COMPLIANCE TO HYPERTENSIVE MANAGEMENT AND BLOOD PRESSURE CONTROL AMONG PATIENTS ATTENDING THE HEALTH PROMOTION CLINIC OF AAR WILLIAMSON HOUSE OUTPATIENT CENTRE, NAIROBI, KENYA

ANASTASIA MUMBUA MPUNGU

MASTER OF SCIENCE

(Public Health)

JOMO KENYATTA UNIVERSITY

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Compliance to Hypertensive Management and Blood Pressure Control among Patients Attending the Health Promotion Clinic of AAR Williamson House Outpatient Centre, Nairobi, Kenya

Anastasia Mumbua Mpungu

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DECLARATION

This thesis is my original work and has not been presented for a degree in any university

Signature: ……Date……

Anastasia M. Mpungu

This thesis has been submitted for examination with approval as university supervisors;

Signature:…… Date……

Dr. Drusilla Makworo, PhD

JKUAT, Kenya

Signature:…… Date……

Dr. Joseph Mutai, PhD

KEMRI, Kenya

DEDICATION

This thesis is dedicated to my loving husband Andrew and wonderful children Muriuki, Kaari and Muriithi, for their support and encouragement.

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ABBREVIATIONS AND ACRONYMS

AAR	Africa Air Rescue
ACOG	American Congress of Obstetricians and Gynaecologists
AHA	American Heart Association
BMI	Body Mass Index
BP	Blood Pressure
HICs	High Income Countries
HMO	Health Maintenance Organization
HTN	Hypertension
KNBS	Kenya National Bureau of Statistics
KNH-UoN ERC	Kenyatta National Hospital-University of Nairobi Ethic and Research Committee
LDL	Low Density Lipoprotein
PURE	Prospective Urban Rural Epidemiology
STEPS	WHO instrument for stepwise surveillance of chronic disease risk factors
UMICs	Upper-Middle-Income Countries
WHO	World Health Organization

ABSTRACT

Hypertension remains a public health disorder of concern globally even in developed countries with functioning health care systems and a large number of available effective treatments. In the year 2000, approximately 972 million people were diagnosed with hypertension worldwide and this is expected to increase to 1.56 billion by the year 2025. Hypertension has been ranked among the leading causes of disabilities and deaths from non-communicable diseases in Africa. Uncontrolled blood pressure is associated with complications. Patient directed assessment of compliance and interventions to improve adherence to medication and lifestyle changes have been a challenge. Despite more people being diagnosed with hypertension in Kenya, compliance to medication and life style changes that are needed in proper hypertension management remain a major concern. The main objective of this study was to assess the compliance of hypertensive management and blood pressure control among patients attending the health promotion clinic of AAR Williamson House Outpatient Centre in Nairobi, Kenya. The first specific objective was to determine the level of compliance to various aspects of hypertension management among hypertensive patients attending selected AAR Health Promotion Clinic in Nairobi. The second was to establish the level of blood pressure control among hypertensive patients attending selected AAR Health Promotion Clinic in Nairobi. The third was to determine the factors associated with compliance among the hypertensive patients attending the selected AAR Health Promotion Clinic in Nairobi. The study adopted a descriptive cross-sectional design to determine the level of compliance in hypertensive patients. The study targeted hypertensive patients that were on follow up in the Health Promotion Clinic. These included insurance members and cash paying patients. Convenience sampling method was used to recruit 172 respondents. WHO instrument for stepwise surveillance (STEPS) of chronic disease risk factors was administered and the blood pressure and anthropometric measures of the respondents recorded. Data entry and statistical analysis was done using Statistical Package for Social Sciences version 23. Pearsons chi-square test was used to determine the association between variables while correlation between variables was determined using the Cramer's phi coefficient and Phi-coeffecient. Bionomial regression analysis was done to determine the risk factors in compliance to blood pressure control. Ethical approval was given by KNH-UoN ERC and the management of AAR Healthcare (K) also gave their consent. Written consent was sought from the partcipants for data collection to ensure participation was voluntary. Those that were found to have uncontrolled BP were referred to see the doctor. The study found that only 27.4% of the patients controlled their blood pressure. The male respondents were 55% and 45% were female. Those who were in university, or already graduates or pursing postgraduate degrees were 61%. The respondents who did not smoke were 97%, 40% were taking alcohol, 52% kept within the recommended diet with 88% of them adhering to the recommended sodium intake. The respondents who engaged in physical activities at work were 63% and only 19.2% had normal BMI. As for associated factors for non-compliance, the study found there was no significant association ($p > 0.05$) between compliance and age, education level, marital status, employment status, smoking tobacco and number of people living with the respondent. However, sex was significant ($p = 0.020$) with men being less compliant. The odds of female respondents being more complaint were 0.402 times more than males. Alcohol intake ($p = 0.037$), high BMI ($p = 0.002$), high sodium intake ($p = 0.030$) and not engaging in physical activities ($p = 0.007$)

were also significantly associated with lack of compliance. Binomial regression analysis indicated alcohol and BMI were the factors that added significantly to blood pressure control. The study concludes that compliance to various aspects of hypertensive management varied among the hypertensive patients with overall compliance being low. This study recommends the Clinical Operations Department of AAR Healthcare provide health information regarding different aspects of hypertension management and control to patients and also put in place measures to monitor and evaluate the performance of the health promotion clinic. Recruitment of a counselor to provide support to patients with compliance challenges was also recommended. Finally, studies were recommended to be carried out on the compliance to hypertension management of patients followed up in the health promotion clinics of the other AAR Healthcare Outpatient Centres.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Hypertension is a chronic disease that can be debilitating to an individual's health. Normal blood pressure is 120 to 129 mmHg systolic and/ or 80 to 84 mmHg diastolic. High-normal blood pressure is 130 to 139 mmHg systolic and /or 85 to 89 diastolic. An individual having blood pressure of 140 to 149 mmHg systolic or 90 to 99 mmHg diastolic is said to have mild hypertension - Grade 1. Grade 2 which is moderate hypertension is BP readings of 150 to 179 and /or 100 to 109 mmHg. Severe hypertension or Grade 3 is BP readings of above 180 mmHg and /or >110 mmHg in diastolic BP readings. According to a definition shared by all medical guidelines until much recently, hypertension is having a blood pressure higher than 140 mmHg systolic and over 90 mmHg diastolic. The European guidelines have maintained this definition (Williams, *et al.*, 2018) while the American guidelines lowered the threshold to <130 mmHg systolic and over 80 mm Hg (Whelton, *et al.*, 2018).

As per the American Heart Foundation guideline which is adopted in Kenya, blood pressure more than 130/80 mmHg is referred to as stage 1 hypertension. Stage 2 hypertension is when the systolic blood pressure is 140 mmHg and above and diastolic is 90 mmHg or higher. Therefore, hypertensive urgency, which is a medical emergency, is when a patient's blood pressure is above 180 mmHg systolic or above 110 mmHg diastolic. Hypertensive emergency is when an individual has BP readings of 220 /140 mmHg with possible target organ damage (American Heart Association, 2016).

In the year 2000, approximately 972 million people were diagnosed with hypertension worldwide, 639 million of whom were from developing countries. This number is expected to rise to 1.56 billion by the year 2025 (Kearney, *et al.*, 2005). Hypertension remains a challenging disorder, even in developed countries with functioning health care systems and a large number of available effective treatments. In America by 2014, studies showed that 75 million people suffered from hypertension. A study done between the year 2006 and 2011 in America's emergency rooms indicated that there was a 25% increase in patients going in for hypertension care and treatment (Meena, 2014). There was no particular reason for this recorded increase.

Hypertension has been identified as a condition that affects more than 20% of adults in many industrialized countries (Gunarathne, *et al*., 2008). In the developing countries, hypertension which was previously rare is estimated to have increased in prevalence. According to a WHO bulletin discussed in the African Union in the year 2006, hypertension was reported as the greatest health challenge in Africa after HIV/AIDS (WHO, 2006). Hypertension and other cardiovascular diseases had been ranked among the leading causes of disabilities and deaths from non-communicable diseases in the continent (Lawes, *et al*., 2006). The increased number of deaths were noted to be among the young and active adults (Opie, *et* al., 2005). By the year 2013, in the Sub-Saharan Africa, the number of people that had been diagnosed with hypertension was estimated to be 74.7 million and a projection of the number of people who would be suffering from hypertension by the year 2025 was estimated to increase by 68% making the number 125.5 million (Ogah, *et al.*, 2013).

A study conducted in two slum areas of Nairobi, Kenya established that hypertension was prevalent in these areas with few individuals aware of the condition and treatment (Van de Vijver, *et al*., 2013). This study indicated a prevalence rate of 12.7% unlike a previous study done in 1998 that indicated a prevalence of 6.7%. In another study conducted in Kenya in the slum areas on the prevalence of hypertension, a prevalence of 13% was indicated (Mark, *et al*., 2014). All these studies were all conducted in urban slum dwellings and hence the prevalence could not possibly show a clear picture of the prevalence of other population with different socio-economic status in Kenya. These numbers were for people generally suffering from hypertension and not specifically for uncontrolled hypertension. Uncontrolled hypertension is associated with heart diseases that usually cause premature mortality. According to Kenya National Bureau of Statistics (KNBS, 2010), there is paucity of empirical data to show those hypertensive patients attending private facilities who manage to comply to medication and life style changes to control their blood pressure. This study addresses this paucity in research.

1.2 Statement of the Problem

Hypertension is a chronic disease which when not well managed leads to complications that are debilitating and even death. The number of people suffering from hypertension is expected to rise from 639 million in 2000 to 1.56 billion in 2025, the largest increase occurring in developing countries (Kearney, *et al*., 2005). Despite the fact that more people seem to be diagnosed with hypertension in Kenya today, this problem is compounded by the low

compliance to anti-hypertensives and rigidity in the change of lifestyle, even though these are critical to their well-being.

Non-adherence is a major concern in the treatment of hypertension and particularly a key factor in patients who appear to have resistant hypertension (Hyman, *et.al.*, 2015). Lack of knowledge about the severity of the disease and the importance of compliance has also been seen as a factor affecting the management of hypertension in patients in Kenya and other parts of the world. Due to this lack of knowledge, it is assumed that patients seldom attend clinics for screening and diagnosis. The asymptomatic nature of hypertension has also been identified as a possible factor that has led to the increase of non-compliance among hypertensive clients globally. With the increase of cases of hypertension in Kenya; it is prudent that studies establishing prevalence of uncontrolled hypertension cases in clinical setups be carried out regularly. This study aims to determine the level of compliance and factors associated with compliance in blood pressure control at the Health Promotion Clinic at AAR Williamson House Outpatient Centre in Nairobi.

