

**DETERMINANTS OF HYPERTENSION COMPLICATIONS AMONG ADULT
HYPERTENSIVE INPATIENTS IN KENYATTA NATIONAL HOSPITAL,
NAIROBI.**

**A RESEARCH DISSERTATION IN PARTIAL FULFILMENT OF THE
REQUIREMENT OF MASTER OF SCIENCE IN NURSING DEGREE (MEDICAL
SURGICAL NURSING)**

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DECLARATION

I, Lillian Amugitsi Isiaho, hereby declare that this dissertation is my original work and has never been submitted for any academic award in any institution of higher learning.

Signature----- Date -----

CERTIFICATE OF APPROVAL

This dissertation has been submitted with our approval as University Supervisors

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DEDICATION

To my beloved mother Mrs. Alice Timothy who has been hypertensive for thirty two years.

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

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LIST OF ABBREVIATIONS

BMI	Body Mass Index
BP	Blood Pressure
CHD	Chronic heart disease
CVA	Cerebro-vascular accident
DBP	Diastolic blood pressure
ERSD	End Stage Renal Disease
ERC	Ethics Research Committee
FGD	Focused group discussion
HBM	Health Belief Model
HIV	Human Immuno-deficiency virus
HIS	Health Information System
HTN	Hypertension
KNH	Kenyatta National Hospital
LMICs	Low and Middle Income Countries
MmHg	Millimeters of mercury
UON	University of Nairobi
SBP	Systolic Blood Pressure
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Adult: A hypertensive patient who is older than 15 years old admitted in medical ward.

Alcohol consumption: This is the consumption of five or more standard drinks for men and four or more for women at a time over a short period.

Awareness: Common knowledge or understanding on matters pertaining to hypertension; definition, pathophysiology, preventive measures, treatment and complications.

Body mass index: A value derived from the division of body weight in kilograms by height in meters squared that is used to quantify the amount of tissue mass in an individual.

Cormobidities: The presence of two or more chronic conditions simultaneously

Determinants: The factors that are likely to predispose an already hypertensive client to have a blood pressure reading of >140/90 mmHg with or without experiencing clinical outcomes despite being on treatment therapy.

Hypertensive patients: Hypertensive patient with an average systolic blood pressure (SBP) of more than 140mmhg and diastolic blood pressure (DBP) of more than 90mmhg with or without the presence of clinical outcomes as a result of persistent high BP.

Hypertension complications: Clinical outcomes that result from persistently elevated blood pressure.

Treatment compliance: The degree to which a patient correctly follows medical advice and treatment.

Knowledge deficit: Inability to explain information or to demonstrate a required skill.

ABSTRACT

Introduction: 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.

Broad objective: The study assessed the determinants of hypertension complications among adult hypertensive patients admitted in medical wards in Kenyatta National Hospital (KNH).

Ethical approval: Approval to conduct the study was sought from the UON/KNH ERC and study participants signed a written informed consent before participation in the study.

Research methods: A cross sectional descriptive study conducted among adult hypertensive patients in medical wards who were clinically stable and consented to take part in the study. Sample size of 80 participants was obtained using Fishers et.al method. Study participants were recruited by simple random sampling to fill in the structured questionnaires and purposive sampling for Focused group discussion and key informants interviews. Data was collected within a period of six weeks. SPSS version 20 was used to analyze the quantitative data and manual analysis of qualitative data was done. Significant findings were identified using both descriptive and inferential statistics. The association between variables was determined at a P-Value of 0.05.

Results: Eighty hypertensive patients admitted in medical wards were enrolled into the study. The mean age was 49.7 years (SD 15.1) with most participants being in the 40-59 age group . Sixty percent of participants were females and the male to female ratio was 2:3 .There was a significant relationship between patients level of education and hypertension complications ($p=0.001$). The risk of hypertensive complications was 94% lower in clients with primary compared to no education (OR 0.06; 95% CI 0.01-0.6)

The risk of hypertension complication increased 2.84 times (OR = 2.84; 95% CI 1.07-7.53) in clients with high systolic blood pressure compared to those with normal systolic blood pressure.

Measurements of BMI indicated that 23 (28.8%) patients were overweight and 32 (40%) were obese.

There was a negative correlation between BMI and both systolic (Pearson's ρ -0.05) and diastolic (Pearson's ρ -0.01) blood pressure.

Financial constraints and lack of adequate knowledge among hypertensive patients were main factors cited to be contributing to development of hypertension complications in the key informants' interviews and focused group discussions.

Conclusion and recommendation

Hypertension and hypertension related complications are high in Kenyatta National Hospital with at least 34: 80 hypertensive patient having hypertension associated complications.

No education/low education level was associated with hypertension complications so there is need to have individualized health education for hypertensive patients so that each patient is educated according to their unique needs.

Financial constraints play a key role in development of hypertension complications so patients should be encouraged to take up insurance covers so that they are able to pay for medical services when need arises.

The risk of hypertension complication increased 2.84 times in clients with high systolic blood pressure compared to those with normal systolic blood pressure it is therefore recommended that the follow up system be strengthened so that the hypertensive patients can be traced and treated, this will prevent/reduce the number of patients coming to hospital already suffering complications.

There is a need for more studies in this area to identify how this determinants that contribute to development of complications can be addressed in KNH as developing countries continue experiencing the epidemiologic transition of non-communicable diseases especially in Kenya where data is scarce

CHAPTER ONE

Hypertension is a non communicable disease defined as systolic blood pressure of greater than 140 mmHg and diastolic greater than 90mmHg based on the average of two or more accurate blood pressure measurements taken during two or more contacts with health care provider (Chobanian et al. 2003)

Hypertension is an independent risk factor for complications like heart failure, renal disease and is the most important risk factor for cardiovascular morbidity and mortality in developing countries (Tylicki 2003; Gaddam 2009; Novo 2009)

Hypertension complications are the clinical outcomes that result from persistently elevated blood pressure (White 2009).

Excessive blood pressure on the arterial walls damages the blood vessels and organs such as the eyes, brain and kidneys, the higher and the longer the blood pressure goes uncontrolled, the greater the likelihood of developing complications.

There are several factors associated with development of hypertension complications; age, gender, race and heredity cannot be modified throughout life; the other factors related to individuals' lifestyle can be changed to minimize the risk of complications

Aggressive control of blood pressure in hypertensive patients can regress left ventricular hypertrophy which is seen in 25% of hypertensive patients and reduce the risk of cardiovascular disease (Cuspidi C 2007).

Complications of hypertension have become increasingly common in sub-Saharan Africa, this is attributable to changes in individual and lifestyle practices such as tobacco use, excessive alcohol consumption, reduced physical activity and adoption of diets that are high in salt, refined sugar, and unhealthy foods.

It is of utmost importance that hypertensive patients adhere to blood pressure control and /or treatment regimen in order to avoid complications associated with the disease. Scientific evidence has revealed that individualized treatment regimen e.g. positive attitude towards the illness, lifestyle modification or/and a pharmacological treatment should be chosen based on the severity of the hypertension as well as the number and type of co-morbidities.

Pharmacological treatment is recommended for those who have diabetes or renal diseases, who have repeated BP measures of 140/ 90 mmHg and who have tried lifestyle modification without success in controlling their BP (Jones and Hall 2004).

A lifestyle approach to control blood pressure and therefore reduce chances of getting hypertension complications includes weight reduction, physical activity, moderation of dietary sodium and fat, limited alcohol intake and avoidance of stress (Lahdenpera 2001) . In addition to a healthy lifestyle, the patient's whole way of life should be evaluated, including its connection with their illness (Khan 2009; Hill 2011).

Moreover, evidence suggests that black people, especially impoverished inner-city men, bear disproportionate social, economic and educational burdens that make behavioral changes for health improvement harder than other segments of the USA population(Hill 2011)

1.1 BACKGROUND INFORMATION

Contemporary literature has revealed that hypertension complications are a growing public health problem in many countries (Muntner et al. 2009). In KNH the number of patients being admitted with hypertension complications is high, from the statistics obtained from the health information systems department in 2014 the number of hypertension related complication to include renal failure, congestive heart failure, and those with unspecified secondary hypertension was 492, 252 of whom succumbed to death, this basically means that 51% of those admitted died.

In 2015, 461 patients were admitted with hypertension related complications 158 of them succumbed to death.

Hypertension was initially associated with the developed countries but currently the condition is increasingly emerging in low and middle-income countries (LMICs) where health resources are scarce and those available are stretched by a high burden of infectious diseases.

1.2 PROBLEM STATEMENT

According to the global brief on hypertension report , hypertension contributes to the burden of heart disease, stroke and kidney failure and premature mortality and disability(WHO 2014). Hypertension remains uncontrolled in many developing and developed countries (Brundtland 2002).

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.

In Kenyatta National Hospital the number of patients with both essential and secondary hypertension is equally high, some patients are admitted already suffering the hypertension complications. Thus, it is of utmost importance that this study is undertaken so as to identify the factors that predispose the hypertensive patients to getting complications.

1.3 JUSTIFICATION OF STUDY

Hypertension associated complications are a major problem in the health care system because of its association with an increased risk of cardiovascular disease; the risk of stroke and coronary heart disease increases progressively as blood pressure increases (Whitworth 2003)

Hypertension deaths in Kenya reached 1,995 or 0.60% of the total deaths in Kenya and this is even projected to be worse in the year 2020 (WHO 2014).

Statistics obtained from the HIS office in Kenyatta National Hospital indicate that the number of hypertensive patients rose from 880 in 2014 to 981 in 2015, and in both years 252 patients succumbed to death associated with hypertension, it also indicates that in 2015 between March and December 4519 new patients were seen in the outpatient clinic with hypertension. In the same year, 1600 patients were admitted to the medical wards with hypertension of which 619 had hypertension complications in terms of renal disease and congestive cardiac failure..

Mortality and morbidity as a result of hypertension associated complications in KNH is a reality.

To my knowledge, no study has been done in KNH to assess the determinants of hypertension complications among adult hypertensive patients admitted in medical wards.

1.4 PURPOSE OF THE STUDY

The results of this research will contribute to the existing body of knowledge regarding the determinants of hypertension complications among adult hypertensive patients admitted in medical wards in KNH.

This knowledge will aid in the development of effective policies and treatment guidelines to reduce the occurrence of complications of hypertension among hypertensive patients, which has

serious cost implications not only for the patients but also for Kenya, a country with a limited health care budget.

1.5 BENEFITS OF THE STUDY

Following the high numbers of patients presenting with hypertension associated 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.

Identification of the challenges that the hypertensive patients face in controlling the blood pressure and finding ways to solve those challenges is a vital part in the prevention of hypertension complications.

This study sought to identify the determinants of hypertension complications among adult hypertensive 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.

1.6 RESEARCH QUESTIONS

- i. What are the demographic factors associated with occurrence of hypertension complications among adult hypertensive patients admitted in medical wards at KNH.
- ii. What are the socio-economic factors that influence occurrence of hypertension complications among adult patients admitted in medical wards in KNH?
- iii. What are the health related factors associated with hypertension complications among adult hypertensive patients admitted in medical wards in KNH?
- iv. How does the patient's level of awareness, personal opinions and lifestyle practices influence the occurrence of hypertension complications among adult hypertensive patients admitted in medical wards in KNH

1.7 RESEARCH OBJECTIVES

1.7.1 BROAD OBJECTIVE

To identify the determinants of hypertension complications among adult hypertensive patients admitted in medical wards at Kenyatta National Hospital.

1.7.2 SPECIFIC OBJECTIVES

- i. To determine the demographic factors that influence occurrence of hypertension complications among adult hypertensive patients admitted in medical wards at KNH.
- ii. To establish the socio-economic status of adult hypertensive patients admitted in medical wards in KNH and its influence on occurrence of hypertension complications
- iii. To assess the health factors associated with hypertension complications among adult hypertensive patients admitted in medical wards in KNH.
- iv. To ascertain patients' level of awareness, disposition and life style practices that influence the occurrence of hypertension complication among adult hypertensive patients admitted in medical wards in KNH.

1.8 HYPOTHESIS

There is no significant relationship between hypertensive patients' level of education and occurrence of hypertension complications.

There is no significant association between hypertensive patients' employment status and development of hypertensive complication

There is no significant relationship between hypertensive patients' Body Mass Index and occurrence of hypertension complications.

There is no significant relationship between blood pressure levels and occurrence of hypertension complications.

CHAPTER TWO: LITERATURE REVIEW

2.1 HYPERTENSION

The recommended blood pressure targets are < 140/90 mmHg in uncomplicated patients with hypertension. However in hypertensive patients who also suffer diabetes or renal disease, the recommended blood pressure target is < 130/80 mmHg (Chobanian et al. 2003; Muntner et al. 2009).

Globally, nearly one billion adult people, equivalent to one-quarter of the world's adult population, had hypertension in the year 2000, and this is estimated to increase to 1.56 billion (29%) by 2025 (Kearney PM 2004).

Hypertension complications prevalence data in Kenya is inadequate in availability. Existing data in KNH reveal that 4519 new patients with essential hypertension were seen in outpatient department from March to December in 2015.

A study done in 2010 in Kibera and a 2012 survey of Nandi District showed that only 1 in 5 of the 22% of adults with hypertension was aware of their status (Hendriks 2012).

