DETERMINANTS OF ADHERENCE TO RECOMMENDED LIFESTYLE MODIFICATION PRACTICES AMONG PATIENTS WITH HYPERTENSION AGED 30-79 YEARS ATTENDING EMBU LEVEL FIVE HOSPITAL, KENYA

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DECLARATION AND RECOMMENDATION

Declaration

This thesis is my original work and has not been presented for an award of diploma or conferment of degree in any institution.

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Recommendation

This thesis has been examined, passed and submitted with our approval as University supervisors.

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DEDICATION

This thesis is dedicated to my loving husband Dr. Gathogo and our children, John, Sophia and Mike.

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ABSTRACT

Achievement of adequate blood pressure control among patients with hypertension requires a combination of pharmacological therapy and lifestyle modifications. The patients' adherence to lifestyle modification strategies to control hypertension is not well documented in Embu County. Therefore, this study assessed the determinants of adherence to lifestyle modification strategies among patients with hypertension. The study adopted an analytical cross-sectional survey design. It was conducted at Embu Level 5 Hospital in Embu County, Kenya among 179 patients with hypertension aged 30-79 years attending the medical outpatient clinic. The participants were selected using systematic sampling method. Participants for focus group discussion(FGD) were purposively selected from among those who had the highest or the lowest adherence scores. Quantitative data were collected using semi-structured researcher developed and administered questionnaires and modified H-scale test. Qualitative data were collected by use of three FGDs facilitated using a semi-structured discussion guide. Prior to data collection, Ethical approval was sought from Chuka University Research and Ethics Committee as well as authorization from the National Commission for Science, Technology and Innovation (NACOSTI). Quantitative data was analyzed via Statistical Package for Social Science (SPSS) 29.0. Descriptive statistical methods among them frequency distribution, percentages, mean and standard deviations were used for summarizing the data. The relationship between study variables was tested using Chi-square tests and multivariate logistic regression analysis at 95% confidence interval. The results of the study were presented in tables, figures and in narrative form. The results showed that the mean age of the participants was 58.2$\pm$12.21 with most participants (29.8%, n=69) aged between 60-69 years. Most participants (63.5%, n=115) were married and 47.5% (n=86) had been on treatment for more than three years. Approximately two thirds (65.2%, n=118) attended follow-up clinic for hypertensive patients monthly. Only 29.3%(n=53) of the participants adhered to the recommended lifestyle modification practices. Employment status (aOR = 0.30, 95% CI [0.10, 0.91], p = .033), level of income (aOR = 2.71, 95% CI [1.28, 5.72], p = .009) and perception of the importance of lifestyle modification practices (aOR = 2.93, 95% CI [1.39, 6.16], p = .005) were significant individual related predictors of adherence to lifestyle modification practices. None of the home-based factors were significant predictors of adherence to lifestyle modifications since all $p > .05$. However, in the FGD, availability of social support emerged as an important determinant of adherence. In conclusion, the level of adherence to lifestyle modification is low. Unemployment, higher income levels, perceived importance of lifestyle modifications practices and availability of social support increased adherence to recommended lifestyle modification practices. It is recommended that the Ministry of Health need to develop and implement targeted health messages on lifestyle and offer subsidy for drugs used in management of hypertension. Further, the health care providers should use every available opportunity to counsel patients on lifestyle modification practices. Further research is recommended on the effect of patient education on adherence to recommended lifestyle modification practices.

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LIST OF ABBREVIATIONS ACRONYMS

ACC: American College of Cardiology

AHA: American Heart Association

BASNEF: Beliefs, Attitude, Subjective Norms, Enabling Factors

DALY: Daily Adjusted Life Years

DASH: Dietary Approaches to Stop Hypertension

DBP: Diastolic Blood Pressure

ESC: European Society of Cardiology

ESH: European Society of Hypertension

FGDs: Focus Group Discussions

HCP: Health Care Provider

HEARTS: Healthy lifestyles, Evidence based factors, Access to medicines, Team based care, Systems for monitoring

JNC-7: The Seventh Report of the Joint National Committee on Hypertension

KNH: Kenyatta National Hospital

LMICs: Low- and Middle-Income Countries

MoH: Ministry of Health

NACOSTI: National Commission for Science, Technology and Innovation

NCDs: Non-Communicable Diseases

RTI: Research Triangle Institute

SDGs: Sustainable Development Goals

SPSS: Statistical Package for the Social Sciences

SSA: Sub-Saharan Africa

WHO: World Health organization

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Hypertension or High Blood Pressure refers to a medical condition whereby the force exerted against the blood vessel walls is persistently too high in most occasions (WHO 2023). According to American Heart Association (AHA), hypertension is considered as a systolic Blood Pressure (SBP) reading of above 130mmHg (Systolic) and above and a diastolic blood pressure (DBP) reading of 80mmHg and above (AHA, 2023).

Globally, the prevalence of Hypertension increased from 650 million in 1990 to 1.28 billion people among persons aged between 30 – 79 years in 2019 (World Health Organization (WHO), 2023). It has also been estimated that 24.5% of the global deaths are as a result of hypertension, with 13% of the total annual deaths occurring in low- and middle-income countries (LMICs) including Kenya (WHO, 2018). It is estimated that close to 40% of these deaths occur in individuals aged below 70 years. Most of these premature deaths can easily be prevented through adherence to lifestyle modifications (Research Triangle Institute (RTI) International, 2020).

Lifestyle modifications are behavioral interventions aimed at altering various health related behaviors within one's lifestyle, hence reducing the risk of hypertension and/or its complications (RTI, 2020). They include smoking cessation, limiting use of alcohol, healthy diet, sufficient physical activity, and medication adherence (RTI, 2020). These lifestyle modification strategies have been found to reduce the Hypertension thus reducing hypertension related complications. One of the previously implemented programs in China indicates that using low-sodium, potassium-enriched cooking salts can reduce blood pressure hence preventing hypertension complications (Ojangba et al., 2023). Even though studies have shown only a modest decrease in blood pressure as a result of dietary and lifestyle changes, lifestyle modifications may complement anti-hypertensive medications and are likely to play a crucial role in the management of hypertension for most patients (Ojangba et al., 2023).

In 2018, the WHO published the six modules that form the HEARTS (Healthy lifestyle counselling, Evidence-based treatment protocols, Access to essential medicines and technology, Team-based care, Systems for monitoring) technical package. This initiative, supported by the World Heart Federation (WHF), offers a structured strategy to enhance cardiovascular health on a national scale and was created to assist countries in setting up systems for the early identification, treatment, control, and ongoing monitoring of hypertension within primary health care services (WHO, 2023).

Sub Saharan Africa (SSA) region has the highest proportion of individuals affected by hypertension, with approximately 46% of adults aged 25 and above living with the condition, as opposed to 35–40% in other regions globally (WHO, 2023). This is attributable to the shift from traditional ways of living to more westernized lifestyles (Kandala et al, 2021). Additionally, a significant number of individuals with hypertension in Africa are unaware of their condition and often remain untreated or have poorly managed blood pressure, placing them at an increased risk of stroke, heart disease, and kidney complications. According to WHO, the prevalence of hypertension among adults aged 30 – 79 years has increased from 45 million in 1990 to 106 million in 2019.

The WHO's HEARTS technical package was introduced in Kenya in 2018 as a strategy to reduce the burden of cardiovascular diseases (CVD) (Kenya National Guideline for CVD management, 2024). The components in the package involves among others health education and lifestyle modifications to prevent cardiovascular disease. The HEARTS technical package was integrated into primary health care system to help Improve hypertension control through lifestyle modifications (Kenya National Guideline for CVD management, 2024).

1.2 Statement of the Problem

The World Health Organization (WHO) targets to reduce the global prevalence of hypertension by 33% between 2010 and 2030, potentially preventing over 24.3 million hypertension-related deaths. To achieve this target, a combination of pharmacologic therapy and adoption of lifestyle modification is required. Unfortunately, adherence to lifestyle modifications remains significantly low.

Globally, fewer than 40% of individuals with hypertension follow recommended lifestyle changes. In sub-Saharan Africa, adherence rates are even lower, averaging around 29%. In Kenya, studies estimate that less than 10% of patients with hypertension adhere to lifestyle modification guidelines. However, there are limited documented studies on lifestyle modification practices among patients with hypertension in Embu County. This study, therefore, sought to assess the determinants of adherence to recommended lifestyle modification practices among adult patients with hypertension attending Embu Level 5 Hospital.

1.3 Objectives of the Study

1.3.1 Broad Objective

To assess the determinants of adherence to the recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending Embu Level 5 Hospital

1.3.2 Specific Objectives

i. To determine the level of adherence to the recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending Embu Level 5 Hospital
ii. To identify individual related factors influencing adherence to the recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending Embu Level 5 Hospital
iii. To determine home-based factors influencing adherence to the recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending Embu Level 5 nHospital

1.4 Research Questions

i. What is the level of adherence to the recommended lifestyle modification practices by patients with hypertension aged 30-79 years attending Embu Level 5 Hospital?
ii. What are the individual factors influencing adherence to the recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending hypertension clinic at Embu Hospital?

iii. What are the home-based factors that influence the adherence to the recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending hypertension clinic at Embu Level 5 Hospital?

1.5 Significance of the Study

The findings of this study provide valuable information to policy makers for developing appropriate policies and guidelines to improve adherence to recommended lifestyle modifications by patients with hypertension. Further, the findings will help the health care workers to develop targeted strategies to improve adherence to recommended lifestyle modification strategies among patients with hypertension. Improved adherence will be beneficial to patients as the risk of developing hypertension complications with attendant consequences will be reduced. This enhances the achievement of strategic Development Goal(SDG)3.4: reducing premature deaths from Non communicable diseases(NCDs) including Cardio-vascular diseases. The findings also contribute to the ongoing studies on the recommended lifestyle modification practices of patients with hypertension thus adding to the body of knowledge of medical surgical nursing.

1.6 Scope of the Study

This study was carried out at the Embu Level 5 hospital and adopted an analytical cross-sectional survey. Patients with hypertension aged 30-79 years attending the medical outpatient clinic were involved in the study. The focal point of the study was assessing individual -related and home- based factors influencing adherence to lifestyle modification practices. Data were collected through researcher developed and administered semi- structured questionnaires, modified H-Scale and three Focus Group Discussions (FGDs) over a period of one month.

1.7 Assumptions

In this study, it was assumed that the sample selected for the study accurately represents the broader population of interest. Further, it was assumed that sociocultural and economic factors influencing participants' responses and behaviors remain relatively constant throughout the study and did not significantly impact the research outcomes.

1.8 Operational Definition of Terms

Adherence	Refers to the extent to which a participant's behavior corresponds to recommended lifestyle modification practices.
Care Giver	Refers to any adult person who is staying and/or offering socioeconomic support to a person with hypertension
Home-Based Factors	Refers to elements that play a role in one's health practices based on where one lives for home environment and socioeconomic status. They include the social support system, sources of income and the patients' residence .
Hypertension	Refers to a condition whereby when the blood pressure is measured in two different days the systolic BP (numerator) is ≥140 mmHg and/or the diastolic BP (denominator) is ≥90 mmHg (recorded as 140/90mmHg and measured through a sphygmomanometer) on both days.
Hypertensive Patient	An individual with a blood pressure reading of 130 (Systolic) and above 80 (Diastolic) mmHg.
Individual Related Factors	Refers to components of a person that influence a person's adherence to lifestyle modification strategies. These include level of education, personal beliefs and attitude.
Lifestyle Modifications	Refers to lifestyle changes for the control of hypertension. They include eating habits, weight reduction, salt restriction, abstaining from alcohol, smoking cessation and physical activity
Modifiable Factors	Refers to risk factors that can be changed through certain lifestyle modifications to prevent or manage hypertension

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of the Recommended Lifestyle Modification Practices in Hypertension

Hypertension is a long-term health condition marked by consistently high blood pressure levels in the arterial system. Globally, hypertension continues to rank as one of the major causes of mortality and long- term health complications. This widespread and life-threatening condition poses a major public health challenge, contributing to serious health complications (WHO, 2023). The 2017 guidelines released by the American Heart Association (AHA) in collaboration with the American College of Cardiology (ACC) define Stage 1 hypertension as a systolic blood pressure (SBP) ranging from 130 to 139 mmHg, or a diastolic blood pressure (DBP) between 80 and 89 mmHg. In contrast, Stage 2 hypertension is characterized by an SBP of 140 mmHg or more, or a DBP of 90 mmHg or above (Elmaki 2025). On the other hand, hypertension (high blood pressure) characterized by a SBP of 140 mmHg or higher and a DBP of 90 mmHg or higher (WHO, 2023).

