DETERMINATION OF FACTORS AFFECTING CLINICAL OUTCOMES OF PATIENTS WITH HYPERTENSION UNDERGOING TREATMENT AT KENYATTA NATIONAL HOSPITAL

ELIZABETH MUSYOKI

H56/87877/2016

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT OF THE AWARD OF MASTER OF SCIENCE IN NURSING DEGREE (MEDICAL SURGICAL NURSING) IN THE UNIVERSITY NAIROBI
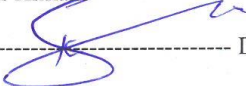
DECLARATION

I, **Elizabeth Musyoki**, hereby declare that this research proposal is my original work and has never been submitted for any academic award in any institution of higher learning.

Signature------- *[signature]* --------- Date ----- 25TH ---- /Nov /2021 -----

This proposal has been submitted with my approval

Supervisor

Dr. Samuel Kimani

Signature------- *[signature]* --------- Date ----- 25/11/2021 ------------

ACKNOWLEDGEMENT

I thank almighty God for this far He has enabled me to come in my studies.

I acknowledge family, for their patience and effort during the process of undertaking this research study.

DEDICATION

I dedicate this dissertation to My Ayieko Ong'any who was my supervisor up to the point of his death. My his works continue among the nursing generations to come

He had been my pillar throughout my studies and actively supported me to reach my true potential. He believed in me and encouraged me to fulfil my dreams beyond the dictates of the society. I thank him for the support.

Fare thee well sir

Table of Contents

Operational definition

Adherence –This is the measure on how a hypertensive patient takes his or her prescribed medication and attends the follow up clinics as scheduled by the physician in treatment of hypertensive disease.

Anthropometrics – these are the measurements obtained on a hypertensive patient every time they visit a health facility that gives the clinician an overview of the underlying physiologic state of the patient and the prognosis of their hypertensive condition in general. These measurements include height, weight, girth, body mass index and waist to hip ratio. These measurements are useful in management of hypertension clinical outcomes.

Body Mass Index–this is the weight of the patient in relation to their height and calculated as an index to determine the body mass and serve as an indicator of health in the patient. An index of 19.5 to 24.9 is considered normal and healthy, an index of 25.0 to 29.9 is considered borderline and one is at risk and an index above 30.0 is considered unhealthy.

Chronic diseases - Those diseases which require regular and persistent use of medication and follow up by health care providers. Hypertension requires consistent medications and management to control the adverse clinical outcomes.

Co morbidity –Other conditions that exist in a patient with hypertensive disease that result to complications and poor outcomes of hypertensive disease. Hypertension usually has two or more other medical conditions in addition hypertension itself.

Clinical outcome- the prognosis of the patient's hypertensive condition based on the physiological parameters that are the blood pressure, body mass index and their perception concerning hypertension. This is indicated by improvement in the condition or one developing cardiac complications as a result of hypertensive disease

Hypertensive disease – patient with increased blood pressure with systolic pressure of more than 145 mm Hg and diastolic pressure of more than 90 mm Hg .

Morbidity - A measure of occurrence of hypertensive disease among the population of patients attending Kenyatta national hospital

Patient perception – the attitude of a hypertensive patient in regards to their current medical condition, their adherence to treatment regimen and whether or not their condition is improving

Physical makers – these are the physiologic parameters that we use to determine the clinical outcome of the patient and they include blood pressure, pulse rate, weight, height, waist circumference and cholesterol levels. Body composition variables such as weight, skinfold thicknesses, etc. have been shown to be significantly correlated with hypertension outcomes condition in adults.

Clinical makers – the signs and symptoms that are relevant in determining the outcome of hypertensive disease

Anthropometrics – weight distribution in the body determined by waist to hip ratio and the Body mass index

Physiological parameters –These are the measurements that indicate the health of a person based on the anthropometrics and clinical makers in this study they will be determined by blood pressure and pulse rate

ABREVIATION AND ACRONYMS

BMI Body Mass Index

BP Blood Pressure

CHD Chronic heart disease

CVA Cerebro-vascular accident

DBP Diastolic blood pressure

ERSD End Stage Renal Disease

HIV Human Immuno-deficiency virus

HTN Hypertension

KNH Kenyatta National Hospital

MmHg Millimeters of mercury

UON University of Nairobi

SBP Systolic Blood Pressure

WHO World Health Organization

ABSTRACT

Background: Hypertension is the major conformable risk factors for cardiovascular, cerebrovascular, and kidney diseases. Validation for poor disease control include non-adherence, lack of patient engagement, and therapeutic inertia. Hypertension is a silent killer disease owing to the late recognition of symptoms, uncontrolled hypertension is the primary risk factor for stroke, heart failure and kidney failure in sub Saharan Africa therefore control of hypertension is associated with reduction in morbidity and mortality. Efforts to address the complications associated with hypertension are still a global concern. In sub Saharan Africa the epidemiological transition of non-communicable diseases poses a great threat to most of the population. There is growing interest in monitoring patients remotely however there is little or no evidence to support the claims that this improves clinical outcomes. This study will help determine the current status of clinical outcomes in these patients and identify pointers that can help in meeting clinically recommended goals among hypertension disease management plans in Kenya.

Objective: To determine factors affecting the clinical outcomes of patients with hypertensive disease at Kenyatta national hospital.

Methods: This was a cross-sectional study, whereby medical records and questionnaires and semi-guided interviews of adult hypertensive patients was used to collect data on clinical outcomes of hypertensive patients and management of the patients. The study was carried out at Kenyatta National Hospital between duration of two months from august to October 2018.The study population consisted of adult patients with hypertension as the primary disease currently on treatment and follow up clinic at the hospital Systematic random sampling method was used to recruit a specific number of study participants each day depending on patient turn out. A sample of size of 101 respondents was used. Data collected was analyzed using Statistics and data statistical software package version 20.0 (STATA). Descriptive statistics, frequency distribution tables and graphs was be used to present the collected data.

Results: Ageing was associated with increased blood pressure. Most of the affected age group was (40-59) years and the least affected group by hypertension was below less 20%, no respondents was below the age of 20 years More females than males had a higher BMI, High waist circumference, high hip circumference and high waist to hip ratio (P > 0.005). More males reported that they drink alcohol and smoke cigarettes. There is a significant association between high blood pressure reading and development of complications. Higher blood pressure was reported in smokers (67%) there was no significant association between high blood pressure and drinking alcohol. Few respondents (34%) reported to have at least done some physical exercises within the past 1 year. Intake of fatty foods was associated with complications among respondents

Conclusion: This study showed there is an association between high systolic blood pressure and occurrence of hypertension complications. Smoking of tobacco, lack of exercise, poor feeding habits are associated risk factors in development of complications in hypertension. interventions should address these risk factors in management of hypertension

CHAPTER ONE

1.1 Background

Hypertension which was defines as prolonged raised blood pressure over 140/90 mmHg) is a common chronic disease (Burnier,2012), for adults usually defined as persistent systolic blood pressure exceeding 140 and/or diastolic blood pressure exceeding 90 mmHg, is one of the most important public health problems around the world, affects about a quarter of the adult population in many countries .

Universally, the overall preponderance of high blood pressure (Hypertension) in adults aged 25 years and above was about 40% in 2015, highest in Africa (46%) and lowest in America (35%), with slightly higher prevalence in men (Daniel , 2016). Hypertension is estimated to cause 7.5 million deaths per year, accounting for 57 million disability adjusted life years (DALYs) or 3.7% of total DALYs (WHO 2016). Hypertension is one of the primary risk factors for heart disease and stroke, the leading causes of death worldwide. Hypertension has been associated with an increased risk for brain ischemia, cardiac failure, coronary cardiac diseases and other serious cardiovascular and renal diseases. about two-thirds of patients living with hypertension live in low- and middle-income countries, resulting in a huge economic burden (Mathenge,2015). This increase in number of people living with hypertension globally is attributed to population growth, ageing and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress. The poor clinical outcomes associated with hypertension are compounded because many people affected also have comorbidities that increase the odds of heart attack, stroke and kidney failure. These risk factors include tobacco use, obesity, high cholesterol and diabetes mellitus (Keany, 2014).

In sub-Sahara Africa (SSA) Hypertension is a major problem, and among some ethnic groups it has been reported to be as high as 38 % (Medius,2015). It is estimated that out of the approximately 650 million people in SSA, 10 to 20 million people have hypertension. Hypertension in sub Saharan Africa has now changed and become an area where hypertension is a major public health problem. (Opie, 2015).It is a widespread problem of immense economic impact because of its high prevalence in urban areas, its frequent under diagnosis and the severity of its complications. It has become the commonest cause of cardiovascular disease on the continent. If nothing is done about

it, by 2020, three-fourth of all deaths in Africa will be attributable to hypertension (Addo, Smeeth& Leon 2011). Despite the high prevalence of hypertension, very little is known among patients on matters how to control BP. The detection rates in most high-income countries vary from 32%–64%, while in many low-income countries, the reported detection rates are substantially lower (Primatesta, Brookes &Poulter 2011).

In Kenya, deaths due to Hypertension in ranges from 6.1% to 8%, while post mortem studies suggest that more than 13% of cause-specific deaths among adults could be due to outcomes of hypertension.

Poorly controlled hypertension leads to Chronic Kidney disease, cardiac failure, coronary heart disease, stroke, and is the leading risk factor for death in Kenya. Despite understanding the risks associated with hypertension, about 30 percent of Kenyan adults are unaware that they have hypertension; more than 40% of persons living with hypertension are not on treatment, and two thirds of hypertensive patients on treatment have not attained their optimal blood pressure goals (Getrude, 2016).

Medical attention and lifestyle modification can help control your high blood pressure to reduce your risk of life-threatening complications. Presently there is no cure for hypertension though it is easily detected and can be controlled, if hypertension is not treated, it will result in irreversible damage to the small blood vessels of the body, which can damage organs such as the heart, brain and kidneys, leading to cardiac failure, stroke and renal failure. It can also cause circulatory problems. Hypertension significantly increase your risk for coronary heart disease (WHO, 2016).

Exercise and physical activity have been shown to protects against a several chronic diseases and disorders. There is evidence suggesting that Blood pressure, is lower in subjects who are fit or physically active. The number of variables that are considered"physical activity" such as type or mode of exercise, length of training, frequency, intensity and duration of training (Pollock et al., 2010), make it difficult to determine the benefits of exercise on BP and to provideguidance on the optimal characteristics of the exercise regime.

The association of BMI and hypertension is of significance to third world countries as increased deaths among lean hypertensive respondents has been noted in some studies.(Jackson , Lawes , Bennett , Milne & Rodgers,2015).

If the patients can be on lifetime treatment they can be prevented from developing hypertension related poor outcomes such as stroke, coronary heart disease, cardiac failure, and kidney disease. The challenges of treating hypertension and prevention of the poor outcomes are not about to capitulate yet hence there need to improve monitoring, intervention and treatment of the patient. In addition to pharmacological therapies, non-pharmacological approach such as physiological parameters, patient perception and body markers contributes significantly in controlling blood pressure. This study will assess how this prevalence factors affect the health outcomes of patients being treated with hypertension.

1.2 Problem statement

The global brief report on hypertension states that, hypertension contributes to the burden of Cardiac disease, stroke and renal failure and untimely mortality and disability (WHO 2014). Hypertension remains poorly managed in many third world countries (Brundtland 2012).In the wake of epidemiological transition of non-communicable disease in sub Saharan Africa the mortality and morbidity from non-communicable diseases in the low and middle class countries like Kenya is on the rise.

Across the globe, people living with hypertension do not follow medical or lifestyle recommendations mostly due to patient's perceptions on hypertension clinical follow ups, this greatly affects the hypertension outcomes. In line with existing findings, Physical makers; advancement in years, Body mass index and lack of exercise are associated with a higher prevalence of hypertension. Treatment of hypertension involves lifestyle changes and drug therapy with blood pressure lowering as the primary goal (Agyemang, 2014

There is a significant association between high blood pressure and occurrence of hypertension complications (Isaiah 2016) .More research studies should be carried out to specifically identify the clinical outcomes of the hypertension complications and ways to prevent them among patients in KNH.

This study will help determine the current status of clinical outcomes in these patients. Identifying trends in clinical outcomes is very important for patients receiving care for chronic conditions such as hypertension. These patients can be spared severe long-term clinical and economic consequences if they are adherent to recommendations and reach established goals. Further, this study will help in characterizing the population utilizing the services of Kenyatta national hospitals. This characterization is important for the organization as it helps the caregivers in improving the process of care for the patients.

1.3 Research question

1. How do Physical markers affect clinical outcomes of hypertensive patients at Kenyatta national hospital?

2. What are impacts of physiological parameters on clinical outcomes of hypertensive patients at Kenyatta national hospital?

3. What are patient perceptions regarding hypertension and what are the related outcomes?

1.4 Research objective

1.41. Broad objectives
To determine the anthropometric assessment, clinical assessment and lifestyle modification assessments of patients with hypertension undergoing treatment at Kenyatta National Hospital

1.4.1 Specific objectives

1. To determine physiologic markers associated with occurrence of hypertension complications among hypertensive patients undergoing treatment at Kenyatta national hospital.

2. To assess the complications related with physiological parameters as indicators of clinical markers in hypertensive patients attending Kenyatta national hospital.

3. To ascertain patients' level of knowledge on life style modification practices in management of hypertension

4. To establish the views of Kenyatta national Hospital care givers on the management of hypertension.

1.5 Hypothesis of the study
1. Physiological parameters have impact on clinical outcomes of hypertensive patients.

1.6 Justification of the study

This study will help to change the current management medication protocol by providing guidelines on how best it can be improved. The results of the study will help Kenyatta national hospital in determining the progress made by their members towards goal attainment.