2.2 COMPLICATIONS OF HYPERTENSION

2.2.1 BLOOD VESSEL DAMAGE

When the blood pressure is persistently elevated blood vessels are weakened. Arteriosclerosis; the hardening of arteries and atherosclerosis; accumulation of fat along damaged areas of the arteriole walls which occurs after several years of hypertension consequently disrupting the normal blood flow in the body.

An aneurysm is the bulging of a section of an artery which may burst and cause internal bleeding which is fatal.

Partial or complete occlusion of the coronary artery that supplies the heart leads to myocardial ischemia or infarction which is fatal.

2.2.2 HEART COMPLICATIONS

Hypertensive heart disease is as a result of structural and functional adaptations of the heart which includes left ventricular hypertrophy, Chronic Heart Failure, abnormalities of blood flow due to atherosclerotic coronary artery disease and cardiac arrhythmias. Over 30% of patients with sustained elevated blood pressure have left ventricular hypertrophy (Steinmetz M 2009). Heart attack is caused by insufficient oxygen to the heart which can be as a result of hypertension.

2.2.3 BRAIN DAMAGE

Hypertension is an important risk factor for brain infarction and hemorrhage, 85% of strokes are due to infarction and 15% due to intra cerebral or subarachnoid hemorrhage (Loscalzo 2008). The incidence of stroke rises progressively with increasing blood pressure levels; this, therefore, means that treatment of hypertension decreases the incidence of stroke.

Treatment of hypertension reduces the incidence of both ischemic and hemorrhagic stroke (Loscalzo 2008). Impaired cognition is associated with hypertension especially in the elderly; this may be as a result of occlusion of a large blood vessel resulting in subcortical white matter ischemia

2.2.4 KIDNEY DAMAGE/HYPERTENSIVE NEPHROPATHY

Hypertension leads to renal damage by promoting obstructive atherosclerotic plaques in the arteries that supply the kidneys this vascular damage leads to deterioration of renal function and eventually renal failure. Hypertension is a risk factor for renal injury and ESRD (Krziesinski JM 2007). The renal risk appears to be more closely related to systolic than to DBP, and black are at greater risk than the whites for developing ESRD at every level of blood pressure (Lindhorst J 2007).

2.2.5 EYE PROBLEMS/HYPERTENSIVE RETINOPATHY

The retinal circulation undergoes pathophysiological changes in response to persistently elevated blood pressure leading to micro retinal aneurysms, hemorrhage, hard exudates and cotton wool spots on the eyes this may result in impaired vision.

2.2.6 HYPERTENSIVE CRISIS

A hypertensive crisis occurs when uncontrolled blood pressure spikes to extremely high levels, typically over 180/120. This condition may cause bleeding in the lungs or brain, stroke, seizures, chest pain, heart attack or acute kidney failure. Chronic hypertension significantly raises the risk of a hypertensive crisis

2.3 DEMOGRAPHIC FACTORS AND HYPERTENSION COMPLICATIONS

Demographic predictors of health, e.g. age, marital status, education level, and race, have an adverse impact on behavioral risk factors and in this way influence the development of hypertension complication.

Aging is a biological process with a decline in the performance of most organs, less activity due to aging causes high blood pressure. In a hypertensive patients case there is impaired ability of the arteries to expand when blood is pumped due to hardening of arteries due to aging, this predisposes them to hypertension complications. (Schofield 1999)

The risk of hypertension complication increases with age due to stiffening of blood vessels, although this can be slowed through healthy living, including healthy eating and reducing the salt and fat intake in the diet. The number of patients with hypertension complications is likely to grow as the population ages since either isolated systolic hypertension or combined systolic and diastolic hypertension occurs in the majority of persons older than 65.

Advancement in age is a risk factor for high blood pressure (Wang, Hamood et al. 2014)

In recent study where hereditary was referred to as participants with one or more first-degree biological family members diagnosed with HBP to identify groups, results indicated that there is a high prevalence of HBP.

In black Americans than whites although there were other factors such as stress, poverty, lack of access to health care and racial discrimination associated with the high prevalence (Terry D. F. 2007).

Women are more likely to be aware of their status and to seek antihypertensive treatment than men (Van de Vijver 2013).

2.4 SOCIO-ECONOMIC FACTORS AND HYPERTENSION COMPLICATIONS.

Hypertension is a chronic condition because it is a long term condition and it requires a continuous expenditure for its treatment regarding buying drugs and paying for checkups and tests, households are trapped in a cycle of poor health and debt and increasing social and economic demands.

Low socioeconomic status and poor access to health services and medications also increase the vulnerability of developing major cardiovascular events due to uncontrolled hypertension. According to the WHO (WHO 2011), more than 80% of deaths from uncontrolled hypertension and associated cardiovascular diseases now occur in low and middle-income countries, and this is common among people of low socioeconomic status (Chobanian et al. 2003; Boutayeb 2005).

Unemployment or fear of unemployment may have an impact on stress levels that in turn influences high blood pressure. Living and working conditions can also delay timely detection and treatment due to lack of access to diagnostics and treatment, and this may impede prevention of complications.

Several hypertensive patients have self-reported that cost is a critical barrier to both buying antihypertensive medications and seeing a physician, and hence negatively affect the effective control of BP.

The RAND study also found that free care improved DBP readings in low-income patients with hypertension. Although patients rarely cite cost as a reason for failure to take medication or keep appointments, price appears to be a more common barrier to effective therapy than is appreciated (Shulman 2012).

2.5 HEALTH RELATED FACTORS AND HYPERTENSION COMPLICATIONS

Rapid unplanned urbanization also tends to promote the development of hypertension complications as a result of unhealthy environments that encourage consumption of fast food, sedentary behavior, tobacco use and the harmful use of alcohol.

2.5.1 TOBACCO AND ALCOHOL USE

Cigarettes contain nicotine which causes the release of stored catecholamine which stimulates the sympathetic nervous system causing vasoconstriction and consequently high blood pressure.

This has been correlated with the development of uncontrolled blood pressure. According to the World Health Organization and Kenya published prevalence estimates from its Global Adult Tobacco Survey (GATS) 2014, estimates total adult tobacco use (including both cigarettes and smokeless tobacco products) at about 11.6%.

The majority of this prevalence is from adult males consuming cigarettes. GATS estimates that about 15.1% of all Kenyan men smoke cigarettes, although the 2009 Demographic Health Survey estimated 20% of adult males and the WHO (WHO 2011) Country Profile put adult male smoking as high as 26%.

Individuals consuming alcohol are at greater risk of developing cardiovascular diseases while those living with hypertension and are drinking alcohol, are even worse concerning the risk of developing cardiovascular pathology.

The World Health Organization in its strategies to reduce incidences of hypertension globally has recommended the reduction of alcohol consumption (WHO 2014). Alcohol use and cigarette smoking also has been correlated with non-compliance to the treatment regimen (Kyngas & Ladenperra, 2009).

2.5.2 EXCESSIVE SALT INTAKE

Increased salt intake of more than 5g per day increases blood pressure and alters the control of blood pressure in people with hypertension and people with normal blood pressure, in all age groups, and in all ethnic groups. Several studies have shown that a reduction in salt intake is one of the most cost-effective interventions to reduce heart disease and stroke worldwide at the

population level. (Mendis 2014) According to the WHO(WHO 2014) reducing salt intake to less than 5 g of salt per day has been correlated with proper control of blood pressure.

Rapid unplanned urbanization also tends to promote the development of hypertension complications as a result of unhealthy environments that encourage consumption of fast food, sedentary behavior, tobacco use and the harmful use of alcohol.

2.5.3 SEDENTARY LIFESTYLE/OBESITY

The Body Mass Index (BMI) is used to measure overweight and obesity, it is obtained by dividing an individuals body weight by height squared. A BMI of $18.5 - 24.9\text{kg/m}^2$ is considered healthy , $25-29.9\text{kg/m}^2$ overweight and greater than 30kg/m^2 is obese.(Chen 2012)

Sedentary lifestyle refers to a lifestyle of lack of exercise despite high calories intake. Physical exercise is key in reducing the fat within the body. Individuals practicing sedentary lifestyle predispose themselves to a compromised immune system and development of obesity.

Furthermore, scientific research has demonstrated that obesity and high body cholesterol level puts an individual at risk for developing atherosclerosis which increases blood pressure tenfold.

2.5.4 CO MORBIDITIES

Diabetic patients develop high blood pressure due to hardening of the arteries. In Diabetes the process of atherosclerosis speeds up. Diabetes has several complications one of which is hypertension. The presence of high blood pressure in diabetes is associated with an increase in mortality from heart disease and stroke. Studies have shown that diabetics with even a slight elevation in blood pressure have 2-3 times the risk of heart disease compared to individuals without diabetes.

2.6 AWARENESS, DISPOSITION AND LIFESTYLE PRACTICE AND HYPERTENSION COMPLICATIONS

Despite the rising alarm on the morbidity associated with hypertension and its complications, approximately one-third of hypertensive patients fail to maintain adequate follow-up schedules and half or more drop out of care within the first year of therapy (Dunbar- Jacob et al. 2011,

Eaton et al. 2013) Moreover, 30% to 50% of patients have uncontrolled blood pressure (Kim et al. 2010; Dunbar-Jacob et al. 2011).

Knowledge on hypertension to include risk factors, warning signs and symptoms, drug therapy adherence as well as complications is an essential step in the proper control of high blood pressure among the general population and even the hypertensive patients.

Empowering hypertensive individuals with the general knowledge of the disease illustrates the active involvement of the client in his/her therapy which is the best approach in the management of lifestyle dependent diseases like hypertension.

A study conducted by Calberg & Kyngas (2013) revealed that compliance to the antihypertensive regimen could be improved by a good relationship between client and health care provider. Clients who are informed can well take an active part in decision making. It illustrated that the better knowledge the patients have, the better or, the higher the rate of compliance(Li W.W. 2008).

Medication compliance, as measured by Morisky's four-question scale, was associated with BP control; although the significance did decrease after addition of the cost barrier variable (Manolio, Cutler et al. 1995). In the Hypertension Detection and Follow-Up Program, pill counts correlated directly with controlled BP. Previous work, using different self-reported measures for antihypertensive medication compliance, found that patients with controlled hypertension were 67% compliant, whereas 46% of those with elevated BP were compliant (Shulman NB 2012).

2.7 THEORETICAL FRAMEWORK AND ITS APPLICATION TO THIS STUDY

2.7.1 HEALTH BELIEF MODEL

This study used the Health Belief Model (HBM). It is a behavioral change theory which was developed in 1966 by Irwin Rosenstock which attempts to explain why people behave or do not behave when faced with certain health conditions. This theory is applied in this study to predict health behavior of hypertensive patients to include; preventive health behaviors, that is, diet and exercise, health risk behaviors like smoking and alcohol use and sick role behaviors like adherence to treatment regimen.

The theory concepts;

Perceived Susceptibility - Each individual has his/her perception of the likelihood of experiencing a condition that would adversely affect one's health. Patients vary in their perception of susceptibility to a disease or condition. Those at the low end of the extreme for example those whose blood pressures are under control deny the possibility of contracting an adverse condition, those in a moderate category admit to a statistical possibility of disease susceptibility. Those individuals at the high extreme of susceptibility, for example, those whose blood pressures are persistently elevated feel there is real danger that they will experience an adverse condition like stroke in this case. The hypertensive patients have their subjective assessments of the possibility of developing hypertension-related complications.

Perceived Severity - refers to the beliefs a person holds concerning the effects a given disease or condition would have on one's state of affairs, the greater the perceived severity of a condition the higher the chances of engaging in activities to reduce the risk. These effects can be considered from the point of view of the difficulties that a disease would create. For instance, loss of work time due to hospitalization, financial burdens, and susceptibility to fatal complications for example myocardial infarction that may lead to death.

Benefits of Taking Action - taking action toward the prevention of disease or toward dealing with an illness is the next step to expect after an individual has accepted the susceptibility of a disease and recognized it is serious. The direction of action that a person chooses will be influenced by the beliefs regarding the action.

Barriers to Taking Action - an individual may believe that the benefits to taking action are effective but still fail to take the action. Barriers relate to the characteristics of treatment, or preventive measure may be inconvenient, expensive, unpleasant, painful or upsetting. These characteristics may lead a person away from taking the desired action.

Modifying variables- this is the factors that change the concepts, for example, patients personal factors i.e. education level or past experiences that affect whether the new behavior like compliance to treatment regime or dietary changes will be adopted. Hypertensive patients are empowered with knowledge about all aspects of the condition by health workers in form of health education at all points of service delivery.

Cues to Action - an individual's perception of the levels of susceptibility and seriousness provide the force to act. Benefits (minus barriers) provide the path of action. However, it may require a 'cue to action' for the desired behavior to occur. These cues may be internal or external.

Self-efficacy- this is an individual's personal belief in his or her own ability to take precautions not to develop a condition in this case a hypertensive patients belief in his/her ability to have controlled blood pressures to avoid getting complications.

The HBM addresses the aspect of perception that the hypertensive patients have towards hypertension complications. Hypertensive patients are empowered with knowledge and are advised on lifestyle practices that will enable prevention of these complications at every point of service delivery within the health facility.

This model will be used to offer insight into the health outcomes of hypertensive patients, showing how their demographic factors (e.g. gender, economic status), HTN-related knowledge and health l factors (e.g. BMI) and socioeconomic factors i.e. level of income interact to determine whether they will maintain controlled hypertensive states or they will suffer from hypertensive related complications.