A range of modifiable and non-modifiable factors contribute to the development of hypertension (WHO, 2021). Modifiable risk factors include excessive salt intake, insufficient potassium consumption, being overweight or obese, physical inactivity, tobacco use, excessive alcohol intake, psychological stress, and diabetes mellitus. Implementing lifestyle modifications is key to addressing these modifiable risks, as they promote healthier behaviors that can effectively manage and reduce elevated blood pressure (WHO, 2021).

Lifestyle modification plays a very critical role in hypertension management and prevention and are frequently advised as the first line of treatment, either alone or in combination with medication (WHO, 2021). Evidence indicates that lifestyle modification can significantly reduce blood pressure levels in individuals with both well-controlled and treatment-resistant hypertension (Elmaki, 2025). It includes: Dietary approaches to stop hypertension (DASH) diet, physical activity, weight management, reduced alcohol consumption, reduced tobacco use, stress reduction, and reduced caffeine consumption (Elmaki, 2025).

2.2 Level of Adherence to the Recommended Lifestyle Modifications

The primary drivers of hypertension appear to be individual environmental exposure such as unhealthy lifestyle like diets high in sodium and low in potassium, excess body weight and obesity, alcohol consumption, tobacco use, and a lack of physical activity (WHO, 2023). Systolic hypertension and its negative health effects can be prevented through lifestyle changes such as consuming a heart-friendly diet with less than one teaspoon of salt per day, ensuring sufficient potassium intake from fruits and vegetables, maintaining a healthy body weight, engaging in regular physical activity, and limiting harmful alcohol consumption (Roth et al., 2020). Despite the well-documented negative health impacts of high blood pressure, it remains poorly controlled worldwide, largely due to insufficient adoption of non-pharmacological measures such as lifestyle changes (Abebe et al., 2025). In a study among hypertensive patients in a hospital in Kathmadu city in Nepal, an adherence rate of 20.8% was established (Dhakal et al, 2022).

Lifestyle modification strategy is poorly implemented in Africa. Several studies done in African countries have confirmed that most individuals from this area do not practice lifestyle modifications. For instance, one study done in Ethiopia on lifestyle modification practice and associated factors among diagnosed hypertensive patients revealed that only 33.3% of the respondents practiced recommended lifestyle modifications (Angelo & Geltore, 2019). Similarly, a study carried out in Ethiopia on level of adherence indicated that the overall adherence level was low at 26.9 (Mideksa et al, 2022). In another study in Ghana on the role of lifestyle factors in controlling BP among Hypertensive patients, the findings showed that more than half of participants did not engage in any exercise activity (Amoah et al., 2020). Studies in Ethiopia by Angelo & Geltore (2019) and Geremew et al (2023) established an overall adherence rate of 33.3% and 32.4% respectively.

Lifestyle modification strategies are poorly practiced in Kenya. In a study conducted at Kenyatta National Hospital (KNH) by Kimani et al. (2019) on association of lifestyle modification and pharmacological adherence on blood pressure control among patients with hypertension, it was determined that patients adhered more to pharmacologic therapy than healthy lifestyle practices. In western Kenya, Gala et al (2023) in their

study found that only 40% of hypertensive patients adhered to lifestyle modification. Further, a study at Thika Level 5 hospital found an adherence rate of 45.9% (Njaramba et al,2025). There are no documented studies encountered in the study area on level of adherence hence this study aims to identify level of adherence to lifestyle modification that need to be addressed to enhance overall control of hypertension and reduce the disease burden.

2.3. Individual Factors Influencing Adherence to the recommended Lifestyle Modifications

2.3.1 Sex

Several studies have established gender as an important determinant of hypertension as a disease and the practice of lifestyle modification practices. A study by Mwenda et al (2021) in Imenti North Sub-County, it was established that most hypertensive patients were female. Similarly, a study by Mahmood et al (2020) in Pakistan also established that female patients had higher odds of adhering to lifestyle modification than male patients. Additionally, in a study on adherence to healthy lifestyle and associated factors in public hospitals in Amhara in Ethiopia, it was established that female patients were 2 times more likely to adhere to recommended lifestyle modification practices compared to their male counterparts. However, other studies such as that by Siam et al (2024) in Saudi Arabia did not find any significant association. There are limited studies in the study area regarding the influence of sex on adherence.

2.3.2 Knowledge on Hypertension

Globally, most studies have described some knowledge deficit on hypertension among the hypertensive patients. However, no previous studies comparing knowledge between hypertensive and non-hypertensive patients were found. Furthermore, WHO estimates a total 580 million hypertensive people (41% of women and 51% of men) do not know that they have the condition because they were never diagnosed (WHO, 2023). Persons who are not aware of their hypertensive status are unlikely to practice lifestyle modification (WHO, 2023). A study conducted in India on knowledge on risk factors for hypertension among the rural Indian population, it was revealed that more than 30% of the participants were unaware of their hypertension status and 69% had inadequate knowledge on hypertension (Businge et al., 2019).

Studies on hypertension awareness in Sub-Saharan Africa (SSA) have also showed a low level of awareness regarding hypertension. A national study carried out in several African countries showed that 46% in Botswana had an awareness rate of 46% and Guinea 24.8% and , and Nigeria 60% (Cissé et al., 2021). Similarly, inadequate Knowledge on hypertension was reported in a study in Ghana whereby about two-thirds of the patients with hypertension who participated in the study were unaware of their condition and only about half of the participant had their blood pressure controlled (Tannor et al., 2019). A study conducted in Nigeria revealed that even though the participants had high awareness on hypertension, unhealthy lifestyle practices and non-regular routine screening were prevalent (Anyanti et al., 2020). A comparable study in 2024 in Ethiopia highlighted that "poor knowledge about hypertension" was a major predictor of non-adherence to lifestyle modifications. This lack of knowledge is often rooted in limited educational opportunities (Zeleke et al, 2025).

In Kenya, a significant number of hypertensive patients are not aware of their elevated blood pressure levels. A study by Cissé et al.,(2021) in Kenya among four African countries established that Kenya had an awareness rate of 15.6%. In another study by Mwenda et al in 2019, it was established that hypertensive patients who participated in the survey had little knowledge of their own blood pressure and were unable to estimate it within acceptable levels(Mwenda et al, 2019). Further, there was deficient knowledge on risk factors to hypertension which contributed to poor adherence to recommended lifestyle modification practices(Mwenda et al, 2019). It is not clear the extent to which the patients in Embu are aware of the hypertension status and its influence on lifestyle modification hence the need for this study.

2.3.3 Knowledge on the Recommended Lifestyle Modifications

Lifestyle modification is a keystone and is also considered the first line of hypertension management for all hypertensive patients. Evidence has shown that these lifestyle modifications can lower BP levels, enhance the efficacy of pharmacological therapy of hypertension hence reducing the risks of CVD(Elmaki,2025). The practices are dopted by patients with hypertension to control progression of hypertension and prevent its short term and long-term complications. As such the practices are initiated before commencement of anti-hypertensive therapy and also after to improve treatment

outcome(WHO,2023). One of the studies on effects of Lifestyle Modification on Patients with Resistant Hypertension, revealed that an intensive 4-month program of exercise and dietary modification as adjunctive therapy delivered in a cardiac rehabilitation setting resulted in improved BP control in patients with resistant hypertension (Blumenthal et al., 2021). These modifications should include: salt reduction, healthy diet, healthy drinks, and moderation of consumption alcohol, weight reduction, smoking cessation and regular physical exercises (Thomas et al., 2020). Hypertensive patients need to be aware of the risk factors of hypertension which can be modified and this will aid in implementation of necessary lifestyle modifications to prevent hypertension complications (Mwenda et al., 2019). For instance, when early stage of hypertension is confirmed, it is paramount that lifestyle changes are instituted where appropriate; weight reduction if body mass index is $\geq$ 25kg/m2, reduction of salt intake to no more than one teaspoon day, reduction or cessation of alcohol intake, cessation smoking, consumption of a balanced diet which is low in saturated fats and sugars, low fat dairy products, diet high in fibers, fruits, vegetables and unrefined carbohydrates (Ferguson et al., 2018).

Knowledge on hypertension and implementation of the recommended lifestyle changes has been linked with blood pressure control in patients with hypertension. However, evidence from previously done studies has demonstrated inadequate knowledge on the same among various communities which in turn affects the prevalence of hypertension among these communities. Several studies deduced that most hypertensive patients are not knowledgeable on application of lifestyle modification strategies on management of hypertension and adhering to medication as prescribed (Yusuf et al., 2022). For instance, in a study conducted in Nigeria on whether patients understand their medicine & lifestyle modification in managing hypertension, findings revealed that a good percentage of the respondents were aware of lifestyle modification strategies of hypertension control (Kebede et al., 2022).

Recommendations from the JNC-7 guidelines, ESH/ESC-2013 practice guidelines and adult hypertension guidelines include the following: Salt restriction to <6g per day (sodium chloride) or 2.4g/day (sodium) lowers SBP by approximately 2-8 mmHg, moderation of alcohol consumption to not more than 2 drinks (20-30g/ day) in men and

not more than 1 drink (10-20g) per day in women lowers SBP by approximately 2-4 mmHg. High-intensity lifestyle modification programs can help individuals with overweight and obesity lose 5–10% (Downey & Kyle, 2018). In addition, in the new WHO guideline for hypertension treatment, "Dr Bente Mikkelsen, Director of WHO's Department of Noncommunicable Diseases mentioned that: "The need to better manage hypertension cannot be exaggerated. By following the recommendations in this new guideline, increasing and improving access to blood pressure medication, identifying and treating co-morbidities such as diabetes and preexisting heart disease, promoting healthier diets and regular physical activity, and more strictly controlling tobacco products, countries will be able to save lives and reduce public health expenditures."

Patients' level of knowledge on most of lifestyle modifications is high and implementation of the same is average in most developed countries. For instance, in one study conducted in Chennai India revealed that there were large gaps in consistency of BP medication use which were strongly associated with knowledge about BP medications (Sudharsanan et al., 2021). Another study conducted to assess knowledge, attitude and practices of lifestyle modification and associated factors among hypertensive patients on-treatment follow up, revealed that though the encouraging high knowledge status and favorable attitudes towards lifestyle modification among hypertensive patients, 62% of the respondents had poor practices (Kebede et al., 2022) Health education has been found to play a crucial role in enhancing self-care practices among individuals with hypertension (Miezah & Hayman, 2024).

In one study conducted in Somalia, it was reported that 68% of patients with cardiovascular disease had poor knowledge, negative attitude and poor practices towards lifestyle modifications (Yusuf et al 2022). Inadequate knowledge on lifestyle modification strategies has been found to be associated with poor practice of these strategies. A study conducted in Zambia revealed that the level of knowledge in management of hypertension was largely correlated with practice of lifestyle modification strategies as it was found that the patients who were knowledgeable on management of hypertension implemented these lifestyle modification strategies (Jack et al., 2018).However, in another study conducted in Kenya noted that control of hypertension had no association with individual awareness on healthy lifestyle nor does

the awareness correlate to adherence to taking anti-hypertensive medication. Therefore, a conclusion was made that awareness of hypertension did not improve people's lifestyle (Mwenda et al., 2019).