Following the high numbers of patients presenting with hypertension related complications in Kenyatta National Hospital, there is an increased need to sensitize the hypertensive patients on the ways to curb the factors that contribute to the occurrence of these complications and how to maintain the blood pressure levels within acceptable limits. And identify challenges that people

living with hypertension face in controlling their blood pressure and finding ways to solve those challenges is a vital part in the prevention of hypertension complications.

This study will seek to identify the factors that are associated with complications of hypertension among adult patients admitted in medical wards in Kenyatta National Hospital, which could be used as a representative sample of all hypertensive patients in Nairobi. This information will not only assist health care professionals to manage hypertension appropriately but also assist policy makers in developing context-specific and relevant policies capable of improving the management of hypertension in the clinics.

Kenyatta national hospital can also utilize the study to characterize the hypertensive population utilizing their services which will allow caregivers to suitably tailor the care which is currently being provided. Further, the results of the study can help identify patient sub-groups that are either performing well or lagging in terms of achieving goal. Identifying these sub-groups will help Kenyatta national hospital to explore potential areas of improvement or in determining populations that require additional care. This will help to change the current management medication framework by providing recommendations on how best it can be improved.

1.7 Variables of the study

1.7.1 Independent variables

1.7.1.1 Physiological markers
Body markers entails; blood pressure and anthropometric measurements, body mass index ratio; the weight/ height ratio. Patients with high BMI usually have more hypertensive clinical outcomes such as cardiovascular comorbidities, and high cholesterol. These factors further increase the development of coronary heart disease (CAD) afterward. (Wilson,Agostino,Sullivan ,Parise&Kannel 2012). Recent studies showed a lower mortality rates in patients undergoing hypertension treatment with a higher value of BMI categorized as overweight ($25 \text{ kg/m}^2 < \text{BMI} < 30 \text{ kg/m}^2$). Factors such as weight, skinfold thicknesses, etc. have been shown to be significantly correlated with hypertension outcomes condition in adults.

1.7.1.2 Physiological parameters
Routine physical exercise is associated with lower blood pressure, reduced cardiac risk, and cardiac restructuring. although physical activity and hypertension can both be associated with the development of ventricular hypertrophy, the cardiac restructuring from hypertension is pathologic with an associated increase in clinical outcomes such as myocyte hypertrophy, fibrosis, and risk of heart failure and mortality

1.7.1.3 Patient perception

Hypertension is a silent disease, however many patients are aware of their diagnosis and they actively manage their anti-hypertensive medications. In order to improve clinical condition of patients with hypertension, their understanding of the disease and monitoring practices need to be improved (Lau et al ,2016). Patients who monitor their BP monthly are likely to have a better perception of their hypertensive therapy condition. This knowledge of the hypertensive patient on self-report data   allows practitioners to identify the patient's understanding and provides insight on knowledge gap this helps to improve the clinical outcomes.

1.7.2 Dependent variables

1.7.2.1 Hypertension clinical outcomes

Lack of proper management of hypertension leads to many clinical outcomes nearly 50% of the people with unmanaged hypertension die due to heart disease related to poor blood flow (ischemic heart disease) and the rest die of stroke. Treatment and lifestyle changes can help control your high blood pressure to reduce your risk of life-threatening complications. Hypertension is easily detected and controlled though there is no existing cure. If left untreated, hypertension can result in irreversible damage which can lead to organ failure and eventually cardiac arrest (WHO, 2016)

1.8 Conceptual frameworks

Independent variables   **Dependent variables**   **Outcome variable**

Patient perceptions

-patient lifestyle

-level of education

awareness
- risk factors
- health services
-morbidity and
mortality causes
-knowledge level

**Hypertension
complications /poor
clinical outcomes**

Anthropometrics

-Body mass index

-Waist to hip ratio

physiological parameters

-Blood pressure
-Pulse Rate

clinical makers
-uncontrolled BP
-clinic follow ups
-patient medication
adherence

Intervening variables

-Health education

- Co morbidity

- Sex/Gender
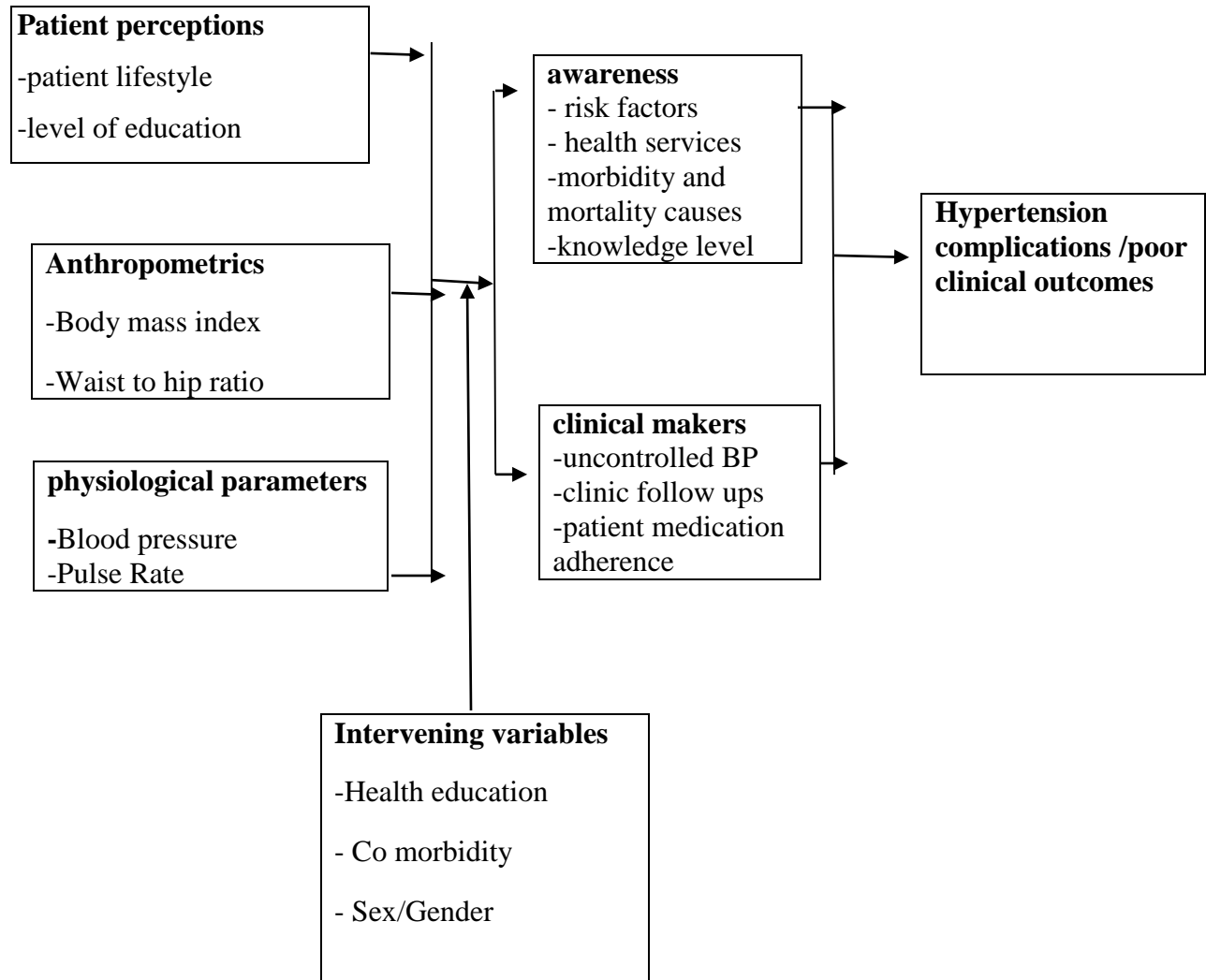
CHAPTER TWO: LITERATURE REVIEW

2.0 Hypertension: definition and clinical implication

Hypertension which was defines as prolonged raised blood pressure over 140/90 mmHg) is a common chronic disease (Burnier,2012), for adults usually defined as persistent systolic blood pressure exceeding 140 and/or diastolic blood pressure exceeding 90 mmHg, is one of the most important public health problems around the world, affects about a quarter of the adult population in many countries .

There are many environmental, genetic and lifestyle choices that effect the clinical outcomes for a hypertensive patient. Several well-known epidemiological studies have identified risk factors for hypertension. One such major study was conducted in Framingham, Massachusetts and is known as the Framingham Heart Study. Some major findings of the study points toward the role of gender, weight gain and elevated cholesterol levels as some indicators of clinical outcomes Men have been found to be more likely to have elevated blood pressure levels compared to females. A 10% gain in relative weight has been found to increase the systolic blood pressure levels by 6.5 mmHg (Kannel,2010) In a study done in a population of minority youth, SBP was found to be significantly greater in obese patients compared with the lean controls(Garcia et al, 2015) The role of smoking in elevating the blood pressure levels has also been well documented in literature. In one of the earlier studies, Regalado et al (2010) demonstrated that smoking should be avoided in any hypertensive patient because it can markedly increase the risk of secondary cardiovascular complications and enhance the progression of renal insufficiency.34 Therefore; clinical outcomes for hypertension are also influenced by the patient's physical state and the lifestyle habits that he/she is following.

2.2 Factors influencing hypertension clinical outcomes

2.2.1 Body makers

Body markers entails; blood pressure and anthropometric measurements, body mass index ratio; the weight/ height ratio.

2.2.1.1 Blood pressure

A lot has been reported on factors that contribute to the low level of BP control and this can be divided into 3 groups : (1) health care workers, (2) institutional factors and (3) patient factors.

The ideology of lack of action inspite of elevated BP is a process known as "clinical inertia"(Borzecki, Oliveria&Berlowitz,2015).Evidence of this has been described in many studies conducted in tertiary hospital facilities. Reasons for clinical inertia are many, though a basic reason implied by some, is that most health care workwers are unlikely to implement elements of guidance if they disagree with them.

Clinical inertia lies within the organizational factors which includes factors such as lack of proper training and poor clinical practice with the goal of achieving therapeutic aims. This Combined with regularly changing clinical guidelines are factors that affect the ability of clinicians to practice and are therefore partly responsible for the existence of poor BP control,

Some of the patient related factors, reported commonly in the literature is the problem of patients adhering to treatment prescribed by HCPs (Burnier,2012). There are many interventions to curb this but Many especially those focusing on patient or provider factors are expensive, complicated or labour intensive and lack systematic accuracy. Consequently the effects on improving patient adherence are limited.

High BP is a significant factor contributing towards cardiac diseases. Prevention is vital as hypertension can be prevented (Cooper et al,2014).Clinical trials (RCTs) have demonstrate some of the benefits of treatment which control BP with minimal side effects and thereby prevent cardiovascular disease (CVD) events .

In the UK, a survey done demonstrated that of those with hypertensive (i.e. either systolic $\geq$ to 140 mmHg or diastolic $\geq$ or $=$ 90 mm Hg or on treatment for hypertension) were only 52% in 2014, about half the people living with hypertension do not have good control (Borzecki, Oliveria&Berlowitz, 2015).

Amongst those at risk of developing clinical complications, 44 per cent had their BP controlled to <140/90 mmHg. For those who did not have coronary complications (CHD) or stroke but who's estimated cardiac risk was $\geq$20%, only 17% were controlled, illustrating that the situation is worse for people at risk (Chobanian,2015).

The preponderance of hypertension is a medical problem that affects 1 in 3 adults. The American Heart Association data shows (Go et al., 2013) that 81.5 % of people with hypertension are self aware, 74.9 % are on treatment, 52.5% have controlled blood pressure, and 47.5 % have uncontrolled hypertension, with about 20% of people living with hypertension not knowing they have it. The AHA predicts that by 2030, preponderance of hypertension will have increase by 7.2% (Go et al., 2013). These figures depict that hypertension is a medical problem for a majority of adults and is expected to continue to increase.

2.2.1.2 Body mass index ratio

Increased BMI increase the risks of high BP, cardiac heart disease, among others. Globally about 58% of diabetes mellitus and 21% of cardiac diseases are credited to BMI exceeding 21 kg/m(WHO,2013) Some studies have shown a close association between BMI and BP, whereas others suggested a BMI threshold is the verge at which relationship with BP begins. (MacMahon, 2015)

Even though the risk of mortality associated with increased weight decreases with age, studies are few on the effect of obesity on cardiac despondency in aging patients with isolated systolic hypertension (ISH). Available evidence also suggests that in middle-aged and older hypertensive mean arterial pressure may be a better predictor of cardiovascular clinical outcomes. There is no relationship between BMI and pulse pressure. Further studies in this area will be valuable to clarify further the effect of obesity on cardiovascular risk.

2.3.2 Physiological parameters

It is accepted Globally that routine physical exercise, among other lifestyle factors, protects against a series of chronic diseases and disorders (Lee, Shiroma&Lobelo, 2012). As a result several international health institutes such as the American College of Sports Medicine, AHA and WHO have published exercise and physical activity recommendations for adoption.

2.3.2.1 Physical training

There has been evidence suggesting that BP, the prevalence of heart disease and mortality is lower in people who exercise routinely. These variables that is "physical activity" such as type or mode of exercise, length of training, frequency, intensity and duration of training (Pollock et al., 2010), pose a challenge in quantifying the benefits of exercise on BP and to provide general advise on characteristics of the training regimen (Fagard, 2011).

2.3.2.2Cholesterol

A relationship between cholesterol levels and development of CHD was first shown in the Framingham Heart Study (Dawber , Moore & Mann 2016), however there was no link between cholesterol and atherosclerotic disease had been proposed by Anitschkow in 1908 . The major groups of lipoproteins, very low density (VLDL), low density lipoprotein (LDL) and high density (HDL) had been identified by John W. Gofman (Gofman , Lindgren , Elliott ,2015). And he laid the foundation for comprehending the association between the lipoprotein groups and the risk of atherosclerosis and cardiac disease. There is no amphibological evidence that LDL cholesterol levels are significantly associated with CVD risk, and reduction of LDL cholesterol levels has become a pillar in CVD managment because of evidence of symbiotic effects from lipid lowering trials.