2.7.2 HEALTH BELIEF MODEL (Rosenstock 1974)

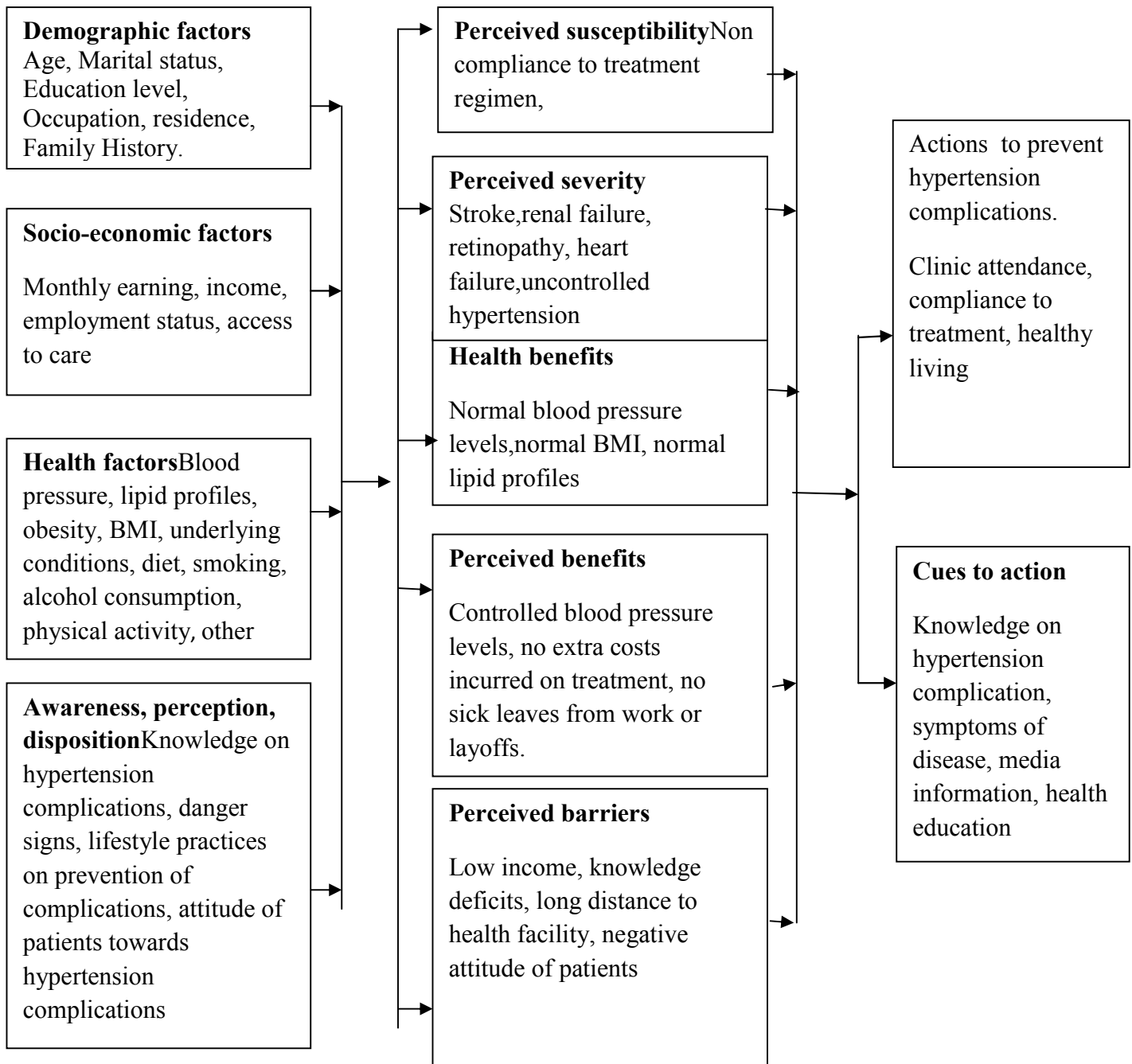


figure 1 theoretical framework

2.8 CONCEPTUAL FRAMEWORK

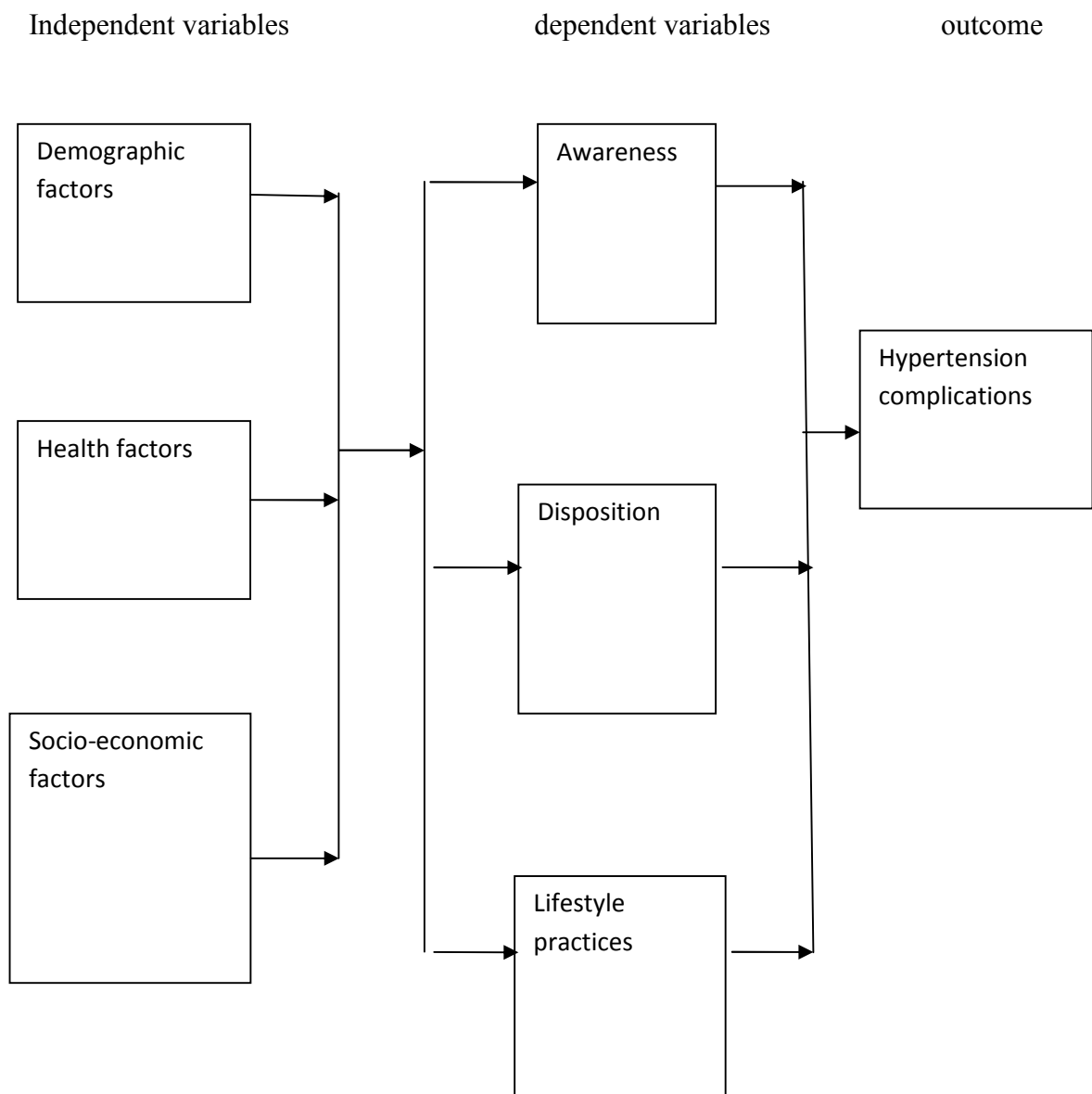


figure 2conceptual framework

2.9 OPERATIONAL FRAMEWORK

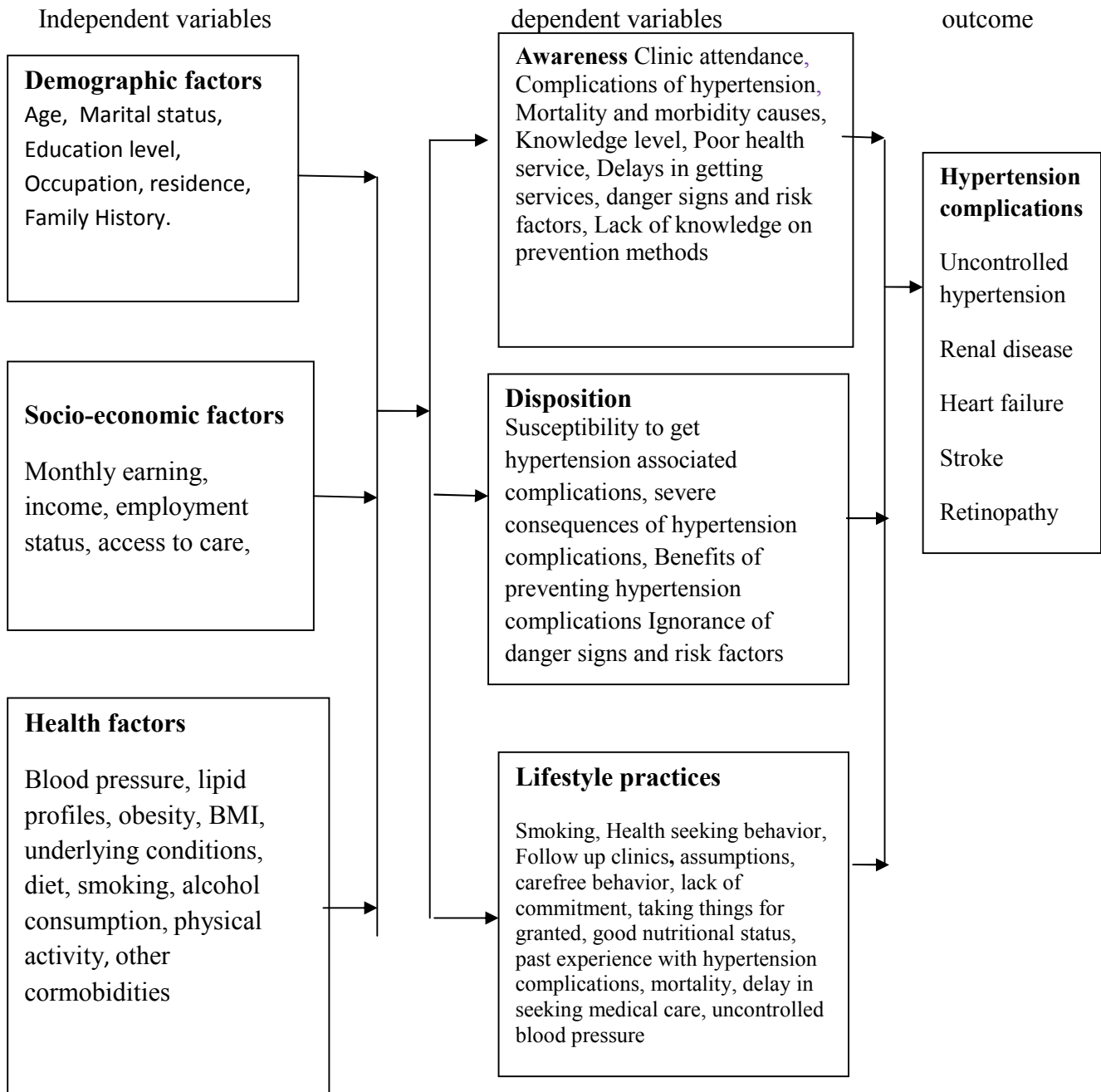


figure 3 operational framework

2.10 DEFINITION OF KEY VARIABLES

Awareness - Familiarity gained by experience of a fact or situation, facts, information, and skills acquired by a person through experience or education; the theoretical or practical understanding of a subject

Demographic variables- Personal characteristics are used to collect and evaluate data on individuals in a given population, they include age, gender, marital status, race, education, income and occupation

Disposition- A settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior

Health risk variables -Attributes, characteristics or exposures that increase the likelihood of a person developing a disease.

Hypertension - Average of systolic blood pressure of more than 140mmhg and diastolic blood pressure of more than 90mmhg with or without clinical outcomes due to persistent HBP.

Hypertension complication- Clinical outcomes as a result of sustained elevated blood pressure

Lifestyle Practice -Lifestyle is expressed in both work and leisure behavior patterns and (on an individual basis) in activities, attitudes, interests, opinions, values, and allocation of income. It also reflects people's self-image or self-concept; the way they see themselves and believe the others see them..

Socio-economic variables - The characteristics that indicate how economic activity affects and are shaped by social processes.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 STUDY DESIGN

A mixed method (qualitative and quantitative) descriptive cross-sectional study was used. This enabled the description of the phenomenon (determinants of hypertension complications) given the short period that was available to conduct the research.

3.2 STUDY AREA

The study was carried out at Kenyatta National Hospital's medical wards.

There are eight wards medical wards where both male and female patients are admitted. Patients are admitted directly from specialized clinics, for example, outpatient medical clinics and renal clinics and others are admitted from casualty.