1.3 Justification of the Study

Hypertension is one of the leading causes of mortality and third largest cause of disability worldwide (Kearney, *et al.*, 2005). Understanding compliance in hypertensive patients is necessary because primary hypertension has no cure and therefore patients are expected to manage their condition for life. Additionally, patients sometimes assume that their blood pressure is under control and stop taking their medication or adhering to a life style change leading to severe high blood pressure or hypertensive crisis (Yang, *et. al.*, 2017)

Hypertension is amenable to control with the right medication that has to be taken at the appropriate time and also through adoption of relevant lifestyle modifications (Kaplan, 2005; Lewanczuk, 2006). Uncontrolled blood pressure is associated with complications. A previous study done in Kenya showed 33.4% of patients had a blood pressure within the recommended limits (Ernest, *et al.*, 2014). Another study revealed that 64.7% of the study participants did not achieve a target blood pressure level which was critical in their treatment regimen (Kubo, *et al.*, 2015). This study therefore sought to establish the level of compliance to hypertensive management and blood pressure control among patients attending the Health Promotion Clinic of AAR Williamson House Outpatient Centre, Nairobi. Most of the clients attending the AAR Healthcare clinics, that is 86%, have some form of medical insurance and are from the middle

to high socio-economic population.

The findings help in showing the importance of effectively identifying non-compliant patients at the clinic and in turn educating them on the pertinent issues to avoid getting complications. The findings of this research will hopefully contribute towards policy development and the improvement in health organizations on the follow up of hypertensive patients to ensure control of their blood pressure. They will also add to the available literature on the same.

1.4 Study Objectives

To determine patients' compliance to blood pressure management and control among hypertensive patients attending a selected AAR Health Promotion Clinic in Nairobi.

1.4.1 Specific Objectives

To determine the level of compliance to various aspects of hypertension management among hypertensive patients attending selected AAR Health Promotion Clinic in Nairobi.

1. To establish the level of blood pressure control among hypertensive patients attending selected AAR Health Promotion Clinic in Nairobi.
2. To determine the factors associated with compliance among the hypertensive patients attending the selected AAR Health Promotion Clinic in Nairobi.

1.4.2 Research Questions

1. What is the level of compliance of hypertensive patients to various aspects of hypertension management at the AAR Health Promotion Clinic in Nairobi?
2. What is the level of blood pressure control among hypertensive patients attending selected AAR Health Promotion Clinic in Nairobi?
3. What are the factors associated with compliance among the hypertensive patients attending the selected AAR Health Promotion Clinic in Nairobi?

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Hypertension is defined by the American Heart Foundation as a blood pressure more than 130/80 mmHg (American Heart Association, 2016) and by the European guidelines as above 140/90 mmHg (Whelton, *et. al.,* 2018). Hypertension is referred to as a silent killer disease because in most cases it has no noticeable signs and symptoms. Most people usually have high blood pressure but experience no obvious symptoms until they get a stroke or heart attack. Without proper diagnosis, one may not know that their blood pressure is high and because of its asymptomatic nature, patients suffering from hypertension are advised to keep their blood pressure under control. Also, being that it is asymptomatic, patients sometimes assume that their blood pressure is under control and stop taking their medication or adhering to life style changes leading to severe high blood pressure. It is estimated that over 50% of hypertensive patients fail to adhere to medication regimens that are critical for blood pressure control (Petrella, *et al*., 2007). Uncontrolled blood pressure can sometimes lead to complications which affect the heart, kidneys and brain (Lima, *et. al*., 2016). In the year 2000, approximately 972 million people were diagnosed with hypertension worldwide with 639 million living in the developing countries. This number is expected to increase to 1.56 billion by the year 2025 (Kearney, *et.al*., 2005).

2.2 Compliance in hypertension management

Compliance refers to adherence to hypertension medication with regards to the patient's behavior towards taking medication and more importantly adhering to a change in life style in terms of following and executing the changes in diet, exercises, among other things as per the instructions of a health care professional hence, ensuring that their blood pressure remains within normal range (Ernest, *et al*., 2014). Studies suggest that this has posed a challenge to most individuals diagnosed with this chronic disease. Non-compliance issues amongst these patients have been documented worldwide, hence the difficulty in its management.

In a study that was done in the USA to determine if hypertensive patients managed to control their systolic blood pressure after diagnosis and some months into management in a clinical

trial, it was reported that the systolic blood pressure control was not maintained in a significant proportion of patients (Welch, *et al.,* 2011).

In a prevalence study conducted in Saudi Arabia to determine the level of overall treatment compliance among hypertensive patients in Almadinah Almunawwarah, it was found that 35.1% of them actually complied with their treatment regimens. Most patients had serious non-compliance towards their exercise and dietary changes which worsened their hypertension (Manal, 2012). Better prevalence rates of compliance to blood pressure control measures was reported in an Iranian study where researchers reported that 44.9% were adherent and hence had controlled their blood pressure reading (Jahangiry, *et al.,*2017*)*. The study focused on older persons in Iran and for this study the European guidelines were used to define poorly controlled hypertension which was blood pressure readings greater than or equal to 140/90 mmHg.

A study that was done in Lesotho in 2015, revealed more or less similar results. The researchers enrolled 70 participants who had been diagnosed with hypertension seeking to determine their level of compliance and the study revealed that prior to treatment, 67.2% of them had chronic uncontrolled hypertension. The patients were then given continuous access to antihypertensive drugs and advised on lifestyle changes which included exercise and tailored diet plans. The study indicates that though there was good compliance to medication (64.3 percent), 37.1 percent of the participants adopted and complied with their diet change and only 7.1 percent complied with their exercise regimen (Thinyane, *et al*., 2015). A study carried out in Nigeria to check on medication compliance using the Mo-risky scale, revealed that levels of adherence was below 40%. Adherence was slightly higher amongst those attending specialist clinic at 39.5% compared to the other group at 36.8 percent (Akintunde, *et al*., 2015).

2.3 Blood pressure control in hypertension management

The control of blood pressure in hypertensive patients is important because it prevents development of complications (Lima, *et.al*., 2016). In a study where blood pressure control was assessed based on the countries overall social economic status, it was found to be generally low. The study was The Prospective Urban Rural Epidemiology (PURE) study that included 142,042 adult participants from three high-income countries (HICs), seven upper-middle-income countries (UMICs), and seven low-income countries and lower-middle-income

countries. The study reported that 13.2% had controlled blood pressure. Overall control was worst in low-income and lower-middle-income countries (10.8%), compared with 19% in HICs and 15.6% in UMICs. Some reasons identified for the poor control of hypertension were insufficient therapy and poor access (Chow & Gupta, 2019).

In a Spanish study that was done in Barcelona among diabetic patients that were also suffering from hypertension, it was reported that despite the co-morbidity, there was poor blood pressure control. The researchers found that 17.5% of patients had good BP control (<130/80mm Hg) while 36.9% had BP below 140/85mm Hg (Serraa, *et al*., 2011).

In the Kenyan context, a study done in Nyeri Provincial General Hospital in Central Kenya, 33.4% of patients were found to have their blood pressure within the recommended limits (Ernest, *et al*., 2014). In another study conducted at the Kenyatta National Hospital, it was revealed that 64.7% of the renal transplant recipients did not achieve a target blood pressure level which was critical in their treatment regimen (Kubo, *et al.,* 2015).

2.4 Factors associated with non-compliance in hypertension

Non-compliance can be intentional or non-intentional (Gerald, *et al*., 2014). The lack of adjustment to required lifestyle among patients diagnosed with hypertension has been attributed to a number of factors. These reasons range from ethical, moral issues, life priorities, individualistic approaches to maintaining and controlling one's health, high levels of independence, complicated drug regimens, lack of motivation due to continuous therapy to deficient comprehension of the role of medication in the management of hypertension. According to a study that was carried out in 16 countries (U.S.A, UK, Brazil, Sweden, Canada, New Zealand, Denmark, Finland, Ghana, Iran, Israel, Netherland, South Korea, Spain, Tanzania and Thailand), it was revealed that most individuals assumed that hypertension was primarily caused by stress and hence once symptoms abated, their blood pressure presumably went down. The study also revealed that most of the patients stopped or reduced their medication even without consulting the doctor and that they disliked the treatment due to side effects and even more importantly that they feared addiction. Some of the external factors that were attributed to non-compliance were; lack of time to take medication or to exercise, low socio-economic status, forgetfulness, the cost associated with

the doctor's appointment, lack of healthy food and lack of insurance (Marshall, *et. al*., 2012).

Serraa, *et al.(*2011), reported that several factors were associated with good BP control not being achieved, and they were the fact that 12.8% of the participants were smokers, 44% were obese and had high LDL cholesterol levels. As a consequence, 39.4% had a history of cardio-vascular disease and 72% had hypercholesterolemia. Jahangiry, *et al*.(2017), also found similar predictors of uncontrolled blood pressure. They reported that being widowed or divorced (due to absence of partner support), having a waist circumference ≥ 90 cm signifying abdominal obesity and having a high BMI contributed significantly to poor control of hypertension. Smoking also contributed to poor control because it increased both cardiac output and peripheral resistance and led to a sedentary life with consumption of less healthy diets.

In a study in Nigeria, age was an important factor. Older people presumably had higher adherence to their anti-hypertensive medication as opposed to other age groups. Education level was also revealed as a contributing factor to compliance to medication. The study concluded that individuals with lower levels of education were less likely to have high medication compliance compared to those who were well educated. This also reflects how access to medication also contributed to high adherence. Individuals with higher monthly income who could afford insurance covers were able to access more medication hence better adherence (Akintunde, *et.* al., 2015). According to the American Heart Association, access to medicines is a very influential factor and this is primarily because it can help minimize unintentional non-adherence. Unintentional non-adherence can be addressed through simpler dosage regimens and involving care givers and their families in medication administration if possible (AHA, 2016).

Another study in Iran, focusing on the effectiveness of multi-component lifestyle intervention on hypertensive women, revealed that their blood pressure reduced because of changes they made in their lifestyles. As their body weight shifted, so did their blood pressure in that when they reduced their body weight so did their blood pressure. As they reduced their salt intake and increased their level of activity, there was significant improvement in their BP readings - this was noted for over a period of 6 months (Hasandokht, *et. al*., 2015). A similar study done in Ghana, though not focusing on women, revealed that the lifestyle behavior modification and challenges actually did impact the management of hypertension (Abd El-Hay, *et. al.,* 2015).

Psychosocial factors have also been reported to affect compliance in these patients. Factors

such as depression and level of social support were found to seriously have an influence on how the patient will perceive his/her treatment regimen and hence directly impact compliance (Ford, *et al*., 2016). Patients that were depressed were found to be less likely to comply with their treatment regimen because of their loss of interest in life. A patient who received proper social support for example financial, logistical support was found to be more compliant.

2.5 Conceptual Framework

The conceptual framework in figure 2.1 shows how variables interplay. Blood pressure control and hypertension management are the dependent variables with, socio-demographic factors as the independent variables and compliance to lifestyle as the modifying variables. Socio-demographic factors determine one's compliance to lifestyle changes, that is, the type of food one eats, if one can afford drugs and their understanding of the importance of exercising. In turn, this affects the control of one's blood pressure and therefore management of their hypertension.