2.3.4 Level of Education

The level of education has an influence of adherence to lifestyle modification practices. The high prevalence of Hypertension and low levels of adherence to the recommended lifestyle modification in LMICs has been linked to low levels of education in those areas. A study done in Ethiopia revealed that the participants with primary education level had lower adherence rates than those with higher education level (Abebe et al., 2024). Other studies such as that by Siam et al. (2024) in primary Health care facilities in Saudi Arabia and Chitani et al. (2022) in Malamulo Hospital, Thyolo, Malawi also identifies level of education as a significant predictor of adherence to lifestyle modification practices.

A four-year cohort study conducted in Finland found that hypertensive patients were less likely to maintain lifestyle modifications after starting anti-hypertensive medication, as indicated by weight gain and a decline in physical activity levels (Korhonen et al., 2020).

Evidence shows that lifestyle modification practices including DASH diet has a significant effect on BP control hence the Health Care Provider's (HCP) advice is a potentially influential and perhaps significant initial step in management and prevention of hypertension. However, several factors for instance; provider-perceived patient characteristics such as time, and lack or perceived lack of accessible patient education materials have been liked to poor practice of and adherence to lifestyle modification in hypertension management. Multiple factors contribute to the low level of DASH diet implementation, including modern food environment which has contributed easy access to fast food, socioeconomic factors, clinical factors, and patient knowledge.

The first step to a patient making lifestyle changes to reduce blood pressure is often advice from their physician. However, a host of barriers prevent physicians from recommending dietary and other lifestyle changes (WHO, 2021). Most studies have revealed that most physicians cite lack of adequate time to provide proper counseling

on general nutrition, perception that patients lack interest and motivation in making lifestyle changes, and lack of training in nutritional counseling as barriers to consistent provision of life-style advice to patients (WHO, 2021).

2.3.5 Perception Regarding Lifestyle Modification

The 2020 Global Hypertension Practice Guidelines by the International Society of Hypertension recommend lifestyle changes as the primary approach for managing hypertension, helping to minimize the reliance on medication (Unger et al., 2020). Lifestyle change behavior is a patient focused care strategy that provide the patients with opportunities to be actively involved in their well-being hence decreasing their dependence on drug therapy (Miezah & Hayman, 2024). Studies done in the past have revealed that tools such as Beliefs, Attitude, Subjective Norms, Enabling Factors (BASNEF) model, can help the individuals to modify their practice based on individual's decision making.

Studies have revealed that patients' attitudes toward lifestyle modification is favorable. For instance, one study conducted in Ethiopia revealed that 66.4% of the respondents had favorable attitude towards lifestyle modification as an approach to hypertension management (Bogale et al., 2020).

2.4 Home Based Factors Influencing Adherence to the recommended Lifestyle Modification

Home based factor may influence one's ability to adopt lifestyle changes especially among the hypertension patients. They require proper support at home to sustain the recommended healthy lifestyle such as dietary recommended foods, physical exercise and stress management.

2.4.1 Support System

The significance of familial and social support in management of long-term illnesses has been well acknowledged across SSA . studies have shown that having support may positively affect the adherence to the recommended lifestyle changes among individuals living with hypertension globally(Alzahrani et al., 2022; Chitani et al., 2022) . According to a study by Alzahrani et al, social support from family members

contributes to better outcomes through providing emotional encouragement and help with activities such as health meal preparation and physical exercise routines (Alzahrani et al., 2022).

A multi- center cross-sectional study on adherence to Healthy Lifestyle and Associated Factors among Hypertension Patients who were under Follow-up at Public Hospitals in Northwest Amhara, Ethiopia established that having social support doubled the odds of adhering to lifestyle modification practices. Similarly, a study by Chitani et al. (2022) established that having family support or being a member of a support group increased the odds of adherence to lifestyle modifications four times. In a comparable study in developed countries, it was established that lack of social support was associated with reduced motivation and poor adherence to lifestyle modifications (Khafaji et al, 2021).

Despite all this, cultural norms, economic instability and migration frequently interfere with traditional support system. A study by Nyaaba et al. (2021) in Ghana revealed that limited family support significantly hindered the adaptation to healthy lifestyle among the hypertension patients. Additionally, in most African areas, cultural practices may compete with or undermine medical recommendations hence interfering with the adherence (Dzudie et al., 2022).

The role of social support in adherence to generally hypertension management is evident in Kenya. However, this is affected by evolving family dynamics and socioeconomic challenges. A recent study by Wambua et al. (2022), stated that patients who had support from their family members were more likely to adhere to health lifestyle. However, lack of awareness or traditional dietary preferences by the family members sometimes interferes with support efforts (Wambua et al., 2022). There is limited information on the effect of social support available to patients with hypertension in the study area.

2.4.2 Residence

Residence may be an influence to lifestyle modification among the hypertension patients. Patients living urban areas seem to have better access to healthcare services

including information about healthy lifestyle (WHO, 2023). On the contrary, it has been revealed that urban residence may not adhere to recommended life style modifications due to hindrances such as lack of recreational spaces (Nguyen et al., 2021).

A systematic review by Gathu et al. (2023) revealed that rural populations in Africa experience limited access to quality healthcare services and information, as opposed to urban populations where even though they have better access, they often engage in sedentary lifestyles and unhealthy diet options. Residence in Kenya critically shapes health seeking behavior and adherence to healthy lifestyles. A study done by Mutua et al. (2021) in Nairobi County showed that urban residents experienced a lot of challenges while adhering to dietary changes due to easy access to unhealthy foods. The patients living in rural areas may have easy access to healthy foods are involved in more physical activities but have limited to health care services and information hence influencing lifestyle modification practices (Wambua et al., 2022).

2.5 Theoretical Framework

This study was guided by the health belief model, which is a psychological model that seeks to explain and predict health behaviors by focusing on patients' attitudes and beliefs. By adopting this model, the study sought to explain why individual patients may choose to accept or reject preventive health services or adopt healthy behaviors such as lifestyle modifications despite being aware of the associated risks. In this study, the HBM provided a framework for assessing the extent to which patients' beliefs influence their adherence to lifestyle modification practices for hypertension management. Its assumption and relevance to this study was that people will adopt to lifestyle changes only when the following conditions exist; Perceived susceptibility where the individual believes that he or she is at risk of developing hypertensive complications. For instance, if a person does not believe that leading a sedentary lifestyle increases the risk of hypertensive complications, there will be no stimulus to implement the health lifestyle practices. Perceived severity which is a patient's understanding of the seriousness of hypertension complications. This model postulates that the more severe patients perceive the condition, the more motivated they are likely to be in adopting and adhering to healthy lifestyle. Perceived benefits which refer to the individual's belief in the effectiveness of the recommended healthy lifestyle; i.e., if patients believe that reducing smoking, salt and alcohol intake, engaging in regular

exercise, or managing stress will help control their blood pressure, they are more likely to adopt to healthy lifestyle. Perceived barriers which are negative factors that may impede the individual's healthy lifestyle practices. In this study barriers to lifestyle modification adherence may include factors such as limited knowledge about healthy practices, financial constraints, limited access to healthy food options, long waiting times at the health facility, or lack of supportive social environments. Understanding these barriers is essential in designing interventions to improve adherence. Cues to Action which are the triggers that motivate individuals to take action toward healthy lifestyle. These may include improving self-awareness of the hypertension and its prevention through lifestyle modifications. Lastly, Self-efficacy which is an individual belief in their ability to successfully implement the recommended healthy behaviors to prevent or control hypertension. Patients who believe that they can effectively change their unhealthy habits are more likely to adhere to these behaviors. By applying the HBM, this study aims to explore how these constructs influence patients' decision-making and behavior regarding lifestyle modification. The illustration in the Figure 2 outlines how the HBM is being related to the study context:

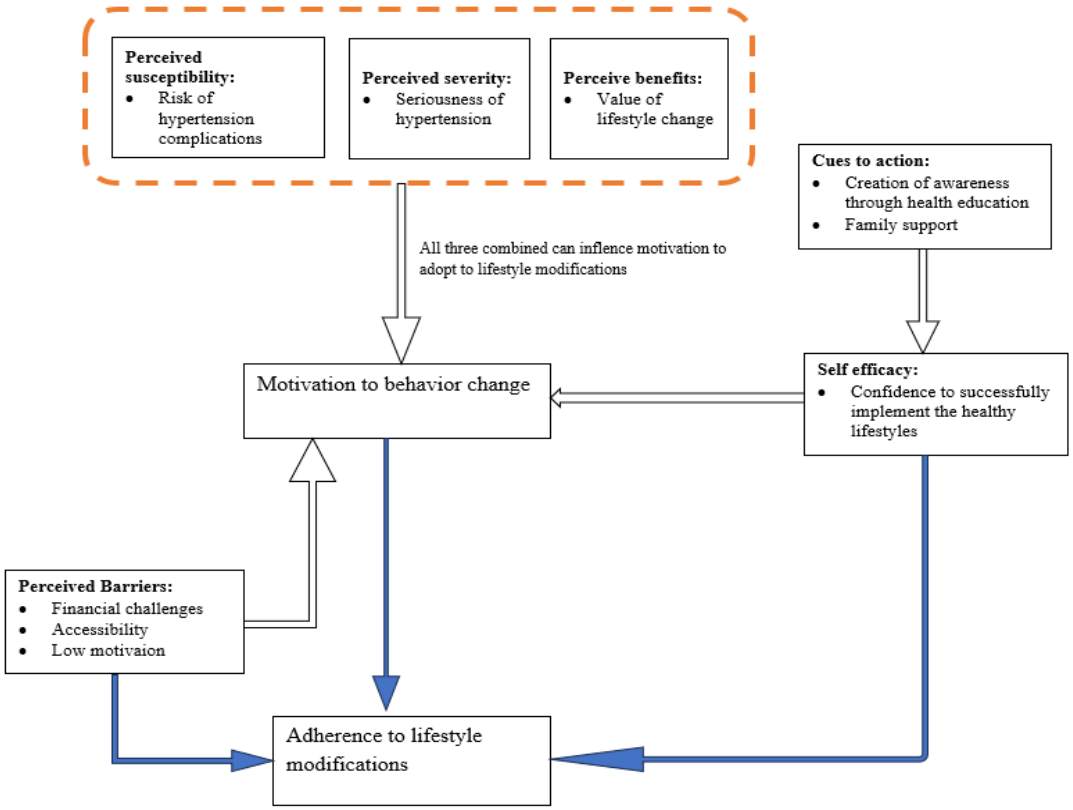

Figure 2.1: The Health Belief Model

Adopted from Becker, (1974)