2.3.3Patient perception

Worldwide, many people diagnosed with high blood pressur do not follow clinical or lifestyle advise. WHO,2013) The most commonly used terms to describe behavior of people living with hypertension are compliance and adherence. To adhere, the patient requires to agree to recommendations from heakth care worker (Lee ,Halimatun , Steven &Ong, 2012) There is minimal information to show if the patients' previous adherence was taken into consideration. A study in Malaysia, which was done on patients with hypertension in a clinic in the state of Selangor found that the patients thought that the prescribed Western medicine by the health clinic was medically right but was having undesirable adverse effects. Therefore, alternative pharmacologic method was used to counterbalance the harmful effects of the Western medicine. The types of adherence behavior found in the study include a strict follower, one with self-regulation, and one who does not adhere. These behaviors become a major concern in health care studies, particularly in the management of chronic conditions such as hypertension, where pharmacological treatment and sedentary lifestyle modification practices are the main management in stoping cardiovascular death and morbidity. (Wong, Tam& Cheung, 2018). Lack of change toward health advise is associated with increase in need for health care services.

A study of 102 hypertensive patients was conducted in the US to show how well partients should farmiliarize with their knowledge of hypertension. patients were on views about the reasons for their hypertension by using 17 items (Patel and Taylor 2012). These reasons include several modifiable factors which were shown to be associated with hypertension, including obesity, lack of exercise, addition of salt in the diet, consumption of coffee or alcohol .(Midgley et al. 2014, Halbert et al. 2015, The Trials of

Hypertension Prevention Collaborative Research Group 2016, Jee et al 2014, Xin et al 2011, Whelton et al. 2013). Below are the findings

Patients' views about the causes of his/her hypertension (Patel and Taylor2012).

Reason	Prevalence (%)
Family history	57
Obesity	42
Stress from work	41
Not enough exercise	37
Stress at home	30
Age	20
Alcohol	12
Fate	6
Bad luck	13
Wrong foods	15

It was clearly illustrated that there is lack of proper communication between the patient and the health care giver In a US study on 60 African-American women with hypertension, 50% of them thought that there are two different diseases: high blood and hypertension, but they are related to each other (Heurtin-Roberts and Reisin2010).

2.4 Comorbidities associated with hypertension clinical outcomes

Hypertension has a high level of Despondency and death associated with it. Some of these comorbidities include chronic kidney disease, diabetes, heart failure, obesity and hypercholesterolemia.

2.4.1 Diabetes

Hypertensive patients are more at risk of developing diabetes than people with normal pressure persons. Up to 75% of cardiovascular disease (CVD) in diabetes may be credited to hypertension leading to radical treatment in persons with diabetes and hypertension as comorbidities (Gress , Nieto , Shahar , Wofford & Brancati, 2010). The findings by Evelyn *et al* (2014) states that diabetes is the most common secondary diagnosis. This study

concludes that patients with diabetes have greater levels of uncontrolled high blood pressure (HBP) leading to frequent emergency department visit. Among hypertensive people, the reported overall prevalence of abnormal glucose tolerance is42% in which 17% have impaired glucose tolerance (IGT) and 25% suffer from diabetes mellitus .

2.4.2Obesity

Obesity is an disproportion between energy intake and expenditure, although other researches have shown that genes, physical markers factors play a role in its etiology. It is associated with disorders such as hypertension, diabetes, hypercholesterolemia and liver disease. Hypertension and congestive heart failure (CHF) in obese people is likely related to LV (left ventricular) hypertrophy. Important to note is that there is a strong association between hypertension and obesity in both genders, all age groups and in almost all ethnic groups. Fat distribution as well as upper-body obesity or increased abdominal fat, serve as better predictors of hypertension than body mass index (BMI) alone (Isezuo&Ezunu , 2015). The prevalence of both hypertension and obesity among patients with Type 2 Diabetes mellitus (T2DM) in Africa is 44.9% (34) and while in Germany it is 50.7% (Hanefeld M, Koehler, Gallo, Benke&Ott ,2017). In Italy where waist circumference is used the prevalence is 52% (36). In South America two studies of the same population reveals a higher prevalence of coexistence between obesity with hypertension (systolic blood pressure> 144mmHg or diastolic blood pressure> 83mmHg. In these studies, obesity was defined by waist circumference and prevalence was 18.2% and29.5% respectively than by BMI which gave a prevalence of 11.3% and 19.2% respectively (Ezenwaka&Offiah, 2011).

2.4.3Dyslipidaemia

Dyslipidaemia includes abnormality in lower density lipoprotein-cholesterol (LDLcholesterol), high density lipoprotein-cholesterol (HDL-cholesterol) and triglyceride levels. Studies have shown that hypertension and hypercholesterolemia frequently coexist causing dyslipidemic hypertension also known as lipitension. In United States (US), the prevalence of lipitension ranges from 15 to 31%. In another study, the prevalence of hypertension was found to be 30% with hypertension alone being 47% and hypercholesterolemia 18% (Laaksonen,Niskanen , Nyyssönen , Lakka , Laukkanen&Salonen 2016).

In a 7yr follow up study on Finnish men, it found that a dyslipidemic characteristic of metabolic syndrome predicts the development of hypertension (Yan Z-Tet al, 2010). A population based survey on four ethnic groups in North West China reports a prevalence of close to 52% for

hypertension, about 48% for overweight or obesity and above 50% for dyslipidaemia. Results show a positive association between hypercholesterolemia and hypertension.

2.4.4 Congestive cardiac failure

It is the inability of the heart pump sustain the body demands, particularly, failure of the heart to eject blood efficiently. consequently the heart provides insufficient blood flow to the main organs

Heart failure is associated with failure of the ventricles (Hunt, Abraham & Chin,2018). Hypertension is a common finding in heart failure patients. One study done on elderly patients with heart failure reports a prevalence of 55% with essential hypertension (Ogah,2016). In Nigeria, one study observes that hypertension and heart failure constitute a double burden of cardiovascular disease. The age adjusted prevalence of hypertension was reported to be between 20-25% (Adedoyin& Adesoye,2011). In South West Nigeria frequency of 35% for heart failure and32% for hypertension during a five year period is realised (48,49). Onwuchekwa*et al* (2014) reports a 56.3% prevalence of hypertension. This is the most frequent cause of heart failure reported during the study period. Analysis of thirty four years follow up of Framingham study data, reports that hypertension and coronary disease are the predominant causes of heart failure and accounted for more than 80% of all clinical events (Kannel , Belanger,2011). In the United States, it was noted that 7.4% with congestive heart failure have blood pressure that is higher than 140/90mmHg .

2.4.5 Chronic kidney disease

CKD is damage to the kidney glomerular filtration rate (GFR < 60ml/min/1.73m2 for three months or more irrespective of cause (52). About 80% of CKD patients are hypertensive (Leoncini ,Viazzi& Pontremoli,2014).Hypertension is very common in patients with stage 5 CKD. As the disease progresses, the prevalence of hypertension increases. Sodium retention, expansion of the fluid compartments and activatio of RAAS makes hypertension refractory. The prevalence of hypertension varies with the cause of CKD, and there exists as significant relationship between hypertension in patients with Kidney disease (93%), diabetic nephropathy(87%) and polycystic kidney disease(74%) (Tedla ,Brar , Browne & Brown 2014).

The prevalence of hypertension in United States reaches an estimated 86% in patients with end stage renal disease (Agarwal ,Nissenson , Batlle , Coyne , Trout & Warnock , 2013). In Turkey the prevalence of hypertension in this population is32.7% and 15.7% have stage 1-5 CKD. The prevalence of hypertension increases with increase in stage of CKD from a low 34.8% in stage 1

to as a high of 92.8% in stage 5 (Altun ,Süleymanlar , Utaş, Arinsoy&Ateş 2013).Age specific prevalence of stage 3 or 4 CKD at 20-49, 50-59 and ≥70 yrs. of age is 1.5%,11.7% and 39% respectively with diagnosed or undiagnosed diabetes mellitus or hypertension.

CHAPTER THREE: MATERIALS AND METHODS

3.0 Introduction

This chapter explains in detail the study site, study design and methods of data collection, analysis and presentation that was used in this study, along with ethical considerations.

3.1 Research design

Descriptive cross-sectional study was used. This enabled the description of the phenomenon (determinants of hypertension outcomes) given the short period that was available to conduct the research., whereby medical records and questionnaires and semi-guided interviews of adult hypertensive patients was used to collect data on clinical outcomes of hypertensive patients and management of the patients and 5 key informants was interviewed on their perception of clinical outcomes of hypertensive patients and some of the challenges they encounter in practice. The study used both quantitative and qualitative methods to collect data.

3.2 Study site

The study was carried out at the Kenyatta National Hospital (KNH). The hospital is a tertiary level 6 hospital with a bed capacity of 2000 beds. It currently comprises of 50 wards, big theatres with 24 operating suites and intensive care unit with a bed capacity of 52 and has been reported to see up to 7000 patients daily at the outpatient clinics thereby making the hospital a good site for the study

3.3 Target population

The study population was derived from adult people living with hypertension and currently on treatment and they had been on follow up at the hospital regularly for at least 6 months

The study consisted of inpatients in medical wards and outpatients at the Kenyatta hospital who have been diagnosed at least for the past six months.

3.3.1 Inclusion criteria

Hypertensive patients aged 18 years and above, who was admitted to the medical wards or visit the medical outpatient clinic in KNH and those who consent to participate in the study was be included. The study only included Patients on treatment for at least the past six months. This helped to effectively measure and monitor the outcome of the patients who have been seeking treatment at KNH.

3.3.2 Exclusion criteria

Patients who have been diagnosed with hypertension in a period not exceeding six months, pregnant patients and those who decline participation was excluded. Patients who was receiving follow ups on other facilities other than KNH was also excluded.

3.4 Sampling frame and sample size

Apilot study was done and this included all hypertensive patients on follow up at the KNH hypertension clinics. respondents aged 18 years and over will be eligible to participate in this study.

Study participants were enrolled daily in the morning at the cardiology medical outpatient clinic through systemic random sampling and a specific number was enrolled depending on patient turnout at the clinic. Patient education and informed consent was sort before their enrolment into the study

Participants were given have equal chance of participation in the study, papers were put in a container, of which will be written on YES, and NO, they picked papers from a container; those who pick papers written on YES were be recruited. The participants were then followed as they are admitted; they were given and taken through the information sheet. Those who agree was requested to sign an informed consent and then the semi structured questionnaire was administered to them to collect data.

Two doctors and three ward nurse in-charges were requested to participate in a key informant's interview. Sampled participants were interviewed after being reviewed by the clinicians. This was done after assessing their eligibility and obtaining informed consent to participate in the study.

A survey of the files of sampled respondents was done to access the patients access the number of scheduled visits and the hypertensive clinical outcomes of the patients for the past one year.

The sample size was calculated based on Fisher's formula for estimating the minimum sample size that is best representative of the population.

The Fisher's et al. 1998 formula

n = $\dfrac{Z2pq}{d2}$

n= the desired sample size (if the target population is greater than 10,000)

z= the standard normal deviate at the required confidence level.

p= the proportion in the target population estimated to have the characteristic being measured.

q= 1-p

d= the level of statistical significance set.

If the target population is less than 10,000, the required sample size will be smaller. In this case the sample estimate is calculated using the formula:

nf= n

1+ (n/N)

Where:

nf= the desired sample size (when the population is less than 10,000).

n= the desired sample size (when the population is more than 10,000).

N=the estimate of the population size.

n= $\underline{(1.96)2(0.5) \ (1-0.5)}$

(0.05)2

= 90

3.5 Data Collection

Two research assistants were identified, then they were trained and recruited into the study, they were final year nursing students training at the University of Nairobi and their availability was assured for the entire period of the study. Pilot of the questionnaires was carried out at KNH on 10 patients diagnosed with hypertensive heart disease and these patients were not included in the final study

Based on the findings from the pilot study, the questionnaire was adjusted to enhance reliability of the tool

Data was collected after obtaining informed consent from the participants through administering structured questionnaires. These questionnaires were captured socio demographic data and key variables of the study which include; BMI, physiological parameters, blood pressure, patient perception that may influence clinical outcomes of hypertension.

An analysis of their medical records was done to access the patient records for the past one year. These were obtained from the department of hospital records. The data that was extracted was patient demographics, clinical characteristics, clinical outcomes, physiological parameters and current clinical condition of the patients.

Qualitative data was collected by use of interviews, three ward nurse in-charges were requested to participate in a key informants interview, a group of 15 hypertensive patients who are clinically stable and able to express themselves and who had did not participate in the administered questionnaire were purposively chosen to participate in the interview schedule, they were provided with a consent form to sign after which the interview and discussion was conducted.

3.6 Data analysis

For statistical analysis, Statistics and data statistical software package version 20.0 (STATA) was used. Descriptive statistics like frequencies and percentages were used for numerical outcomes while means and standard deviation was used for continuous data like age.

Analysis using Chi-square tests was used to identify associations between patients variables. Logistic regression was done to outline independent predictors of outcome variables and the predictor variables.

Descriptive statistics, frequency distribution tables and bar graphs was used to present the collected data.

3.7 Ethical consideration

Clearance was sought from Kenyatta National Hospital/University of Nairobi Ethical and Research Committee to carry out the study in the hospital. Permission to carry out the study from the medical wards and outpatient departments was obtained from head of medical wards department before conducting the study. A brief information giving information to the study subject regarding the study purpose and benefits confidentiality of their information and willingness to volunteer was done alongside obtaining informed consent.

