with cardiovascular disease. Red meat consumption showed a coefficient of 0.005, reflecting a weak positive correlation. Greens consumption exhibited a coefficient of -0.086, suggesting a weak negative association. Whole grains had a coefficient of -0.004, indicating a minimal negative relationship with cardiovascular disease. Fried foods presented a coefficient of 0.017, revealing a weak positive correlation. Lastly, the consumption of legumes had a coefficient of -0.078, indicating a slight negative correlation, suggesting minimal consumption among those diagnosed with cardiovascular disease.

4.4.4 Influence of Dietary and Cooking Habits on Cardiovascular disease diagnosis.

The regression model results indicated a moderate positive correlation ($R=0.243$) between dietary and cooking practices and cardiovascular disease diagnosis. The R-Squared value of 0.059 showed that these factors accounted for 5.9% of the variability in cardiovascular disease diagnosis. The adjusted R-Squared score was 0.037. The standard error, which measured the distance between actual and predicted values, was 0.489. The R-Squared change statistic of 0.059 reflected a 5.9% improvement in the model's explanatory power with the inclusion of predictors. The F-Statistic change of 2.690 and a P-Value of 0.005 indicated that the overall model was statistically significant

Table 4.18

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.243 ^a	0.059	0.037	0.489	0.059	2.690	9	385	0.005

a. Predictors: (Constant), D5.11 How often do you take Fried foods, D5.1 How often do you take Legumes, D5.10 How often do you take Greens, and D5.5 How often do you take Wholegrains, C1. What energy source do you majorly/often use for cooking? C2. Do you cook over an open flame or in a closed space with limited ventilation? D5.8 How often do you take red meat, D5.4 How often do you take Refined grains, D5.9 How often do you take Fruits

b. Dependent Variable: H1. Have you been diagnosed with any cardiovascular disease in the past or presently?

4.5 Health Literacy

4.5.1. Health Literacy characteristics of the study population

Table 4.19

Health Education Factor Characteristics of the study participants.

Characteristics		% (n= 400)
Know any cardiovascular disease		
no	273	68.25 (273)
Yes	127	31.75 (127)
Ever Received nutritional Education?		
no	270	67.50 (270)
Yes	130	32.50 (130)
Aware of recommended Dietary guidelines for Healthy heart?		
No	287	71.75 (287)
yes	113	28.25 (113)
Have you made any changes in your diet to improve heart health?		
No	322	80.50 (322)
yes	78	19.50 (78)
Dietary Changes made		
Dietary Habits (i.e., taking balanced diet, taking plenty of vegetables, Reducing sugar intake)		
	33	8.3 (33)
Exercise and Physical Activity	6	1.5 (6)
Fat Intake Reduction	10	2.5 (10)
Salt Intake Reduction	23	5.8 (23)

Regarding population's health literacy characteristics, 68.25% of respondents reported lack of awareness in cardiovascular disease. Green et al. emphasized the crucial role of health education in increasing awareness and fostering behavioral changes that

enhance cardiovascular health. Additionally, 67.5% of respondents had never received nutrition education or counseling. Only 28.25% were aware of dietary guidelines for a healthy heart, with 71.75% lacking knowledge on these guidelines.

4.5.2. Cross Validation between Health Literacy and Cardiovascular Disease

Diagnosis

Table 4.20

Health Literacy Cross Tab with Cardiovascular disease diagnosis

Characteristics	Diagnosed with Cardiovascular Disease (CVD)		% (n=400)
Know any cardiovascular disease	No	Yes	
No	163	110	68.25 (273)
Yes	56	71	31.75 (127)
Ever Received nutrition education?			
No	151	119	67.5 (270)
Yes	68	62	32.5 (130)
Aware of recommended Dietary guidelines for Healthy heart?			
No	166	121	71.75 (287)
yes	53	60	28.25 (113)
Have you made any changes in your diet to improve heart health?			
No	183	139	80.5 (322)
Yes	36	42	19.5 (78)
Dietary Changes Made			
Dietary Habits (i.e., taking balanced diet, taking plenty of vegetables, Reducing sugar intake)	14	15	29
Salt Intake Reduction	9	17	26
Fat Intake Reduction	7	5	12

Exercise and Physical Activity	2	3	5
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Cross-tabulation revealed that 27.5% of participants who lacked knowledge about cardiovascular disease (CVD) had a CVD diagnosis. Among those who had never received nutrition education, 29.8% were diagnosed with CVD. Additionally, only 3.8% of individuals who had made dietary changes reported a CVD diagnosis.