2.7 Conceptual Framework

This study was guided by the conceptual framework shown in Figure 2.2

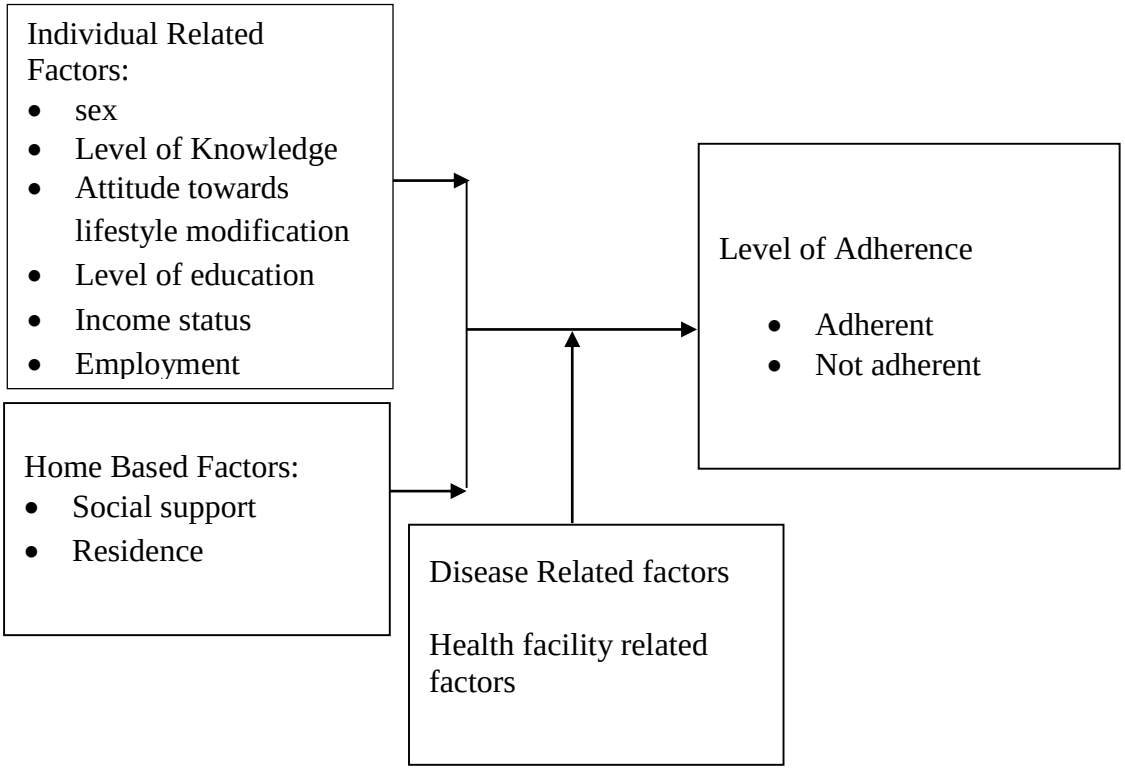

Figure 2.2: A Conceptual Framework for Management of Hypertension

Source: Researcher, (2025)

Figure 2 outlines the relationship between various factors influencing adherence to lifestyle modification among patients with hypertension. In the correlation there are the independent variables, which represent the primary factors that are thought to affect the adherence to lifestyle modification. These are further categorized into Individual - related factors and Home-based factors.

The dependent variable is the outcome that the study sought to explain which in this framework is the adherence to recommended lifestyle modification practices. This is the extent to which the patients follow the recommended lifestyle changes (i.e., diet, physical activity, smoking cessation, alcohol reduction and stress management). In overall, the framework emphasizes the relationship between personal, social, economic, and cultural factors in determining the success of lifestyle modification interventions among hypertensive individuals.

Individual related factors such as sex, patient's knowledge of hypertension and the role of lifestyle modification; attitude which encompasses the patient's mindset, level of education and income status has an influence on adherence to life style modifications. Having knowledge regarding lifestyle modifications and a positive attitude improves adherence to lifestyle modifications practices.

Home based factors on the other hand refers to elements within the patient's immediate environment that may support or hinder adherence. These include: social support such as encouragement from family members, friends, or caregivers, which can significantly affect a patient's motivation and capacity to implement lifestyle changes; and residence as the living environment (urban or rural) may influence access to health lifestyle. Having social support improves adherence to lifestyle modifications. The interaction between dependent and dependent variable is influenced by intervening variables. For example, the presence of hypertension complications may have a positive influence on lifestyle modification.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Location of the Study

The study was carried out at the Embu Level 5 Hospital in Embu County, Kenya. The facility is located along Embu – Meru highway at coordinates 0.5239° S, 37.4525° E. This is the referral Hospital for Embu County with a catchment area of more than 600,000 people, where the majority of the hypertension cases are referred from other health facilities within the County. The study was carried out in the medical Outpatient clinic. The clinic operates on every Wednesday of the week between 8:30 AM to 4:30PM. It is serviced by two (2) physician specialists, two (2) medical officers, two to three medical officer interns (2-3) and two (2) nurses. Embu Level 5 hospital was selected because it is a high-volume hypertension clinic in the region attending to approximately 2400 patients with hypertension annually (Embu HMIS, 2024).

3.2 Research Design

An Analytical cross-sectional survey design was used whereby the researcher employed both quantitative and qualitative methods in order to achieve the objectives of this study. The methods were employed sequentially whereby the researcher initially collect and analyze quantitative data, and used the same cohort to seek further clarification.

This study design was preferred because it allowed for the collection of data at a single point in time, making it efficient and cost effective (Chikaodili & Chikeme, 2020). It also enabled the researcher to describe the current level of adherence to lifestyle modification practices among hypertensive patients and to explore the factors influencing this adherence (Chikaodili &Chikeme, 2020). In addition, the integration of both quantitative and qualitative approaches provided a comprehensive understanding of the phenomena under study. Quantitative data offered measurable insights on the prevalence and patterns of adherence, while qualitative data helped to uncover deeper perceptions, motivations, and barriers experienced by the patients.

3.3 Study Population

The study involved all patients with hypertension aged 30-79 years who have been booked for follow-up care at the outpatient medical clinic at Embu Level 5 Hospital.

According to health information system (HIS) at the hospital, it is estimated that about 50 patients are reviewed of their condition at the clinic every week and this translates to about 200 patients every month (Embu HMIS, 2024).

3.3.1 Inclusion Criteria

The study included all the patients with hypertension aged 30-79 years. According to WHO, this age group shows a high prevalence of hypertension compared to other age categories (WHO, 2021)

3.3.2 Exclusion Criteria

The study excluded patients diagnosed within the last one month before the study since they did not have adequate time to practice or may not have been aware of the recommended lifestyle modification practices. Those who were too sick to participate and those who declined to consent were excluded.

3.4 Sample Size Determination

Cochran's formula was used to calculate the sample size for the patients to participate in the study. The Cochran's formula is as follows:

$$\mathbf{n} = \frac{Z^2 (p) (q)}{d^2}$$

Where; **n** = sample size when N is greater than 10 000

z = the standard normal deviate value for the level of confidence, for instance 95% level of confidence =1.96.

d = margin of error or level of precision at 0.05 for CI at 95%

p = proportion to be estimated, in one study on evaluation of hypertension management carried out at KNH in 2016, a BP control rate was reported to be at 30% (Mongi et al, 2016); therefore, p = 0.3

q = 1- p (0.7)

$$\frac{1.96^2 \text{ x } 0.3 \text{ X } 0.7}{0.05^2} = 322.8$$

n = 323

However, since the study population was less 10,000 the sample size was adjusted using the formula:

$$nf = \frac{n}{1 + n/N}$$

Where;

n_f = the desired sample size when N is less than 10 000

n = sample size when N is greater than 10 000 (n = 323)

N = estimated population size (400 hypertensive patients)

$$nf = \frac{n}{1 + n/N}$$

$$nf = \frac{323}{1 + 323/400}$$

$$nf = 178.7$$

To cater for non- response rate, 5 % of the calculated sample size was added (9 participants. Therefore, the final sample size was 189.

3.5 Sampling Procedure

Systematic random sampling technique was used to select the study sample. In this method, every second patient from the study population was selected. The first participant was determined randomly through the use of table of random numbers. The study population is 400 and the sample size was 189.

$$n^{th} = N/n_f = \frac{400}{179} = 2.1 = 2^{nd}$$

The patients attending the medical outpatient clinic were given numbers 1 to 400 and every 2nd patient was invited to participate in the study. In the event where the participant declined, the next person was be invited to participant. Participants for FGD were purposively selected from among those who showed high and low levels of adherence to recommended lifestyle modification practices.

3.6 Data Collection Instruments

A modified Hill-Bone compliance(H) scale by Adebowale & Adeoye(2018) was used to assess lifestyle modification practices. Among the items assessed were medication adherence, intake of low salt diet, physical activity, smoking status, alcohol use and weight management. A semi-structured questionnaire was used to gather data on the patient's demographic characteristics as well as individual-related and home -based

factors. The H-scale was incorporated into the questionnaire and administered as one tool. The Focus group discussions (FGD) were facilitated using a semi-structured discussion guide. Three FGDs of 6 participants each were undertaken since at this point data saturation had been attained. FGD enabled the researcher to get an in-depth understanding of the facilitators and barriers to adherence to lifestyle modification practices

3.7 Pretesting

A pretest of study was carried out at Chuka Level 5 Hospital whereby 18 questionnaires, which is 10% of the sample size, were administered to patients with hypertension attending the medical outpatient clinic. Chuka hospital was selected for the pretest because it has a comparable patient population and setting to the actual study site. The results of the pretest were used to review the questionnaires and necessary adjustments were made before the actual data collection.

3.7.1 Validity of the Study Instruments

Measures were taken to ensure that there were minimal errors of the data collected. The questionnaires were reviewed by three experts involved in the management of patients with hypertension. These were a physician, a medical Officer and a nurse attending to patients with hypertension. Their inputs were incorporated into the instruments.

3.7.2 Reliability of the Study Instruments

A test re-test method was used to determine the reliability of the study instruments. This involved the administration of the same questionnaire to the same sample of participants during the pretest on two separate occasions 2 weeks apart. The correlation coefficient(r) between the responses from the first and second administrations was analyzed using SPSS version 29.0. Items with $r>0.7$ will be considered reliable. Those which had lower scores were revised or discarded.

3.8 Data Collection Procedures

Data was collected over a period of 1 month from 30th July to 3rd September 2025. Prior to initiating the data collection process, the researcher obtained all the necessary approvals and permissions from relevant authorities, including ethical clearance and

administrative authorizations. On every clinic day, the researcher approached the potential participants as per the sampling procedure, after which the study was introduced to the participants. Voluntary informed consent was then obtained before proceeding with the data collection.

Once the consent has been obtained, the researcher then guided the participants through the filling of the questionnaire by reading the questions and allowing the participant time to respond. The administration of the questionnaire will be conducted in a quiet and private space within the clinic to ensure confidentiality, and each took 10-15 minutes to complete. After the completion of individual data collection sessions, all entries on the data forms were reviewed for completeness. Any unclear responses or missing information was immediately clarified with the participant before they left the data collection area.

Three FGDs were also conducted to explore in-depth perspectives on adherence to lifestyle modifications. The participants were organized into small groups consisting of 6 participants. Interactive discussions were carried out in a secluded space within the outpatient department. Each session was conducted in a respectful and participatory manner to encourage open and honest sharing of experiences and views. The discussions were audio-recorded with consent from the participants, and were conducted in Kiswahili and Kiembu dialects. Throughout the data collection period, privacy and confidentiality of the research participants was maintained. Each session lasted 1-1 ½ hours.

3.9 Data Analysis and Presentation

The data collected during the study was screened manually for errors and inconsistencies, coded and entered into Microsoft Excel spread sheet on a daily basis. Statistical analysis was conducted using SPSS software version 29.0. Descriptive statistical methods such as frequency distribution, percentages, and standard deviations were used to summarize participant characteristics and adherence patterns.

Chi square and multivariate logistic regression analysis were used to assess the relationship between individual- related and home- based factors and adherence to

lifestyle modification practices. The p-values of 0.05 or less were considered statistically significant. Qualitative data from the FGDs was analyzed thematically using NVivo version 13.0. The audio-records were transcribed verbatim and translated into English where necessary. The transcripts were read several times for familiarization, coded and categorized into themes relevant to the study objectives. The overall results were presented in narrative form, tables, pie charts and graphs. Data analysis plan is shown in Table 3.1 below.