Voluntary participation: Every participant was aware that being in the study was voluntary and they had the right to withdraw from the study at will. **Informed consent:** Participants were given information regarding the study verbally and were given pamphlet with information regarding the same

Confidentiality: All data collected was handled with confidence and the participants were assured of the same .

Anonymity: Participants was assured that they will not be named in the research report and any possible publication arising from the study. Participation was not aimed at jeopardizing the participant's employment.

Potential benefits and risks: The participants were informed that this study did not pose any harm or risk to the participants and that the researchers will take all necessary precaution to ensure that such risk does not occur .

Permission: The study was registered and approved and ethical clearance will be sought from the UON/KNH Ethics and Research Committee

CHAPTER FOUR: RESULTS

4.0 Introductions

A total of 120 hypertensive patients from Kenyatta National Hospital medical wards and medical outpatient clinics were screened for inclusion into the study out of which only 90 met the study inclusion criteria

This chapter will present the findings on demographic, clinical markers health related factors and awareness, disposition and lifestyle practices that contribute to development of hypertension complications among them. The study was guided by the main objective of the study that was to determine anthropometric assessment, clinical assessment and lifestyle modification assessments of patients with hypertension undergoing treatment at Kenyatta National Hospital.

4.1 demographic characteristics

The mean age of the study subjects was 39.1 years (SD 15.1) with most patients 47 (52%) being in the 40-59 age groups and 26(27%) being over 60 years the rest 17 (21%) were below 40 years. This showed that most of the affected age group was (40-59) years and the least affected group by hypertension is below less 20%, no respondents was below the age of 20 years . There were 37 (40%) male and 53 (60%) female hypertensive patients giving a male-to-female ratio of 2:3. Hence most of the respondents were female hypertensive patients. Most participants reported that they had primary 37 (46%) or secondary 21 (24%) level of education, 7 (8.8%) had never been to school and 20 (21%) had tertiary level of education. This shows most of the respondents had completed secondary school level.

Table 1. Summary of demographic characteristics of respondents with hypertension at KNH

	Frequency (n)	Percent (%)
Age		
Less than 20 years	0	0
20-39 years	17	21
40-59 years	47	52
Over 60 years	26	27
Gender		
Male	37	40
Female	53	60
Level of education		
Never been to school	13	9
Primary	37	46
Secondary	21	24
University/ college	20	21
Marital status		
Single	8	10
Married	54	67.5
Divorced	8	5
Separated	6	2.5
Widowed	12	15
Religion		
Protestant	56	66
Catholic	30	30
others	5	4

4.2.1 Association between Sex and BMI, Waist circumference and waist Hip Ratio for the study population

More female respondents had a higher BMI compared to men 26.5%, similarly more females were obese 26.5% than men 7%. Further analysis revealed an association between BMI and blood pressure control. The proportion of females who were overweight and obese were significantly higher (P value = <0.001) compared to men. More females 60% than males had a high BMI 37%. Waist circumference is higher (41.6%) in females than in males (2.5%) and female respondents with high waist to hip ratio were more (22.9%) than men with high waist to hip ratio (2.8%)

Table 3: Association between sex and BMI, Waist circumference and waist Hip Ratio for the study population

Variable	Male (n)/ (%)	Female (n)/ (%)	Chi Square	P value
BMI Underweight(<18.5 kg/m2) Normal(18.5–24.9 kg/m2) Overweight(25–29.9 kg/m2) Obese (≥30 kg/m2)	3(6.2%) 27(60.2%) 15 (26.5%) 9 (7.0%)	2 (3.5%) 12 (37.4%) 17 (32.6%) 14 (26.5%)	0.02	<0.001
Waist circumference High(Male > 102 cm, Female > 88 cm) Normal(Male < 102 cm, Female > <88 cm)	2 (2.5%) 45(97.5%)	22 (41.6%) 31(58.4%)	0.03	<0.001
Waist Hip ratio High (male >0.95, female >0.85) Normal (male <0.95,female < 0.85)	2(2.8%) 45 (97.2%)	12(22.9%) 41 (77.1%)	0.97	<0.001

4.2.2. Prevalence of Hypertension among respondents

Of the 90 study subjects 12 were found to be hypertensive giving a prevalence of 13% (CI 11.5-14.7%).The prevalence in male and female was 10.3% and 15.9% respectively with a male to female ratio of 1:1.5. Eighty percent of this hypertensive were newly diagnosed and were unaware of their hypertension status previously.

4.2.3 Clinical complication of the respondents with hypertension

From the study 43% of the respondents presented with chest pains 43% while the highest portion of the respondents had a routine hospital 81%, 19% experienced palpitations and 27% reported to have experienced asymptomatic related problems. From the study it can be concluded that most of the respondents were routinely visiting Kenyatta for medical checkups due to hypertension complications.
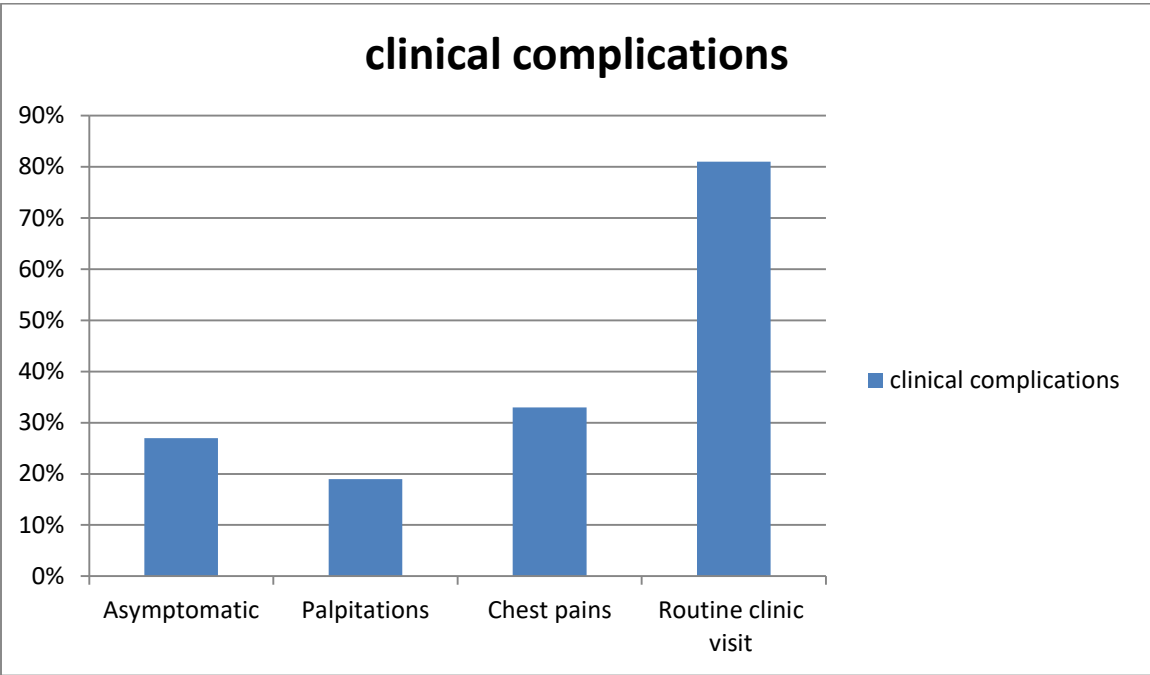
Figure 2: Clinical complication of the respondents with hypertension

From the study 43% of the respondents presented with chest pains 43% while the highest portion of the respondents had a routine hospital 81%, 19% experienced palpitations and 27% reported to have experienced asymptomatic related problems. From the study it can be concluded that most of the respondents were routinely visiting Kenyatta for medical checkups due to hypertension complications.

4.2.4 Heart Rhythms

It was observed that 51% of the respondents had atrial flutter followed by the atrial fibrillation at 43% while 12% exhibited Other dysrhythmias.
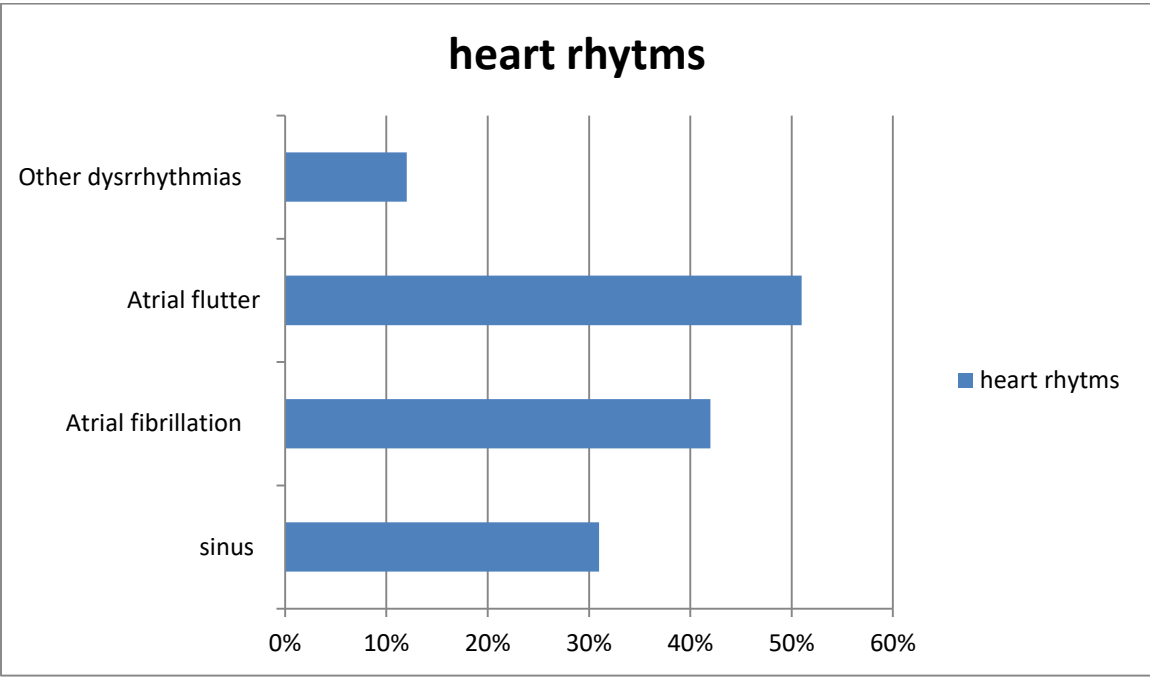
Figure 3: Heart Rhythms

4.2.5 Chest X – ray

The study sought to understand if the respondents had performed chest x ray for the past one year. The results were out of the 90% 47(52%) had undergone chest X rays for the past one year while 43(48%) reported to have not experienced any chest X for the past one year as illustrated in fig 5
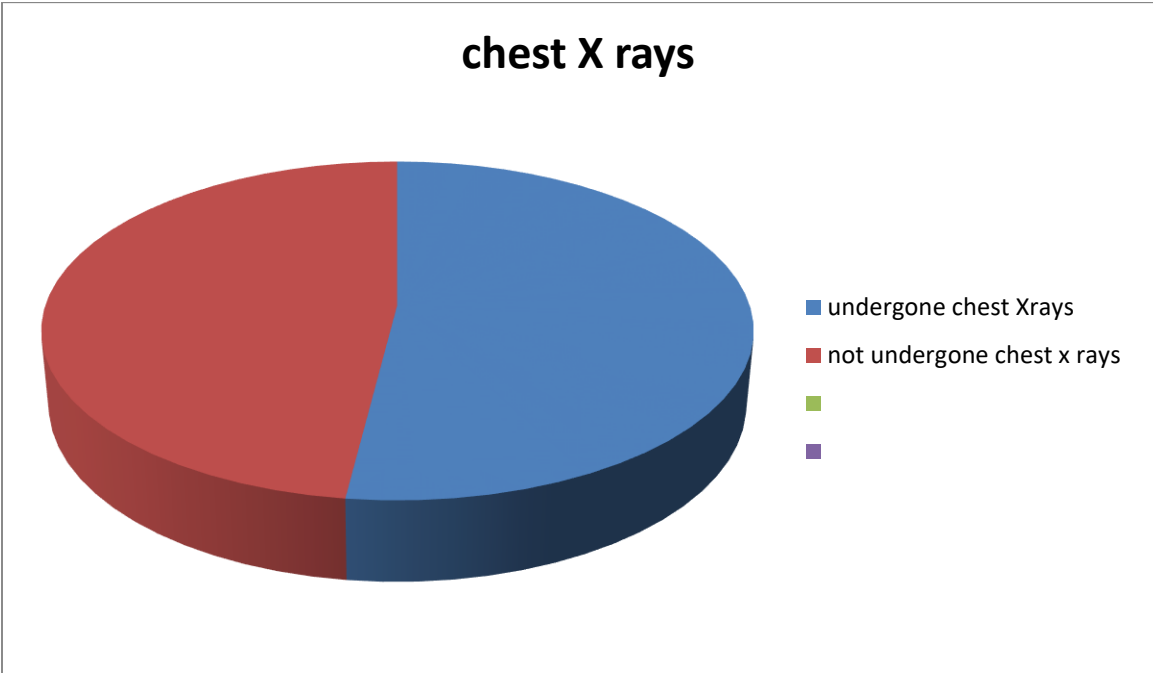
Figure 4: respondents who had a Chest X – ray done