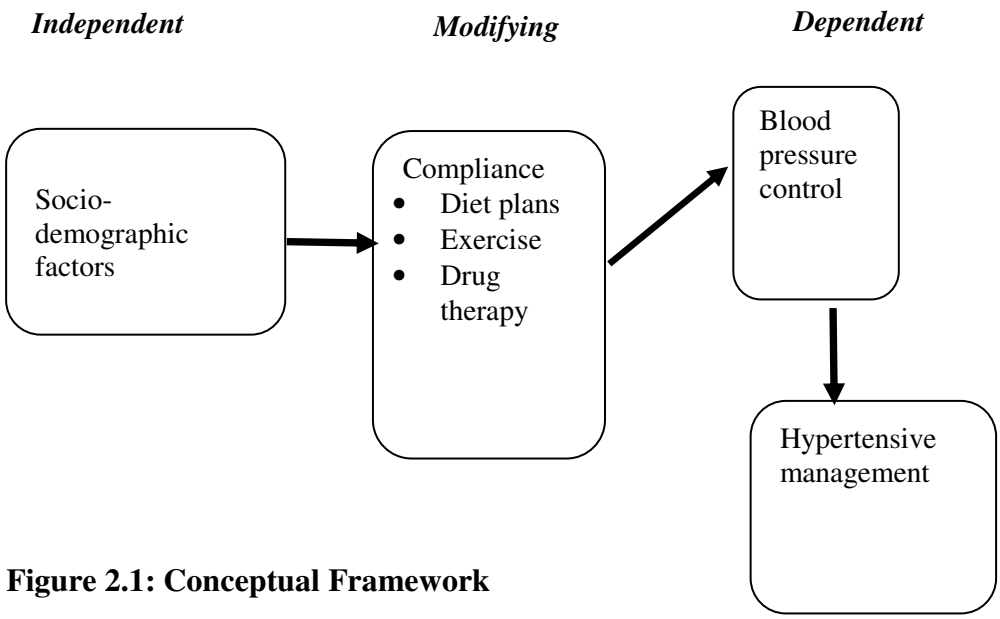

Figure 2.1: Conceptual Framework

CHAPTER THREE

METHODOLOGY

3.1 The study site

Africa Air Rescue was started in 1984 to provide accident and medical evacuation services by road and air. In 1991 it expanded its operations to provide health care services and medical insurance and hence became a health maintenance organization (HMO). As a result of this expansion, in 1996, "AAR" ceased being an acronym and became a word. Hence the company name changed to AAR Health Services. The company expanded its services to Uganda in 1994 and in Tanzania in 1998. In 2012, AAR Health Services split into two companies, AAR Insurance Limited and AAR Healthcare Limited. The former provides health and general insurance products and the latter health care services through a total of 36 outpatient centers in Kenya, Uganda and Tanzania. In Kenya, AAR Healthcare has 21 outpatient centers with 15 in Nairobi County, Williamson House Outpatient Centre being one of them. These outpatient centers provide outpatient services to both insurance members and the public at large. These also include pharmacy and laboratory services, immunizations, and wellness and health checkups among other services. There is also follow up of clients with chronic conditions like hypertension, diabetes, hypercholesterolemia and obesity in the health promotion clinics found within these outpatient centers.

The study was conducted at the Health Promotion Clinic at AAR Williamson House Outpatient Centre in Nairobi. This outpatient centre is located in Williamson House situated on 4th Ngong Avenue, Upper Hill area. It operates 24 hours and has 7 consultation rooms and a total of 38 staff members of doctors, nurses, pharmacy technologists, laboratory technologists, accountants and front office staff. This outpatient center also has the majority of the hypertensive patients enrolled in the health promotion clinic.

The choice of carrying out the study in Williamson House Outpatient Centre was determined by the fact that it was the first clinic to be established and it had the most number of hypertensive patients on follow up. Also with the increase in the number of patients with hypertension, it was prudent to determine how well the health promotion clinic was faring in

ensuring patients' blood pressures were well controlled.

3.2 Study Design

The study adopted a descriptive cross-sectional research design which utilized quantitative data collection technique. This research design implies that the study takes place at a single point in time but also allows the researcher to look at numerous variables at once for example gender, age, level of education among other things. It normally will not allow any manipulation of the variables. Previous patient data from the AAR database dating back one year was also used as a point of reference to establish compliance.

3.3 The Study Population

These were hypertensive patients that are followed up in the AAR Health Promotion Clinic and were covered by insurance and/or paying cash.

3.4 Exclusion and Inclusion Criteria of the Study

3.4.1 Inclusion Criteria

Patients suffering from hypertension who had been on management for at least 6 months and were above 18 years of age.

3.4.2 Exclusion Criteria

Patients with co-morbidities that would complicate blood pressure control.

3.5 Sampling

3.5.1 Sampling Method

The sampling method used for the study was convenience sampling whereby the participants or respondents were selected because they had attended the health promotion clinic. Daily as the hypertensive patients came to the cllinic, they were informed of the study and those who accepted to take part in it, had the questionnaire administered. This was done until the required number of participants was achieved.

3.5.2 Sample Size Determination

The number of patients that suffered from hypertension and attended the AAR Health Promotion Clinic at Williamson House Outpatient Centre were 300 in total. This was determined from the data frame from AAR Healthcare's electronic records. From this number, a sample size was determined by adopting Yamane's sample size determination standard formula (Yamane, 1967).

Yamane formula was used to calculate small sample sizes. A 95% confidence level and P significance value = 0.05 were assumed for the following equation.

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

Where

n is the sample size of target population needed for the study

N is the entire population size of target population

e is the level of precision (error estimate) which is 0.05

Therefore, the number of hypertensive patients used for the study were:

$$\frac{300}{1+300(0.05)^2}$$

$$=172 \text{ patients}$$

3.6 Recruitment and Consenting Procedures

AAR has a database on all their patients and therefore from that database, patients that were identified to be suffering from hypertension were selected to participate in the study. This was done with consent from the KNH-UoN ERC and AAR Healthcare permission prior to accessing this database. Considering the nature of the study, the researcher understood that it would be difficult to get the targeted number of respondents and that not all patients would be willing to participate in the study and hence as mentioned earlier convenience sampling was used whereby all the patients that were approached and in turn showed some interest in the study were urged to participate if they fit in the inclusion criteria. This was done until the

sample size was attained. The procedure was that; the possible respondent was contacted when he/she attended the health promotion clinic and informed of the study. Once they agreed to participate in the study, they signed the consent form prior to being engaged in the study.

3.7 Methods of data collection

To determine the respondents' level of compliance among the hypertensive patients, the WHO instrument for stepwise surveillance (STEPS) of chronic disease risk factors was adopted and administered by the researcher. The WHO instrument was a comprehensive tool that captured the socio-demographic issues of the patients, the risk factors the patients were exposed to that may impact compliance and finally an actual measure of blood pressure. The blood pressure was measured using a digital sphygmomanometer utilizing the American Heart Association guidelines (American Heart Association, 2016).

3.8 Data Analysis

Data collected was coded and cleaned. Data entry and statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 23. The proportion of patients that were compliant to blood pressure management was measured while chi-square, and correlation were used to determine association between variables in the study. Binomial regression analysis was done to determine the factors associated with compliance to blood pressure management.

3. 9 Ethical Considerations

Ethical approval for the study was given by the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee and clearance by the Board of Postgraduate Studies of JKUAT. AAR Healthcare management also gave permission for the researcher to access the facility and use patients' information. Participants were requested to provide their consent before their acceptance to participate in this study. Consent forms were signed by participants to ensure that the respondents' participation was voluntary**.** The participants were also assured of their confidentiality and anonymity and hence no names were indicated in the study tools and instead codes were used. Objectivity was also upheld during the study and bias avoided by the researcher. This was achieved by avoiding to make any assumption on behalf of the respondents. The patients who were found to have uncontrolled BP were referred to see a doctor.

CHAPTER FOUR

RESULTS

4.1 Response Rate

The sample size of population for the study was 172 respondents. The researcher managed to interview 139 respondents in the study; therefore, the response rate was 81%.

4.2 Socio Demographic Characteristics of Respondents

Out of the total respondents 55% were male and 45% female. The mean age of the sample population was 50.21years (±std. 13.688) while the mode was 40 years. On the level of education, 61.2% of the respondents were either in university, were already graduates or pursuing post graduate degrees. With regards to marital status, 83.5% of the respondents were married. The findings also showed 59.7% of the respondents were employed while almost 28.9% of the respondents were self-employed. As for the number of people that were living with the respondents, the average number was 4 (±1.788). Table 4.1 shows the rest of the socio-demographic variables. This is indicated in table 4.1.

Table 4.1: Socio-Demographic Profiles of the Respondents

Socio- Demographic Characteristics	Frequency (Percent)
	Sex
Male	76(54.7%)
Female	63(45.3%)
	Age
20 to 30yrs	9(6.5%)
31 to 40yrs	27(19.4%)
41 to 50yrs	42(30.2%)
51 to 60yrs	30(21.6%)
61 to 70yrs	17(12.2%)
71 to 80yrs	8(5.8%)
81yrs+	4(2.9%)
No Response	2(1.4%)
Employment Status	
Employed	83(59.7%)
Self Employed	39(28.9%)
Student	1(0.7%)
Retired	13(9.4%)
Unemployed	3(2.2%)
Marital Status	
Single	12(8.6%)
Married	116(83.5%)
Separated	3(2.2%)
Divorced	2(1.4%)
Widowed	6(4.3%)
Education	
Primary School	6(4.3%)
Secondary School	46(33.1%)
University	85(61.2%)
No Response	2(1.4%)
No. of People living with Respondents	
1-3people	20(14.4%)
4-6 people	106(76.3%)
7-9 people	11(7.9%)
10-12people	1(0.7%)
None	1(0.7%)

4.3 Compliance to Various Aspects of Hypertensive Management

4.3.1 Respondents Smoking Habits

Majority (97%) of the respondents did not smoke. Only 2.99% respondents indicated they were currently smoking. This is shown in figure 4.1. The respondents who had indicated that they were non-smokers were further asked if they had smoked before and stopped and 16.9% of them indicated that they were smokers before.

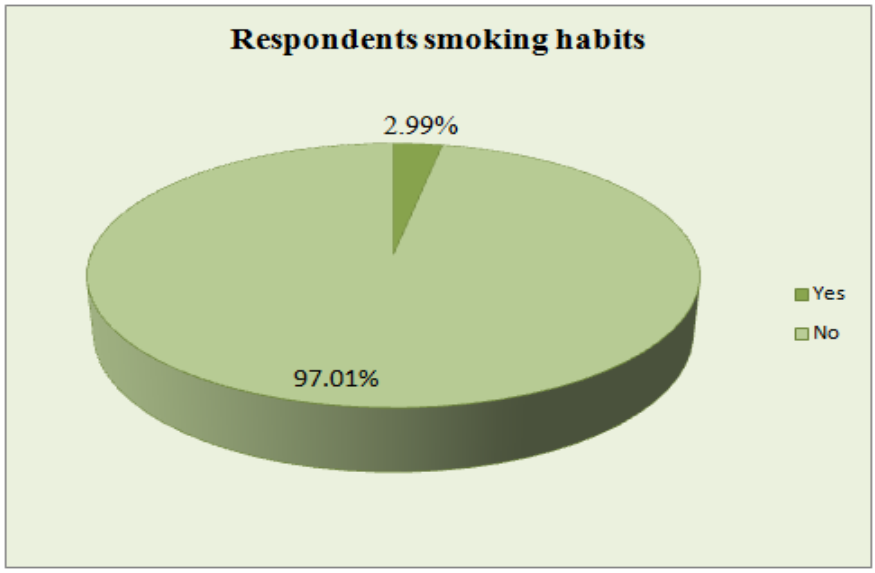

Figure 4.1: Respondents Smoking Habits

4.3.2 Age at which the Respondents Started Smoking

Table 4.2 shows that 23.1% of the respondents started smoking below the age of 18 years; 30.7% of the respondents started smoking at the age bracket of 18-24 years.