Table 3.1: Data Analysis Matrix

Objective	Variables	Type of data	Statistical procedure
To establish the level of adherence to lifestyle modification practices among patients with hypertension aged 30-79 years attending Embu Level 5 Hospital	Healthy diet Physical activity Smoking and alcohol cessation Stress management	Categorical	Frequencies, percent
To identify individual related factors influencing adherence to lifestyle modification practices among patients with hypertension aged 30-78 years attending Embu Level 5 Hospital	Knowledge Attitude Level of education Economic status Risk awareness Motivation	Nominal, ordinal Qualitative	Descriptive Chi-square Logistic regression analysis Thematic analysis
To determine home-based factors influencing adherence to lifestyle modification among patients with hypertension aged 30-79 years attending Embu Level 5 Hospital	Social support Residence Economic status	Ordinal, categorical Qualitative	Descriptive Chi-square Logistic regression analysis Thematic analysis

3.10 Ethical Consideration

The researcher obtained ethical clearance and approval from Chuka University Ethics and Research Committee (Appendix 4). The researcher secured a research permit from National Commission for Science, Technology and Innovation (NACOSTI) before commencing the data collection (Appendix 5). Authorization was also obtained approval from Embu Level 5 Hospital management team before data collection (Appendix 6).

An informed written consent was obtained from the study participants (Appendix 1) following a detailed explanation on the purpose of the study, their voluntarism to participate in the study, right to withdraw without any penalty. The participants were assured of confidentiality of their information. Anonymity was maintained by ensuring that the participants' names were not linked to the study documents. The researcher also ensured that all the materials used in the study were stored in a secure place to prevent unauthorized access.

CHAPTER FOUR

RESULTS

4.1 Demographic Characteristic of the Participants

Questionnaires were administered to one hundred and eighty- nine patients with hypertension. Out of these, 181 questionnaires were completed translating to 95.8% response rate. The mean age of the participants was 58.2 $\pm$ 12.21 years with several participants (29.8%, n=69) aged between 60-69 years. A notable 8.8%(n=16) were aged below 40 years. Majority of the participants (63.5%, n=115) were married. More than half of the participants (58.0%, n=105) were protestants. Most participants (47.5%, n=86) had been on treatment for hypertension for more than three years and approximately two thirds (65.2%, n=118) attended follow-up clinic for hypertensive patients monthly. The results are summarized in Table 4.1 below.

Table 4.1: Demographic Characteristics of the Participants

Variable	Frequency N=181	Percentage
Age of participants (years)		
Mean $\pm$SD	58.2$\pm$12.21	
30-39	16	8.8
40-49	28	15.5
50-59	45	24.9
60-69	54	29.8
70-79	38	21.0
Religion		
None	1	0.6
Catholic	73	40.3
Protestant	105	58.0
Muslim	2	1.1
Marital Status		
Never married	16	8.8
Married	115	63.5
Divorced/separated	11	6.1
Widowed	38	21.0
Other	1	0.6
Duration on Treatment for Hypertension		
<1 year	35	19.3
1-3 years	60	33.2
>3 years	86	47.5
Follow-up Clinic Attendance		
Weekly	13	7.2
Monthly	118	65.2
Every 2 months	19	10.5
Every 3 months	28	15.5
Other	3	1.7

4.2 Level of Adherence to Recommended Lifestyle Modification Practices

The level of adherence to lifestyle modification practices was assessed using a modified H-scale. As shown in table 4.2 below, 29.3%(n=53) of the participants adhered to the recommended lifestyle modification practices. On specific components of lifestyle modification, about two- thirds of the participants (67.4%, n=122) demonstrated medicine adherence with 60.8%(n=110) adhering to low salt diet. Most participants (92.8%, n=168) were not using alcohol with similar percentage (92.8%, n=168) avoiding smoking. Less than half of the participants (47.0%, n=85) adhered to physical activity, with only23.8%(n=43) adhering to weight management

Table 4.2: Level of Adherence to Recommended Lifestyle Modification Practices

Variable	Frequency N=181	Percentage
Level of Adherence		
Adherent	53	29.3
Not adherent	128	70.7
Medication Adherence		
Yes	122	67.4
No	59	32.6
Low Salt Diet		
Yes	110	60.8
No	71	39.2
Physical Activity		
Yes	85	47.0
No	96	53.0
Smoking Status		
Yes	168	92.8
No	13	7.2
Alcohol Use		
Yes	168	92.8
No	13	7.2
Weight Management		
Yes	43	23.8
No	138	76.2

4.3 The Relationship between Demographic Characteristics and Adherence to Lifestyle Modification Practices

A chi square test was computed to establish the relationship between demographic characteristics and the overall level of adherence to lifestyle modification practices. From the analysis, none of the variables was significantly associated with adherence (Table 4.3).

Table 4.3: The Relationship between Demographic Characteristics and Adherence to Lifestyle Modification Practices

Variable	X^2(df)	p-value
Age	0.412(4)	0.982
Religion	6.351(1)	0.096
Marital Status	2.138(4)	0.710
Duration on Treatment for Hypertension	1.525(2)	0.467
Follow-up Clinic Attendance	3.819(4)	0.431

*-significant at 95% CI

4.4 Individual Related Factors Influencing Adherence to Recommended Lifestyle Modification

As shown in table 4.4, about two thirds of the participants (69.6%, n=126) were female. The knowledge of hypertension and lifestyle modification mean score was 4.65 $\pm$ 1.255 out of 7 with most participants scoring between 4-5. Most of the participants (46.4%, n=84) had primary level of education. Half of the participants (51.4%, n=93) were self-employed with two thirds (66.9%, n=121) having an income of less than 10,000kenya shillings. Majority of the participants (51.9%, n=94) were aware of recommended lifestyle modification practices with 57.5%(n=104) having received health education on the same. Two thirds of the participants (66.8%, n=121) said viewed lifestyle modification practices as important with the remaining 33.2%(n=60) not sure of their importance

Table 4.4: Individual Related Factors Influencing Adherence to Recommended Lifestyle Modification

Variable	Frequency N=181	Percentage
Gender		
Male	55	30.4
Female	126	69.6
Level of Knowledge		
Mean Score ±SD	4.65 ±1.255	
0-3	26	14.4
4-5	105	58.0
6-7	50	27.6
Level of Education		
None	16	8.8
Primary	84	46.4
Secondary	64	35.4
Tertiary	17	9.4
Employment Status		
Unemployed	76	42.0
Self Employed	93	51.4
Formally Employed	12	6.6
Income(Ksh.)		
<10,000	121	66.9
10,000-19,000	36	19.9
20,000-29,000	9	5.0
30,000-39,000	9	5.0
>40,000	6	3.3
Awareness of Lifestyle Modification Practices		
Yes	94	51.9
No	87	48.1
Health Education on Lifestyle Modification Practices		
Yes	104	57.5
No	77	42.5
Importance of Lifestyle Modification Practices		
Very important	52	28.7
Important	69	38.1
Not sure	60	33.2

4.4.1 Source of Information on Lifestyle Modifications

The 94 participants who indicated awareness of recommended practices were asked to indicate the source of the information. As shown in Figure 4.1 below, the main source of information was health care providers

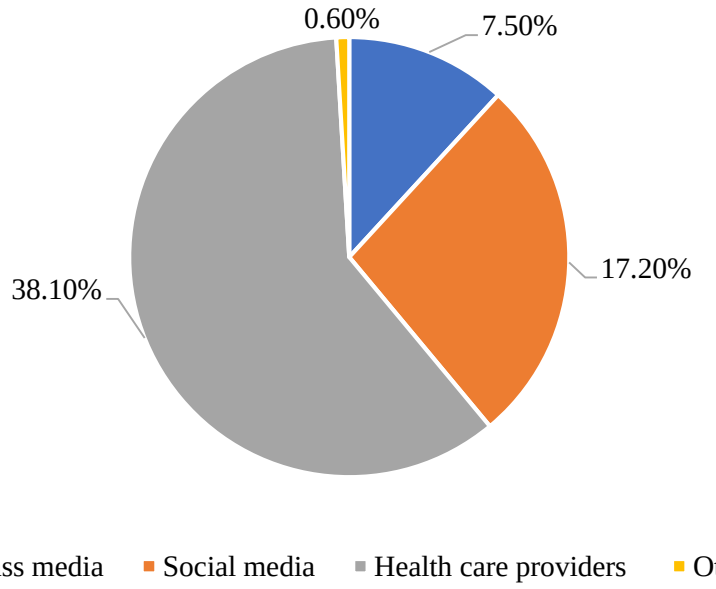

Figure 4.1: Source of Information

4.5 The Relationship between Individual Related Factors and Adherence to Lifestyle Modification Practices

After subjecting the individual related factors to a chi square to establish their association, it was established that adherence was significantly associated with gender of the participants(X^2=4.701(1), p=0.030) and the perception that lifestyle modification practices are important(X^2=4.234(1), p=0.040). the other variables were not significant. (Table 4.5)

Table 4.5: Chi Square Values for the Relationship between Individual Related Factors and Adherence to Lifestyle Modification Practices

Variable	X^2(df)	p-value
Sex	4.701(1)	0.030*
Knowledge	0.568(2)	.753
Level of Education	0.562(1)	0.454
Occupation	1.160(1)	0.281
Income Level	3.763(1)	0.052*
Awareness	0.233(1)	0.630
Health education	0.261(1)	0.609
Importance of lifestyle Modification practices	4.234(1)	0.040*

*-significant at 95% CI

A multivariate logistic regression analysis was performed to evaluate the influence of the individual related predictors of adherence to lifestyle modifications. That employment status was a significant predictor. Employed individuals had significantly lower odds of adherence than unemployed individuals (aOR = 0.30, 95% CI [0.10, 0.91], p = .033). Income also emerged as a significant predictor. Participants with a higher income had 2.7 times the odds of adherence compared to those in the lowest income bracket (aOR = 2.71, 95% CI [1.28, 5.72], p = .009).

Perceived importance of lifestyle modification was also a significant predictor. Participants who attributed importance to lifestyle modifications had 2.9 times the odds of adherence compared to those who found them unimportant (aOR = 2.93, 95% CI [1.39, 6.16], p = .005). The other variables were not significant predictors of adherence to recommended lifestyle modifications

Table 4.6: Individual related Predictors of Adherence to lifestyle modifications: Results from Binary Logistic Regression (N = 181)

Individual Variable	aOR	95%CI	p-value
Gender	0.43	[0.13,1.45]	.172
Knowledge	.922	[0.71,1.19}	.536
Level of Education	0.56	[0.26,1.21]	.140
Occupation	0.30	[0.10,0.91]	.033*
Income Level	2.71	[1.28,5.72]	.009*
Awareness			
Health education	0.51	[0.11,2.31]	.384
Importance of lifestyle	2.93	[1.39,6.16]	.005*
Modification practices			

**-significant at 95% CI, aOR = adjusted odds ratio. CI = confidence interval*

4.6 Home -based Factors Influencing Adherence to Recommended Lifestyle Modification Practices

As shown in table 4.7 below, majority of the participants (66.9%, n=121) resided in the rural areas with the remaining 33.1%(n=60) residing in urban areas. Most participants (60.8%, n=110) lived with their spouses with a notable21.0%(n=38) living alone. The majority of the participants (71.8%, n=130) indicated that they received support in their implementation of recommended lifestyle modification practices. Additionally, 27.6%(n=50) Indicated that they experienced challenges in the implementation of lifestyle modification practices

Table 4.7: Home -based Factors Influencing Adherence to Recommended Lifestyle Modification Practices

Variable	Frequency N=181	Percentage
Residence		
Rural	121	66.9
Urban	60	33.1
Lives with:		
Alone	38	21.0
Spouse	110	60.8
Children	21	11.6
Other relatives	12	6.6
Receives support in implementing lifestyle modifications		
Yes	130	71.8
No	51	28.2
Experiences challenges in implementing lifestyle modifications		
Yes	50	27.6
No	131	72.4

4.6.1 Source and Kind of Support

Patients who indicated that they received support in implementing lifestyle modifications were required to indicate the source and kind of support they received. The results showed that more than half of the participants (56.9%, n=74) received support from their spouses followed by children (28.5%, n=37). Most participants (80.8%, n=79) received support in meal preparation with 19.2%(n=25) having company during physical activity. The results are displayed in table 4.8 below.