Most of the respondents 73% exhibited complications of pulmonary oedema, 33% had cardiomegaly and the remaining 21% had pleural effusion as illustrated in fig 6
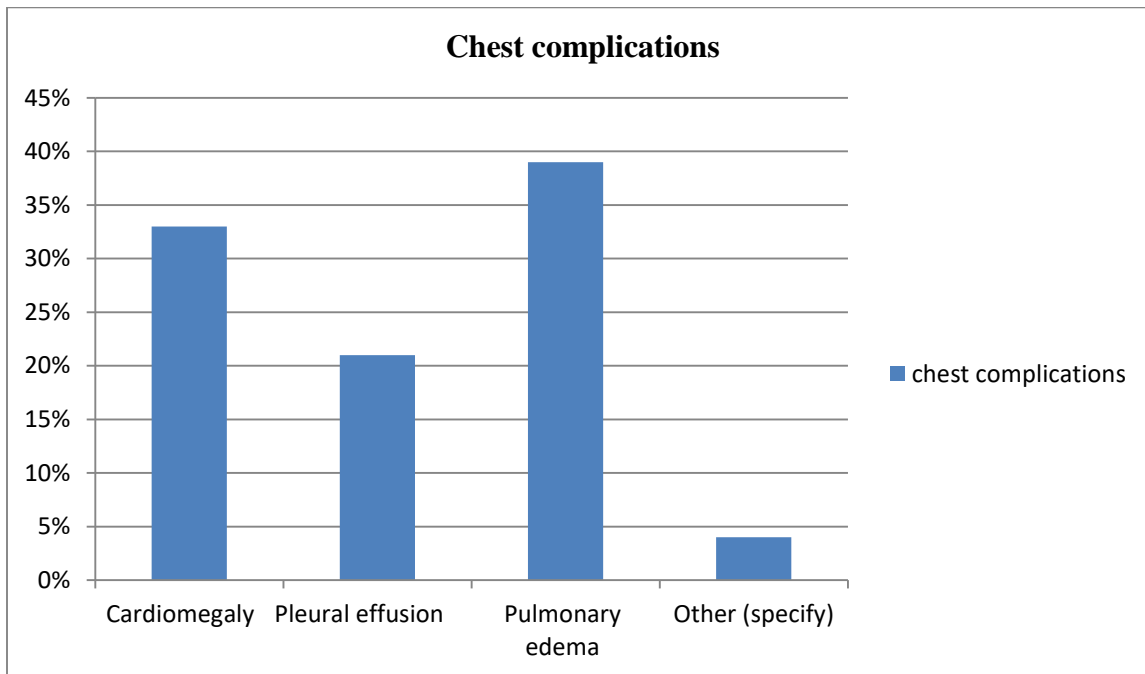
Fig 5: Clinical complications

4.2.6 Blood pressure

Among the respondents 68% had high blood pressure among whom 60% had developed complications. There was a significant association between the respondents' current systolic blood pressure and development of complications, with those with high systolic pressure likely to present with complication compared to those with normal systolic pressure. Majority of the respondents 15 (60%) who presented with current high blood pressure also had   complications (p = 0.033) compared to 19 (34.5%) to those with normal blood pressure (Normal blood pressure being considered to be a systolic of 90 mmHg– 140 mmHg and a diastolic of 60mmhg – 90 mmHg.) Current diastolic reading (p = 0.134), BMI (p = 0.155) and duration since diagnosis (p = 0.629) were not associated with occurrence of complications.

Table 4: Health related factors and association with hypertension complications

	Study population		Hypertension complications		OR (95% CI)	P Value
	n	%	Yes	No		
Current SBP						0.033
Normal Systolic Pressure	57	68.8	19(34.5)	36(65.5)		
High Systolic Pressure	33	31.3	15(60.0)	10(40.0)	2.84 (1.07-7.53)	
Current DBP						0.134
Normal Diastolic Pressure	38	45	12(33.3)	24(66.7)	1.0(ref)	
High Diastolic Pressure	42	55	22(50.0)	22(50.0)	2.00	

The above quantitative findings were confirmed by responses from in the in-depth interviews with health care providers, who cited problems with blood pressure measurement as equipment and personnel shortages:

4.2.5 Relationship between BMI and duration of diagnosis on hypertension clinical outcomes

The study revealed that 1.3% of the respondents were underweight, 30% had a healthy weight (considered to be people with a BMI rate of 19.5 – 24.5) 28.8% were overweight and 40% were obese. Further analysis showed that obesity is associated with clinical outcomes 65.2% . The findings show that there is a significant relationship between hypertension and BMI with a P value of 0.034 affecting the respondent's clinical outcomes, this would imply that respondents with high BMI are likely to have high blood pressure. The duration of which the respondent has had hypertension did not have significance on clinical outcomes and there was also no significant relationship between the duration since the respondent was last treated and the clinical outcomes of the respondents.

Table 6: BMI , duration of diagnosis on hypertension clinical outcomes

	Study population		Clinical outcomes		95 CI	P Value
BMI	n	%	yes	No		
Underweight	1	1.3	1(100.0)	0(0.0)	NA	
Healthy	24	30	24(58.3)	20(41.7)	1.0(ref)	
Overweight	23	28.8	8(34.8)	15(65.2)	0.38 (0.12-1.24)	0.034
Obese	32	40	11(34.4)	21(65.6)	0.37 (0.13-1.11)	
Duration since diagnosis with hypertension						
Less than 2 years ago	34	42.5	14(41.2)	20(58.8)	1.0(ref)	
2-5 years ago	31	38.8	12(38.7)	19(61.3)	0.90 (0.33-2.44)	0.578
5 years and above	15	18.8	8(53.3)	7(46.7)	1.63 (0.48-5.55)	

4.3 Hypertension related complications

The factors assessed were the period on treatment for hypertension, other chronic ailments suffered by the respondents, hospitalization due to hypertension related complications in the last one-year and the type of complication the respondents developed

4.3.1 Other chronic ailment(s) suffered by the respondents

The study illustrated that that majority of the respondents (53.2%) did not suffer from any other chronic ailment, whereas 44% did. The remainder (2.8%) did not give a response. Some of the chronic conditions included diabetes, asthma, epilepsy, chronic cardiac failure, peptic ulcer disease and pelvic inflammatory disease.

Table 7: Other chronic ailment(s) suffered by the respondents

Clinical outcomes	Frequency	Percent
Yes	36	44.0%
No	47	53.2%
No response	7	2.8%
Total	90	100.0

4.3.1 Hospital admissions due to complications arising from hypertension

The study showed that 26% of the respondents had been admitted due to hypertension and complications of hypertension in the past 1 year whereas 74% had not been admitted.
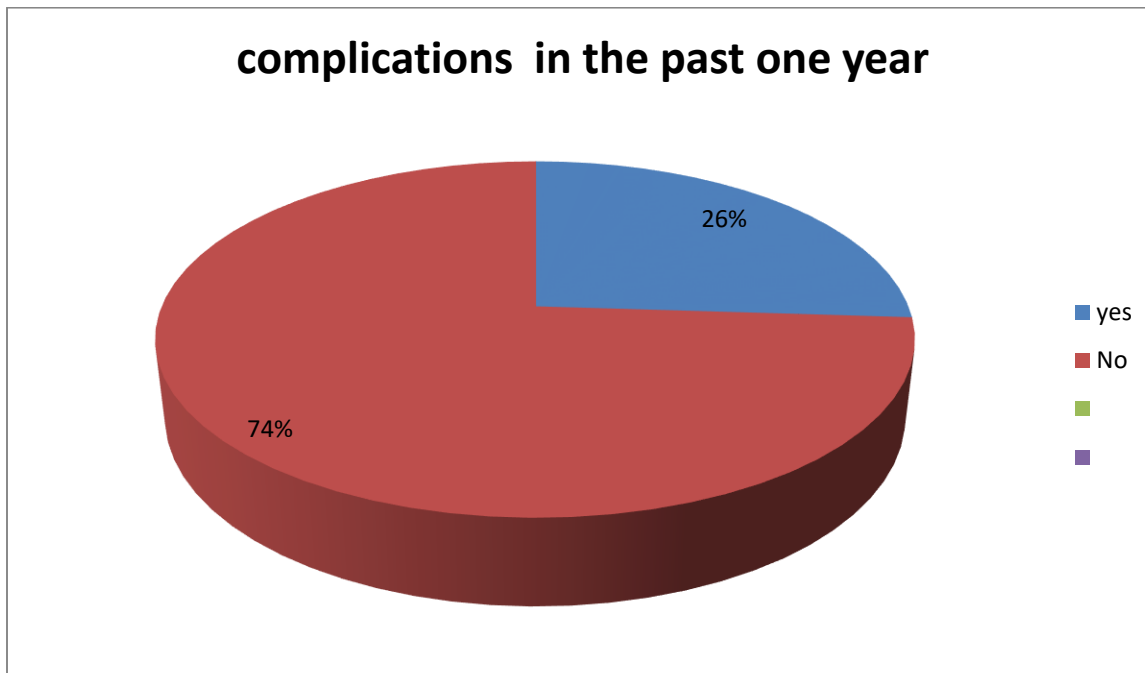
Figure 6: complications over the past one year

4.3.2 Complications suffered by the respondents

From the study findings a good percentage of those hospitalized were due to increased blood pressure, diabetes, and chronic heart failure in that order

Table 8: Type of complication suffered by the respondents

Complication	Frequency	Percent
High BP	63	70%
chronic cardiac failure	13	14%
Diabetes	24	26%
Total	**90**	**100.0**

4.4 Lifestyle
4.4.1 Physical exercises

About 34% of the respondents reported to have at least done physical training exercise while 66% reported to have not done physical training exercises within the past 1 year. Out of the 34% respondents 65% lasted 30 minutes with the least percentage 5% lasting 1 hour long. The results are presented in the chart below.

duration of exercises.

- 1 hour long
- 45 minutes long
- 30 minutes long
- Less than 30 minutes
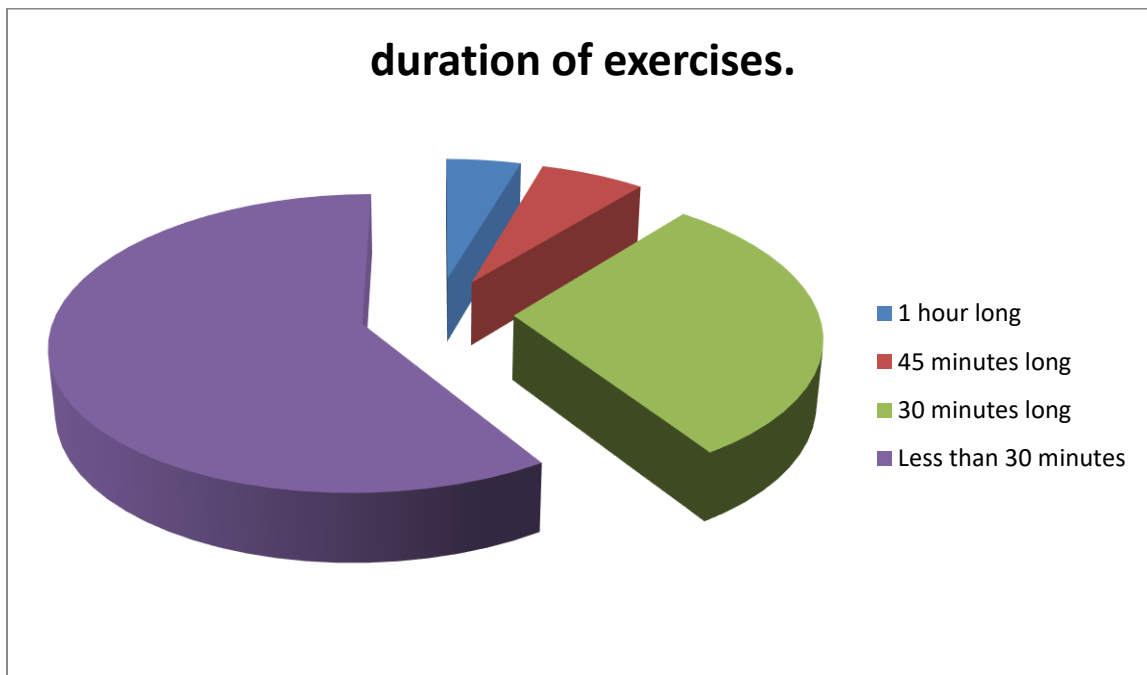
Figure 7: Duration of exercises

4.4.2 Tobacco use

Of the respondents 33% were active smokers while 77% were not smokers.
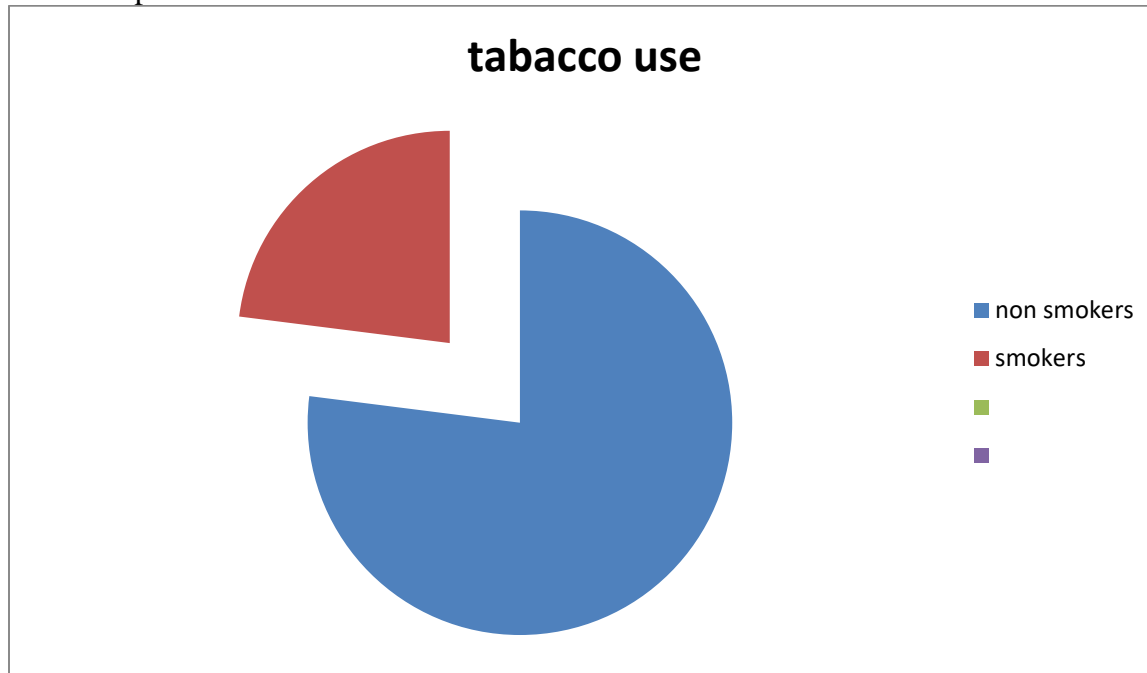
Figure 8: tobacco use

Table 9: Tobacco use among study population

Of the 21 current smokers, majority (6%) were smoking cigarettes daily. 4 percent smoked 1 packet of cigarettes daily while 2% percent reported to be smoking occasionally with 77% of the study population being non-smokers.