Table 4.2: Age at which the Respondents Started Smoking

Age	Frequency	Percent
<18yrs	6	23.1
18-24yrs	8	30.7
25-31yrs	1	3.8
No Response	11	42.4
Total	26	100.0

4.3.3 History of Alcohol Intake

As indicated in the figure 4.2, 40% of them reported to take alcohol. Ninety-five percent (94.5%) indicated that they had taken alcohol in the past 12 months.

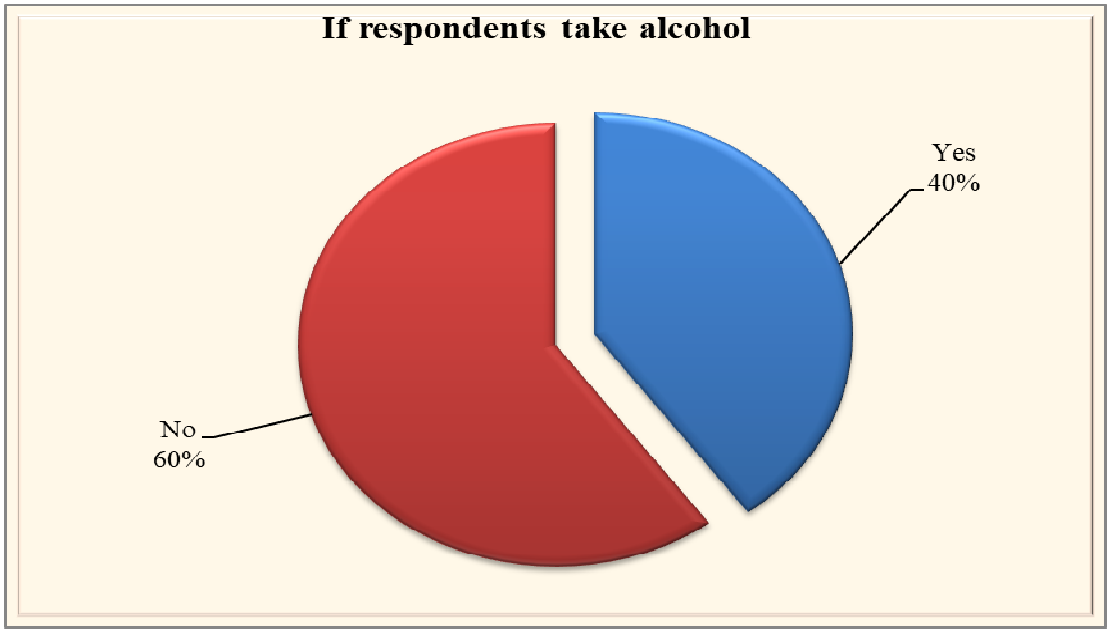

Figure 4.2: Alcohol Intake by Respondents

4.3.4 Cessation of Alcohol Intake by Respondent Due to Health Reasons

As indicated in Table 4.3, slightly above 10% of the respondents had been advised to stop drinking.

Table 4.3: Ceased Alcohol Intake for Health Reasons/Advice

Response	Frequency	Percent
Yes	14	10.1
No	114	82.0
No Response	11	7.9
Total	139	100.0

4.3.5 Frequency of taking 1 Standard Drink of Alcohol in the past 1 year

The respondents were asked the frequency of consumption of 1 standard drink (350 ml of beer, 150 ml of wine (12% alcohol) and 44 ml of spirit) in the past year and the response was as shown in Table 4.4. Most of the respondents (18.7%) indicated that they took the standard drink less than once a month and 15.8% indicated they did so at least 1 - 2 days in a week.

Table 4.4: Taking 1 Standard Drink of Alcohol in the 12 months

Response	Frequency	Percent
Daily	1	0.7
5-6days per week	2	1.4
3-4 days per week	6	4.3
1-2 days per week	22	15.8
1-3 days per month	10	7.3
less than once a month	26	18.7
No Response	72	51.8
Total	139	100.0

4.3.6 Taking the recommended Diet

Almost 52% of respondents kept within their recommended diet to lower their blood pressure. The remaining 48% of the respondents indicated that they did not check their diet. This is shown in figure 4.3.

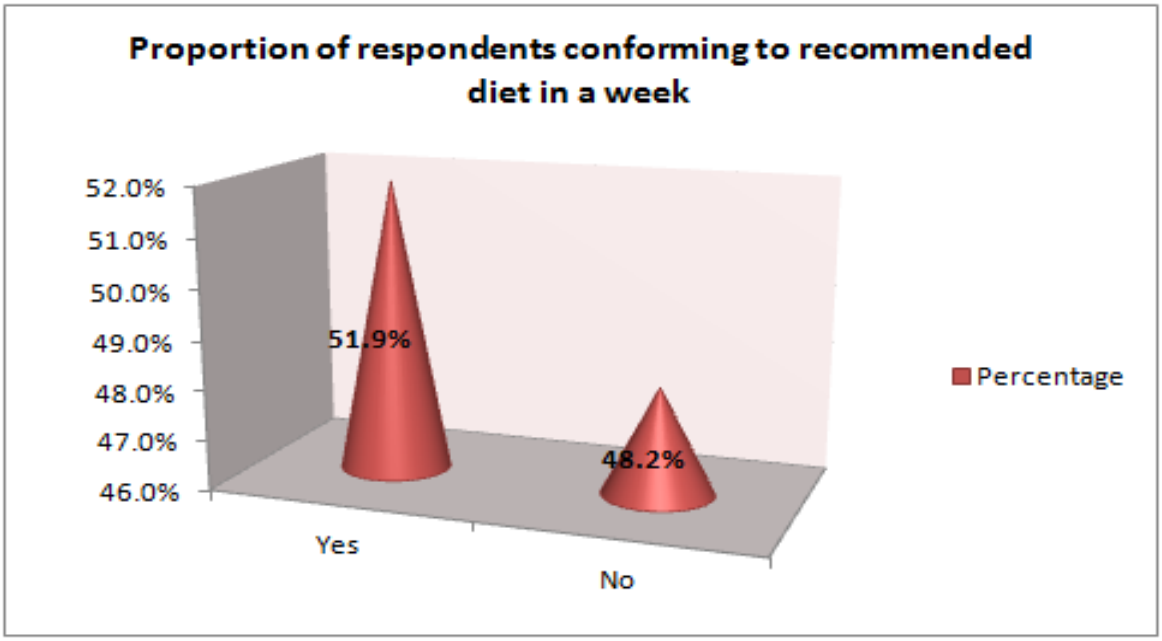

Figure 4.3: Respondents' adherence to recommended Diet

The adherence to recommended sodium intake is as indicated in Table 4.5. 88% of the respondents adhered to this.

Table 4.5: Sodium intake in recommended amount

Response	Frequency	Percent
Always	58	41.7
Often	27	19.4
Sometimes	37	26.6
Rarely	5	3.6
Never	4	2.9
Don't know	6	4.3
No Response	2	1.4
Total	139	100.0

4.3.7 Physical Activities

4.3.7.1 Engaging in Physical Activities at Work

The respondents that engaged in physical activities at work were 62.6% and 7.9% of them indicated that they never participated in physical activities at work. This is shown in table 4.6.

Table 4.6: Physical Activities at Work

Responses	Frequency	Percent
Always	18	12.9
Often	27	19.5
Sometimes	42	30.2
Rarely	36	25.9
Never	11	7.9
Don't know	1	0.7
No Response	4	2.9
Total	139	100.0

4.3.7.2 Engaging in Physical Activities for Leisure

Table 4.7 indicates 9.4% of the respondents always engaged in physical activities for leisure, 24.5% often did and 36% sometimes did. 4.3% of them indicated that they never participated in physical activities for leisure.

Table 4.7: Physical Activities for Leisure

Responses	Frequency	Percent
Always	13	9.4
often	34	24.5
Sometimes	50	36.0
Rarely	33	23.7
Never	6	4.3
Don't know	1	0.7
No Response	2	1.4
Total	139	100.0

4.3.8 Weight Control and BMI Check

From the respondents' BMI calculations, 46.4% of the respondents were found to be overweight. The number of respondents that were found to be obese was 34.4%. Only 19.2% of the respondents were found to have normal BMI. This is shown in figure 4.4.

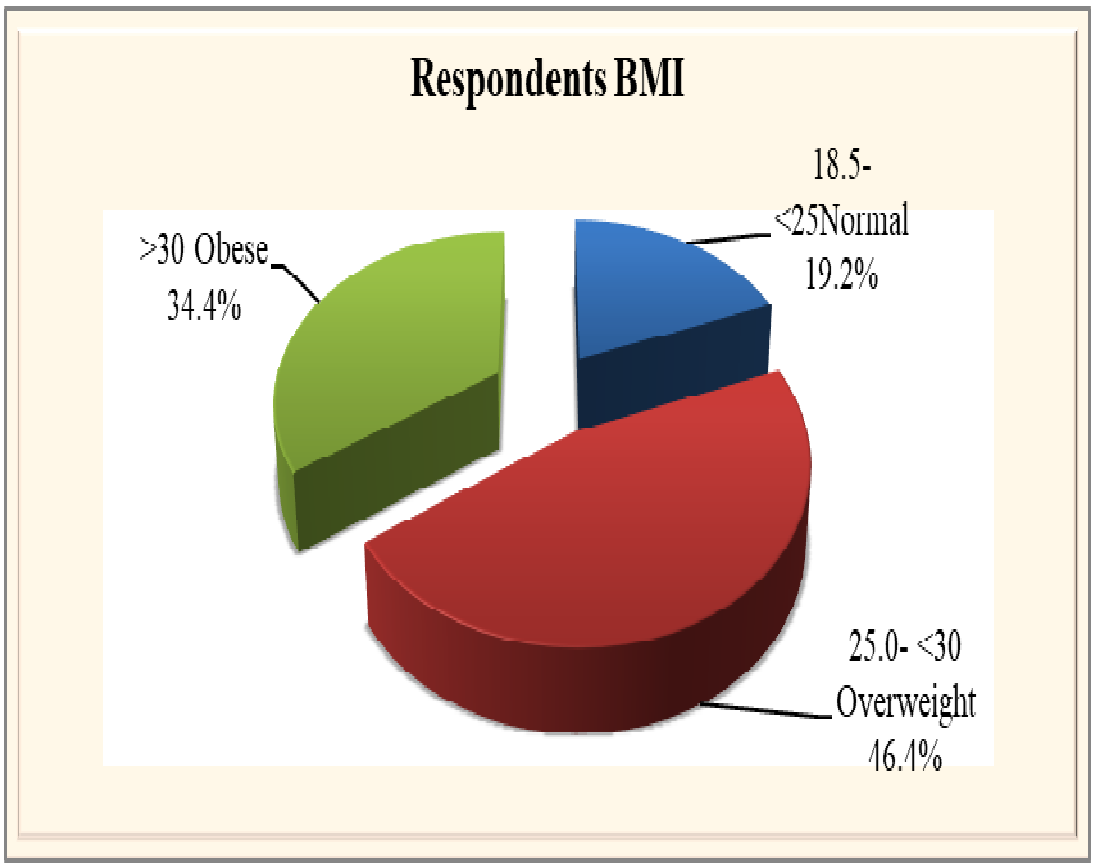

Figure 4.4: Respondents' BMI

4.4 Overall level of Compliance

Figure 4.5 illustrates that only 27.4% of the respondents were found to be compliant and therefore having their blood pressure controlled within the acceptable limits.