Table 4.8: Source and Kind of Support

Variable	Frequency N=130	Percentage
Source of Support		
Spouse	74	56.9
children	37	28.5
Other relatives	15	11.5
Friends	3	3.1
Kind of Support		
Company during Physical Exercise	25	19.2
Meal preparation	79	80.8
Counselling on alcohol and smoking cessation	4	3.1
Financial support	13	10.0
Reminders to take medicines	9	6.9

4.6.2 Challenges Faced in Implementing Lifestyle Modification Practices

The fifty participants who indicated facing challenges in implementing lifestyle modification practices were asked to state the challenge. As shown in figure 4.2 below, the most common challenge is financial (38.0%, n=19) followed by side-effects of drugs (32.0%, n=16)

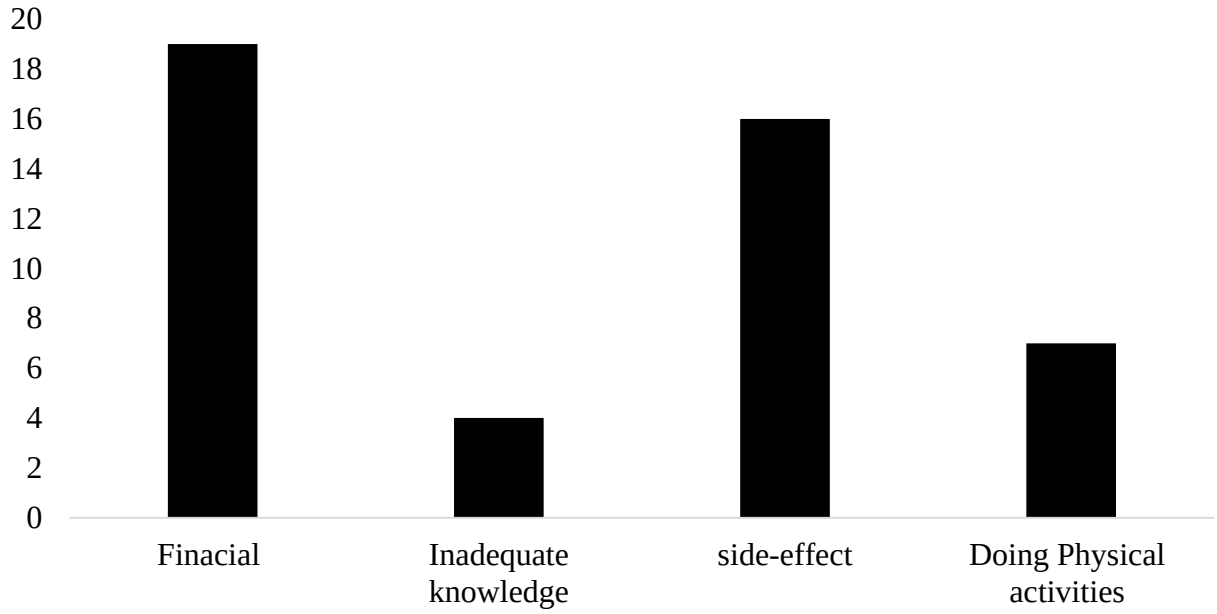

Figure 4.2: Challenges Faced in Implementing Lifestyle Modification Practices

4.7 The Relationship Between Home- based Factors and Adherence to Recommended Lifestyle Modification Practices

A Chi square was computed to determine the association between home-based factors and lifestyle modification practices. The results showed that none of the variable had a significant association with lifestyle modification practices (Table 4.9).

Table 4.9: Chi Square Values for the Relationship between Individual Related Factors and Adherence to Lifestyle Modification Practices

Variable	X^2(df)	p-value
Residence	.247(1)	.815
Living situation	3.353(4)	.620
Support	3.209(1)	.073
Perceived challenges	.55(1)	.815

*-significant at 95%CI

A binary logistic regression was performed to predict the likelihood of adherence to lifestyle modifications based on residence, living situation, support, and perceived challenges. The model indicated that none of the predictors were statistically significant since all p > .05(Table 4.10)

Table 4.10. Home based Predictors of Adherence to lifestyle modifications: Results from Binary Logistic Regression (N = 181)

Variable	aOR	95% CI	p-value
Residence	0.69	[0.32, 1.50]	.349
Living Situation	0.72	[0.41, 1.27]	.252
Social Support	0.95	[0.59, 1.52]	.817
Perceived Challenges	1.04	[0.45, 2.37]	.933

**-significant at 95% CI, aOR = adjusted odds ratio. CI = confidence interval*

4.8 Qualitative Outcomes

Three focus group discussions of six participants each were carried out. The participant's demographic characteristics are shown in Table 4.11 below.

Table 4.11: Demographic Characteristics of Participants in the FGDs

Variable	Frequency	Percentage
Age		
Mean + SD	58.33 +12.18	
30-39	2	11.0
40-49	3	16.7
50-59	5	27.8
60-69	5	27.8
70 and above	3	16.7
Gender		
Male	6	33.3
Female	12	66.6
Level of Education		
None	4	22,2
Primary	6	33.3
Secondary	5	27.8
Tertiary	3	16.7
Employment Status		
Unemployed	6	33.2
Self employed	7	38.9
Formally employed	7	39.9
Residence		
Rural	12	66.8
Urban	6	33.3

Analysis of the qualitative data revealed three major themes: level of adherence, barriers to adherence, and facilitators of adherence. Each theme consisted of several themes as described below.

4.8.1 Theme 1: Level of Adherence to Lifestyle Modification Practices

Participants differed in the extent to which they adhered to lifestyle modification practices

Sub-theme 1.1: High Adherence

When the participants were asked about their adherence to lifestyle modification practices, some reported being consistent with both medication and lifestyle changes: *"I take my medicines every day as instructed and I stopped adding salt to my food."(*Female, FGD 1). Another participant added: *"I walk for atleast 30 minutes daily and I rarely use a boda boda(motorbike) these days when I am going to town."*(Male in FGD2, 2025)

Subtheme 1.2: Partial Adherence

Other participants said that they adhered to selected lifestyle modification practices: *"I am strict with my medicines but I rarely exercise because of my joints."*(Female, FGD1). Another participant added: *"I stopped smoking when I was diagnosed with high blood pressure. But I am unable to stop taking alcohol."*(Male in FGD 3, 2025)

Subtheme 1.3: Low Adherence

Some participants admitted to low adherence: *"Honestly, I take my medicines when I am unwell. I don't always follow the rules."*(Female in FGD 1, 2025). Another participant explained:

"We are always reminded by the doctor to exercise and avoid adding salt to the food. As for me I am unable to follow these instructions."(Male in FGD1, 2025)

4.8.2 Theme 2: Barriers to Adherence

Participants described multiple factors that limited their ability to consistently follow the recommended lifestyle modification practices

Sub-theme 2.1: Lack of Awareness

Some participants reported not receiving adequate information on the specific practices they were expected to follow. This limited their ability to make appropriate lifestyle adjustments. *"The doctor only told me to avoid adding salt to my food."*(Female in FGD2, 2025). This may be attributed to inadequate time by the health care providers. One female participant remarked: *" The nurse is always very busy. There is no time to teach us about these things you are asking."* (Female in FGD3, 2025).

Sub-theme 2.2:Inadequate Time

Competing responsibilities, particularly work and family duties were reported as barriers to adherence. Many participants indicated that they could not find adequate time for physical activity.

"I know exercise is important. However, working eight to five, I have little time for it. And even when there is time, I come home very tired." (Female in FGD1, 2025). Another participant added, *"I live alone. When I come home from work, I have to prepare my meals and do other household chores leaving no time for exercise."*(Male in FGD2, 2025)

Sub-theme 2.3: Other Health Problems

Comorbidity such as joint pains reduced the ability of some participants to engage in exercise despite being motivated to do so. *"I would like to walk in the evenings, but my knees hurt whenever I try"*(Female in FGD1, 2025)

Sub-Theme 2.4: Expensive Drugs

Several participants cited the high cost of medication as a challenge to adherence. They explained that they sometimes skipped doses to stretch their prescriptions:

"The medicines that I take are too expensive and most of them are not available here in the hospital. Some -times I go for days without taking them when I have no money to buy(them)."(Female in FGD2, 2025)

This problem is compounded by frequent changes in the prescriptions. One male participant explained, *" Every time I come to the clinic, they (doctor) change my medicine. Now I have to throw away what I already had and look for other medicines. It is very frustrating."* (Male FGD 3, 2025)

4.8.3 Theme 3: Facilitators of Adherence

Despite the barriers identified, participants also highlighted factors that supported and motivated them to adhere to lifestyle modification practices.

Sub-theme 3.1: Social Support

Availability of social support was frequently mentioned as a factor that helped in the adherence to lifestyle changes. Key among these were spousal encouragement and reminders. “My husband always encourages me and accompanies me on my morning runs. This helps me to keep going.”(Female, FGD 2). Another male participant added, *“ My daughter always reminds me to take my medicines.”*(Male in FGD3, 2025)

Subtheme 3.2: Fear of Complications

Participants described fear of complications as a strong motivator to adhere to lifestyle modification. This droves them to maintain positive behavior change. *“ The doctor explained that I can end up paralyzed or even damage my kidneys if I don’t control my blood pressure. With this information , I know I have no alternative.”* (Female in FGD 3, 2025)

Sub-theme 3.3: Information Regarding Lifestyle Modification Practices

Regular counselling and education from health care providers reinforced behavior change and improved understanding of recommended practices. *“During my clinic visit, the doctor always take time to explain to me what I need to do and checks if I have improved. This encourages me.”(Male in FGD1, 2025).*

Additionally, the availability of social media helps in providing need information regarding lifestyle modification. One participant remarked, *“ I have acquired a lot of information from the internet. That how I have been able to manage my weight.”* (Male in FGD1, 2025)

CHAPTER FIVE
DISCUSSION

5.1 Demographic Characteristics of the participants

The mean age of participants in this study 58.2 years(SD 12.21). This finding closely mirrors other Kenyan hospital- based studies. For example, a study by Kathuri et al. (2024) in Meru teaching and Referral hospital , patients with hypertension had a mean of 58.5years(SD14.3), almost identical to the finding in this study. Similarly, another study in India by Yerra et al (2020) established that patients with hypertension had a mean age was 57 ± 13.2 years. These findings indicate that hospitals predominantly serve middle aged and older patients with hypertension.

Majority of the patients (63.5%, n=115) in this study were married. This finding aligns with the population profile of Kenya where most of the middle aged and older patients are married(KNBS&ICF, 2022). In this study 65.2% of the participants(n=118) reported attending follow-up clinics on a monthly basis reflecting commendable adherence compared to similar study settings. A study by Mahmood et al. (2020) among hypertensive patients found that only 41.0% of the patients regularly attended treatment follow-up appointments. The relatively higher rate of attendance in this study reflects a structured nature of appointment systems among patients. However, WHO(2020) advocates for fixed monthly clinic attendance. Instead, once blood pressure is controlled follow-up clinic can be every 3-6 months. This implies that staff in this facility may not be aware of the WHO guidelines.

5.2 Level of Adherence to Recommended Lifestyle Modification Practices

In this hospital-based study, overall, only 29.3%(n=53) of the participants adhered to the recommended lifestyle modification practices. The level of adherence in this study is lower than that established in other studies. Studies in Ethiopia by Angelo & Geltore(2019) and Geremew et al. (2023) established an overall adherence rate of 33.3% and 32.4% respectively. In a study at Thika level 5 in Kenya, it was established that only 45.9% of hypertensive patients complied with recommended lifestyle modification practices (Njaramba et al,2025).