Variable	(%)
Currently smoking,	7
Smoking daily,	6
1 – 2 cigarette per day	3
I smoke Occasionally	2
1 packet of cigarettes per day	4
Non smokers	77%

4.4.3 Alcohol consumption

The study found that 37% of the population had ever consumed an alcoholic drink .Of those

who had ever taken alcohol 62.6% had taken alcohol within the last thirty days. Twenty nine

percent were taking alcohol daily. Among the respondents 37% were hypertensive and consumed alcohol whereas 22% of the respondents were hypertensive and did not consume alcohol. Among the population that consumed alcohol, 18.5% had taken alcohol in the past 30 days. There was a significant relationship between those who drank 1-2 bottles with the clinical outcomes with a P value of 0.007 while there was a significant relationship with those who had taken alcohol with the past one year and hypertensive clinical outcomes.
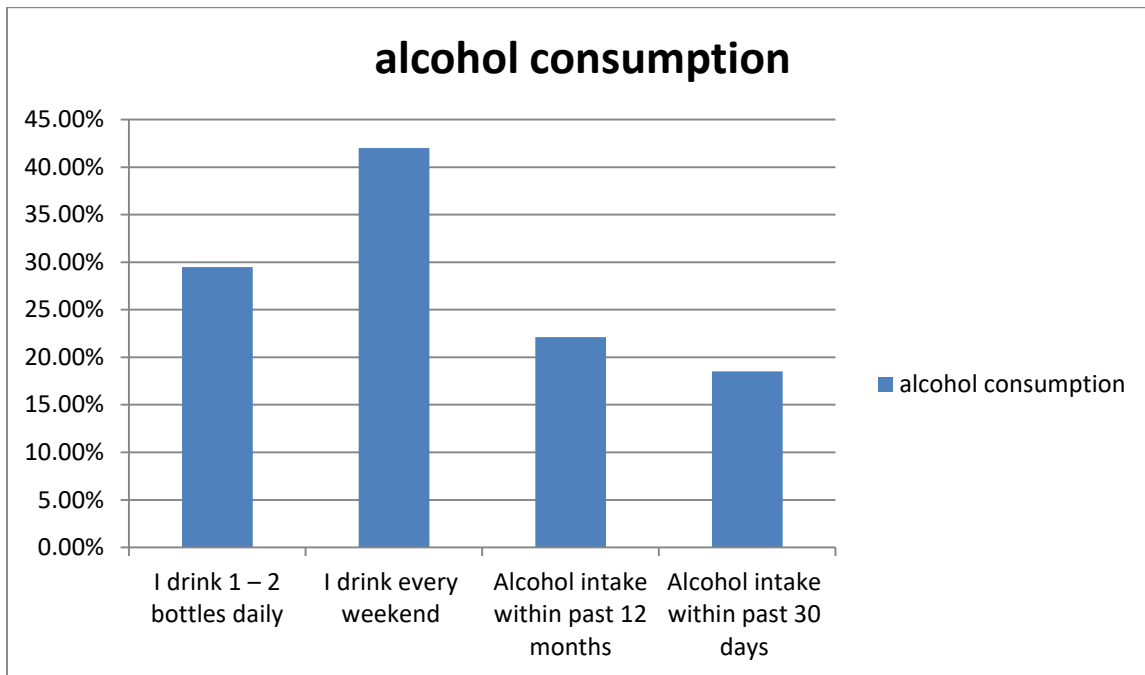
Figure 9: Alcohol consumption among study subjects

Table 11: Hypertension clinical outcomes and alcohol consumption

Variable	Frequency (%)	Hypertension Clinical outcomes		Chi square	P Value
		yes	No		
I drink 1 – 2 bottles daily	29.5%	73%	27%	0.433	0.567
I drink every weekend	42%	58.3%	41.7	0.412	0.588

					0.913
Alcohol intake at least within past 12 months	22.1%	34.8 %	65.2	0.087	
Alcohol intake within past 30 days	18.5%	34.4%	65.6%	0.312	0.688

4.4.4 Hypertension clinical outcomes and tobacco use

Self-reported smoking and alcohol consumption are presented. Among the respondents, 23% reported smoking, with those who reported to be smoking likely (p=0.047) to have high blood pressure compared to non-smokers (77%). The duration of smoking and median packet of cigarettes daily were also significantly different between the two groups.

There number of cigarettes smoked per day is significant to development of clinical outcomes with those who smoke occasionally (P value = 0.006) having less clinical outcomes and those who smoked 1 packet of cigarettes per day (P value = 0.022) having high clinical outcomes. The findings show that among those who smoke, there is significant P value of (0.006) relationship between the number of cigarettes smoked daily and probability of one developing complications.

Table 10: Association of Tobacco use with hypertension clinical outcomes

Variable	Study population (%)	Hypertension clinical outcomes	P value
Currently smoking,	7	12.7	0.047
Smoking daily, n (%)	6	54.8	0.854
1 – 2 cigarette per day	3	15.2	0.184
I smoke Occasionally	2	9.7	0.006
1 packet of cigarettes per day	4	6	0.022

4.4.5 Compliance with lifestyle changes and clinical outcomes

The study showed that there is a relationship between intake of fatty foods and poor clinical outcomes with a P value of 0.82. There was a less significant effect with salt intake and hypertension clinical outcomes. Hypertensive patients reported that they frequently 53.8% ate fruits and vegetables, rarely took fatty foods 76.3%, rarely exercised 43 (53.8%) and frequently 77.6% had enough sleep Patient reporting that they hardly added salt to their food

Variable	Study population	Hypertension clinical outcomes		Chi square	P value
	(%)	Yes	No		
spoons of sugar do you take					
No sugar	1	100.0	0.0	3	0.313
Two teas spoons of sugar	3.8	66.7	33.3		
More than two spoons ofsugar	92.5	41.9	58.1		
fast foods					
Daily	1.3	100.0	0.0	3	0.269
Frequently	7.5	33.3	66.7		
Rarely	18.8	60.0	40.0		
Never	72.5	37.9	62.1		
Add salt to food					
Rarely	45	58.3	41.7	6.7(1)	0.01
Never	55	29.5			
Physical exercise					
Daily	1.3	0.0	100.0	1.2(2)	0.545
Frequently	45	38.9	61.1		
Rarely	53.8	46.5	53.5		
Enough sleep					
Daily	7.5	16.7	83.3	2.6(3)	0.458
Frequently	77.5	45.2	54.8		
Rarely	13.8	45.5	54.5		
Never	1.3	0.0	100.0		
Eat fruits and vegetable					
Daily	37.5	43.3	56.7	0.8(2)	0.678
Frequently	53.8	39.5	60.5		
Rarely	8.8	57.1	42.9		
Take fatty food					
Daily	2.5	50.0	50.0	1.0(3)	0.81
Frequently	7.5	33.3	66.7		
Rarely	76.3	41.0	59.0		
Never	13.8	54.5	45.5		

CHAPTER FIVE: DISCUSSION

5.1 Discussion of the findings

The primary aim of this study was to determine anthropometrics, clinical and lifestyle modification assessments of patients with hypertension. The sample was drawn from patients with hypertension from KNH which is a national referral hospital. To achieve this, the following specific parameters were measured anthropometrics (weight, height, BMI, waist circumference, hip circumference and waist to hip ratio) clinical markers (presenting symptoms – palpitations, easy fatigability, chest pains; ECG reports, chest X – rays) lifestyle habits (Nutrition, exercise, alcohol and cigarettes consumption)

5.1.1 Demographic factors and hypertension clinical outcomes.

The study revealed that a majority of the people suffering from hypertension are people of aged 40 – 59 years with a majority (53%) being females. Advancing age is a risk factor not only for hypertension but also hypertension clinical outcomes. This could be due to the physiological changes that take place in the body to include stiffness of arteries due to arteriosclerotic structural alterations and calcification. The Framingham Heart Study indicated that cardiovascular risk is positively, continuously and independently associated with rising BP. In older individuals, high SBP and high PP have been shown to be more powerful independent predictors of risk, specially decreased DBP and elevated SBP (Franklin S.S 1999). In hypertensive persons aged over 40 years years, an increase in systolic blood pressure by 20mmHg and diastolic blood pressure by 10mmHg, doubles the risk of developing cardiovascular complications.(Khatib 2004). Level of education was significantly associated with hypertension complications, those who have never been to school had a higher predisposition to developing complications compared to those who had attained secondary and tertiary levels of education this is because illiteracy tends to make people ignorant of the importance of adherence to treatment and of the consequences of non-adherence

5.1.2 Anthropometrics and clinical outcomes

Females were observed to have high BMI than men, waist circumference and Hip circumference were higher in females than in men. The waist hip ratio was observed to be significantly high in

females with hypertension compared to males. The study exhibited that abnormal anthropometrics are associated with development of complications in hypertension. High BMI, waist circumference and hip circumference findings are risk factors in management of hypertension. These findings are similar to a study that was done in Gambia showed that while overall prevalence of obesity (body mass index (BMI) >30) was low (2.3%), nearly a third (32.3%) of the urban women aged 35 and over were obese(Huna,2009).

5.1.3 Blood pressure and hypertension outcomes

It was observed that patients who presented at the clinic with high blood pressure were more likely to have complications compared to those who had their blood pressure within the normal range (systolic of 120 – 140 and diastolic of 60-90). The duration from when the patient was diagnosed with hypertension did not seem to have any significance in whether a patient will develop complications or not. The risk of hypertensive complication increased 2.84 times in clients with high systolic blood pressure compared to those with normal systolic blood pressure.

A study done in KNH outpatient clinic in 2009 indicated that only 26% of hypertensive patients on follow-up in the hospital's medical outpatient clinics had well-controlled blood pressure. (Achieng.et al 2009). This is in line with this study where the percentage of patients with controlled blood pressure among patients admitted with hypertension is low despite them being on treatment.

5.1.4 Compliance with lifestyle changes and clinical outcomes

Half of the respondents reported that they frequently ate fruits and vegetables, most of the participants rarely ate fatty foods, and this was not statistically significant. This is contrary to a study which indicated that dietary changes alone can effectively reduce the systolic blood pressure of a person with hypertension by a range of 8-14 mmHg. Reduced saturated fat and dietary salt consumption are important dietary factors in the prevention and control of hypertension. (Miller et al 2002)

Most participants (58.3%) reported rarely adding salt to food, compared to those who never. Studies indicate that indeed dietary salt reduction is an essential component of the non-

47

pharmacological treatment of hypertension indicated strong associations between salt intake and

hypertension (Appel et al 2006, He &

MacGregor 2003, Obarzanek et al 2003). This could be because they might have been sensitized

about adding salt in their diet

5.1.5 Nutrition

Nutritionally, patients who consumed vegetables and fruits on a daily basis had lower heart rates,

BMI, blood pressure and cholesterol levels. However, those who consumed fast foods and meals

high in animal fats daily were observed to have increased heart rate. This suggests the protective

or healthy nature of vegetables and fruits to the cardiovascular system. Vegetables and fruits have

been reported to have cardio protective properties, while animal products are associated with risk

for cardiovascular metabolic diseases. Indeed, frequent consumption of vegetables and fruits is

associated with an inverse relationship to cardiovascular diseases, while meat that is high in

saturated fat is directly linked with cardiovascular-related mortality. Studies have shown that fruits

and vegetables moderate the risk for hypertension, reduce systolic blood pressure and slow the rise

in both systolic and diastolic blood pressure over time. Consumption of recommended servings of

vegetables and fruits facilitate weight loss and lower BMI, as well as reducing the workload on

the heart.