4.5.3. Correlation between Health Literacy and Cardiovascular disease diagnosis

Table 4.21

Correlation matrix between health literacy and cardiovascular disease diagnosis

	H1. Diagnosed with any cardiovascular disease?	E1. Do you know any cardiovascular diseases?	E3 Ever received nutrition education from a healthcare provider?	E4. Aware of any dietary guidelines recommended for healthy hearts	E4. Made any changes to your diet to improve heart health?
H1. Diagnosed with any cardiovascular disease?	1	0.336	0.434	0.599	0.29

The correlation coefficient between knowledge of cardiovascular disease and cardiovascular disease diagnosis was 0.336, indicating a weak positive correlation. Nutrition education and cardiovascular disease diagnosis showed a correlation coefficient of 0.434, reflecting a moderate positive correlation. The correlation coefficient between awareness of dietary guidelines and cardiovascular disease diagnosis was 0.599, suggesting a moderate positive correlation. Lastly, the correlation coefficient for dietary changes related to heart health and cardiovascular disease diagnosis was 0.290, indicating a weak positive correlation.

4.5.4. Influence of Health Literacy on Cardiovascular Disease Diagnosis

Table 4.22

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.398 ^a	0.345	0.033	0.495	0.365	2.259	4	392	0.042

The analysis revealed a correlation coefficient of $R=0.398$, indicating a moderate positive correlation. The R-Squared score was 0.345, showing that 34.5% of the variability in cardiovascular disease diagnosis could be explained by the selected health education factors. The adjusted R-Squared value of 0.365 indicated a 36.5% increase in model explanatory power with the inclusion of predictors. The standard error of 0.495 represented the average distance between observed and predicted values. With an F-change value of 2.259 and a P-Value of 0.043, the model was statistically significant. Overall, health education factors modestly contributed to explaining the likelihood of cardiovascular disease diagnosis.

4.6. Limitations and Future Research

While this research provides significant insight, its limitations that are inherent include self-reported data that would potentially present some bias. Future research could explore longitudinal associations between clinical factors and CVD outcomes to establish causality, investigate the impact of specific lifestyle interventions on CVD risk reduction in high-risk populations, and examine the interplay between genetic factors, environmental influences, and clinical characteristics in CVD development.

Qualitative research could also explore individual experiences and perceptions related to CVD risk factors and prevention strategies to inform tailored interventions.

There is need to evaluate the effectiveness of educational interventions in enhancing health literacy, conduct long-term studies to assess the impact of health education programs on CVD outcomes. It is also important to delve into factors influencing the adoption of heart-healthy habits across diverse populations. Furthermore, understanding socio-cultural and environmental influences on cardiovascular health behaviors can lead to the development of more effective strategies for promoting cardiovascular health

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Clinical characteristics revealed many respondents had stage 2 HTN, with high rates of overweight/obesity. Less common was, menopause and hormonal imbalance as significant risk factors. Gestational hypertensive disorder was reported by many, alongside a high prevalence of family history of CVD, hypertension, diabetes, and heart attack. Through cross-tabulation, correlation, and regression analyses, the study showed that overweight individuals, those with hypertension stage 2, and those not in menopause are more likely to be diagnosed with CVD.

Regarding health literacy many lacked awareness of CVD and dietary guidelines and had not received nutritional education. However, some reported making dietary changes to improve heart health. Cross-validation analysis revealed higher rates of CVD among individuals lacking knowledge on CVD and dietary guidelines. Correlation analysis indicated weak to moderate positive correlations between health literacy factors and CVD diagnosis. Regression analysis further supported these findings, demonstrating a modest contribution of health education factors in predicting the likelihood of CVD diagnosis.

The socio-demographic characteristics showed that younger individuals, (19 and 43 years), exhibit a higher likelihood of being diagnosed with CVD. Furthermore, education level, employment status, income level, health insurance coverage, and marital status also demonstrate varying degrees of association with CVD diagnosis.

Psycho-social characteristics showed a notable portion of the population reported no depression diagnosis, those with depression had lower rates of CVD diagnosis. Individuals with infrequent physical exercise showed higher CVD frequencies, contrasting with higher CVD rates among non-smokers compared to smokers. Moreover, non-drinkers displayed a heightened frequency of CVD. Correlation analysis delineated these relationships, albeit with varying strengths. The logistic regression model shed light on the predictive capacity of psycho-social factors in CVD diagnosis, albeit with moderate accuracy.