3.3 STUDY POPULATION

The study population consisted of hypertensive patients admitted in the medical wards at Kenyatta National Hospital. These are the hypertensive patients with SBP more than 140mmhg and DBP more than 90 mmHg with or without clinical outcomes as a result of sustained BP.

A mixed method (qualitative and quantitative) descriptive cross sectional study was used. This enabled description of phenomenon (determinants of hypertension complications) given the short period of time that was available to conduct the study.

3.4 INCLUSION AND EXCLUSION CRITERIA

3.4.1 Inclusion criteria

Hypertensive patients over 15 years old admitted in medical wards

Those who gave consent to participate in the study.

3.4.2 Exclusion criteria

Hypertensive patients admitted in other wards and outpatient department, patients who did not consent to participate in the study and those who were clinically unstable at the time of enrollment

3.5 SAMPLE SIZE DETERMINATION

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

$$n = \frac{Z^2 pq}{d^2}$$

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.

$$\begin{aligned} n &= \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2} \\ &= 384.16 \\ &= 384 \end{aligned}$$

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:

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

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.

$$\begin{aligned} nf &= \frac{384}{1 + (384/100)} \\ &= \frac{384}{1 + 3.84} \\ &= 79 \end{aligned}$$

Therefore, the study participants will be 80 hypertensive patients.

3.6 SAMPLING PROCEDURE

A list of all hypertensive patients admitted in the medical wards was obtained from the health information systems to identify the study population.

Simple random sampling was used to ensure that there is a fair selection of the study participants.

Participants had equal chance of participation in the study, 160 papers put in a container, 80 of which were written on YES, and 80 written on NO, they picked papers from a container, those who picked papers written on YES were recruited. The participants were then followed as they were admitted; they were given and taken through the information sheet. Those who agreed were 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 informants interview, a group of 6-15 hypertensive patients who are clinically stable and able to express themselves and who had not participated in the administered questionnaire were purposively chosen to participate in a focus group discussion, they were provided for a consent form to sign after which the interview and discussion were conducted.

3.7 STUDY TOOLS

A structured administered questionnaire, a structured key informants interview guide and structured FGD guide.

An automatic digital blood pressure machine (OMRON M2 intellisense)

Tape measure and a weighing scale.

3.8 DATA MANAGEMENT AND ANALYSIS

Data was collected within six weeks using the semi-structured questionnaire, five key informant's interviews, and two focused group discussions. 70% filled questionnaires were considered eligible to be analyzed and the data collected was kept confidential in firewall and password protected computers. The data included demographic, socioeconomic, lifestyle, and health profile.

Data was entered using Statistical Package for Social Sciences (SPSS) version 20, and data on the closed-ended questions was coded manually by the researcher. Descriptive and analytical statistics were used to analyze data at a confidence interval of 95%. This minimized error and hence made the findings valid. The analyzed data was presented in the form of tables and figures.

3.9 PRETESTING OF STUDY INSTRUMENT

The study instrument was pretested at Mbagathi sub-county hospital which is located in Nairobi Kibra constituency near Kenyatta market.

It is a public hospital which offers integrated health services and has a medical ward where hypertensive patients are admitted.

3.10 RESEARCH ASSISTANTS RECRUITMENT AND TRAINING

Two research assistants were recruited among the nurses working in the medical wards at KNH who have knowledge on hypertension and its management; they were trained on how to fill the questionnaires before data collection.

3.11 STUDY LIMITATION

The fact that this study was conducted in one study area (KNH) may interfere with the generalization of the study finding. However, KNH being the country's referral hospital, the results may be extrapolated to other hypertensive patients within the county and nation at large.

3.12 DISSEMINATION PLAN

The findings will be presented to the school of nursing sciences faculty during the thesis defense and in the school websites.

The ethics and review committee, UON and KNH library, will be supplied with a copy of the entire research report.

The research study will be published in an international journal.

3.13 ETHICAL CONSIDERATIONS

Review of the proposal, clearance, and approval to conduct the study was sought by from The University of Nairobi- Kenyatta National Hospital Ethics and Research Committee (P75/02/2016).

Participants gave a signed, voluntary informed consent before participation and were briefed on their rights and the expected benefits of the study.

CHAPTER FOUR; RESULTS

A total of 80 hypertensive patients admitted to KNH medical wards in level seven and eight were recruited in the study. The study objective was to identify the demographic, socio-economic, health related factors and awareness, disposition and lifestyle practices that contribute to development of hypertension complications among them.

4.1 DEMOGRAPHIC CHARACTERISTICS

The mean age of the hypertensive patients was 49.7 years (SD 15.1) with most patients 38 (47.5%) being in the 40-59 age groups and 22(27.5%) being over 60 years the rest 20 (25%) were below 40 years. There were 32 (40%) male and 48 (60%) female hypertensive patients giving a male-to-female ratio of 2:3. Most participants reported that they had primary 36 (45%) or secondary 20 (25%) level of education, 7 (8.8%) had never been to school and 17 (21.3%) had tertiary level of education. Married patients accounted for 54 (67.5%) participants and approximately two-thirds of patients 51 (63.8%) reported that they were Christians.

Table 1. Demographic characteristics of hypertensive patients at KNH

	Frequency (n)	Percent (%)
Age		
Less than 20 years	2	2.5
20-39 years	18	22.5
40-59 years	38	47.5
Over 60 years	22	27.5
Sex		
Male	32	40
Female	48	60
Level of education		
Never been to school	7	8.8
Primary	36	45
Secondary	20	25
University/ college	17	21.3
Other	0	0
Marital status		
Single	8	10
Married	54	67.5
Divorced	4	5
Separated	2	2.5
Widowed	12	15
Other	0	0
Religion		
Protestant	51	63.8
Catholic	27	33.8
Other	2	2.5

4.2.1 DEMOGRAPHICS AND HYPERTENSION COMPLICATIONS

Table 2 shows that among the participants demographic factors; level of education was significantly associated with hypertension complications. The complications occurred in 6(85.7%) patients with no education compared to 10 (27.8%) with primary, 14 (70%) secondary and 4 (23.5%) university/ college education. Therefore the null hypothesis; **There is no relationship between level of education and development of hypertensive complication was rejected**

The risk of hypertensive complications was 94% lower in participants with primary compared to no education [OR 0.06; 95% CI 0.01-0.6] and 95% lower in those with tertiary compared to no education [OR 0.05; 0.0-0.56].

Patient age ($p = 0.563$), sex ($p = 0.518$), marital status ($p = 0.35$) and religion ($p = 0.466$) were not significantly associated with hypertension complications.

Participant 2 in the second FDG “ *Hypertensive men are more vulnerable to hypertension complications because they are the heads of the households and so they bear the stress of the households. Besides, men hardly seek medical attention when sick*”

“*Hypertension is caused by stress; life in itself is stressful so to an individual who is already hypertensive stress contributes to occurrence of complications*”

Table 2 Demographic characteristics and occurrence of hypertension complications

	Hypertension complications		OR	95% CI		X ² Value (df)	X ² test p-Value
	Yes n (%)	No n (%)		Lower limit	Upper limit		
Age							
Less than 20 years	1(50.0)	1(50.0)	1.0(ref)			2.0(3)	0.563
20-39 years	7(38.9)	11(61.1)	0.64	0.03	11.9		
40-59 years	19(50.0)	19(50.0)	1.00	0.06	17.18		
Over 60 years	7(31.8)	15(68.2)	0.47	0.03	8.60		
Sex							
Male	15(46.9)	17(53.1)	1.0(ref)			0.4(1)	0.518
Female	19(39.6)	29(60.4)	0.74	0.30	1.83		
Level of education							
Never been to school	6(85.7)	1(14.3)	1.0(ref)			17.2(3)	0.001
Primary	10(27.8)	26(72.2)	0.06	0.01	0.60		
Secondary	14(70.0)	6(30.0)	0.39	0.04	3.97		
University/ college	4(23.5)	13(76.5)	0.05	0.05	0.56		
Marital status							
Single	4(50.0)	4(50.0)	1.0(ref)			2.1(2)	0.35
Married	25(46.3)	29(53.7)	0.86	0.20	3.81		
Divorced/ separated/ widowed	5(27.8)	13(72.2)	0.38				
Religion							
Protestant	22(43.1)	29(56.9)	1.0(ref)			1.5(2)	0.466
Catholic	12(44.4)	15(55.6)	1.05				
None	0(0.0)	2(100.0)	NA				

4.2 SOCIOECONOMIC FACTORS

Overall, the hypertensive patients commonly reported that they were unemployed 35 (43.8%), depended on medical insurance to pay for health services 44 (55%) and did not have a hypertensive family member 43 (53.8%), Table 3. None of these socioeconomic attributes were significantly associated with development of hypertensive complications: employment status ($p = 0.254$), mode of payment for health services ($p = 0.43$) and positive family history of hypertension ($p = 0.137$). Therefore the null hypothesis; There is no association between hypertensive patients employment status and development of hypertension complications was accepted.

Participant 1 in the first FGD

“Even if the drug costs as little as 100 shillings, sometimes we lack even that amount to buy the drugs ”

Table 3 socio economic characteristics and hypertensive complications.

	Total		Hypertension complications		Chi (DF)	P
			Yes n(%)	No n(%)		
	number	percent				
Employment status						
Employed	14	17.5	6(42.9)	8(57.1)	4.1(3)	0.254
Unemployed	35	43.8	12(34.3)	23(65.7)		
Self employed	29	36.3	14(48.3)	15(51.7)		
Student	2	2.5	2(100.0)	0(0.0)		
Mode of payment for health services						
Cash	13	16.3	8(61.5)	5(38.5)	2.8(3)	0.43
Insurance	44	55	16(36.4)	28(63.6)		
Well wishers	20	25	9(45.0)	11(55.0)		
Don't know	3	3.8	1(33.3)	2(66.7)		
Any hypertensive family member						
Yes	37	46.3	19(51.4)	18(48.6)	2.2(1)	0.137
No	43	53.8	15(34.9)	28(65.1)		

4.2.1 MONTHLY EARNING

Majority of the participants 43.75 % (n=35) reported that they had no income.

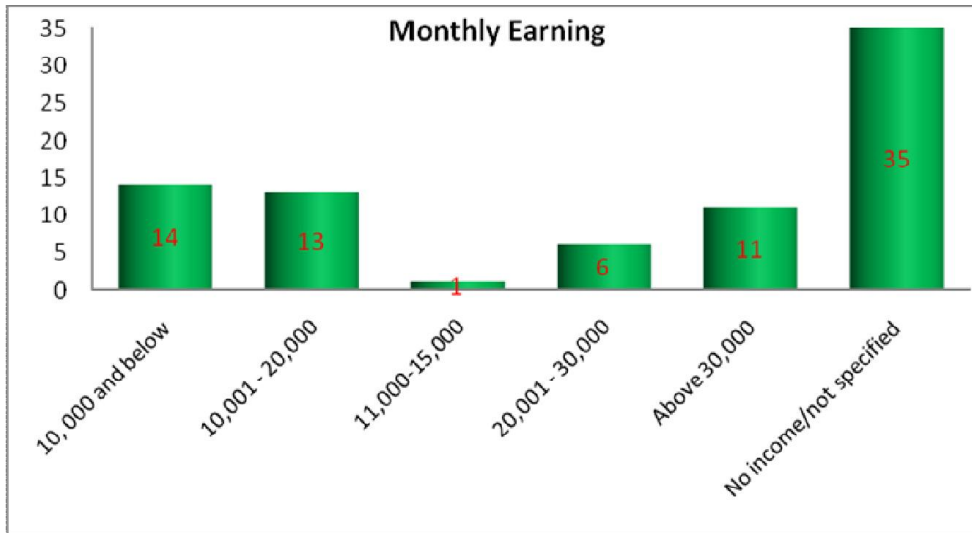


Figure 4. Monthly earning of hypertensive patients in KNH

4.2.2 RESIDENCE AND DISTANCE TO NEAREST HEALTH FACILITY

Most participants 57.50% reported that they stayed in urban informal residence and 81.25% have health facilities less than 5km from where they stay.

Table 4 Participants residence and distance to health Facility

Residence	Frequency(n)	Percentage(%)
Urban formal	13	16.25
Urban informal	46	57.50
Rural	21	26.25
Distance to health facility		
Less than 5km	65	81.25
5km and above	15	18.75

4.3 HEALTH RELATED FACTORS AND HYPERTENSION COMPLICATIONS

Most patients had normal systolic blood pressure 55 (68.8%) and 44(55%) had a high diastolic blood pressure measurement at the time of the study (Table 5).

The risk of hypertensive complication increased 2.84 times [OR = 2.84; 95% CI 1.07-7.53 (p= 0.033)] in clients with high systolic blood pressure compared to those with normal systolic blood pressure.

Measurements of BMI showed that 23 (28.8%) patients were overweight and 32 (40%) were obese. There was no correlation between BMI and both systolic (Pearson's *rho* -0.05) and diastolic (Pearson's *rho*-0.01) blood pressure. Therefore the null hypothesis ; There is no relationship between hypertensive patients body mass index and occurrence of hypertension complications was accepted.