Conclusions
In conclusion the prevalence of complications among hypertensive patients is high in our

population and there is almost an equal distribution of the complications among men and women

with higher incidences in those above 40 years of age. More women than men are obese but this

has no statistical significance in the development of complications as the study showed that there

was no relationship between weight and development of complications. Hypertensive patients with

well controlled blood pressure are less likely to develop complications as compared to those with

poorly controlled blood pressure. Respondent who do not stick to their follow – up schedule often have poorly controlled blood pressure and they are likely to develop complications. Progression from simple hypertension to developing complications is significantly high among people living a sedentary lifestyle, with poor feeding habits, poor diet, those who smoke and indulge in alcohol. Due to poor progression of clinical symptoms and significant progression to developing complications, hypertensive patients should be followed up strictly and an individualized medical plan with the best outcome be adopted for each patient based on their unique needs. Health education with emphasis on lifestyle modification and the impact that sedentary lifestyle has on hypertension will greatly improve the prognosis of people living with hypertension. Adding exercise to ones' daily routine, exercising for at least 20 – 30 minutes a day, eating a healthy balanced diet, avoid smoking or reducing the number of cigarettes to 1 or 2 a day, abstaining from alcohol or drinking leisurely without over indulgence are some of the lifestyle modifications that people living with hypertension could benefit from

Findings from this study revealed advanced age was associated with risk for having high blood pressure. Smoking and alcohol consumption was higher in males, Alcohol consumption was associated with poor blood pressure control. Daily intake of vegetables and fruits were associated with healthier levels of blood pressure, BMI and heart rate. These findings suggest that modifiable risk factors that is BMI, exercise, diet and nutrition are areas that the health care workers need to focus health education on to create awareness among the patients and screening of these risk factors be done of patients routine clinics for early detection and management in order to prevent the risk of getting complications in hypertension

5.2 Recommendations

- There is need to increase public awareness of hypertension and it's risk factors, and the awareness of preventive measures and lifestyle modification that could be undertaken to prevent worsening of the disease

- Introduce an electronic data capture method that is synchronized across all public hospitals to improve on data capture that is screening, treatment and follow up of hypertensive clients as this will effectively improve management of hypertensive clients and reach to clients with remote access

- Primary care physicians to be trained on common markers of hypertension and complications associated with hypertension for detection of asymptomatic patient and expedited treatment of these patients to prevent progressing to complications

- Possible incorporation of health education in the management of hypertensive patients especially in medical outpatient clinics

- Further studies are required to investigate clinical and lifestyle modification with patient follow up over a longer duration and compare this to current practice in order to advise on best practice in management of hypertensive clients

- Conduct a study to determine the effect that lifestyle modification, early diagnosis and proper medical management has on hypertensive disease and progression to complications

References

Achieng' L, M. D. Joshi, E. N. Ogola, and E. Karari, "Adequacy of blood pressure control and level of adherence with antihypertensive therapy," East African Medical Journal, vol. 86, no. 11, pp. 499–506, 2009

Adedoyin RA, Adesoye A. Incidence and pattern of cardiovascular disease in a Nigerian teaching hospital. Trop Doct. 2015;35(2):104–6.

Agarwal R, Nissenson AR, Batlle D, Coyne DW, Trout JR, Warnock DG. Prevalence, treatment, and control of hypertension in chronic hemodialysis patients in the United States. Am J Med. 2013;115(4):291–7.

Agyemang C. Rural and urban differences in blood pressure and hypertension in Ghana, West Africa.Public Health. 2006;120:525–33

Altun B, Süleymanlar G, Utaş C, Arinsoy T, Ateş K,. Prevalence, awareness, treatment and control of hypertension in adults with chronic kidney disease in turkey: Results from the CREDIT study. Kidney Blood Press Res. 2012;36(1):36–46.

Borzecki AM, Oliveria SA, Berlowitz DR. Barriers to hypertension control. *Am Heart J* 2015; 149(5):785-794

Burnier M. Blood pressure control and the implementation of guidelines in clinical practice: can we fill the gap? *J HYPERTENS* 2012; 20(7):1251-1253

Brundtland G, (2012). Reducing risks to health, promoting healthy life.Jama, 288(16), pp.1974-1974.

Borzecki AM, Oliveria SA, Berlowitz DR. Barriers to hypertension control. *Am Heart J* 2015; 149(5):785-794

Burnier M. Blood pressure control and the implementation of guidelines in clinical practice: can we fill the gap? *J HYPERTENS* 2012; 20(7):1251-1253.

Boulware LE, Daumit GL, Frick KD, Minkovitz CS, Lawrence RS, Powe NR. An evidencebased review of patient centered behavioral interventions for hypertension. *Am J Prev Med* 2011; 21(3):221-232.

Blacher J, Staessen JA, Girerd X, Gasowaski J, Thijs L: Pulse pressure not mean pressure determines cardiovascular risk in older hypertensive patients. Arch Intern Med 2010;160:1085 – 1089.

Chobanian. A., Bakris G.L., Black, H.R., Cuschman, W.C., Green, L.A., Izzo, J.L., Jones, D.W., Materson, B.J., Oparil, S., Wright, J.T., Rocella, E.J. (2013). The 7th report of the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure. (JNC VII). *JAMA, 289*, 2560-2572.

Chobanian AV. Control of hypertension--an important national priority.*NEngl J Med* 2011; 345(7):534-535.

Dawber TR, Moore FE, Mann GV.Coronary heart disease in the Framingham study.Am J Public Health Nations Health. 2016 Apr;47(4 Pt 2):4-24

De Ridder D, Geenen R, Kuijer R, van Middendorp H. Psychological adjustment to chronic disease. *The Lancet* 2015; 372(9634):246-255.

Diaz KM, Shimbo D. Physical Activity and the Prevention of Hypertension.Curr.Hypertens. Rep. 2013;15:659–668.

Daniels, S.R. (2016) The consequences of childhood overweight and obesity. Future of Children, 16, 47-67.

Ezenwaka CE, Offiah N V. Cardiovascular risk in obese and nonobese patients with type 2 diabetes in the West Indies. J Biomed Sci. 2011;8(4):314–20.

Eisenmann, J.C. (2014) Physical activity and cardiovascular disease risk factors in children and adolescents: An overview. Canadian Journal of Cardiology, 20, 195-301.

Falkner, B., Gidding, S.S., Ramirez-Garnica, G., (2016) The relationship of body mass index and blood pressure in primary care pediatric patients. Journal of Pediatrics, 128, 195-200.

Gress TW, Nieto FJ, Shahar E, Wofford MR, Brancati FL. Hypertension and antihypertensive therapy as risk factors for type 2 diabetes mellitus. Atherosclerosis Risk in Communities Study. N Engl J Med. 2010;342(13):905–12.

Gofman JW, Lindgren FT, Elliott H. Ultracentrifugal studies of lipoproteins of human serum. J Biol Chem. 2015 Jun;179(2):973-9.

Hagger MS, Orbell S.A meta-analytic review of the common-sense model of illness representations.*Psychology& Health* 2013; 18(2):141-184.

Hunt SA, Abraham WT, Chin MH, Guideline update for the diagnosis and management of chronic heart failure in the adult. J Am CollCardiol. 2015; 46:e1-82.

Hanefeld M, Koehler C, Gallo S, Benke I, Ott P. Impact of the individual components of the metabolic syndrome and their different combinations on the prevalence of atherosclerotic vascular disease in type 2 diabetes: the Diabetes in Germany (DIG) study. CardiovascDiabetol. 2017;6:13.

Hamatani Y, Ogawa H, Uozumi R, Iguchi M, Yamashita Y, Esato M, Chun Y, Tsuji H, Wada H, Hasegawa K, Abe M, Morita S, Akao M. Low body weight is associated with the incidence of stroke in atrial fibrillation patients—insight from the Fushimi AF Registry. Circ J. 2015;79:1009–1017.

Hlaing, W.M., Prineas, R.J. and Zhu, Y. (2016) Tragectory of systolic blood pressure in children and adolescents. Annals of Epidemiology, 16, 11-18.

James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: Report from the panel members appointed to the eighth joint national committee (jnc 8) JAMA. 2014;311:507–520.

Kannel WB, Belanger AJ. Epidemiology of heart failure. Am Heart J. 2011 Mar;121(3):951–7.

Kaneko H, Yajima J, Oikawa Y, Tanaka S, Fukamachi D, Suzuki S, et al. Obesity paradox in Japanese patients after percutaneous coronary intervention: An observation cohort study. J Cardiol.2013;62:18–24.

Kjeldsen, S.E., Aksnes, T.A., Fagard, R.H., Mancia, G. (2015). *Hypertension*.In A.J. Camm, T.F. Lüscher, P.W. Serruys (Eds.), ESC Textbook of Cardiovascular Medicine. 2° Ed. (pp. 437-464). Oxford University Press. England.

Kannel WB, Risk stratification in hypertension: new insights from the Framingham Study. Am J Hypertens. 2010;13(1 Pt 2):3S-10S

Kodama S, Tanaka S, Saito K, Shu M, Sone Y, Onitake F, Effect of aerobic exercise training on serum levels of high-density lipoprotein cholesterol: a meta-analysis. Archives of internal medicine. 2015 May 28;167(10):999-1008.

Kemi OJ, Wisløff U. Mechanisms of exercise-induced improvements in the contractile apparatus of the mammalian myocardium.Acta Physiol. 2010;199:425–439

Lajous M, Banack HR, Kaufman JS, Hernan MA. Should patients with chronic disease be told to gain weight? The obesity paradox and selection bias.Am J Med. 2015;128:334–336.

Laaksonen DE, Niskanen L, Nyyssönen K, Lakka T a, Laukkanen J a, Salonen JT. Dyslipidaemia as a predictor of hypertension in middle-aged men. Eur Heart J. 2016;29(20):2561–8.

Lee IM, Shiroma EJ, Lobelo F, Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. Lancet 2012; 380: 219–229.

Lee K, Halimatun HM, Steven EK, Ong BK. Understanding the perception concerning medication and types of adherence behaviour in hypertensive patients. Pertanika J SocSci Hum. 2012;20(3):781–796.

Leoncini G, Viazzi F, Pontremoli R. Chronic kidney disease and albuminuria in arterial hypertension. CurrHypertensRep. 2010;12(5):335–41

Lau E, Kaczorowski J, Karwalajtys T, Dolovich L, Levine M, Chambers L. Blood pressure awareness and self-monitoring practices among primary care elderly patients. Canadian Pharmacists Journal.2016;139(6):34–41.

Mathenge W, Foster A, Kuper H*: Urbanization, ethnicity and cardiovascular risk in a population in transition in Nakuru, Kenya: a population based survey. BMC Public Health.2010, 10: 569-581.10.1186/1471-2458-10-569.*

MacMahon S, Neal B, Rodgers A. Hypertension – time to move on. Lancet 2015; 365: 1108–1109.

Muntner, P., He, J., Cutler, J.A., et al. (2014) Trends in blood pressure among children and adolescents. Pediatrics, 291, 2107-2113.

Mohrman, D.E., Heller L.J. (2014). *Cardiovascular Physiology*. (6th Ed) United States of America: McGraw-Hill Companies, Inc.

Ono K. Current concept of reverse cholesterol transport and novel strategy for atheroprotection.JCardiol. 2012 Nov;60(5):339-43.

Ogah OS. Hypertension in sub-Saharan African Populations : the burden of hypertension in Nigeria. Ethn Dis. 2016;16(January):765.

Puri M, Flynn JT, Garcia M, Nussbaum H, Freeman K, DiMartino-NardiJR. The frequency of elevated blood pressure in obese minority youth.JClinHypertens (Greenwich). Feb 2015;10(2):119-124.

Petrie KJ, Weinman J, Sharpe N, Buckley J. Role of patients' view of their illness in predicting return to work and functioning after myocardial infarction: longitudinal study. *BMJ* 2016 ; 312(7040):1191-1194

Regalado M, Yang S, Wesson DE. Cigarette smoking is associated with augmented progression of renal insufficiency in severe essential hypertension. Am J Kidney Dis. Apr 2010;35(4):687-694.

Steyn K, Bradshaw D, Norman R, Laubscher R. Determinants and treatment of hypertension in South Africans: the first Demographic and Health Survey. S Afr Med J. 2008;98:376–80

Tedla FM, Brar a, Browne R, Brown C. Hypertension in chronic kidney disease: navigating the evidence. Int J Hypertens. 2014;2011:132405.

Isaiah (2016).Determinants of hypertension complications among adult hypertensive inpatients in kenyatta national hospital,nairobi. Thesis, University of Nairobi

Isezuo S a, Ezunu E. Demographic and clinical correlates of metabolic syndrome in Native African type-2 diabetic patients. J Natl Med Assoc. 2015;97(4):557–63.

Jackson R, Lawes CM, Bennett DA, Milne RJ, Rodgers A. Treatment with drugs to lower blood pressure and blood cholesterol based on an individual's absolute cardiovascular risk. Lancet 2015; 365: 434–441

Wilson PW, D'Agostino RB, Sullivan L, Parise H, Kannel WB. Overweight and obesity as determinants of cardiovascular risk: The Framingham experience. Arch Intern Med. 2016;162:1867–72.

Wolf-Maier K, Cooper RS, Kramer H, Banegas JR, Giampaoli S, Joffres MR et al. Hypertension treatment and control in five European countries, Canada, and the United States. *Hypertension* 2014; 43(1):10-17.

Williams B, Poulter NR, Brown MJ, Davis M, McInnes GT, Potter JF et al. British Hypertension Society guidelines for hypertension management 2015 (BHS-IV): summary. *BMJ* 2015; 328(7440):634-640.

World Health Organization .Adherence to long-term therapies: evidence for action. Geneva: World Health Organization; 2016.

Wong MC, Tam WW, Cheung CS, et al. Drug adherence and the incidence of coronary heart disease- and stroke-specific mortality among 218,047 patients newly prescribed an antihypertensive medication: a five-year cohort study. Int J Cardiol. 2013;168(2):928–933.

Yao X-G, Frommlet F, Zhou L, Zu F, Wang H-M, Yan Z-T, et al. The prevalence of hypertension, obesity and dyslipidemia in individuals of over 30 years of age belonging to minorities from the pasture area of Xinjiang.BMC Public Health. 2010;10:91

Zeller A, Schroeder K, Peters TJ. An adherence self-report questionnaire facilitated the differentiation between nonadherence and nonresponse to antihypertensive treatment. *J Clin Epidemiol*2016; 61(3):282-288.