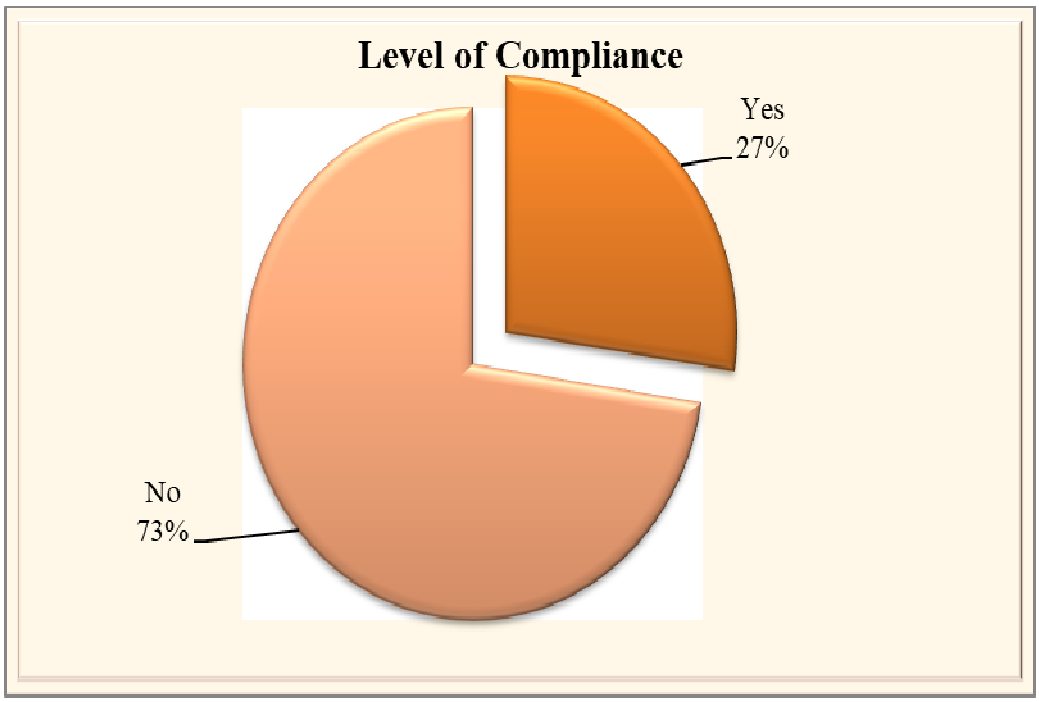

Figure 4.5: Respondents Level of Compliance

4.5 Factors Associated with Compliance among Hypertensive Patients

To determine the factors that were associated with compliance among the patients, chi square tests were done with a number of factors as independent variables while compliance was the dependent variable. The findings established that there was no significant association between compliance and age, education level, marital status, employment status, smoking tobacco and number of people living with the respondent with the variable having P values above 0.05. Correlation statistics were determined by calculating the phi coefficient between two dichotomous variables or Cramer's phi coefficient for categorical variables.

4.5.1 Relationship between Sex and Compliance in Hypertensive Patients

Sex was found to be significantly associated with compliance at P Value of 0.020. More females than males were found to be compliant. The phi-coefficient was therefore calculated to determine the direction of the relationship between these variables. As illustrated in table 4.8, the value of phi-coefficient was -0.200 indicating

that there was negative association between the two variables in that being male increased the chances that one would not be compliant.

Table 4.8: Sex & Compliance

Compliance		Sex		Total	Chi-Square (PValue)	Phi Coefficient (Φ)
		Male	Female			
Yes	Count	14	23	37	Chi-5.410	-0.200
	% of Total	10.4%	17.0%	27.4%	Df=1	
No	Count	59	39	98	P=0.020	
	% of Total	43.7%	28.9%	72.6%		
Total	Count	73	62	135		
	% of Total	54.1%	45.9%	100.0%		

As indicated in the table 4.9, the odds of female respondents being more compliant were 0.402 times more than males. The lower and upper bounds was between 0 and 1 meaning that gender had reached statistical significance.

Table 4.9: Risk Estimate

	Value	**95% Confidence Interval**	
		Lower	**Upper**
Odds Ratio for Gender (Male / Female)	.402	.185	.876

4.5.2 Relationship between Alcohol and Compliance in Hypertensive Patients

Alcohol was found to be significantly associated with compliance at P Value of 0.037. Majority of the respondents who were taking alcohol were found to be non-compliant in controlling their blood pressure. As illustrated on the table 4.10, the value of phi-coefficient was -0.180 indicating that there was negative association between the two variables in that taking alcohol increased the chances that one would not be compliant

Table 4.10: Alcohol & Compliance

Compliance		**Do you consume alcohol**		**Total**	**Chi-Square (P- Value)**	**Phi Coefficient (Φ)**
		Yes	**No**			
Yes	Count	9	27	36	Chi-4.360	-0.180
	% of Total	6.7%	20.1%	26.9%	Df=1	
No	Count	44	54	98	P=0.037	
	% of Total	32.8%	40.3%	73.1%		
Total	Count	53	81	134		
	% of Total	39.6%	60.4%	100.0%		

4.5.3 Relationship between BMI & Compliance in Hypertensive Patients

BMI was found to be highly significantly associated with compliance at P Value of 0.002. Majority of the respondents that were found to be having high BMI ranging from overweight to obese categories were also found to be non-compliant in controlling their blood pressure. The Cramer's V was 0.318 showed that BMI has a very strong effect on compliance hence a strong relationship between the variables. This is shown in table 4.11.

Table 4.11: BMI & Compliance

Compliance		**BMI 18.5 to <25- Normal**	**25.0 to <30- Over Weight Range**	**Above 30 - Obese**	**Total**	**Chi-Square (P-Value)**	**Cramer's Phi (V) Coefficient**
Yes	Count	13	15	6	34	Chi-12.677	Cramer's V=0.318
	% of Total	10.4%	12.0%	4.8%	27.2%		
No	Count	11	43	37	91	Df=2	
	% of Total	8.8%	34.4%	29.6%	72.8%	P=0.002	
Total	Count	24	58	43	125		
	% of Total	19.2%	46.4%	34.4%	100.0%		

4.5.4 Relationship between Diet & Compliance in Hypertensive Patients

Diet was found to be highly significantly associated with compliance at P Value of <0.001 as illustrated in table 4.12. Majority of the respondents that were found not to be checking their diet were also found to be non-compliant in controlling their blood pressure. The Value of phi-coefficient was 0.351 indicating that there was positive association between the two variables in that sticking to a recommended diet increased the chances that one would be compliant

Table 4.12: Diet & Compliance

Compliance		In a typical week, can you confirm that you keep within the recommended diet for HTN patients		Total	Chi-Square (P- Value)	Phi Coefficient (Φ)
		Yes	No			
Yes	Count	30	7	37	Chi-	0.351
	% of Total	22.7%	5.3%	28.0%	16.241	
No	Count	40	55	95	Df=1	
	% of Total	30.3%	41.7%	72.0%	P=<0.001	
Total	Count	70	62	132		
	% of Total	53.0%	47.0%	100.0%		

4.5.4.1 Relationship between Sodium intake & Compliance in Hypertensive Patients

Sodium intake was found to be significantly associated with compliance at P Value of 0.030 as shown in table 4.13. Majority of the respondents that were found to be carefully observing their intake were also found to be compliant in controlling their blood pressure. The Cramer's V was 0.297 which showed that sodium intake has a moderate effect on compliance hence a moderate relationship between the variables.

Table 4.13: Sodium intake & Compliance

Compliance		Do you ensure that your salt intake is within the recommended amounts						Total	Chi-Square (P-Value)	Cramer's Phi (V) Coefficient
		Always	Often	Sometimes	Rarely	Never	Don't know			
Yes	Count	23	8	4	1	0	1	37	Chi-	Cramer's
	% of Total	17.3%	6.0%	3.0%	0.8%	0.0%	0.8%	27.8%	11.746	V=0.297
No	Count	34	17	32	4	4	5	96	Df=5	
	% of Total	25.6%	12.8%	24.1%	3.0%	3.0%	3.8%	72.2%	P=0.038	
Total	Count	57	25	36	5	4	6	133		
	% of Total	42.9%	18.8%	27.1%	3.8%	3.0%	4.5%	100.0%		

4.5.5 Relationship between Physical Activities at Work & Compliance in Hypertensive Patients

Engaging in physical activities at work was found to be highly significantly associated with compliance at P Value of 0.007 as illustrated in table 4.14. Majority of the respondents that were found to be non-compliant in controlling their blood pressure, rarely engaged in physical activities at work. The Cramer's V was 0.348 which showed that these activities at work had a strong effect on compliance hence a very strong relationship between the variables.

Table 4.14: Physical Activities at Work & Compliance

Compliance		How regularly do you engage in physical activities at work						Total
		Always	Often	Sometimes	Rarely	Never	Don't know	
Yes	Count	9	10	14	3	1	0	37
	% of Total	6.8%	7.6%	10.6%	2.3%	0.8%	0.0%	28.0%
No	Count	9	16	26	33	10	1	95
	% of Total	6.8%	12.1%	19.7%	25.0%	7.6%	0.8%	72.0%
Total	Count	18	26	40	36	11	1	132
	% of Total	13.6%	19.7%	30.3%	27.3%	8.3%	0.8%	100.0%

Chi-Square= 15.941; Df= 5
P- Value= 0.007
Cramer's Phi (V) Coefficient= 0.348

4.5.5.1 Relationship between Physical Activities for Leisure and Compliance in Hypertensive Patients

Engaging in physical activities for leisure was found to be significantly associated with compliance at P Value of 0.041. Most of the respondents that were found to be non-compliant in controlling their blood pressure, rarely engaged in physical activities for leisure. The Cramer's V was 0.295 which showed that these activities for leisure

had a moderate effect on compliance hence a moderate relationship between the variables. This is shown in table 4.15.