Patterns in dietary and cooking habits showed a significant portion using solid fuels for cooking and consuming refined foods frequently. There's a correlation observed between certain dietary/cooking practices and cardiovascular disease (CVD) diagnosis, such as higher CVD cases among those using solid fuels and consuming fried foods daily. However, correlations are generally weak, indicating complex relationships.

5.2 Recommendations

Moving forward it's important that interventions addressing modifiable risk factors such as obesity, hypertension, and diabetes are put in place. These interventions include lifestyle modifications like healthy weight management, regular physical activity, and dietary improvements. There is need to implement screening programs for hypertension, diabetes, and heart disease, particularly among high-risk individuals. Healthcare providers should vigilantly monitor and manage hormonal imbalances to mitigate cardiovascular disease risk.

Additionally, it's important to promote health literacy and heart-healthy dietary practices through educational programs, nutritional counseling, and behavioral interventions to help reduce CVD risk. Tailored intervention programs addressing socio-demographic factors, ensuring equitable access to healthcare services, and advocating for policies promoting socio-economic equity can further improve cardiovascular health outcomes.

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APPENDICES

Appendix I: Consent Form

STUDY ON EVALUATION OF SOCIODEMOGRAPHIC AND PSYCHOSOCIAL RISKS ASSOCIATED WITH WOMEN CARDIOVASCULAR HEALTH IN KIAMBU, KENYA

This questionnaire is set to help in carrying out a study on sociodemographic and psychosocial factors influence on cardiovascular disease among women. Confidentiality of any information will be keenly upheld. Assistance with honest and accurate information will be much appreciated.

Fill in the questions and tick the boxes as appropriate.

Section A: Consent Form.

Sharon Lesa Chepchumba
Master's in public health,
Kenya Methodist University

Dear Respondent....

You are invited to be in a research study of evaluation of socio-demographic and psycho-social-factors on women's cardiovascular health in Kiambu county, Kenya. You were selected as a possible participant because you recently attended a medical service in Kiambu County. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

Purpose: This study is designed to evaluate sociodemographic and psychosocial risks of Kiambu women cardiovascular health. The researcher would like to use this information to champion the sociodemographic and psychosocial risks linked to cardiovascular health in women. This consent form defines the procedures used for the study, the benefits and risks of participation, and ways in which confidentiality will be upheld.

What do I have to do? I have approached you for this study because you are one of the women pre-disposed to sociodemographic and psychosocial factors associated with

cardiovascular disease in Kiambu County. You will be asked questions concerning clinical, psychosocial, socio-economic and health literacy factors associated with cardiovascular diseases. As you respond to the questions, a questionnaire will be filled. No invasive procedures such as drawing of blood will be involved.

Duration: it is expected that you will take approximately 30 -45 minutes for you to respond to the questions within the questionnaire.

Withdrawal: Taking part in the study is voluntary and you are allowed to withdraw at any given stage. Refusal to take part in the study will also have no penalty or in any way be linked to lack of access to care within this county.

Benefits: The information generated by this research will be important in guiding decisions and interventions related to sociodemographic and psychosocial factors associated with cardiovascular disease in women.

Comfort: This study involves invasion of personal life on questions related to your medical, mental and economic well-being, however it is only the researcher asking the questions who will know who has responded to what at the point of filling the questionnaire. This is a non-invasive procedure; therefore, it poses no risks associated with pain or infection.

Confidentiality: This is to assure you that I will not be using your name and personal information in this study but instead I will issue a study number that will be used for each of the participants. The researcher will keep the records in a lockable filing cabinet with access restricted to the research assistants and the principal investigator. Your name and other personal information will not be used when the researcher presents the findings of the study and publishes the outcomes.

Concerns: In case you have any queries or concerns regarding this research or related matter please contact: Dr. Job Mapesa 0703567768 or Dr. Mary Akinyi 0718369748

Assent: I, the undersigned give consent to participate in this study. The purpose and what the study entails has been fully explained to me. I understand the procedures involved, that I can withdraw from the study at any point. I do understand that there is no money that will be given to participate in this research, that there is no risk in participating and no personal issues will be discussed and that confidentiality will be

observed at all times and all data gathered will be utilized for purposes of this study only.

Date

Signature or mark of assent

Researcher..... Signature.....

Section B: Sociodemographic/economic factors

How old are you? (Years)

What is your highest level of education?