Studies in other areas have found lower adherence rate. For, example, a study in a hospital in Kathmadu city in Nepal, an adherence rate of 20.8% was established(Dhakal et al,2022). Another study among patients with hypertension in selected hospitals in Tanzania by Shilole et al. (2024) only 17.7% of the participants had good compliance. Similarly, a study in North East Ethiopia found that only 23.6% of the patients adhered to recommended lifestyle modification practices (Anadualem et al, 2020)

About two- thirds of the participants (67.4%, n=122) demonstrated medicine adherence in this study. This level of adherence is slightly higher than that in a study in a tertiary hospital in Kathmadu by Sharma et al. (2025). In their study, adherence rate of 60.0% was established. Other studies have established lower or higher adherence rate. A study by Njaramba et al (2025) among hypertensive patients in Thika Level 5 Hospital Kenya, only 38.2% of the patients demonstrated drug adherence.

In contrast, Hossain et al (2025) in their study on medication adherence among hypertensive patient in North Bangladesh found that 85.0% of the patient had either moderate or high adherence to medication. In a study in China by Lu et al (2025) in rural areas of North East China, medicine adherence was reported by 73.7% of participants

In this study, behavior adherence had the highest score with 92.8%, (n=168) indicating that they did not take alcohol or smoke cigarette. This finding affirms that by Shilole et al. (2024) among patients with hypertension in selected hospitals in Tanzania where 99% and 94.2% adhered to non -smoking and moderate alcohol consumption respectively. This finding is in contrast with a study by Lu et al (2025) in China where behavioral adherence was found to be 29.3%. Similarly, an assessment of adherence to lifestyle modifications in Saudi Arabia fund that about 15% of the participants were smokers.

Adherence to weight management recommendations is a critical component in lifestyle modification. Unfortunately, only 23.8%(n=43) of the participants in this study adhered weight management. This may be because there are few patients who felt that they needed to manage their weight. This finding is consistent with findings in other areas

where weight management is not considered a serious concern by patients(Lu eta al, 2025; Gala et al,2023). Rahimi and Nkombua(2022) in their study on lifestyle modification practices in Middelburg also established that 88.0% of hypertensive patients do not engage in exercise. However, a study by Siam et al. (2024) on self- care practices among hypertensive patients at primary care centres in Unaizah City in Saudi Arabia showed that most patients engaged in weight management activities.

5.3 Individual related Factors Influencing Adherence to Lifestyle Modification Practices

Several individual related factors were evaluated in this study. Most participants in this study (69.6%, n=126) were female. This finding is in tandem with other studies where most hypertensive patients were female (Kathuri et al, 2024; Siam et al,2024; Sharma et al, 2024). A chi square in this study demonstrated a significant relationship between gender and adherence. However, similar to a finding by Siam et al. (2024) in Saudi Arabia, gender did not emerge as a significant predictor of adherence. This is in contrast to a study in Pakistan and Public hospitals in Amhara in Ethiopia where being a female had higher odds of adherence than a male.

The mean score for the knowledge on hypertension and lifestyle modification practices was 4.65(SD 1.255) out of 7. This implies that most of the patient have moderate level of knowledge. Further analysis revealed that knowledge is not a significant predictor of adherence. However, this finding is contrary to findings in other studies. A study by Dabalo et al. (2023) on life style modification practices among hypertensive patients at public hospitals in Ambo Town, Ethiopia, Knowledge was identified as a significant predictor of adherence (AOR=3.77 95 % CI: [1.81–7.85]). Another study in Bishoftu General Hospital, Oromia Region, Ethiopia, also established that good knowledge about healthy lifestyle was independently associated with adherence.

In this study majority of the (46.4%, n=84) had primary level of education. This finding is congruent to a study in North East China where more than half of the patients had primary level of education. However, the finding is in contrast to a study in rural sub-county in Meru County where most patients had a secondary level of education (Mwenda et al, 2020). This study did not establish level of education as a significant

predictor of adherence (aOR = 0.56, 95% CI [0.26, 1.21], p = .140). This finding is contrary to findings in other studies by Siam et al. (2024) in primary Health care facilities in Saudi Arabia, Midkesa et al. (2022) in Oromia Region of Ethiopia and Chitani et al. (2022) in Malamulo Hospital, Thyolo, Malawi in which level of education was established as a significant predictor of adherence. Similarly, a study in Ethiopia revealed that the participants with primary education level had lower adherence rates than those with higher education level (Abebe et al., 2024).

Among the participants interviewed, majority of the participants (51.9%, n=94) were aware of recommended lifestyle modification practices. A comparable study in Imenti North Subcounty of Meru County Kenya by Mwenda et al. (2020) found that 68.0% were aware. Most participants got the information from the health care provider. In the FGD , the participants affirmed that health care providers are the main source of information. This agrees with a finding by Rahimi& Nkombua (2022), who in their study on knowledge and practices on lifestyle modification among hypertensive patients in Extension 6, Middelburg, established that most patients (73%) acquired information about hypertension and recommended lifestyle modification practices from the health care provider.

Most hypertensive in the current study (63.4%) were either unemployed or self-employed. This finding affirms findings Rahimi& Nkombua (2022) in Middelburg where more than half of the patients were either unemployed or self -employed. However, the finding differs with that by Siam et al. (2024) in their study in Saudi Arabia where most participants (61.35) were employed. Employment status was identified as a significant predictor of adherence to recommended lifestyle practices. Employed individuals had significantly lower odds of adherence than unemployed individuals (aOR = 0.30, 95% CI [0.10, 0.91], p = .033). this may be because persons who are employed have consistent source of income which may facilitate the purchase of drugs. Additionally, these persons may be exposed to greater awareness compared to those who are not employed. This finding is in tandem with other regional studies. A study by Dabalo et al. (2024) in public hospitals in Ambo town, Ethiopia, being employed (AOR=3.59, 95 % CI: [1.22–10.54]) was associated with good adherence to lifestyle modifications.

Two thirds of the participants (66.9%, n=121) had a low income of less than 10,000kenya shillings. Income level in this study emerged as a significant predictor of adherence. Participants with a higher income had 2.7 times the odds of adherence compared to those in the lowest income bracket (aOR = 2.71, 95% CI [1.28, 5.72], p = .009). Having higher income may be associated with higher economic capacity. Considering that the participants in the FGD said that hypertensive drugs are expensive, having a higher income may translate to ability to afford the drugs. The finding in this study is similar findings that have been reported in other studies. A study by Andualem et al. (2020) in North east Ethiopia found that having a higher level of income was associated with adherence to lifestyle modification practices. Siam et al. (2024) and Geremew et al. (2023) reports similar findings.

Two thirds of the participants (66.8%, n=121) viewed lifestyle modification practices as important with the remaining 33.2%(n=60) not sure of their importance. The high number of participants who were not sure of the benefit may be explained by lack of awareness regarding lifestyle modification. In the FGD, lack of awareness came out strongly as a barrier to adherence. Perception about the benefits of adherence to lifestyle modification was a significant predictor of adherence in this study. Participants who attributed importance to lifestyle modifications had 2.9 times the odds of adherence compared to those who found them unimportant (aOR = 2.93, 95% CI [1.39, 6.16], p = .005). This can be explained by the health belief model as utilized in this study. Those who perceive lifestyle modification as beneficial are more likely to adhere. This finding however is different from other studies evaluated.

5.4 Home based Factors influencing Adherence to Lifestyle Modification Practices

Majority of the participants in this study (66.9%, n=121) resided in the rural areas with the remaining 33.1%(n=60) residing in urban areas. Most participants (60.8%, n=110) lived with their spouses. This is explained by the fact that Embu Level 5 hospital is located in peri-urban area serving mainly the rural population and few urban residents. Congruent with this study, studies reviewed such as that by Chitani et al. (2022) and Shilole et al. (2024) did not show a significant relationship between area of residence and adherence. However, Nyuyen et al. (2021) and Gathu et al. (2023) in their respective studies revealed that urban residence is associated with adherence than rural

residence. This is because rural residents in Africa experience limited access to quality healthcare services and information

Most participants (71.8%, n=130) indicated that they received support in their implementation of recommended lifestyle modification practices. In the FGD participants said that available social support is one of the facilitators of adherence to lifestyle modification practices. Studies have also found a strong correlation between social support and adherence. A multi- center cross-sectional study on adherence to Healthy Lifestyle and Associated Factors among Hypertension Patients Under Follow-up at Public Hospitals in Northwest Amhara, Ethiopia, it was established that having social support increased the odds of adhering to lifestyle modification practices (AOR = 2.89; 95% CI: 1.97 to 4.25) (Zeleke et al, 2025).

The participants in this study faced important challenges as brought out in the questionnaire and FGD. A critical challenge was inadequate finances as well as side effects of drugs. This finding is congruent to other studies reviewed. For example, a 2023 study in Saudi Arabia found that a primary reason for non-adherence to dietary recommendations was the "high cost of healthy food." Patients reported that it was economically challenging to maintain a diet low in salt and rich in fruits and vegetables consistently (Rammal et al, 2023).

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Findings

The mean age of the participants was 58.2 SD 12.21 with most participants (29.8%, n=69) aged between 60-69 years. Most (63.5%, n=115) were married. And majority (47.5%, n=86) had been on treatment for hypertension for more than three years. Approximately two thirds (65.2%, n=118) attended follow-up clinic for hypertensive patients monthly.

Only 29.3%(n=53) of the participants adhered to the recommended lifestyle modification practices with most participants ((92.8%, n=168) avoiding alcohol and cigarette smoking. Physical activity (47.0%,n=85) and weight management(23.8%, n=43) had the lowest adherence scores.

That employment status (aOR = 0.30, 95% CI [0.10, 0.91], p = .033), level of income (aOR = 2.71, 95% CI [1.28, 5.72], p = .009) and perception of the importance of lifestyle modification practices (aOR = 2.93, 95% CI [1.39, 6.16], p = .005) were significant individual related predictors of adherence to lifestyle modification practices. None of the home-based factors were significant predictors of adherence to lifestyle modifications since all p > .05. however, in the FGD, availability of social support emerged as an important determinant of adherence.

6.2 Conclusion

The level of adherence to the recommended lifestyle modification practices, such as body weight reduction, regular physical activity, cessation of alcohol intake and cigarette smoking, adherence to anti-hypertension medications as well as reduction in salt intake in among patients with hypertension attending Embu Level 5 Hospital remains is low. Individual factors such as higher level of knowledge and awareness of hypertension, its complications and the role of lifestyle modification practices have significance in the level of adherence. Furthermore, higher income levels and perceived importance of lifestyle modification practices increased the level of adherence.

Home-based factors such as availability of social support from family (meal preparation and accompanying to the clinic) was an important determinant of adherence to lifestyle modification practices.

6.3 Recommendations

i. The Ministry of Health needs to develop and implement targeted health messages on lifestyle modifications practices.
ii. The government should consider offering subsidy for drugs used in management of hypertension to make the drugs more affordable.
iii. The health care providers should use every available opportunity to counsel patients on lifestyle modification practices especially on Physical activity and weight management.
iv. Support system for patients with hypertension should be identified and involved in the management of hypertensive patients.

6.4 Suggestion for Further Research

i. Effect of patient education on adherence to recommended lifestyle modification practices.
ii. Health facility determinants of adherence to lifestyle modification practices.