Table 4.15: Physical Activities for Leisure & Compliance

Compliance		How regularly engage in physical activities for leisure						Total
		Always	often	Sometimes	Rarely	Never	Don't know	
Yes	Count	6	14	10	7	0	0	37
	% of Total	4.5%	10.5%	7.5%	5.3%	0.0%	0.0%	27.8%
No	Count	7	17	39	26	6	1	96
	% of Total	5.3%	12.8%	29.3%	19.5%	4.5%	0.8%	72.2%
Total	Count	13	31	49	33	6	1	133
	% of Total	9.8%	23.3%	36.8%	24.8%	4.5%	0.8%	100.0%
Chi-Square= 11.575; Df= 5 P- Value= 0.041		Cramer's Phi (V) Coefficient= 0.295						

4.5.6 Independent Predictors for Adherence

Binomial regression analysis was done to determine the significant factors associated with compliance to blood pressure control. Table 4.16 shows alcohol and BMI added significantly to this.

Table 4.16: Independent Predictors for Compliance

	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Gender	-1.195	.701	2.906	1	.088	.303
Age	-.393	.285	1.907	1	.167	.675
Education	-.241	.236	1.042	1	.307	.786
Marital	-.128	.390	.107	1	.743	.880
employment	-.075	.244	.095	1	.757	.927
People in House	.231	.455	.257	1	.612	1.259
Tobacco	-18.815	18034.548	.000	1	.999	.000
Alcohol	-1.409	.626	5.058	1	.025	.244
Salt	.562	.322	3.044	1	.081	1.754
Physical activities At work	.304	.315	.932	1	.334	1.355
Physical activities for leisure	.350	.417	.702	1	.402	1.418
Knowledge of HTN	17.100	26060.734	.000	1	.999	26688039.477
On Meds for HTN	1.427	1.479	.931	1	.335	4.166
Lifestyles	.300	.957	.099	1	.754	1.350
BMI	.353	.137	6.616	1	.010	1.424
Weight	-.061	.043	1.993	1	.158	.941
Constant	18.577	44498.771	.000	1	1.000	116971537.895

a. Variable(s) entered on step 1: Gender, Age, Education, Marital, employment, pple in hse, Tobacco (do you currently smoke), Alcohol (Do you take Alcohol), Salt, Physical activities at work, Physical activities for leisure, Knowledge of HTN (told of HTN); On meds for BP (drugs for BP), Lifestyles, BMI, Weight.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Socio Demographic Characteristics

The study revealed that 61.2% of the respondents had post-secondary education and 83.5% were married. This is in contrast to a similar study carried out in Kiambu District Hospital in Kenya that indicated 12% of the respondents to have post-secondary education and 72.2% married (Kimuyu, 2014). Those employed were 60% with 29% being self-employed unlike in the Kiambu District Hospital study which revealed 29% and 65% respectively. The study revealed 51.8% of the respondents to be in the age bracket of 41-61 years similar to the Kiambu District Hospital study (54.1%).

5.1.2 The level of compliance to various aspects of hypertension management among hypertensive patients

The study revealed that most of the respondents were non-smokers with almost 3% reporting to be currently smoking. Smoking contributes to poor blood pressure control because it increases both cardiac output and leads to a sedentary life. The study further indicated that only 16.9% of the respondents were previous smokers and currently had stopped smoking. This is contrary to a study done in China on the association between smoking and blood pressure in men which revealed 53.9% of the respondents were current smokers with 17.6% having been former smokers (Li, *et al*., 2017).

The study also established that 39.48% of the respondents were taking alcohol. Alcohol intake increases blood pressure. Other studies have shown the tendency for hypertensive patients to engage in alcohol use. In a study that was carried out to determine the psychological morbidity and substance use among patients with hypertension in Ethiopia, it was found that 31.6% of the total participants were taking

alcohol (Soboka, *et al*., 2017). Another study, however, indicated that the level of alcohol an individual consumes is more important in managing hypertension compared to the fact that an individual just consumes alcohol (Ferreira, *et al*., 2017).

The study also showed that a considerable number of respondents (slightly above 48%) did not check on the dietary plans with regards to blood pressure control. 41.7% of the respondents checked on their sodium intake while the rest either tried to or failed to do so. Higher prevalence rates have been reported in other studies. For instance, a study that was carried out in a hypertensive clinic in Siriraj Hospital in Thailand, 78 % of the patients were reported to have high salt intake (Buranakitiaroen, *et al*., 2013). Intake of high sodium results in high levels of it in the blood which lead to high blood pressure due to fluid retention.

For physical activities either at work or for leisure, over 50% (summative) of the respondents fell between rarely engaging and sometimes engaging in physical activities. A study that was carried out in the United States, found that 52% of hypertensive individuals were at the time of the study physically inactive (Aljadhey, 2012). Physical activity strengthens the heart so that it uses less effort to pump blood and this leads to a decrease in the systolic and diastolic pressures.

The study found 19.2% of the respondents had normal BMI. This is similar to a study done in Lebanon on factors associated with hypertension prevalence and control that found 11% of the hypertensive individuals had normal BMI (Soubra, *et al*., 2016). Weight loss significantly reduces blood pressure hence hypertensives should endeavor to have a normal BMI.

5.1.3 Level of Blood Pressure Control

The study revealed that 27.4% of the respondents controlled their blood pressure while 72.6% did not. The control of blood pressure in hypertensive patients is important because it prevents the development of complications which affect the heart, kidneys and brain. Similar findings have been reported in other studies. For

instance, a study in Brazil, found that 61.8% of the participants had uncontrolled BP. This was despite the fact that almost 68% of the participants were already on anti-hypertensive medication (Minelli,*et al*., 2016). A systemic review of studies done on hypertension prevalence and control from 90 countries, established that unlike middle income countries and high income countries and more so despite the fact that awareness of hypertension had increased across the globe, BP control was still reported as low (7.7% to 8.4%) in low and middle income countries (Mills, *et al*., 2016). Further, another study in South Africa, established that a third of the 500 participants had controlled BP (Duncan, *et al*., 2014).

5.1.4 Factors Associated with Compliance among the Hypertensive Patients

Age, level of education and employment status were not found to be significantly associated with compliance ($p > 0.05$). This is contrary to a study done in Nigeria which showed older people, those with higher level of education and with higher monthly income to have high compliance (Akintunde, *et al*., 2015). However, a study done in Kiambu District Hospital in Kenya showed age was not associated with compliance (Kimuyu, 2014). Marital status was not associated with compliance. This was contrary to a study done in Iran that indicated being widowed or divorced (due to absence of partner support) contributed to poor compliance (Jahangiry, *et al*., 2017).

There was no significant association between compliance and number of people living with the hypertensive patients ($p > 0.05$). This is contrary to a study done in Brazil that found compliance was highest among hypertensives who were living with two to four people at home (Lima, et al., 2016). This would probably be due to the other household members ensuring the hypertensives take their medication and adhere to recommended lifestyle measures.

There was also no significant association between tobacco smoking and compliance. This finding is contrary to a study done in Spain to estimate the prevalence of BP control for patients with arterial hypertension and diabetes that showed smoking was associated with poor blood pressure control (Serraa, *et al*.,2011).

Sex was found to be significantly associated with compliance (p = 0.020) where more females were found to be controlling their BP. Similar results have been reported in another study that was conducted in Korea which looked at the sex differences in hypertension prevalence and control (Choi, *et al*., 2017). Contrary to this, other studies report women as having challenges controlling their BP. In a study that looked at sex differences in blood pressure control in hypertensive patients, it was found that for women, BP control after 3 months' therapy was worse than in men. This was also attributed to age, and absence of "working" status (Radchenko, *et al*., 2016).

Alcohol was also significantly associated with compliance (p = 0.037) in that most individuals who were taking alcohol were also found to be non-compliant in controlling their blood pressure. A study that sought to determine the effect of reduced alcohol consumption on blood pressure found that reduction of alcohol intake could significantly lower blood pressure (Xin, *et al*., 2001). Having just one drink a day can increase the risk, and the overall risk climbs higher for every drink after that. The relationship remains significant even when age, weight, gender, ethnicity, diet, exercise and smoking habits are taken into account. However, it has been noted that alcohol is one of the most controllable and preventable risk factor for hypertension (Sesso, *et al*., 2008).

Sodium intake was found to be significantly associated with compliance (p = 0.030); respondents that were found to be watching their intake were also found to be controlling their blood pressure. High sodium intake results in high levels in the blood and this reduces the ability of the kidneys to remove water. This extra fluid leads to a higher blood pressure. A study done in Italy showed similar findings, that is, reduced sodium intake led to control of blood pressure (Grillo, *et al*., 2019).

BMI was found to be significantly associated with compliance (p = 0.002). This essentially also pointed to diet. Hence, the study revealed that respondents having high BMI ranging from overweight to obese categories were also non-compliant in controlling their blood pressure. Studies have shown that weight loss and dietary counseling does help reduce BP in hypertensive patients. For instance, a study that

was carried out in Brazil, revealed that those that carefully checked their diet managed to lose weight up to 10% within the period. This was also associated with lower BMI and BP readings (Torres, *et al*., 2011).

Engaging in physical activities at work and for leisure was found to be highly significantly associated with compliance ($p = 0.007$); respondents that were found to be non-compliant in controlling their blood pressure, rarely engaged in physical activities at work or for leisure. Studies have shown that there is a relationship between hypertension and physical activities. In a study that was carried out in the United States, it was established that the risk of hypertension was higher in physically inactive individuals than in those who were physically active. It also showed controlling BP for individuals who engage in physical activities is easier than those who do not (Aljadhey, 2012). A study with dissimilar results, indicated that physical activities in later years after developing hypertension is inconsequential in controlling BP or even developing hypertension in the first place. Instead it emphasized the need to engage in physical activity in adolescence which was associated with a decreased risk of adulthood hypertension particularly for women (Reichert, *et al*., 2009). This is an indication that more studies need to be done on this.

5.2 Conclusions

The study concludes that compliance to the various aspects of hypertensive management varied among the hypertensive patients followed up in the health promotion clinic at AAR Williamson Outpatient Centre. Majority (97%) did not smoke tobacco though among those who smoked, 23.1% started smoking before they turned 18 years of age. Some were taking alcohol with majority of them taking the standard drink less than once a month. Majority of the patients kept to the recommended sodium intake and engaged in physical activities. Over 80% of the patients had a high BMI.

The level of blood pressure control was found to be low. This is not good as

uncontrolled blood pressure causes complications.

Alcohol intake, sex, sodium intake, BMI and engaging in physical activities were found to be significantly associated with compliance with alcohol and BMI being the risk factors contributing most to blood pressure control.

5.3 Recommendations

The study recommends that;

1. The Clinical Operations Department of AAR Healthcare needs to enhance compliance of patients to the various aspects of hypertension management. This can be done by availing health information material through brochures and also electronically via the TV screens at the waiting area.
2. The Health Promotion Clinic of Williamson House Outpatient Centre should come up with measures of closely monitoring hypertensive patients. For example, they can give frequent appointments to those patients who have not achieved optimum BPs. Also they can advise all the hypertensive patients to buy blood pressure machines to measure and monitor their BPs at home. This will enhance compliance to management which will in turn lead to optimum blood pressure control of the patients.
3. The Health Centre Manager, who is charge of Williamson Outpatient Centre, should recruit a counsellor to complement the staff running the health promotion clinic. His/ her role will be to provide support to those patients who have a challenge in adhering to the hypertension management.
4. The Clinical Operations Department will need to put in measures of monitoring and evaluating the performance of the health promotion clinic to ensure it is achieving its objectives.
5. Studies to be carried out on the compliance to hypertension management of patients followed up in the health promotion clinics of the other AAR Healthcare Outpatient Centres.