- ☐ No formal education
- ☐ Primary
- ☐ Secondary
- ☐ Tertiary
- ☐ Postgraduate

What is your employment status?

- ☐ Unemployed
- ☐ Self-employed
- ☐ Formally Employed

What is your average daily income level?

- ☐ Below KSH. 500
- ☐ KSH. 500-1000
- ☐ Above KSH. 1000

Do you have health insurance?

Yes ☐ No ☐

If yes, what Health Insurance do you have?

- ☐ Public (NHIF)
- ☐ Private
- ☐ Both NHIF and private insurance

If no, why don't you have health insurance?

6. What is your marital status?

- ☐ Single
- ☐ Married
- ☐ Separated/divorced
- ☐ Widow

Section C: Psychosocial Factors

Have you ever been diagnosed with depression or depressive symptoms?

Yes ☐ No ☐

How long do you averagely walk in a day?

..... hrs. minutes

How often do you engage in physical exercise as part of your routine? Please select one option:

- ☐ Daily
- ☐ 3-6 times a week
- ☐ 1-2 times a week
- ☐ Rarely or never

Have you smoked in the past or present?

Yes ☐ No ☐

If yes:

For how long?

- ☐ Below 5 years
- ☐ 5-10 years
- ☐ Above 10 years

How many cigarettes did you in the past or currently smoke in a day?

Have you taken alcohol in the past or present?

Yes ☐ No ☐

If yes:

For how long did you/have you taken alcohol in the past or present?

- ☐ Below 5 years
- ☐ 5-10 years
- ☐ Above 10 years

Tick the following statements appropriately.

Perceived Stress Scale (PSS-10)					
	0 (never)	1 (almost never)	2 (sometimes)	3 (fairly often)	4 (very often)
In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
In the last month, how often have you felt nervous and stressed?	0	1	2	3	4
In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
In the last month, how often have you felt that things were going your way?	0	1	2	3	4
In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
In the last month, how often have you felt that you were on top of things?	0	1	2	3	4

In the last month, how often have you been angered because of things that happened that were outside of your control?	0	1	2	3	4
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Section D: Behavioral factors

What energy source do you majorly/often use for cooking?

- ☐ Electricity
- ☐ Gas
- ☐ charcoal
- ☐ firewood
- ☐ Biomass (animal, human, or plant waste)
- ☐ Other. (Please specify)

Do you cook over an open flame or in a closed space with limited ventilation?

- ☐ Open flame
- ☐ Closed space with limited ventilation
- ☐ Both
- ☐ Neither

Do you find some served foods to be less of salt?

- ☐ Yes
- ☐ No

If yes, how often add salt when served on the plate?

- ☐ Rare
- ☐ Often
- ☐ Very Often

Do you find some served drinks to be less of sugar and often add sugar when served on the cup?

- ☐ Yes
- ☐ No

Tick appropriately

	Never	At least once a day.	At least once a week	At least once a month
Legumes e.g., beans, lentils, peas.				
Nuts e.g., macadamia, groundnuts.				
Herbal drinks e.g., green tea, ginger, lemon.				
Refined grains e.g., white bread.				
Whole grains e.g., brown rice, brown bread.				
Beverages e.g., soda.				
Fish.				
Red meat.				
Fruits.				
Leafy greens/vegetables.				
Fried foods e.g., chips, mandazi.				

Section E: Awareness

Do you know of any cardiovascular diseases?

Yes ☐

No ☐

If yes, list them all.

.....

.....

.....

.....

.....

.....

What causes or risk factors do you know to be contributing to cardiovascular diseases?

(List them all)

.....

.....

.....

.....

.....

.....

Have you ever received nutrition education or counselling from a healthcare provider?

Yes ☐

No ☐

Are you aware of any dietary guidelines recommended for healthy hearts (e.g., reducing saturated fats, sodium intake)?

Yes ☐

No ☐

Have you made any changes to your diet to improve heart health?

Yes ☐

No ☐

If yes, which changes? (List all)

Section F: Biological

Fill in the following information:

Weight	 Kg
Height	 cm
BMI $= \frac{\text{Weight (kg)}}{\text{Height (m}^2\text{)}}$	
Blood Pressure	
Pulse rate	

Are you in the menopause stage?

Yes ☐

No ☐

If yes, for how long have you been in the menopause stage? Years

What type(s) of Hormone Replacement Therapy have you used or are currently using?