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APPENDICES

Appendix I: Informed Consent

Title of the study: Adherence to lifestyle modification practices among patients with hypertension aged 30-79 attending the Embu Level 5 Hospital

Principal Investigator: Ms. Magdalene Waithera Muchoki

Introduction

Primary prevention of cardiovascular disease is a significant step in reduction of morbidity and mortality in the community. Increasing awareness of hypertension disease through health messages on its management and effective treatment is a point of focus. Many studies have been conducted globally, but only a few publications have been done which discusses on risk factors for poor blood pressure control among hypertensive patients. Factors associated with poor control of hypertension are modifiable through tailored, culturally appropriate patient education and treatment strategies. Many studies conducted including those done in Kenya on how patient related barriers affect the control of high blood pressure, revealed that unawares of modifications in lifestyle and lack of application of these strategies was identified as patient related barriers in hypertension control. I am inviting you to participate in the research study Adherence to lifestyle modification practices among adult patients, to examine how the hypertensive patients implement and adhere to these strategies.

Study location

The study will be conducted at the Embu Level 5 Hospital medical outpatient clinic.

Purpose

Hypertension cases are becoming a menace and most of the hypertensive patients end up suffering from complications of hypertension. The studies have revealed that combination of pharmacologic therapy and non-pharmacologic therapies such as lifestyle modifications play an important role in preventing death from HYPERTENSION. The purpose of this study is to examine the Adherence to lifestyle modification practices in order to help improve in implementation of these strategies.

Study procedure

During the study, you will be required to fill a questionnaire that contains questions regarding your Adherence to lifestyle modification practices in controlling HYPERTENSION. I will keep a record of who has participated with the use of signatures in consent form. Your name will not be used during analysis so that data will not be linked to your name. All data will be stored in a secured place and no unauthorized person will access the data. Your identity will not be reveled when study is reported or published.

Risks

There will be no risk or much discomfort to you in sharing your information. No any invasive procedures involved in the study. No name will be written on the questionnaire hence the information you share cannot be linked to you. Some questions may be a bit personal and may cause discomfort, but the information you give will be treated with confidentiality.

Benefits

There is no direct benefit from participating in this study. However, during the participation, you will receive comprehensive health education on lifestyle modification strategies to control HYPERTENSION. In addition, you may feel a satisfactory for participating in research that will bring about a discovery of adequate ways to improve the adherence of lifestyle modifications.

Alternative to study participation

Your participation in this study is totally voluntary. You will not be coerced to participate. You can withdraw from this study at any time without repercussion or penalty.

Consent and signatures

This study has been explained to me and I have understood the procedures, risks and benefits involved. I understand that my participation in this study is voluntary and I can withdraw from the study any time without penalties. If I have any questions about the study, I will contact Magdalene Waithera Muchoki, who is the principal researcher on **0720557220**

Participant's signature

Signed/Thumbprint……. Date…….

Signature of the witness (for illiterate participants)

Signed…….

Date……...

Name of the individual obtaining the consent

…….

Signed……... Date……

Appendix II: Questionnaire

QUESTIONNAIRE ON ADHERENCE TO LIFESTYLE MODIFICATION PRACTICES AMONG PATIENTS WITH HYPERTENSION AGED 30-79 ATTENDING THE EMBU LEVEL 5 HOSPITAL

Questionnaire number……Date ……..

Instructions:

Please tick (√) appropriate answer

SECTION A: SOCIO DEMOGRAPHIC CHARACTERISTIS

1. What is your gender?
   - □ Male
   - □ Female
2. What is your age in completed years? _____years
3. What is your religion?
   - □ Catholic
   - □ Protestant
   - □ Muslim
   - □ Other(specify)…….
4. What is your marital status?
   - □ Never married
   - □ Married
   - □ Divorced
   - □ Widowed
   - □ Other(Specify)……
5. How long have you been on medication for hypertension?
   - □ Less than 1 year
   - □ 1-3 years
   - □ More than 3 years
6. How often do you attend the hypertension clinic?
   - □ Weekly
   - □ Monthly
   - □ Quarterly
   - □ Other(Specify)……..
7. If yes to question 3 above, why?
   - □ I forgot
   - □ I lacked transport money
   - □ I lacked time
   - □ Other (please specify) …….
8. Have you ever missed to swallow drugs as per the schedule
   - □ Yes
   - □ No
9. If yes to question 5 above, why?
   - □ I had run short of drugs
   - □ I normally forget
   - □ I experienced side effects
   - □ Other (please specify) ……..

SECTION B: ADHERENCE TO RECOMMENDED LIFESTYLE MODIFICATION(H-SCALE)

10. In the last 7 days, how many days did you:	No. of days							
	1	2	3	4	5	6	7	
Medication adherence:								
Take your blood pressure medicine as prescribed?								
Take your blood pressure medicine at the same time every day?								
Not skip any blood pressure medicine doses?								
Low salt diet								
Avoid eating foods high in salt ?								
Did not add salt to your food at the table?								
Physical activity								
Engage in 30 minutes of physical activity?								
Do any activity that increased your heart rate or made you breathe harder for atleast 10 minutes at a time?								
Smoking status								
How many days did you smoke a cigarette or use tobacco?								
Alcohol use								
How many days did you drink alcohol?								
Weight management(Indicate Yes or No)								
Are you currently trying to lose weight?	Yes=1 No=2							

SECTION C: INDIVIDUAL FACTORS INFLUENCING ADHERENCE TO RECOMMENDED LIFESTYLE MODIFICATION PRACTICES

11. What is your highest level of education?
    - None
    - Primary
    - Secondary
    - Tertiary

12. What is your occupation?
    - Unemployed
    - Self employed
    - Formally employed
    - Other(specify)……

13. What is your minimum level of income per month in Kenya shillings?
    - Less than 10,000
    - 10,000 -19,000
    - 20,000-29,000
    - 30,000-39,000
    - 40,000 and above

14. Have you ever heard of lifestyle modification practices regarding your condition?
    - Yes
    - No
15. If yes to question 14, from who?(Tick all that apply)
    - Mass media
    - Social media
    - Health care provider
    - Friend
    - Family member
    - Other(specify)…….
16. What are the components of life style modifications required because of your condition?(List all that you know)

    ……
    …….
17. Have you ever received any form of health education from your health care provider regarding your condition and what you need to do?
    - Yes
    - No
18. If yes to question 17, what were you educated on?.....

……

19. Tick appropriately

Question	**Yes**	**No**
Normal values of BP as 120/80 mmHg		
Hypertension may result in kidney failure and stroke		
Medicines alone is adequate for controlling hypertension		
Smoking and alcohol intake is prohibited for persons with hypertension		
Hypertension can be controlled without use of medicines		
Only elderly people develop hypertension		
One-hour physical activity is necessary for patients with hypertension		

20. How important is lifestyle modification practices for blood pressure control?
    - Very important
    - Important
    - Not sure
    - Not important
21. If important, why do you feel it is important?.....

…….

22. If not important? Why ……

SECTION D: HOME-BASED FACTORS INFLUENCING ADHERENCE TO RECOMMENDED LIFESTYLE MODIFICATION PRACTICES

23. Where do you reside?
    - In my house
    - In a home for the aged
    - Other(specify)…….
24. Whom do you live with?
    - I live alone
    - Spouse
    - Children
    - Other Relatives(specify)……..
    - Others(Specify)……..
25. Do you get support in adhering to lifestyle modification?
    - Yes
    - No
26. If yes to question 20, What kind of support?
    - Company during physical activity
    - Meal preparation
    - Counselling on alcohol and smoking cessation
    - Other(specify)
27. Who prepares your meal?
    - Self
    - Spouse
    - Children
    - Other(specify) ……
28. From whom do you get support?.....
29. Are there any challenges you experience in trying to adhere to lifestyle modification practices?
    - Yes
    - No
30. If yes to question 24. Please specify the challenges…….....
31. Any other information you want to give?.....

……..

Thank you for your participation

Appendix III: Discussion Guide for Focus Group Discussion (FGD)

Study Title: Determinants of Adherence to lifestyle Modification Practices among Patients with hypertension aged 30-79 years Attending the Embu Level Five Hospital, Embu County, Kenya

Socio – Demographic Data

1. What is your gender?
   b) Male
   c) Female
1. What is your age in completed year?.....
2. What is your marital status?
   a) Never married
   b) Married
   c) Widowed
   d) Divorced
   e) Others(specify) ……..
3. What is your religion?
   a) Catholic
   b) Protestant
   c) Islamic
   d) Other(specify) ……
4. What is your highest level of education?
   a) None
   b) Primary
   c) Secondary
   d) Tertiary

Life style modification practice

5. What lifestyle modifications have you been advised to adopt(Explore by who? When? How?)
6. How is your practice of these lifestyle modifications? (Explore each of the recommended practice)
7. What is the benefit have you seen as a result of practicing the lifestyle modification practices?

Factors influencing lifestyle modification practice

8. What would you say about the success of adhering to life style modifications?
9. What would you say about the support from the health facility?
10. What challenges do you face in adhering to lifestyle modifications?(Explore the reason why each is a challenge?
11. What measures may be implemented to assist in adherence to lifestyle modification?

Appendix 4: Ethical Committee Authorization

CHUKA UNIVERSITY

Knowledge is Wealth *(Sapientia divitia est)* Akili ni Mali

CHUKA UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE

Telephones: 020-2310512/18
Direct Line: 0772894438
Email: info@chuka.ac.ke,
P. O. Box 109-60400, Chuka
Website: www.chuka.ac.ke

11th July, 2025

REF: CUIERC/ NACOSTI/842
TO: **Magdalene Waithera Muchoki**

RE: **Determinants of Adherence to Recommended Lifestyle Modification Practices Among Patients with Hypertension Aged 30-79 Years Attending Embu Level Five Hospital**

This is to inform you that *Chuka University IERC* has reviewed and approved your above research proposal. Your application approval number is *NACOSTI/NBC/AC-0812.* The approval period is 11th July, 2025 – 11th July, 2026.

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 *Chuka University IERC.*
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 *Chuka University IERC* 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 *Chuka University IERC* 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 *Chuka University IERC.*

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

Yours sincerely

Dr. Benjamin Kanga
SECRETARY

11 JUL 2025

Appendix 5: NACOSTI License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **986275**

Date of Issue: **12/September/2025**

RESEARCH LICENSE

This is to Certify that Ms.. Magdalene Waithera Muchoki of Chuka University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Embu on the topic: DETERMINANTS OF ADHERENCE TO RECOMMENDED LIFESTYLE MODIFICATION PRACTICES AMONG PATIENTS WITH HYPERTENSION AGE 30-79 YEARS ATTENDING EMBU LEVEL 5 HOSPITAL for the period ending : 12/September/2026.

License No: **NACOSTI/P/25/4179294**

986275

Applicant Identification Number

Ag. Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code

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

See overleaf for conditions

Appendix 6: Hospital Approval

EMBU COUNTY GOVERNMENT
DEPARTMENT OF HEALTH

EMBU LEVEL 5 HOSPITAL
Address P.O. Box 33-60100 Embu Telephone 068-2231055/56
Cell phone +254 722 406 595 Email: pghembu@gmail.com

REF: EL5H/ADM//VOL.IV/176 **DATE:** 28th July, 2025

THE INCHARGE
OUTPATIENT MEDICAL DEPARTMENT
EMBU LEVEL 5 HOSPITAL

RE: AUTHORITY TO CONDUCT RESEARCH AT EMBU LEVEL 5 HOSPITAL
MAGDALENE WAITHERA MUCHOKI
ID NO: 23924456

The above subject matter refers.

The above named has been given authority to conduct a research on **'Determinants of adherence to recommended lifestyle modification practices among patients with hypertension aged 30-79 years attending Embu level 5 hospital'**

NB: The student is expected to observe and maintain utmost confidentiality of information while doing her research and the findings **MUST** be shared with the hospital.

Kindly accord her the necessary support.

EMBU LEVEL 5 HOSPITAL
CHIEF EXECUTIVE OFFICER
28 JUL 2025
Email: Pghembu@gmail.com
P.O. Box 33 EMBU | Tel: 0722 406 575

Fora. BANCY W.MUTUAH
Ag .CHIEF EXECUTIVE OFFICER
EMBU LEVEL 5 HOSPITAL.