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APPENDICES

APPENDIX I: Consent Form

TITLE OF STUDY: Compliance of Hypertensive Management and Blood Pressure Control among Patients attending Health Promotion Clinic of AAR Williamson House Outpatient Centre, Nairobi.

PRINCIPAL INVESTIGATOR AND INSTITUTIONAL AFFILIATION: Anastasia Mpungu, Jomo Kenyatta University of Agriculture and Technology

INTRODUCTION:

I would like to tell you about a study being conducted by the above listed researcher. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a unteer, and anything else about the research or this form that is not clear. When we have answered all your questions to your satisfaction, you may decide to be in the study or not. This process is called "informed consent". Once you understand and agree to be in the study, I will request you to sign your name on this form. You should understand the general principles which apply to all participants in a medical research: i) Your decision to participate is entirely voluntary ii) You may withdraw from the study at any time without necessarily giving a reason for your withdrawal iii) Refusal to participate in the research will not affect the services you are entitled to in this health facility or other facilities. We will give you a copy of this form for your records.

May I continue? YES/ NO

This study has approval by The Kenyatta National Hospital–University of Nairobi Ethics and Research Committee protocol no. P399/07/2017.

WHAT IS THIS STUDY ABOUT?

The researcher listed above is interviewing individuals who have hypertension. The

purpose of the interview is to find out their compliance to the management of hypertension. Participants in this research study will be asked questions about their drug therapy and lifestyle. Participants will also have their blood pressure taken.

There will be approximately 172 participants in this study randomly chosen. We are asking for your consent to consider participating in this study.

WHAT WILL HAPPEN IF YOU DECIDE TO BE IN THIS RESEARCH STUDY?

If you agree to participate in this study, the following things will happen:

You will be interviewed by a trained interviewer in a private area where you feel comfortable answering questions. The interview will last approximately 30 minutes. The interview will cover topics such as demographic information (age, level of education, marital status), treatment for hypertension and your lifestyle (exercise, diet, etc).

After the interview has finished, counseling and health education may be provided if deemed necessary.

We will ask for a telephone number where we can contact you if necessary. If you agree to provide your contact information, it will be used only by people working for this study and will never be shared with others. The reasons why we may need to contact you include: clarification of information given.

ARE THERE ANY RISKS, HARMS, DISCOMFORT ASSOCIATED WITH THIS STUDY?

Medical research has the potential to introduce psychological, social, emotional and physical risks. Effort should always be put in place to minimize the risks. One potential risk of being in the study is loss of privacy. We will keep everything you tell us as confidential as possible. We will use a code number to identify you in a password-protected computer database and will keep all of our paper records in a

locked file cabinet. However, no system of protecting your confidentiality can be absolutely secure, so it is still possible that someone could find out you were in this study and could find out information about you.

Also, answering questions in the interview may be uncomfortable for you. If there are any questions you do not want to answer, you can skip them. You have the right to refuse the interview or any question asked during the interview.

It may be embarrassing for you to have to give details of your personal life. We will do everything we can to ensure that this is done in private. Furthermore, all study staff and interviewers are professionals with special training in these examinations/interviews. Also, discussing your condition maybe stressful.

In case of any injury, illness or complications related to this study, contact the study staff right away at the number provided at the end of this document. The study staff will treat you for minor conditions or refer you when necessary.

ARE THERE ANY BENEFITS BEING IN THIS STUDY?

You may benefit by receiving free health information. We will refer you to a clinic for care and support where necessary. Also, the information you provide will help us better understand the factors that influence compliance to management of hypertension. This information is a contribution to science and knowledge in hypertension management.

WILL BEING IN THIS STUDY COST YOU ANYTHING?

There will be no financial cost to you as the interview will be carried out during your clinic visit.

WILL YOU GET REFUND FOR ANY MONEY SPENT AS PART OF THIS STUDY?

As indicated above, you will not spend any money to take part in this study.

WHAT IF YOU HAVE QUESTIONS IN FUTURE?

If you have further questions or concerns about participating in this study, please call or send a text message to the study staff at the number provided at the bottom of this page. The study staff will pay you back for your charges to these numbers if the call is for study related communication.

For more information about your rights as a research participant you may contact the:

KENYATTA NATIONAL HOSPITAL-UNIVERSITY OF NAIROBI ETHICS AND RESEARCH COMMITTEE

SECRETARY/ CHAIRPERSON,

Telephone No. 2726300 Ext. 44102,

Email uonknh_erc@uonbi.ac.ke.

WHAT ARE YOUR OTHER CHOICES?

Your decision to participate in research is voluntary. You are free to decline participation in the study and you can withdraw from the study at any time without injustice or loss of any benefits.

CONSENT FORM (STATEMENT OF CONSENT)

Participant's statement

I have read this consent form or had the information read to me. I have had the chance to discuss this research study with a study counselor. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study.

I understand that all efforts will be made to keep information regarding my personal identity confidential.

By signing this consent form, I have not given up any of the legal rights that I have as

a participant in a research study.

I agree to participate in this research study:	**Yes**	**No**
I agree to have the questionnaire preserved for later study:	Yes	No
I agree to provide contact information for follow up:	Yes	No

Participant printed name: _____

Participant signature / Thumb stamp _____ Date _____

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/ her consent.

Researcher's Name: _____ Date _____

Signature _____

Role in the study: _____ (*i.e. study staff who explained informed consent form)*

For more information contact Anastasia Mpungu from 8.00 am to 5.30 pm (Monday to Friday) at AAR Williamson House Outpatient Centre, P.O. Box 41766 – 00100, Nairobi, and Tel no. 0724290150.

APPENDIX II: RIDHAA YA KUSHIRIKI KWA UTAFITI

MADA YA UTAFITI: Compliance of Hypertensive Management and Blood Pressure Control among Patients attending Health Promotion Clinic of AAR Williamson House Outpatient Centre, Nairobi.

MPELELEZI MKUU NA CHUO KIKUU ANAKOSOMEA: Anastasia Mpungu,

Jomo Kenyatta University of Agriculture and Technology

UTANGULIZI:

Ningependa kukueleza juu ya utafiti huu unaofanywa na mtafiti aliyetajwa mbeleni. Kiini cha ridhaa hii ni kukupa habari au mawaidha ambayo yatakusaidia kuamua kama utakuwa mshiriki wa utafiti huu. Jisikie huru kuuliza maswali yoyote juu ya madhumuni ya utafiti huu, unatarajia nini kama mshiriki, kama kuna hatari au faida, haki zako kama mshiriki ambaye amejitolea na lolote lingine juu ya utafiti isiyokuridhisha kimawazo. Tukishajibu maswali yako yote uridhike, unaweza amua kushiriki au kutoshiriki.

Huu mchakato unaitwa “utoaji idhini”. Ukishaelewa na ukubali kushiriki kwenye utafiti huu, nitakuhitaji utie saini la jina lako kwenye fomu hii.

a) Lazima uelewe kanuni za jumla zinizotumika kwa washirika wote wa utafiti wa matibabu.

b) Uamuzi wako kushiriki ni kwa hiari yako

c) Unaweza kujitoa kama mshiriki wa utafiti huu wakati wowote bila kupatiani kielelezo

d) Kukataa kushiriki kwenye utafiti huu haita dhuru au kuingilia kati kwa vyovyote huduma unayopata kwenye kituo hiki cha matibabu au lingine lolote. Tutakupa nakala ya fomu hii ujiwekee kwenye kumbukumbu zako.

Naweza endelea? NDIO / LA

Utafiti huu unaidhini kutoka Kenyatta National Hospital–University of Nairobi Ethics and Research Committee protocol No. P399/07/2017.

UTAFITI HUU UNAHUSU NINI?

Mtafiti aliyetajwa atahoji watu ambao wana shinikizo la damu. Madhumuni ya mahojiano haya ni kujua kama wanafuata maelezo na namna ya kuidhibiti presha. Washiriki wa utafiti huu wataulizwa maswali juu ya madawa yao na maisha yao(wanavyo ishi kilasiku). Presha yao pia itapimwa. Hesabu ya washiriki wote wa utafiti huu inapaswa kuwa watu 172. Tunakuuliza ridhaa yako ushiriki kwenye utafiti huu

NI NINI KITAFANYIKA UKIAMUA KUWA MSHIRIKI?

Ukikubali kuwa mshiriki, vitu vifuatavyo vitafanyika:

Utahojiwa na mtafiti ambaye amepitia mafundisho ya kuhojiana pahala pa kibinafsi ambapo utajisikia starehe kujibu maswali. Mahojiano itadumu dakika thelathini. Mahojiano itakuwa juu ya mada kama kijamii na idadi ya watu, matibabu na jinsi ya kuishi(mazoezi, mpango wa chakula na mengine zaidi).

Baada ya mahojiano, ushauri na elimu ya afya yatafanywa kulingana na mahitaji.

Utaulizwa uwache nambari ya simu itakayo tumiwa kuwasiliana nawe iwapo kunajambo muhimu unayostahili kujua. Nambari yako ya simu itatumiwa na watu wanao husika na utafiti huu pekee yake na kamwe haitatangazwa. Nambari yako ya simu ni muhimu kwetu kwasababu tunaweza hitaji ufafanuzi zaidi ya majibu umeyatoa.

KUNA HATARI, MADHARA NA USUMBUFU INAYOHUSISHWA NA UTAFITI HUU?

Utafiti wa madawa yanaweza sababisha madhara ya kisaikolojia, kijamii,hisia and kimwili. Ni lazima Juhudi na mikakati yapangwe ili haya madhara yasifanyika. Kwa mfano, faragha yako inaweza potea au punguka ukiwa mshiriki wa utafiti huu.

Lakini tutahakikisha kuwa unacho tueleza kama mshriki itakuwa siri. Tutatumia msimbo kukujua kwenye data itakayokuwa kwa kompyuta ambayo imelindwa na neno la kificho. Isitoshe, makaratasi yetu yote yatawekwa na kufungiwa ndani ya kabati ya faili. Lakini, jambo lakukutahadharisha ni kuwa, mtu anaweza kupata habari kuwa ulihusika kwenye utafati huu hata kama mikakati haya yamefanikishwa.

Pia, kujibu maswali wakati wa mahojiano inaweza kuenda ikawa haikupi starehe. Kama kuna maswali ambayo hautataka kujibu, wacha swali hizo. Unahaki kukataa kuhojiwa ama kukataa kujibu swali lolote wakati wa mahojiano.

Unaweza ona aibu kutupea maelezo juu ya maneno yako ya kibinafsi, lakini tutahakikisha kuwa kila kitu itafanyawa kwa faragha. Hata hivyo watifiti wetu wamefunzwa vyema na wanautaaluma wakufanya haya mahojiano. Tunahisi pia kuelezea hali yako inaweza kufanya usikie uzito wa mafikira.