(Check all that apply)

☐ Estrogen

☐ Combined estrogen and progesterone

☐ Bioidentical hormones

☐ Others (Please specify)

Have you been diagnosed with hormonal imbalance in the past or present?

Yes ☐

☐ No ☐

Which mode of contraception do you use?

☐ Barrier Methods

☐ Hormonal Methods

- ☐ Intrauterine Device Method
- ☐ Sterilization Method
- ☐ I am not on contraception.

Tick all of the pregnancy-related disorders you have experienced:

- ☐ None
- ☐ Gestational hypertensive disorder (e.g., pre-eclampsia)
- ☐ Gestational diabetes
- ☐ Preterm delivery

Section G: Prevalence of Cardiovascular diseases

Have you been diagnosed with any cardiovascular disease in the past or presently?

Yes ☐ No ☐

Does any of your immediate family members e.g., parents, siblings have a history of cardiovascular disease (e.g., heart attack, heart disease, stroke)?

Yes ☐ No ☐

For how long have you been diagnosed with the following diseases?

Disease	Measurement Scale				
	Never	Below 6 months	6 -12 months	12-24 months	Above 24 months
Hypertension					
Diabetes					
Heart attack/failure					
Stroke					
Deep venous thrombosis					

Appendix II: Ethical Approval



KENYA METHODIST UNIVERSITY

P. O. BOX 267 MERU - 60200, KENYA
TEL: 254-064-30301/31229/30367/31171
INFO@KEMU.AC.KE

FAX: 254-64-30162
EMAIL:

March 21, 2023

KeMU/ISERC/PHT/03/2023

SHARON LESA CHEPCHUMBA
PHT-3-2267-2/2021

Dear Sharon,

SUBJECT: EVALUATION OF SOCIO DEMOGRAPHIC AND PSYCHOSOCIAL RISKS ASSOCIATED WITH WOMEN CARDIOVASCULAR HEALTH IN KIAMBU, KENYA.

This is to inform you that Kenya Methodist University Institutional Scientific Ethics and Review Committee has reviewed and approved your research proposal. Your application approval number is KeMU/ISERC/PHT/02/2023. The approval period is 21st March, 2023 – 21st March, 2024.

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 Kenya Methodist University Institutional Scientific Ethics and Review Committee.
- III. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KeMU ISERC within 72 hours of notification.
- IV. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KeMU ISERC 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 KeMU ISERC.

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.



Appendix III: Introductory letter to NACOSTI



KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya
Tel: 254-064-30301/31229/30367/31171

Fax: 254-64-30162
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DIRECTORATE OF POSTGRADUATE STUDIES

March 21, 2023

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100
NAIROBI.

Dear Sir/Madam,

RE: SHARON LESA CHEPCHUMBA – (REG. NO. PHT-3-2267-2/2021)

This is to confirm that the above named person is a bona fide student of Kenya Methodist University, in the School of Medicine and Health Sciences, Department of Public Health, Human Nutrition and Dietetics undertaking a Master's Degree in Public Health. She is conducting research on; "Evaluation of Sociodemographic and Psychosocial risks Associated with Women Cardiovascular Health in Kiambu, Kenya".

We confirm that her research proposal has been presented and approved by the University.

In this regard, we are requesting your office to issue a research license to enable her collect data.

Any assistance accorded to her will be highly appreciated.

Yours sincerely,



Dr. John M. Muchiri (PhD)
Director, Postgraduate Studies

Cc: Dean SMHS
CoD, PHT
Program Coordinator - PHT
Student Supervisors

Appendix IV: NACOSTI Research License



REPUBLIC OF KENYA



NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 631458

Date of Issue: 26/April/2023

RESEARCH LICENSE



This is to Certify that Ms.. Sharon Iesa Chepchumba of Kenya Methodist University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kiambu on the topic: EVALUATION OF SOCIODEMOGRAPHIC AND PSYCHOSOCIAL RISKS ASSOCIATED WITH WOMEN CARDIOVASCULAR HEALTH IN KIambu, KENYA for the period ending : 26/April/2024.