Appendix I: Informed consent information

Title of the study

TO DETERMINING THE CLINICAL OUTCOME OF PATIENTS WITH HYPERTENSIVE DISEASE, A CASE STUDY OF KENYATTA NATIONAL HOSPITAL

Institution

University of Nairobi

P.O Box 30197-00400

Nairobi

Supervisors

Supervisor

Dr. Samuel Kimani

Mobile number: 0722384917

Email:skimani@uoni.ac.ke

Introduction

Introduction: I am a student at the School of Nursing Sciences, University of Nairobi pursuing a Master of Science in Medical Surgical Nursing. I am conducting a study titled: **To Determining the clinical outcome of patients with hypertensive disease attending Kenyatta National Hospital.** This study will be conducted at Kenyatta national hospital medical wards.

This study will be looking to determine the clinical outcomes of hypertensive patients. To achieve this, the study will look at the, body markers; body mass index, blood sugar physiological parameters and patient and how they determine clinical outcome conditions of hypertensive patients. This research will ultimately help in improving management of hypertension.

The purpose of this information is to give you details pertaining to the study that will enable you make an informed decision regarding participation. You are free to ask questions to clarify any of the aspects we will discuss in this information and consent form. I will also ask you questions regarding the study before you sign the consent form to ascertain your comprehension of the information provided.

Purpose of the study

This study will determine the current status of clinical outcomes of hypertensive patients. Identifying trends in clinical outcomes is very important for patients receiving care for chronic conditions such as hypertension.

Procedure: The study is expected to be carried out within two months' time from august to September 2018.Those hypertensive clients who agree to participate in this study will be required to give some information about them and also answer several questions which will be used to estimate their adherence to hypertension treatment. Blood pressure will also be measured during the interview. You will be required to participate only once during the entire period of this study.

Risks

There will be no economic or physical risks to participating in the study. However, you will take some time off your schedule to respond to questions from the researcher administered questionnaire. Also during the interview, some questions will require you to disclose some personal information that might trigger some negative feelings and possibly anxiety. If this happens, the researcher will refer you to the hospital counselor.

Benefits: There is no direct monetary benefit in participating in this study. However, the results of the study will be useful in facilitating the understanding of the various factors that determine the occurrence of hypertension complications and how they can be controlled. The findings will be availed to the hospital, other relevant decision makers and stakeholders to aid in putting in place measures that will improve the care given to hypertensive patients in order to avoid those suffering complications.

Confidentiality: Confidentiality will be maintained and the information you provide will only be used for the intended purpose of the study. In addition, your name will not be required on any forms or used during publication of the final report thus ensuring your anonymity. All materials used during the study will be under lock and key and only the personnel involved in this study will have access to them. Electronic files will be saved on password and fire-wall protected computers.

Voluntary participation: Participation in this study is voluntary. Refusal to take part will not attract any penalty. You retain the right to withdraw from the study without any consequences. You are free not to answer any question during the interview.

Compensation: There is no compensation for participating in the study.

NOTE: Any issues regarding this study can be raised to me through open discussions or through my mobile number 0725708796 or my e-mail lizzmusyoki@yahoo.comas well as through Kenyatta National Hospital/University of Nairobi Ethics and Review Committee using contacts below.

1. Kenyatta National Hospital,   2.University of Nairobi,

P.O BOX 20723-00202,   College of Health Sciences,

Tel. (254)020 726300 Ext.44102, 44355 P.O Box, 19676-00202,

Tel. (254)020 2726300,

Appendix II: Consent form

If you Consent to Participate in the study please sign below:

I hereby consent to participate in this study. I have been informed of the nature of the study being undertaken and potential risks explained to me. I also understand that my participation in the study is voluntary and the decision to participate or not to participate will not affect my employment status at this facility in any way whatsoever. I may also choose to discontinue my involvement in the study at any stage without any explanation or consequences. I have also been reassured that my personal details and the information I will relay will be kept confidential. I confirm that all my concerns about my participation in the study have been adequately addressed by the investigator and the investigator have asked me questions to ascertain my comprehension of the information provided.

Participants Signature (or thumbprint)…………………………….Date…………………

I confirm that I have clearly explained to the participant the nature of the study and the contents of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator Signature……………………………. Date …………………………………...

For any Clarification, please contact

Elizabeth Musyoki
Researcher
Mobile Number: 0725708796
Email: lizzmusyoki@yahoo.com

Or

Supervisor

Dr. Samuel Kimani

Mobile Number: 0722384917

Email:skimani@uoni.ac.ke

Appendix III: Interview Guide
DETERMINING THE CLINICAL OUTCOME OF PATIENTS WITH HYPERTENSIVE DISEASE, A CASE STUDY OF KENYATTA NATIONAL HOSPITAL

Participant I.P _____

1. What do you think about your current hypertension clinical outcomes?

2. What are your thoughts about your current hypertension medications? Do you get any challenges taking the medications? How do you deal with them?

3. What are the clinical outcomes that make you to be admitted to hospital more often? Do you experience severe complication on certain hypertension outcome than others? If yes please name them

4. Do you think your lifestyle affects your hypertension clinical outcomes? If yes in what ways does it affect you clinical outcomes?

5. a) in what ways does your medical professional advised you to change your lifestyle in order to lower your blood pressure?

b) Which mechanism do you apply to lower your blood pressure? Are there any challenges?

6. What are the challenges you face in performing self-monitoring practices in monitoring your blood pressure?

7. Are you satisfied with the information the health professionals give you on hypertension complications management? If no, what do you think is missing?

8. What do you think should be done by the hospital management to improve managing of the hypertension clinical outcomes?

Appendix IV: structured questionnaire

DETERMINING THE CLINICAL OUTCOME OF PATIENTS WITH HYPERTENSIVE DISEASE, A CASE STUDY OF KENYATTA NATIONAL HOSPITAL

INSTRUCTIONS

1. Fill all the sections
2. Tick the right response in the space provided or mark with an X
3. Some questions may require further explanation, write the response in the spaces provided
4. If you need to clarify a question, ask the person administering the questionnaire

SECTION A : DEMOGRAPHIC DATA

Participant id _____

a) Visiting Date

b) Gender   Male [   ]   Female [   ]

c) Ethnicity

   ……

d) Religion

   ……

e) Residence

   ……

f) Marital status
   a) Single [   ]
   b) Married   [   ]
   c) Separated [   ]
   d) Divorced [   ]
   e) Widowed [   ]

g) Hospital on follow up

   ………………………………………………………………………………………………………

SECTION B: ANTHROPOMETRICS

a) Weight in Kgs   b) Height in cm

   …………………………….   ………………………………….

c) BMI

…………………………………

d) Waist circumference

…………………………………………

e) Hip circumference

…………………………………………

f) Waist to hip ratio

…………………………………………

SECTION C: PHYSIOLOGICAL PARAMETERS
What is your current blood pressure?

a) Blood pressure in mm Hg]

Systolic			
Diastolic			
Pulse			

SECTION D: CLINICAL MAKERS

The following section will be filled by the research assistant, Please tick appropriately

1.0 Which Symptoms has the patient been exhibiting in the past 1 month (Tick all that are applicable)
   a. Asymptomatic [   ]
   b. Palpitations [   ]
   c. Easy fatigability [   ]
   d. Chest pains [   ]
   e. Routine clinic visit [   ]
   f. Other (specify) ………………………………………………………………………………………………

1.2 Is the participant pregnant
   a. Yes [   ]
   b. No [   ]

1.3 ECG report
   Date taken

   Report available
      a. Yes [   ]
      b. No [   ]

1.4 Rhythm
   a)   Sinus   [   ]
   b)   Atrial fibrillation [   ]

c)   Atrial flutter   [ ]

d)   Other dysrrhythmias [ ]

1.5 Other comments on the ECG

……

……

……

1.6 Chest X – ray performed within the last 12 months

        a) Yes [ ]

        b) No [ ]

1.7 Report available

a)   Yes [ ]

b)   No [ ]

1.8 From the X – Ray report tick any of the following that was noted on the report

a)   Cardiomegaly   Yes [ ] No [ ]

b)   Pleural effusion   Yes [ ] No [ ]

c)   Pulmonary edema Yes [ ] No [ ]

d)   Other (specify)

        ………

        ………

1.9 Is the participant currently on hypertensive medication

a)   Yes [ ]

b)   No [ ]

1.10 How often do you attend your follow up clinic

a)   On a monthly basis [ ]

b)   Every three months [ ]

c)   Every six months [ ]

d)   Once a year [ ]

1.11 In the past one year what percentage of your clinic appointments did you attend

Expected number of appointment clinics attended	Observed number of appointment clinics attended	Total percentage of the appointment clinics attended

1.12 How often do you refill your prescription

a)   As soon as my medication are over [ ]

b)   I refill after my clinic visits [ ]

c)   I refill only when I am symptomatic [ ]

d)   I don't refill at all [ ]

1.13 Have you been admitted in the past one year

a)   Yes [ ]

b) No [ ]

1.15 If yes what was the reason for admission

....

SECTION D: PERCEPTION AND LIFESTYLE

2.0 Nutrition

2.1 How often do you take fruits
  a) a)daily
  b) twice a week
  c) once a week
  d) never

2.2 How often do you take vegetables
  a) a)with every meal
  b) once a day
  c) once or twice a week
  d) never

2.3 Do you add salt to your food
  a) Yes [   ]
  b) No [   ]

2.4 How many spoons of sugar do you take
  a) No sugar
  b) One tea spoon of sugar
  c) Two teas spoons of sugar
  d) More than two spoons of sugar

2.5 How often do you take fast foods (French fries, fried chicken, burger, pizza, etc)
  a)   daily
  b)   once a week
  c)   once or twice a month
  d)   never

2.6 what cooking fat do you use to prepare your meals
  a)   cooking oil
  b)   solid cooking fat

2.7 What constitutes the meals that you eat in a day?
  a)   Meals and snacks in between the meals [   ]
  b)   Just meals [   ]
  c)   I take snacks as meals [   ]

2.8 Draw a plate and indicate the contents of the food you take per meal and indicate on the plate the portions of starch, proteins and vitamins as per your usual serving
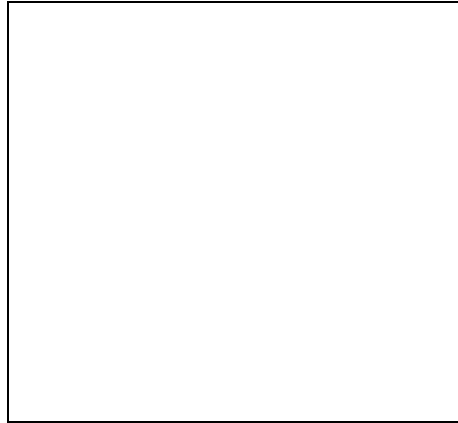
3.0 How often   do you have a routine exercise schedule
a) Yes
b) No

If yes proceed to answer the next section if no skip to part 7

3.1 how often do you exercise please tick appropriately
a) 5 days a week ( )
b) 2 to 3 times a week ( )
c) Once a week ( )

3.2 How often do you carry out the exercises below (Tick multiple choices as applicable

Exercises	5 days a week	2 to 3 times a week	once a week
a) Aerobics			
b) Swimming			
c) Cardio			
d) Plunks			
e) Cycling			

3.3 How long is your exercise session
- a) 1 hour long ( )
- b) 45 minutes long
- c) 30 minutes long ( )
- d) Less than 30 minutes ( )

4.0 Sleep patterns

4.1 How long do you sleep at night, please tick appropriately
- a) More than 8 hours ( )
- b) 8 hours sleep ( )
- c) 6 – 8 hours ( )
- d) Less than 6 hours( )

4.2 do you take naps during the day
- a) Yes ( )
- b) No ( )

4.3 Do you work at night?
- a) Yes ( )
- b) No ( )

5.0 Lifestyle

5.1 Describe the nature of your work

    ……
    ……
    ……………………

5.2 Do you smoke
- a) Yes
- b) No

5.3 if yes how much cigarettes do you smoke
- a) 1 – 2 cigarette per day
- b) 1 packet of cigarettes per day
- c) Occasionally

5.4 Do you take alcohol?
- a) Yes
- b) No

5.5 if yes how much alcohol do you take
- a) I drink 1 – 2 bottles daily
- b) I drink every weekend
- c) I drink on special occasions
- d) I drink as much as I am able to consume for the day

5.6 What do you think about your current medical condition? Is your condition getting better or worse

………

………

………

……………………………………………………………………

(Thank you for your participation in this study)

Appendix V: KEY INFORMANT INTERVIEW GUIDE

DETERMINING THE CLINICAL OUTCOME OF PATIENTS WITH HYPERTENSIVE DISEASE ATTENDING KENYATTA NATIONAL HOSPITAL

INSTRUCTIONS

1. Fill all the sections
2. Tick the right response in the space provided or mark with an X
3. Some questions may require further explanation, write the response in the spaces provided
4. If you need to clarify a question, ask the person administering the questionnaire

1.1 Briefly share your experience in the management of hypertensive patients at the Kenyatta national hospital. What are your perceptions on the control of their blood pressure, whether or not the patients adhere to the treatment regimen and medications prescribed and whether the lifestyle they live has an effect on the prognosis of their condition

………

………

………

………

………

……...

1.2 In your experience what are some of the challenges you experience in the management of hypertensive patients (the challenges could be patient related e.g their financial status, drug adherence etcetra or infrastructural)

………

………

………

………

………

1.3 What would you recommend be done to improve the clinical outcomes of the patients you manage with hypertension at the Kenyatta national hospital

………

………

………

………

………

………

Appendix Vi: Time Plan

Description	Months										
	Dec 2017	Jan 2018	Feb 2018	March 2018	April 2018	May 2018	June 2018	July 2018	August 2018	Sept 2018	October 2018
Preliminary Activities and literature review	▓	▓	▓								
Proposal writing and ethical approval			▓	▓	▓						
Data collection						▓	▓	▓			
Report writing									▓	▓	
Compilation and presentation										▓	▓

Appendix Vii: Map of KNH