Table 5. Health related factors and association with hypertension complications

	Total		Hypertension complications		OR (95% CI)	P
	n	%	Yes	No		
Current SBP						
Normal Systolic Pressure	55	68.8	19(34.5)	36(65.5)	1.0(ref)	0.033
High Systolic Pressure	25	31.3	15(60.0)	10(40.0)	2.84 (1.07-7.53)	
Current DBP						
Normal Diastolic Pressure	36	45	12(33.3)	24(66.7)	1.0(ref)	0.134
High Diastolic Pressure	44	55	22(50.0)	22(50.0)	2.00 (0.80-4.97)	
BMI category						
Underweight	1	1.3	1(100.0)	0(0.0)	NA	0.155
Healthy	24	30	14(58.3)	10(41.7)	1.0(ref)	
Overweight	23	28.8	8(34.8)	15(65.2)	0.38 (0.12-1.24)	
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)	0.629
2-5 years ago	31	38.8	12(38.7)	19(61.3)	0.90 (0.33-2.44)	
5 years and above	15	18.8	8(53.3)	7(46.7)	1.63 (0.48-5.55)	

There was a significant association between current systolic blood pressure and complications with 15 (60%) of patients with current high readings presenting with complications compared to 19 (34.5%) of those with normal readings ($p = 0.033$). Current diastolic reading ($p = 0.134$), BMI ($p = 0.155$) and duration since diagnosis ($p = 0.629$) were not significantly associated with occurrence of complications.

4.3.1 HYPERTENSION COMPLICATIONS

There were 34 patients who reported developing complication related to hypertension yielding a prevalence of 42.5% (95% CI 31.4 – 53.6%) for hypertensive complications. Figure 5 shows the specific types of hypertensive complications that occurred. Kidney damage/ hypertensive nephropathy occurred in 18 (22.5%) patients. The second most common complication associated with hypertension was blood vessel damage 8 (10%) followed by brain damage 7 (8.8%). There were no cases of hypertensive crisis.

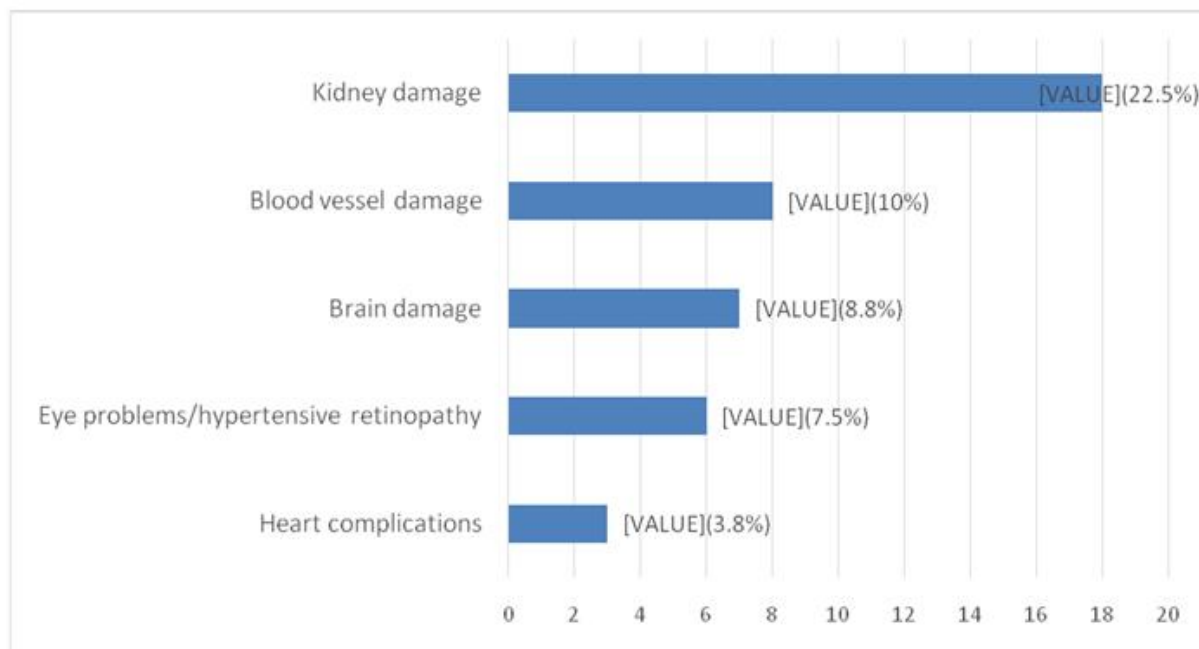


Figure 5. Hypertension complications among patients in KNH

4.3.2 PHARMACOLOGICAL MANAGEMENT OF HYPERTENSION

Most 71 (88.8%) participants reported that they were adhering to prescribed antihypertensive medication and 50 (62.5%) participants were on other medications apart from the antihypertensive drugs; anti-coagulants, diabetic drugs, diuretics, asthmatic drugs, opioids, chemotherapy drugs, antibiotics, and anti ulcer drugs, Anti Retroviral drugs, anti-Tuberculosis and steroids.

There was no association between treatment adherence ($p = 0.12$), being on other medications ($p = 0.726$) or experience of treatment side effects ($p = 0.291$) and the occurrence of complications related to hypertension as shown on table 6.

Eighty nine percent self reported compliance to treatment, 11.25% reported non compliance and indicated the reasons for non compliance to be; financial constraints, forgetfulness, "to see if symptoms have abated" and when someone doesn't feel the symptoms of hypertension/high blood pressure.

Most participants, 90 % reported not to be experiencing any side effects to hypertensive drugs, 10% reported to be experience side effects to include ; blurred vision, dizziness, fatigue, sleepy, nausea, anorexia, drowsiness, swelling of the body and mood swings

Participant 5 in the first FGD;

"The doctors change your medication; it takes time for the body to adjust to the new prescribed drug. For example when I came here, the drug that I had used for a long time was changed, then they said the drug is out of stock in KNH pharmacy so they gave me a prescription to go and buy. Now, how does an admitted patient leave the hospital to go and buy drugs?"

Table 6: Pharmacological management of hypertension

	Total		Hypertension complications		Chi (DF)	P
			Yes	No		
	number	percent	n(%)	n(%)		
Taking antihypertensive medication as prescribed						
Yes	71	88.8	28(39.4)	43(60.6)	1.0(ref)	0.12
No	9	11.3	6(66.7)	3(33.3)	3.07 (0.71-13.30)	
Taking other medication						
Yes	50	62.5	22(44.0)	28(56.0)	1.0(ref)	0.726
No	30	37.5	12(40.0)	18(60.0)	0.85 (0.34-2.13)	
Experienced any side effects						
Yes	8	10	2(25.0)	6(75.0)	1.0(ref)	0.291
No	72	90	32(44.4)	40(55.6)	2.40 (0.45-12.70)	

4.4 LEVEL OF AWARENESS, DISPOSITION AND LIFE STYLE PRACTICES

4.4.1 KNOWLEDGE ON HYPERTENSION AND HYPERTENSION COMPLICATIONS

Half of the participants 53% (n=43) were able to define hypertension correctly the rest didn't know or gave wrong definition, this is contrary to the fact that 98.75 % (n=79) of the participants said that they were satisfied with the health information given to them on hypertension and its complications.

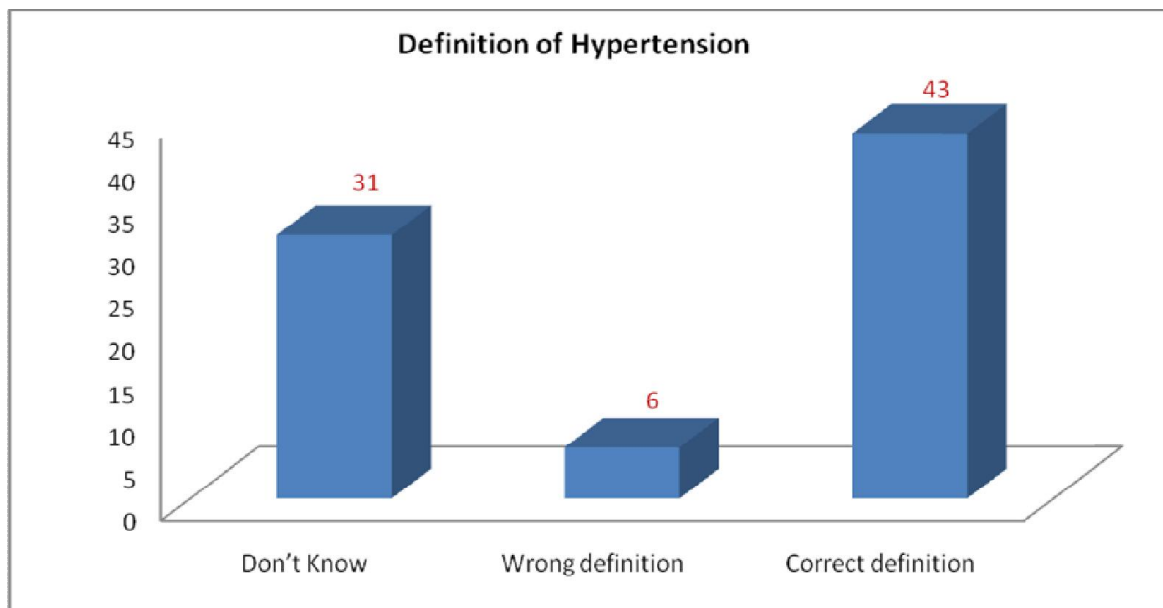


Figure 7. Definition of hypertension

4.4.2 IF STOPS TAKING MEDICATIONS WHEN BP NORMALIZES

Most participants 82.5% (n=66) do not stop taking medications when BP normalizes while 17.50% (n=14) stop and the reasons indicated were; to cut cost, because they no longer feel the side effects and to avoid drug resistance.

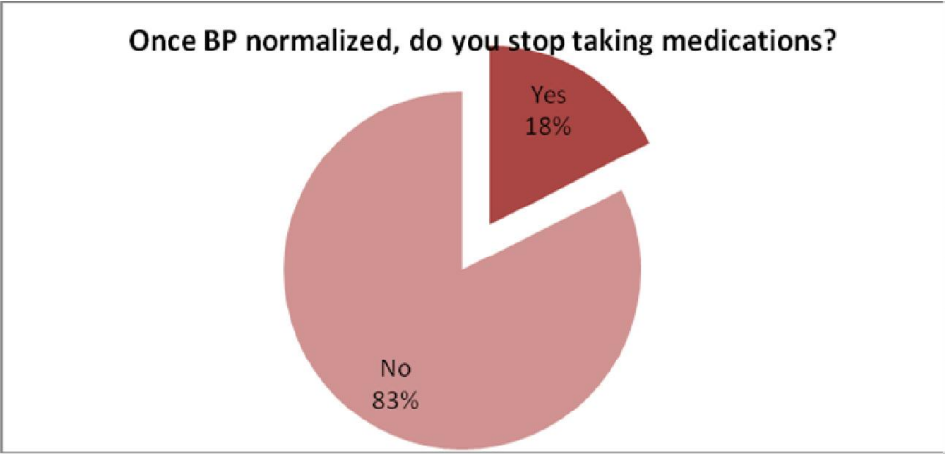


Figure 5; Stops taking medications when BP normalizes

4.4.3 PATIENTS LIFESTYLE PRACTICES ASSOCIATED WITH HYPERTENSION COMPLICATIONS

Table 7 shows that 6 (7.5%) patients were smokers, 6 (7.5%) always drunk alcohol and 17 (21.3%) occasionally consumed alcoholic beverages. Thirty-two (40%) patients had been admitted previously for hypertension, and 74 (92.5%) were on low salt diet. Sixty nine (86.3%) engaged in walking as an exercise and 21 (26.3%) engaged in heavy work.

None of these factors showed a significant association with occurrence of complications in hypertension

Table 7 Association of lifestyle practice and hypertension complications

	Total		Hypertension complications		Chi (DF)	P
			Yes	No		
			n(%)	n(%)		
Advised by medical professional to change lifestyle						
Yes	29	36.3	16(55.2)	13(44.8)	3.0(1)	0.084
No	51	63.8	18(35.3)	33(64.7)		
Ever been admitted for hypertension						
Yes	32	40	14(43.8)	18(56.3)	0.0(1)	0.853
No	48	60	20(41.7)	28(58.3)		
Using family planning pills						
Yes	8	10	1(12.5)	7(87.5)	3.3(2)	0.192
No	40	50	18(45.0)	22(55.0)		
Not applicable	32	40	15(46.9)	17(53.1)		
Cigarette smoker						
Yes	6	7.5	3(50.0)	3(50.0)	0.1(1)	0.699
No	74	92.5	31(41.9)	43(58.1)		
Advised against smoking by medical professional						
Yes	24	30	12(50.0)	12(50.0)	0.8(1)	0.374
No	56	70	22(39.3)	34(60.7)		
Exposed to indoor cigarette smoking						
Yes	11	13.8	7(63.6)	4(36.4)	2.3(1)	0.127
No	69	86.3	27(39.1)	42(60.9)		
Amount of salt taken in food						
No salt	5	6.3	4(80.0)	1(20.0)	3.7(2)	0.155
Low salt	74	92.5	30(40.5)	44(59.5)		
Too salty	1	1.3	0(0.0)	1(100.0)		
Alcohol consumption						
Always	6	7.5	3(50.0)	3(50.0)	2.7(2)	0.254
Occasionally	17	21.3	10(58.8)	7(41.2)		
No	57	71.3	21(36.8)	36(63.2)		
Engaged in walking as physical activity						
Yes	69	86.3	30(43.5)	39(56.5)	0.2(1)	0.658
No	11	13.8	4(36.4)	7(63.6)		
Engaged in heavy work						
Yes	21	26.3	11(52.4)	10(47.6)	1.1(1)	0.286
No	59	73.8	23(39.0)	36(61.0)		

4.4.4 COMPLIANCE WITH LIFESTYLE CHANGE

Hypertensive patients reported that they frequently 43 (53.8%) ate fruits and vegetables, rarely took fatty foods 61 (76.3%), rarely exercised 43 (53.8%) and frequently 62 (77.6%) had enough sleep (Table 7). Patient reporting that they rarely 21 (58.3) added salt to food had higher complication rates compared to those who never 13 (29.5) added salt to food ($p = 0.01$).