Iwapo unaweza pata majeraha, ugonjwa ama matatizo yoyote inayohusiana na utafiti huu, wasiliana na watafiti wetu maramoja ukitumia nambari iliyoandikwa kwenye ukurusa wa mwisho wa ridhaa hii. Watafiti wetu watakutibu maumivu madogo madogo na wanaweza pia kutuma mahali pengine kupata matibabu zaidi kama itakuwa muhimu.

KUNA FAIDA KUWA MSHIRIKI WA UTAFITI HUU?

Unaweza faidika kwa kupokea mawaidha ya bure. Utatumwa kupata matibabu na kiguzo kwa kliniki kama itaonekana ni muhimu. Hata hivyo, habari na maelezo utakayo tupatia yanaweza tusaidia kuelewa mambo yanayohusika na kufunza maelezo ya kuidhibiti presha. Maneno haya yanaongezea katika masomo ya kisayansi and upanuaji wa maarifa ya kuidhibiti presha.

JE, KUWA MSHRIRIKI ITANIGHARIMU MIMI LOLOTE?

LA, hakuna gharama kwako kwa sababu mahojiano yatafanyika wakati umeenda kliniki kama kawaida.

NITAREGESHEWA PESA AMBAYO NITATUMIA KAMA MSHIRIKI WA UTAFITI HUU?

LA, kama ilivyoelezewa, hautahitaji pesa kuhusishwa kwa utafiti huu.

JE, KAMA NINA MASWALI BAADAYE?

Kama unamaswali zaidi ama wasiwasi yeyote baada ya kushiriki kwenye utafiti, tafadhali wasiliana nasi kwa simu au unaweza tuma ujumbe kwetu kwenye nambari iliyoandikwa hapo chini kwenye ukurasa huu. Kama unamaswali yanohusu haki zako kama mshiriki wa utafiti huu, unaweza wasiliana na

KENYATTA NATIONAL HOSPITAL-UNIVERSITY OF NAIROBI ETHICS AND RESEARCH COMMITTEE

KARANI/ MWENYEKITI,

Nambari ya Simu: 2726300 Ext. 44102,

Barua Pepe: uonknh_erc@uonbi.ac.ke.

CHAGUO ZAKO ZINIGINE NI NINI?

Uamuzi wako kushiriki ni kwa hiari yako. Uko na huru kukataa kuwa mshiriki wa utafiti huu. Unaweza kujitoa kama mshiriki wa utafiti huu wakati wowote bila udhalimu au upungufu wa faida yoyote kwako.

FOMU YA RIDHAA YA MSHIRIKI

Kauli ya Mshiriki

Nimesoma fomu ya ridhaa hii ama nimesikiza maneno ambayo nimesomewa. Nimepata muda wa kujadiliana juu ya utafati huu na mshauri wa utafiti. Maswali yangu yamejibiwa kwa lugha ambayo ninaelewa. Nimeelezewa juu ya madhara na faida na ninaelewa kuwa kushiriki kwenye utafiti huu ni kwa hiari yangu na ninaweza kujitoa wakati wowote kama mshiriki. Ninakubali kuhisika na utafiti huu.

Ninaelewa kuwa watafiti watafanya juhudi na mikakati ambayo yatahakikisha kuwa

mambo yangu(utambulisho) yatabaki kuwa siri.

Kwa kutia saini kwenye fomu hii, sijawapa au kukana haki zangu za kisheria ambayo ninazo kama mshiriki wa utafiti huu.

Nakubali kuwa mshiriki wa utafiti huu Ndio La

Nakubali kuwa dodoso yangu inaweza wekwa na kutumika

Katika utafiti mwingine Ndio La

Nakubali kuwapa nambari yangu ya mawasiliano iliniweze

Fuatiliwa virahisi Ndio La

Jina la Mshiriki: _____

Saini la Mshiriki / Kidole _____ Tarehe _____

Mtafiti

Mimi niliyepiga saini yangu hapa, nimemweleza mshiriki maneno yote muhimu juu ya utafiti huu na nina amini kuwa ameelewa na kuamua kwa hiari yake kuwa mshiriki wa utafiti huu.

Jina la Mtafiti: _____ Tarehe _____Saini _____

Jukumu langu kwa utafiti huu: _____

Kwa maelezo zaidi, tafadhali wasiliana na Anastasia Mpungu - AAR Williamson House Outpatient Centre, P.O. Box 41766 – 00100, Nairobi kutoka saa mbili asubuhi hadi saa kumi na moja na nusu jioni (Jumatatu hadi Ijumaa), nambari ya simu 0724290150.

APPENDIX III: STEPS INSTRUMENT

WHO STEPS INSTRUMENT

FOR NON-COMMUNICABLE DISEASE RISK FACTOR SURVEILLANCE

Questions should be numbered for ease of data entry and analysis

Survey Information		
CORE: Demographic Information		
Question	**Response**	**Code**
Sex (*Record Male / Female as observed)*	Male	C1
How old are you?	…….	C3
Highest level of education	No formal education Less than primary school Primary school completed Secondary school incomplete High school completed	C5

Marital Status	Single/Never married Married Separated Divorced	C7
Employment status (last 12 months)	Employed Self-employed Volunteer/intern(Non-Paid) Student	C8
No. People living in your household		C9
Step 1 Behavioral Measurements		
Question	**Response**	**Code**
Tobacco use- Do you **currently** smoke any **tobacco**	Yes	T1
If No, please indicate if you smoked any tobacco products in the past	Yes	T8
Do you currently smoke tobacco products daily?	Yes No	T2
For how long have you smoked Tobacco	Indicate Months or Yrs Refused (88)	T4
OR how old were you when you started smoking tobacco?	Indicate Months or Yrs Refused (88)	T3

On average, **how many** of the following products do you smoke **each day/week?**	Manufactured cigarettes…….. Hand-rolled cigarettes……... Pipes full of tobacco…….. Cigars, cheroots, cigarillos……..	T5

Question	**Response**	**Code**
Alcohol Consumption- Do you consume alcohol i.e. beer/wine?	Yes	A1
If yes, please indicate if you have consumed alcohol for the past 12 months?	Yes	A2
Have you stopped drinking due to health reasons, such as a negative impact on your health or on the advice of your doctor or other	Yes No	A3
During the past 12 months, **how frequently** have you had at least one standard alcoholic?	Daily 5-6days per week 3-4days per week	A4
Diet- In a typical week, can you confirm that you keep within the recommended diet for HTN	Yes No	A11
Salt intake- Do you ensure that your salt intake is within the recommended amounts	Always Don't know Often Sometimes	

Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. [Insert other examples if needed]. In answering the following questions 'vigorous-intensity

Question	Response	Code
Physical activities- How regularly to engage in physical activities at work	Always Often Sometimes Rarely	A1
How regularly to engage in physical activities for leisure	Always Often Sometimes Rarely	A2
Step2: Physical Measurements		
Question	**Response**	**Code**
Blood pressure- Reading 1 Reading 2	……..	M1
Weight	…….....	M2

THANK YOU PARTICIPATING

APPENDIX IV: STEPS INSTRUMENT (Kiswahili Translation)

WHO STEPS

YA UTAFITI WA KUANGALIA SABABU ZA HATARI AMA ZAKUHUSISHWA NA MAGONJWA YASIYOAMBUKIZWA

MANENO YA UTAFITI		
MANENO YA KIJAMII NA IDADI		
Maswali	**Majibu**	**Kanuni**
Jinsia(*Kiume/ kike)-inavyoonekana*	Kiume	C1
Unamiaki mingapi?	…….	C3
Kiwango chako cha elimu?	Hakuna elimu rasmi Chini ya shule ya Msingi Umemaliza shule ya Msingi Chini ya shule ya Sekondari Umemaliza shule ya Sekondari	C5

Hali ya ndoa	Bado hujaoa Umeoa Umeachana na mke/bwana Umetalakiana	C7
Hali ya ajira (kwa muda wa mwaka moja uliyopita)	Umeajiriwa Umejiajiri Unafanya kazi kwa hiari Mwanafunzi	C8
Idadi ya watu wanaoishi nyumbani		C9
STEP 1 VIPIMO YA TABIA		
Maswali	**Majibu**	**Kanuni**
Matumizi ya Tumbaku- Je, unavuta bidhaa yanayotengenezwa na	Ndio	T1
Kama unavuta, umevuta kwa mwaka moja uliyopita?	Ndio	T8
Je unavuta bidhaa hizi kila siku? *Kama sivyo, tafadhali eleza ni mara ngapi*	Ndio La	T2
Umevuta tumbako kwa muda gani?	Eleza kwa miezi au miaka Umekataa kujibu(88)	T4
Ama, ulianza kuvuta kama unamiaka Mingapi?	Eleza kwa miezi au miaka Umekataa kujibu(88)	T3

Kwa wastani, ni ngapi za bidhaa zilizotajwa unavuta kilasiku ama kwa wiki moja?	Sigara za kampuni…….. Sigara za kujitengenezea……... Mabomba ya tumabuko……..	T5
Kwa mwaka moja uliopita, ni mara ngapi umekunywa moja kwa kiwango cha kunywa	Kila siku Biri……..	A4
	Siku 5-6 kila wiki Siku 3-4 kila wiki Siku 1-2 kila wiki	
Chakula- Kwa muda wa wiki moja, unaweza eleza kama umekula vile itakikanavyo na	Ndio La	A11
Chumvi- Unahakikisha kuwa chumvi inawekwa kiwango inayohurusiwa?	Kila saa haujui Wakati mwingi Saa zingine	A12

Maswali	**Majibu**	**Kanuni**
Shughuli/Zoezi za Kimwili- Ni mara ngapi unafanya zoezi za kimwili kazini?	Kila saa Wakati mwingi Saa zingine Mara chache	A1
Ni mara ngapi unafanya zoezi za kimwili ukistarehe?	Kila saa Wakati mwingi Saa zingine Mara chache	A2
KIPIMO YA KIMWILI		
Maswali	**Majibu**	**Kanuni**

Shinikizo la damu - Usomaji 1 Usomaji 2	……..	M1
Uzito wako	…….....	M2

AHSANTE SANA KWA KUSHIRIKI KWENYE UTAFITI

APPENDIX V: ETHICAL APPROVAL

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

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

KENYATTA NATIONAL HOSPITAL APPROVED 11 DEC 2017 KNH/UoN-ERC P.O. Box 20723-00202 NRB

Ref: KNH-ERC/A/372

11th December, 2017

Anastasia M. Mpungu
Reg. NO.TM 310-0083/07
School of Public Health
JKUAT

Dear Anastasia

RESEARCH PROPOSAL – COMPLIANCE TO HYPERTENSIVE MANAGEMENT AND BLOOD PRESSURE CONTROL AMONG PATIENTS ATTENDING THE HEALTH PROMOTION CLINIC OF A.A.R WILLIAMSON HOUSE OUTPATIENT CENTRE, NAIROBI (P399/07/2017)

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 11th December 2017- 10th December 2018.

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) 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.
d) 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.
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) 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.

Protect to discover

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 Director, CS, KNH
The Assistant Director, Health Information, KNH
The Chairperson, KNH-UoN ERC
Supervisors: Dr. Drusilla Makworo, Dr.Josph Mutai