License No: NACOSTI/P/23/25193

631458

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION

Verification QR Code



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

Appendix V: Kiambu County Approval

COUNTY GOVERNMENT OF KIAMBU DEPARTMENT OF HEALTH SERVICES

All correspondence should be addressed to HEAD
HRDU – HEALTH DEPARTMENT
Email address: rwandirite@gmail.com
mkwasa@live.com
Tel. Nos: 0721641516
0721974633



HEALTH RESEARCH AND DEVELOPMENT
UNIT
P. O. BOX 2344 – 00900
KIAMBU

Ref. No.: KIAMBU/HRDU/23/05/04/RA_CHEPCHUMBA Date: 4th May 2023

TO WHOM IT MAY CONCERN

RE: CLEARANCE TO CONDUCT RESEARCH IN KIAMBU COUNTY

Kindly note that we have received a request by Ms. Sharon Lesa Chepchumba of Kenya Methodist University to carry out a study in Kiambu County, the research title being "Evaluation Of Sociodemographic And Psychosocial Risks Associated With Women Cardiovascular Health In Kiambu, Kenya".

We have duly inspected her documents and found that she has been cleared by NACOSTI to carry out the research for a period ending 26th April 2024. She thus does not need any further clearance with another regulatory body in order to conduct research within the county of Kiambu.

However, it is incumbent upon the institution where she is carrying out research to ensure that she receives adequate supervision during the process of conducting the research. This note also accords her the duty to provide a feedback on her research to the county at the conclusion of her research.

DR. MWANCHI KWASA
COUNTY CLINICAL RESEARCH OFFICER
KIAMBU COUNTY

Appendix VI: Thika level 5 approval

COUNTY GOVERNMENT OF KIAMBU DEPARTMENT OF HEALTH SERVICES		
Telephone: +254722106797 Email address: thikal5hospital@gmail.com When replying please quote:		THE MEDICAL SUPERINTENDENT, P. O. BOX 227 – 01000, THIKA

Ref: CGK/TL5H/07/01/2023 Date: 30th May, 2023

APPROVAL TO CARRY OUT RESEARCH

PRINCIPAL INVESTIGATOR: SHARON LESA CHEPCHUMBA

RE: A STUDY ON EVALUATION OF SOCIO-DEMOGRAPHIC AND PSYCHOSOCIAL RISKS ASSOCIATED WITH WOMEN CARDIOVASCULAR HEALTH AT THIKA LEVEL 5 HOSPITAL.

Following deliberations by Thika Level 5 Hospital's Training, Research and Ethics Committee (TREC), and subject to provision of all the necessary licenses and ethical approvals, your proposal to carry out the above referenced research, at this facility, has been approved.

This approval is subject to the following mandatory conditions:

1. You shall submit a copy of the abstract of the final report, through the above contact details.
2. Where called upon, you shall be expected to make a feedback presentation to the hospital's Training, Research and Ethics Committee.
3. You shall maintain ethical consideration and the research subjects' confidentiality as outlined in your proposal.
4. Any patient confidential information that you may access during your research should not be used without consent.
5. You shall make payments of applicable research fees to the hospital before commencing research activities.

This letter is valid up to 26th April, 2024.
For any queries feel free to contact the committee chair through the Medical Superintendent's office or Training, Research and Ethics Committee Office.

Thank you and all the best.


SUSAN GATEI
FOR: CHAIRPERSON, TRAINING RESEARCH & ETHICS COMMITTEE,
THIKA LEVEL 5 HOSPITAL

Appendix VII: Kiambu level 5 approval

COUNTY GOVERNMENT OF KIAMBU DEPARTMENT OF HEALTH SERVICES		
Telephone: (066) 2022191 Email address: kiambudistricthospital@yahoo.com When replying please quote:		KIAMBU COUNTY REFERRAL LEVEL 5 HOSPITAL P. O. BOX 39 – 00900, KIAMBU

Ref No: KIAMBU/HRDU/23/05/04/RA /7CHEPCHUMBA

Date: 31ST MAY 2023

SHARON LASA CHEPCHUMBA
DHT- 3-2267-2/2021

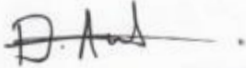
RE: CLEARANCE TO CONDUCT RESEARCH IN KIAMBU COUNTY

In reference to your request letter dated 4th May 2023 conducting research on evaluation of Sociodemographic and psychosocial risks associated with women cardiovascular Health in Kiambu Level 5 Hospital.

We hereby inform you that your request has been approved.

This approval also accords you the duty to provide feedback on this research to the institution at the conclusion of your research.

Thank you.



DR. ANTONY MURAGE
MEDICAL SUPERINTENDENT
KIAMBU REFERRAL HOSPITAL

MEDICAL SUPERINTENDENT
KIAMBU SUB COUNTY LEVEL 5
HOSPITAL
P.O. Box 39-00900
KIAMBU
TEL: 0662022191