The risk of hypertensive complications reduced by 70% in patients in patients who reported that they did not add salt to food compared to those who added salt to food (OR 0.3; 95% CI 0.12-0.76).

First key informant

“Non compliance is a very important cause of these complications and the reasons for non compliance vary, some have inadequate knowledge, some experience side effects so they stop taking drugs, some have negative attitude towards the prolonged period of taking drugs, lack of supportive system and use of alternative medicine”.

Table 8: Compliance with lifestyle changes

		Total		Hypertension complications		Chi (DF)	P
				Yes	No		
		number	percent	n(%)	n(%)		
Smoking	Daily	1	1.3	1(100.0)	0(0.0)	3.6(3)	0.313
	Frequently	2	2.5	0(0.0)	2(100.0)		
	Rarely	3	3.8	2(66.7)	1(33.3)		
	Never	74	92.5	31(41.9)	43(58.1)		
Alcohol	Daily	1	1.3	1(100.0)	0(0.0)	3.9(3)	0.269
	Frequently	6	7.5	2(33.3)	4(66.7)		
	Rarely	15	18.8	9(60.0)	6(40.0)		
	Never	58	72.5	22(37.9)	36(62.1)		
Add salt to food	Rarely	36	45	21(58.3)	15(41.7)	6.7(1)	0.01
	Never	44	55	13(29.5)			
Physical exercise	Daily	1	1.3	0(0.0)	1(100.0)	1.2(2)	0.545
	Frequently	36	45	14(38.9)	22(61.1)		
	Rarely	43	53.8	20(46.5)	23(53.5)		
Enough sleep	Daily	6	7.5	1(16.7)	5(83.3)	2.6(3)	0.458
	Frequently	62	77.5	28(45.2)	34(54.8)		
	Rarely	11	13.8	5(45.5)	6(54.5)		
	Never	1	1.3	0(0.0)	1(100.0)		
Eat fruits and vegetable	Daily	30	37.5	13(43.3)	17(56.7)	0.8(2)	0.678
	Frequently	43	53.8	17(39.5)	26(60.5)		
	Rarely	7	8.8	4(57.1)	3(42.9)		
Take fatty food	Daily	2	2.5	1(50.0)	1(50.0)	1.0(3)	0.81
	Frequently	6	7.5	2(33.3)	4(66.7)		
	Rarely	61	76.3	25(41.0)	36(59.0)		
	Never	11	13.8	6(54.5)	5(45.5)		

CHAPTER FIVE: DISCUSSION

INTRODUCTION

A hospital based study aimed at identifying the determinants of hypertension complications among hypertensive patients admitted in medical wards at a National referral Hospital in Kenya. The study results indicated that level of education, inadequate financial support; high systolic blood pressure and inadequate knowledge and poor diet among hypertensive participants are associated with occurrence of hypertension complications.

5.1 DEMOGRAPHIC FACTORS AND HYPERTENSION COMPLICATIONS.

Most participants 75 % were over 40 years, and the mean age of participants was 49.7 years. Advancing age is a risk factor not only for hypertension but also hypertension complications. This is 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 40-70 years, an increase in systolic blood pressure by 20mmHg and diastolic blood pressure by 10mmHg, doubles the risk of developing cardiovascular complications.(Khatib 2004). This is in line with this study where there was a positive association between systolic blood pressure and hypertension complications (p=0.033)

Women are more likely to be aware of their status and to seek antihypertensive treatment than men (Van de Vijver 2013) . This was equally true in this study where majority of respondents 48 (60%) were women, with a male : female ratio of 2:3. In addition it was cited in the focused group discussions that indeed women are good health seekers than men and therefore men are more likely to suffer the complications because of the poor health care seeking behaviors.

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.

Contrary to this, a study to assess level of blood pressure control among Sudanese individuals revealed that blood pressure control decreased with higher level of education.(Babiker. F 2013)

Marital status was not significantly associated with development of hypertension complications although in the FGD it came out that family social support plays a key role in preventing hypertensive patients from getting complications and in some cases the same social support network is responsible for the complicated hypertensive states. For example being stressed by husbands or wives or children, this is because social support networks like family are important in the long-term management of chronic conditions such as hypertension, which require life-long changes in the lifestyle practices of the patients.

The FGD results are in line with a study by Cooper et al 2005 which indicated that marital status has positive influence on compliance, whereby the help and support from a spouse could be the reason why married patients were more compliant to treatment than single patients.

5.2 SOCIO ECONOMIC FACTORS

Socioeconomic status of a hypertensive individual is not an independent predictor of occurrence of hypertension complication, but it is significant because it places patients especially in developing countries like Kenya in the state of having to choose between competing priorities (Kopczyński J 2001). Hypertension being somewhat asymptomatic allows patients to direct the limited resource available to meet the house hold needs rather than on treatment.

Most participants reported that they were unemployed and so had no source of income. The FGD and key informants interview results are consistent with findings from a study which found out that several hypertensive patients self-reported that cost is a key barrier to both buying antihypertensive medications and seeing a physician, and therefore affect the effective control of BP and that free care improved DBP readings in low-income patients with hypertension. (Shulman, 2012).

Close to half of the participants depended on insurance to pay for health services, for the common Kenyan person out of pocket mode of payment is expensive. This is especially true considering that out of the 80 participants 37 reported to have no source of income. In the FGD, participants confessed that they shy away from seeking medical attention because it is expensive and sometimes they lack money.

This findings are in line with a study on access to improved quality healthcare through an insurance program in rural Nigeria was associated with a significant long-term reduction in systolic BP in subjects with moderate or severe hypertension.(Hendricks M.E et al 2014)..

Several studies have cited distance as a hindrance to compliance to hypertension treatment regime and therefore predispose to development of hypertension complications. Most of the participants reported to have health facilities less than 5km from their residence. So generally speaking, the patients are more accessible to the health facilities. A study done in India showed that adherence was better among those, whose distance to health facility was <5 km (57.8%) than those with >5 km (18.9%) (Venkatachalam J. et al 2015) Similarly a study from Ethiopia, distance <0.5 h was significantly associated with adherence and showed that as the distance to health facility decreased adherence improved.(Dessie A .2012)

5.3 HEALTH RELATED FACTORS

Blood pressure was measured using a digital Omron blood pressure machine and for all patients' two readings from both arms were taken and an average of both was used.

Results in this study indicated that 31.25% of admitted hypertensive patients had high SBP above 140mmhg while 55% had high diastolic BP above 90mmhg despite being on treatment. There was a statistically significant association between current systolic BP and hypertension complications at $p=0.03$. 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 L. et al 2009). This is in line with this study where percentage of patients with

controlled blood pressure among the admitted patients is low despite being on admitted and on treatment.

Body Mass Index

More than half of the of respondents were obese and overweight and Correlation of BMI and blood pressure indicated no statistical significant relationship between weight and systolic BP and diastolic BP (Pearsons rho -0.05) and (Pearson rho -0.01) respectively. The Nurses Health Study of 1995 by Manson et al observed a 2 to 6-fold increase in mortality among women with a Body Mass Index greater than 30kg/m^2 compared to women with a Body Mass Index less than 19kg/m^2 .

Cormobidities

The presence of two or more chronic conditions in a hypertensive patient may influence adherence to treatment regimen. For example, concomitant use of antihypertensive and another drug therapy is associated with poor adherence and therefore to complications. In this study prevalence of hypertension complications among hypertensive patients was $42.5\%(n=34)$.

Twenty five percent of participants were diabetic, this is not surprising because not only does diabetes complicate to hypertension; the opposite is equally being evidenced. The presence of high blood pressure in diabetes is associated with an increase in mortality from heart disease and stroke.

In an American study to evaluate adherence in hypertensive patients with DM indicated that preexisting disease, older age, higher number of medications, and doctor-related variables (prescription for both DM and HTN medications) were significant factors in determining multiple medication adherence. (An J, Nichol MB 2013)

In contrast, Chapman et al. found that taking fewer medications was a factor associated with better adherence in patients taking medications for HTN and dyslipidemia (Chapman R.H 2005).

Co morbidities that necessitated regular medication consumption did not affect the patients' compliance with antihypertensive. (Ghembaza MA et.al 2014)

5.4 AWARENESS, DISPOSITION AND LIFESTYLE

Half of the participants were able to define hypertension correctly, interestingly 98.75% reported satisfaction with the health education given to them by the health workers on hypertension and its complications. This indicates that there is a gap between the perceived and actual knowledge that the patients possess owing to the fact that the patients lack adequate knowledge but are satisfied with the status quo.

A study on the Impact of patient knowledge of hypertension complications on adherence to antihypertensive therapy indicated that there is a positive relationship between patients' knowledge about the hypertensive complications and adherence and therefore blood pressure control. (Ghembaza MA et al.2014)

This view was supported by a study in the USA where the researchers found out that among diagnosed hypertensive persons' awareness and knowledge of the disease was strongly related to good blood pressure control (Knight et al 2001).

In contrast, (Wang et al 2002) found no significant effect between prior knowledge of hypertension and compliance with medication but reported depression was a significant predictor of non-compliance in their study

Dietary changes necessary to lower hypertension

Half of the respondents reported that they frequently ate fruits and vegetables, most of the participants rarely ate fatty foods, 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, and this was statistically significant ($p=0.01$) compared to those who never. Studies indicate that indeed dietary salt reduction is an essential component of the non-pharmacological treatment of hypertension

indicated strong associations between salt intake and hypertension (Appel et al 2006, He & MacGregor 2003, Obarzanek et al 2003).

Compliance

Compliance is a complex and dynamic health enhancing behavior that involves appointment keeping, obtaining and taking medications as prescribed and persisting with health provider recommendations such as lifestyle changes. (Lahdenpera & Kyngas 2000)

In a study by Achieng' et al. among patients with hypertension attending medical outpatient clinics at the Kenyatta National Hospital indicated that 31.8% of the study population were adherent to therapy as assessed by the Hill-Bone questionnaire.

CONCLUSIONS

This study provided evidence that , level of education, financial constraints, high systolic blood pressure and salt intake are associated with occurrence of hypertension complication. In conclusion,

The prevalence of hypertension complications among hypertensive patients in KNH 42.5% with 34: 80 hypertensive patient having hypertension associated complication

Patients level of education is significantly associated with development of hypertension complication, the illiterate participants are more predisposed to developing complications .

Financial constraints is a hindrance to participants seeking medical attention and or honouring medical clinics.

There is a significant association between high systolic blood pressure and occurrence of hypertension complications.

Patients who add salt to food are more likely to develop hypertension complications compared to those who never add salt to food.

Hypertensive patients knowledge on hypertension and hypertension complication is inadequate.

RECOMMENDATIONS

The prevalence of hypertension complications among hypertensive patients in KNH is 42.5% with 34: 80 hypertensive patients having hypertension associated complication. Therefore, measures should be taken to control the patients blood pressure to prevent those without complications from developing and those already experiencing complications from getting more complications.

Financial constraints is a hindrance to participants seeking medical attention and or honouring medical clinics therefore hypertensive patients should be encouraged to take up insurance covers so that they are able to seek medical attention when they feel the need without fear of paying out of pocket or not being able to pay.

There is a significant association between high systolic blood pressure and occurrence of hypertension complications therefore patients should be followed up and individualized medical attention should be given to patients according to their unique needs

Patients who add salt to food are more likely to develop hypertension complications compared to those who never add salt to food. Patients should be educated on lifestyle modifications to practice in order to prevent hypertension complications like the DASH diet-dietary approach to prevent hypertension.

Participants self report that they are satisfied with the health education given to them by health workers but a high percentage still lack the knowledge on the basic issues about their condition. Knowledge on hypertension complication is inadequate therefore there is need to promote knowledge of hypertensive patients not only on hypertension but also hypertension complications and importance of prevention of these complications

There is need for more studies on hypertensive complications as developing countries continue experiencing epidemiologic transition of non communicable diseases and especially in Kenya where data is scarce. More research studies should be carried out to specifically identify the causes of the hypertension complications and ways to prevent them among patients in KNH

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APPENDICES

APPENDIX 1: PARTICIPANT INFORMATION SHEET AND CONSENT FORM

Title: “Determinants of hypertension complications among adult hypertensive patients in medical wards at Kenyatta National Hospital, Nairobi.”

Investigator: Lillian amugitsi isiaho Tel.: 0726733795
School of Nursing Sciences,
University of Nairobi
P.O. Box 19676, Nairobi.

Introduction: I am a student at the School of Nursing Sciences, University of Nairobi pursuing a Master of Science Degree in Nursing. I am conducting a study titled: Determinants of hypertension complications among adult hypertensive clients admitted in medical wards at Kenyatta national hospital. **A descriptive cross sectional study at Kenyatta national Hospital, Nairobi.** This study will be conducted at Kenyatta national hospital medical wards.

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.

Background and objective: The purpose of this study is to identify the determinants of hypertension complications among adult hypertensive patients admitted in medical wards in KNH. It will identify gaps in the care provided to this patients with a view of coming up with suggestions to avoid hypertension associated complications. . The finding from this study could be used to come up with strategies to reduce the occurrence of hypertension complications which are fatal and expensive to treat.

Participation: Participation in the study will entail answering questions which will be filled by the interviewer in the semi-structured questionnaire. You will not be subjected to any invasive procedure.

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.

Risks: There are 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. The researcher will also endeavor to spend approximately 25 minutes with you and one hour for focused group discussion

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.

Conflict of interest: The researcher and the supervisors confirm that there is no conflict of interest amongst them.

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

Lillian Isiaho Amugitsi

Researcher

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Or

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Or

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P.O BOX 19676 Code 00202
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APPENDIX 2: FOMU YA MAELEZO YA MSHIRIKI, HABARI NA RIDHAA

MADA: VIJEZO VYA MATATIZO YA SHINIKIZO LA DAMU MIONGONI MWA WAGONJWA WAZIMA WA SHINIKIZO LA DAMU WALIOLAZWA KATIKA HOSPITALI KUU YA KENYATTA.

MTAFITI; Lillian Amugitsi Isiaho

Shule ya Uuguzi

Chuo Kuu La Nairobi

Sanduku La Posta 19676, Nairobi

Rununu: 0726733795

Tangulizi

Nasomea Shahada ya Uzamili katika chuo kikuu cha Nairobi, shule ya uuguzi.

Ninafanya utafiti wenye mada Vigezo vya Matatizo kutokana na matatizo ya shinikizo la damu miongoni mwa wagonjwa wazima wa shinikizo la damu waliolazwa kwa matibabu katika hospitali kuu ya Kenyatta.

Madhumuni ya taarifa hii ni kukupa maelezo yanayohusu utafiti huu ili kukuhezesha kufanya maamuzi kuhusu ushiriki.

Uko huru kuuliza maswali kwa ufafanuzi wa maswali yoyote ambayo tutajadili katika karatasi hii ya habari na fomu ya ridhaa. Nami nitakuuliza maswali kuhusu utafiti kabla hujatia sahihi fomu ya ushirikiano ya idhini ili kuhakikisha ufahamu wako wa taarifa iliyo tolewa.

Historia na lengo

Lengo la utafiti huu ni kutambua vigezo vya matatizo ya shinikizo la damu miongoni mwa wagonjwa wazima wa shinikizo la damu waliolazwa kwa matibabu katika hospitali kuu ya Kenyatta.

Utafiti huu utabaini upungufu katika huduma zinazotolewa kwa wagonjwa hao katika lengo la kubaini mapendekezo ili kuepuka matatizo yanayo sababishwa na kutodhibiti shinikizo la damu.

Ushiriki

Ushiriki katika utafiti huu itahusisha kujibu maswali ambayo itajazwa na mtafiti katika nusu muundo dodosa. Hutakabiliwa na taratibu yoyote ramisi.

Faida

Hakuna faida moja kwa moja ya kifedha kwa kushiriki kwa utafiti huu. Hata hivyo, matokeo ya utafiti huu itakua na manufaa kuwezesha mambo mbali mbali kana kwamba kuamua jinsi tukio la matatizo yanayo husishwa na kutodhibiti shinikizo la damu yanaweza kuzuiliwa.

Matokeo ya utafiti huu utatolewa na kupeanwa kwa hospitali , watunga wengine muhimu na wadau wa msaada ili kuboresha huduma wanaopewa wagonjwa wa shinikizo la damu.

Hatari

Hakuna hatari ya kiuchumi au mwili kwa kushiriki katika utafiti huu. Hata hivyo kutokana na muda utakaochukuliwa kujibu maswali utachukua muda mbali na ratiba yako ya siku kujibu maswali ili kujaza dodosa, wakati wa mahojiano baadhi ya maswali yatahitaji ufichue taarifa binafsi ambayo inaweza sababisha hisia hasi na uwezekano wa wasiwasi. Kama hali hii ikitokea mtafiti atakueleza kwa diwani wa hospitali.

Mahojiano itachukua takriban dakika ishirini na tano.

Usiri

Usiri utahakikishwa na habari utakayotoa itatumika kwa madhumuni yaliyokusudiwa na utafiti. Aidha jina lako hilitaandikwa kwenye cheti chochote wala halitatumika katika uchapishaji wa repoti ya mwisho. Vifaa vyote vitakavyotumika katika utafiti huu vitawekwa chini ya ufunguo na kufuli na wale wote watakaohusika na utafiti huu ndio wataweza kuzipata.

Faili za elektroniki zitawekwa katika ulizi wa kompyuta.

Ushiriki kwa hiari

Ushiriki katika utafiti huu ni kwa hiari. Kukataa kushiriki hakutvutia adhabu yoyote. Unahifadhi haki ya kujitoa katika kushiriki kwa utafiti huu bila madhara yoyote. Uko huru kutojibu maswali yatakayokufanya ujihisi na wasiwasi wakati wa mahojiano.

Fidia

Hakuna fidia kwa kushiriki katika utafiti huu.

Mugongano wa maslahi

Mtafiti na wasimamizi wanadhibitisha kwamba hakuna mgongano wa maslahi miongoni mwao.

FOMU YA RIDHAA

Ukikubali kushiriki katika utafiti huu tafadhalia tia sahihi hapo chini.

Nimekubali kushiriki katika utafiti huu baada ya kufahamishwa asili na hatari zinazohusika. Pia, nimeelrwa kwamba ushiriki wangu katika utafiti ni kwa hiari na uamuzi wa kushiriki au kutoshirika hautaadhiri njia nitakayotibiwa katika kituo hiki kwa njia yoyote ile. Niko huru kuamua kuacha kushiriki katika utafiti wakati wowote inje ya maelezo au madhara. Nimehakikishiwa kuwa maelezo yangu binafsi itawekwa siri. Ninadhibitisha kwamba wasiwasi wangu wote kuhusu kushiriki katika utafiti huu umeshughulikiwa na mpelelezi na kwamba mpelelezi ameniuliza maswali ili kuhakikisha ufahamu wangu wa taarifa zilizotolewa.

Sahihi ya mshiriki (au alama ya kidole).....Tarehe.....

Ninadhibitisha kwamba nimemweleza mshirika asili ya utafiti na yaliyomo kwa undani na mshiriki ameamua kushiriki kwa hiari yake bila kutumia nguvu au shinikizo visivyofaa.

Sahihi ya Mtafiti.....Tarehe.....

Kwa ufafanuzi yoyote tafadhali pigia:

Mtafiti,

Lilian Amugitsi Isiaho,

Namba: 0726733795

Barua pepe: lilianisiaho@gmail.com

AU

Bwana Antony Ayieko

Dkt. Blasio Omuga

Mhadhiri, Shule ya Uuguzi

Mhadhiri, Shule ya Uuguzi,

Chuo kikuu cha Nairobi.

Chuo Kikuu cha Nairobi.

Namba: 0723521528

Namba: 0722256080

Barua pepe: ayieko@uonbi.ac.ke

Barua pepe: mitenga@yahoo.com

AU

Mwenyekiti

Kamati ya maadili na utafiti ya Chuo kikuu cha Nairobi / Hospitali kuu ya Kenyatta.

Namba: 020-2726300

S. L. P. 19676- 00202

Simu (254-020)-2726300 Ext 44355

Barua pepe: uonknh_erc@uonbi.ac.ke

APPENDIX 3: STUDY QUESTIONNAIRE

SECTION I: DEMOGRAPHIC DATA.

1. What is your age?
 - A. Less than 20 years ()
 - B. 20-39 years ()
 - C. 40-59 years ()
 - D. over 60 years
2. What is your gender?
 - A. male ()
 - B. female ()
3. What is your highest level of education?
 - A. Never been to school ()
 - B. Primary ()
 - C. Secondary ()
 - D. University/college ()
 - E. other (specify) ()
4. What is your occupation(state).....
5. What is your marital status?
 - A. single ()
 - B. married ()
 - C. divorced ()
 - D. separated ()
 - E. widowed ()
 - F. other (specify)
6. What is your religion?
 - A. Protestant ()
 - B. Catholic ()
 - C. Muslim ()
 - D. Hindu ()

E. Other (specify)

SOCIO-ECONOMIC FACTORS

- 7. What is your current employment status?
 - A. Employed
 - B. Unemployed
 - C. Self employed
 - D. Student
 - E. Other (specify)
- 8. How much is your net earnings per month?(State).....
- 9. How do you pay for the health services here?
 - a. cash
 - b. insurance
 - c. well wishers
 - d. don't know
- 10. How much do you spent on hypertension treatment per month?(state)
.....
- 11. Is there anyone else in your family who is hypertensive?(state)
.....
- 12. Where do you stay?(state).....
- 13. How far is your home from the health facility? (state).....

HEALTH RELATED FACTORS

- 14. What is your latest blood pressure (state).....
- 15. What is your weight? (state).....
- 16. What is your height? (state).....
- 17. What is your BMI? (Calculate from weight and height).....

18. When were you diagnosed to have hypertension?

- A. less than 2 years ago ()
- B. 2-5 years ago ()
- C. 5-10 years ago ()
- D. 10-20 years ago ()
- E. over 20 years ago ()

19. Do you suffer from any other condition apart from hypertension?

- A. Respiratory ()
- B. Kidney ()
- C. Eye problems ()
- D. Diabetes
- E. Cancer
- F. Other (specify) ()

20. Do you take your drugs as prescribed?

- a. Yes
- b. No

If no, why?

.....

21. Apart from antihypertensive, are there any other drugs you take often?

- a. yes
- b. no

If yes, specify

.....

22. Are you experiencing any side effects of the antihypertensive drugs you are taking?

- a. Yes
- b. No

(if yes, specify)

.....

23. Has a medical professional advised you to change your way of living to lower your blood pressure?

A. yes

B. no

(If yes, what instructions did he/she given)

.....

24. Have you ever been admitted with hypertension before?

A. yes

B. no

25. Are you on any family planning pills?

A. Yes

B. No

C. Not applicable

26. Do you smoke cigarette?

A. yes

B. no

27. Have you been advised by a health professional against smoking in the past 12 months?

A. Yes

B. No

28. Are you exposed to indoor cigarette smoke at home or at work?

A. Yes

B. No

(if yes, how many hours per day are you exposed).....

29. . Are you engaged in any physical activity in your day to day life?

A. Walking

B. Gym

C. Heavy working conditions

D. None

E. Other (specify)

30. . How would you describe the amount of salt you take in food?

A. No salt?

B. Low salt

C. Too salty

D. Other (specify)

31. . Do you take alcohol?

A. Yes always

B. Yes occasionally

C. No

KNOWLEDGE, ATTITUDE AND PRACTICE

32. . What is hypertension?

.....

33. . What are hypertension complications?

.....

.....

34. . What causes hypertension complications?

- a. Not taking drugs as prescribed
- b. Hormonal contraceptives
- c. Positive family history
- d. Stress
- e. Don't know

35. How did you know you were hypertensive?

- a. You came to hospital with symptoms
- b. During a regular check up without symptoms
- c. Don't remember

36. What antihypertensive drugs do you take?(state)

.....

37. . How often do you come to the clinic for check ups

- a. Routinely
- b. If I have symptoms

38. . Once the blood pressure normalizes, do you stop taking medications?

- a. Yes
- b. No

If yes specify

.....

39. . Are you satisfied with the information the health professionals have given you on hypertension complications?

- a. Yes
- b. No

If no, what do you think is missing?

40. What practices do you do to avoid hypertension complication?

.....
.....

Compliance with lifestyle changes

How Often Do You?	Daily	Frequently	Rarely	Never
Smoke				
Alcohol				
Add Salt To Food				
Engage In Physical Exercise				
Have Enough Sleep				
Eat Food And Vegetables				
Take Fatty Foods				

APPENDIX 4: FOMU DODOSA

DATA ZA JAMII NA IDADI ZA WATU.

1. Umri wako ni miaka ngapi?
 - a. Chini ya miaka 20
 - b. Miaka 20-39
 - c. Miaka 40-59
 - d. Zaidi ya miaka 60
2. Jinsia yako ni gani?
 - a. Mwanaume
 - b. Mwanamke
3. Kiwango chako cha masomo ni kipi?
 - a. Sijawahi kusoma
 - b. Shule ya msingi
 - c. Shule ya upili
 - d. Chuo /chuo kikuu
 - e. Nyingine, taja
4. Kazi yako ni gani?(taja)
.....
5. Hali yako ya ndoa ni ipi?
 - a. Hujaoleka
 - b. Umeoleka
 - c. Talakiwa
 - d. Kutengana
 - e. Mjane
 - f. Ingingine, taja
6. Dini yako ni ipi?
 - a. Mprotestanti
 - b. Katoliki
 - c. Mwislamu
 - d. Mhindi
 - e. Ingingine, taja

KIJAMII NA KIUCHUMI

7. Je, ajira yako ya sasa ni ipi?

- a. Kuajiriwa
- b. Kutoajiriwa
- c. Kujiajiri
- d. Mwanafunzi
- e. Ingingine, taja

8. Mapato yako kwa mwezi ni ngapi?(taja)

.....

9. Unalipia jinsi gani huduma za afya?

- a. fedha/pesa
- b. bima ya afya
- c. misaada
- d. sijui

10. Unatumia kiasi gani cha pesa katika matibabu ya shinikizo la damu?

.....

11. Kuna mtu mwingine kwa familia yako anayeugua ugonjwa wa shinikizo la damu?

.....

12. Unaishi wapi?eleza

.....

13. Huduma ya afya iko umbali gani kutoka nyumbani?

.....

AFYA

1. Kiwango chako cha shinikizo la damu ni ngapi?.....
2. Uko na kilo ngapi?.....
3. Urefu wako ni upi?.....
4. Hesabu ta kiwango cha misuli na mafuta ya mwili(BMI).....
5. Umeugua ugonjwa wa shinikizo la damu kwa muda gani?
 - a. Chini ya miaka miwili
 - b. Miaka 2-5
 - c. Miaka 5-10
 - d. Miaka 10-20
 - e. Zaidi ya miaka 20
6. Je,unakabiliwa na ugonjwa nyingine yoyote mbali na shinikizo la damu?
 - a. Shida ya mapumuzi
 - b. Shida ya figo
 - c. Shida ya macho
 - d. Kisukari
 - e. Kansa
 - f. Ingingine, taja
7. Kando na tembe za shinikizo la damu kuna dawa zzingine za unatumia?
 - a. Ndio
 - b. B. la
 - c. Kama ndio,eleza
8. Je,unapitia madhara yoyote kutokana na dawa za shinikizo la damu unazotumia?

.....
9. Umewahi kulazwa hospitali kwa ajili ya ugonjwa wa shinikizo la damu?
 - a. Ndio
 - b. B. la
10. Je, unatumia njia zozote za kupanga uzazi

- a. Ndio
 - b. B. hapana
11. Unavuta sigara?
- a. Ndio
 - b. B. la
12. Je,umewahi kushauriwa na muhudumu wa afya dhidi ya uvutaji sigara ili kuzuia matatizo yanayo husika na shinikizo la damu?
- a.ndio
 - b. hapana.
13. . je, una uhusiano na wavutaji sigara kazini au kazini?
- a. ndio
 - b. hapana
- kama ndio,masaa ngapi kwa siku?.....
14. Je,wewe hushiriki katika mazoezi yoyote ya kimwili katika siku za maisha yako?
- a. Kutembea/kukimbia
 - b. Hali nzito ya kazi
 - c. Ukumbi wa mazoezi
 - d. Ingingine, taja
15. Unaweza eleza jinsi gani kiasi cha chumvi unachochukua katika chakula?
- a. Hakuna
 - b. Chumvi kidogo
 - c. Chumvi mingi
 - d. Ingingine,taja
16. Unakunywa pombe?
- a. Ndio,daima
 - b. Ndio, mara kwa mara
 - c. Hapana

KIWANGO CHA UFAHAMU, MAONI BINAFSI NA MAZOEA

1. Shinikizo la damu ni nini?
.....
2. Taja baadhi ya matatizo ya shhunikizo la damu
.....
3. Chanzo cha matatizo ya shinikizo la damu ni nini?
 - a. Kutotumia dawa kama ulivyo agizwa na wahudumu wa afya?
 - b. Dawa za kupanga uzazi
 - c. Historia chanya kwa familia ya shinikizo la damu
 - d. Msongo/mkazo/stresi
 - e. sijui
4. je, uligundua vipi kua unaugua ugonjwa wa shinikizo la damu?
 - a. Ulikuwa hospitali ukiwa na dalili
 - b. Ulikuwa uangaliwa bila dalili
 - c. Hukumbuki
5. Unatumia dawa gani kutibu huu ugonjwa wa shinikizo la damu?taja
.....
6. Wewe huja kliniki mara ngapi?
 - a. Kwa maagizo
 - b. Ukiwa na dalili
7. Shinikizo la damu likiwa sawa unawacha kumeza dawa?
 - a. Ndio
 - b. Hapana
 - c. Kama ndio,eleza
.....
8. Je, umeridhika na maelezo ambayo wahudumu wa afya wamekupa kuhusu shinikizo la damu?
 - a. Ndio
 - b. La
 - c. Kama la,ungependa wakueleze kuhusu nini zaidi?
9. Ni mazoea gani wewe hufanya ili kuzuia tukio ya matatizo ya shinikizo la damu?

.....
10. Unachukua dawa zako kama ulivyo agizwa?

- a. Ndio
- b. La
- c. Kama la,eleza

KUZINGATIA MAISHA

Ni mara ngapi wewe?	Kila siku	Mara kwa mara	Mara chache	kamwe
Huvuta sigara				
Hunywa pombe				
Ongeza chumvi kwa chakula				
Jihusisha na mazoezi ya kimwili				
Kupumzika ya kutosha				
Kula matunda na mboga				
Kula chakula kilicho na mafuta mingi				

APPENDIX 5: KEY INFORMANTS INTERVIEW GUIDE

Dear participant,

You are hereby invited to participate in a ‘Determinants of hypertension complications among adult hypertensive patients admitted in medical wards in KNH ’’ research as one of the key informants. The details of the research are as per the information sheet for participants and requirements for informed consent in the informed consent form. Read all the issues carefully and ensure that you comply with all the requirements. Be as honest as possible in responding to all the questions as specified.

1. What are some of the hypertensive complications the patients are admitted with here in KNH?
2. In your opinion, what could be the cause of the hypertension complications?
3. What are the socio-economic factors that influence occurrence of hypertensive complications in hypertensive patients?
4. What challenges do you face when attending to hypertensive patients
5. What role do you play in preventing occurrence of these complications?
6. Are you satisfied with the health services provided to the hypertensive patients?
7. What can be done to improve the service to hypertensive patients and prevent occurrence of hypertensive complications?

APPENDIX 6: FOCUSED GROUP DISCUSSION GUIDE

INFORMATION SHEET FOR PARTICIPANTS

Dear participant,

You are hereby invited to participate in a ‘Determinants of hypertension complications among adult hypertensive patients admitted in medical wards in KNH’ research as one of the members in a focused discussion group made up of 8 participants. The details of the research are as per the information sheet for participants and requirements for informed consent in the informed consent form. Read all the issues carefully and ensure that you comply with all the requirements. Be as honest, free and active in your participation as possible in responding to all the questions as specified. There will be an observer, moderator and note taker for your focus group discussion.

Theme A: demographic factors influence on hypertension complications

1: How do you think gender and age influence the occurrence of hypertension complications?

Theme B: The socio-economic factors influence on hypertension complications

2a. what are the socio economic factors that influence occurrence of hypertension complications?

2b. what measures can be done to get overcome these factors

Theme C: The health related factors influence on hypertension complications

3a. : what other health conditions contribute to occurrence of uncontrolled hypertensive states?

3b. what are the risky health habits that predispose to hypertension complications.

Theme D: The knowledge, attitude and practice influence on hypertension complications

- 4a. is it important to be knowledgeable on hypertension?
- 4b. how does ones knowledge on hypertension aid in prevention of complications associated with uncontrolled hypertensive states?
- 4c. Are hypertension complications preventable?
- 4d. what practices do you engage in to prevent hypertension complication?
- 4e. what can you suggest on improvement of the services to hypertension patients in KNH to avoid occurrence of hypertension complications.

APPENDIX 7: TIME FRAME

Duration in Weeks / Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Problem Identification	■															
Proposal Writing		■														
Seeking consent from Ethical committees			■	■	■											
Recruitment and training of research assistants					■											
Pre-testing of study tools						■										
Administration of tools							■	■	■	■						
Data cleaning and entry											■					
Data analysis												■	■			
Report writing and presentation														■	■	
Compilation of final report and dissemination																■

APENDIX 8. BUDGET

ITEM	UNIT COST	QUANTITY	COST	TOTAL COST
HUMAN RESOURCE				
Research assistants allowance(2)	500	2x2x500	2,000	
Principal researcher(1)	1,000	2x1,000	2,000	
Pre-testing of questionnaire Research assistants(2)	500	2x2x500	2,000	
Principal researcher(1)	1,000	2x1,000	2,000	
Data collection: Research assistants(2)	500	2x5x4x500	20,000	
Principal researcher(1)	1,000	1x5x4x1,000	20,000	
Sub-total				48,000
MATERIALS AND SUPPLIES				
Biro pens(1 packet)	400	400x1	400	
Pencils(1 dozen)	60	60x1	60	
Rubbers(4)	10	10x4	40	
Folders(3)	100	100x3	300	
Field books	100	100x3	300	
Stapler and staples	600	600	600	

Sub-total					1,500
PROPOSAL AND THESIS					
Proposal typing and printing (65 pages)		50	65x50	3250	
Payment to	ethics	1	2000	2000	
Photocopying final report (5 copies)		3	250 x3	750	
SUB TOTAL 6000					
DATA ANALYSIS AND PRESENTATION					
Data processing and analysis		20,000	1	20,000	
Research result book binding		15000	1	15000	
Contingency 10%of total				9050	
TOTAL				99550	

APPENDIX 9: APPROVAL TO PRETEST STUDY TOOLS.



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING SCIENCES

TELEGRAMS: VARSITY NAIROBI
TELEPHONE: 020 2726300 EXT: 43390
TELEFAX: 020 2711250

P.O. BOX 19676 00202
KENYATTA NATIONAL HOSPITAL
NAIROBI KENYA

22nd April 2016



The Medical Superintendent
Mbagathi County Hospital
NAIROBI.

Handwritten initials

Dear Sir

LILIAN AMUGITSI ISIAHO – H56/75398/2014

The above named is a Masters Student at the School of Nursing Sciences, University of Nairobi. She is undertaking a research on **“Determinants of hypertension complications among adult hypertensive patients in Kenyatta National Hospital”**. She wishes to pretest her research tools between 25th April to 5th May 2016.

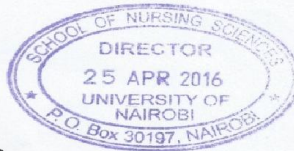
Kindly accord her the necessary assistance in your institution.

Thank you for your continued support.

Yours faithfully,

Handwritten signature of Dr. Samuel T. Kimani

DR. SAMUEL T. KIMANI
AG. DIRECTOR,
SCHOOL OF NURSING SCIENCES




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APPENDIX 10: REGISTRATION OF RESEARCH IN KNH

KNH/R&P/FORM/01



KENYATTA NATIONAL HOSPITAL
P.O. Box 20723-00202 Nairobi

Tel.: 2726300/2726450/2726565
Research & Programs: Ext. 44705
Fax: 2725272
Email: knhresearch@gmail.com

Study Registration Certificate

1. Name of the Principal Investigator/Researcher
LILLIAN ANUGITI KISALO

2. Email address: lliananugiti@gmail.com Tel No. 0726738795

3. Contact person (if different from PI) MR ANTONY ATIEKO ONG'ANY

4. Email address: _____ Tel No. _____

5. Study Title
DETERMINANTS OF HYPERTENSION COMPLICATIONS AMONG ADULT HYPERTENSIVE PATIENTS IN KNH MEDICAL WARDS

6. Department where the study will be conducted MEDICAL WARDS
(Please attach copy of Abstract)

7. Endorsed by Research Coordinator of the Department where the study will be conducted.
Name: _____ Signature _____ Date _____

8. Endorsed by Head of Department where study will be conducted.
Name: FRANCIS W. MURRAY Signature _____ Date 22/04/2016

9. KNH UoN Ethics Research Committee approved study number P16102/2016
(Please attach copy of ERC approval)


10. I LILLIAN ANUGITI KISALO commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Research and Programs.
Signature Lillian Date 18th APRIL 2016

11. Study Registration number (Dept/Number/Year) Medicine / 61 / 2016
(To be completed by Research and Programs Department)

12. Research and Program Stamp _____

All studies conducted at Kenyatta National Hospital must be registered with the Department of Research and Programs and investigators must commit to share results with the Hospital.

Version 2: August 2014



APPENDIX 11: UON/KHN ERC APPROVAL



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P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/134

15th April, 2016

Lillian Amugitsi Isiaho
Reg. No. H56/75398/2014
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Lillian,

Revised Research Proposal: Determinants of Hypertension Complications among Hypertensive Patients in Medical Wards at Kenyatta National Hospital, Nairobi (P75/02/2016)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH-UoN ERC) has reviewed and **approved** your above proposal. The approval period is from 15th April 2016 – 14th April 2017.

This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- c) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- f) Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- g) Submission of an *executive summary* report within 90 days upon completion of the study.
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Yours sincerely,



PROF. M.L. CHINDIA
SECRETARY, KNH-UoN ERC

c.c. The Principal, College of Health Sciences, UoN
 The Deputy Director, CS, KNH
 The Assistant Director, Health Information, KNH
 The Chair, KNH- UoN ERC
 The Director, School of Nursing Sciences, UoN
 Supervisors: Mr. Anthony Ayieko Ong'any, Dr. Blasio Osogo Omuga

APPENDIX 12 STUDY TOOLS



