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PERCEPTION OF ANTIHYPERTENSIVE DRUGS AND COMPLIANCE AMONG PATIENTS ATTENDING ACHIMOTA HOSPITAL

BY

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DECLARATION

I, Botchway Lady Christabel, hereby declare that apart from references to other people's works, which have been duly acknowledged, this disseration is a result of my own independent work produced from research undertaken under supervision. I further declare that this dissertation has not been submitted for award of any degree in this institution and other universities elsewhere.

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(SUPERVISOR)

DEDICATION

I dedicate this dissertation to my family and friends. A special gratitude to my parents who have supported me through the process. I will always appreciate all you have done.

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I would like to thank all the people who have helped and supported me with writing the research project. I would like to thank God for making it possible for me to go through this period of study by His grace.

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LIST OF ACRONYMS

BP -	Blood Pressure
JNC-	Joint National Committee
MMAS8 -	Morisky Medication Adherence Scale-8
NCD-	Non communicable diseases
OPD -	Outpatient Department
TRA-	Theory of Reasoned Action
WHO-	World Health Organization

ABSTRACT

INTRODUCTION: Hypertension is a global public health problem. Although efforts have been made to combat this global epidemic, inadequate control of blood pressure due to poor compliance is prevalent. The aim of this study was to examine patient perceptions of antihypertensive drugs and how it affects compliance at the Achimota Hospital

METHODS: 300 patients were selected and interviewed using structured questionnaires regarding compliance and perceptions of antihypertensive drugs. 20 participants were further engaged in in-depth interviews to explore perceptions, beliefs and knowledge of the drugs. A logistic regression model was used to assess the relationship between compliance and associated factors and a thematic content analysis was conducted to arrive at logical conclusions.

RESULTS: The average BP of the participants was 135/85mmHg and over half of them (59.33%) were on less than four antihypertensive drugs. The level of compliance was 32.67% and overall, perception of antihypertensive drugs was good, with perception scores ranging from 14-20. Patient perception of the drugs was associated with compliance ($p < 0.05$). Family played an important role for compliance and married participants were more compliant (79.59%) than unmarried participants. Knowledge of the disease and treatment was low and perceived challenges were drug costs, availability and patient waiting times at the hospital.

CONCLUSION: Despite having a good perception of antihypertensive drugs as a standard of treatment for hypertension, patients are failing to comply with medication regimens. This can be attributed to inadequate knowledge of hypertension and its treatment. There is the need to improve health promotion programs at both community and clinical levels, to increase the effectiveness of chronic healthcare delivery in Ghana.

CHAPTER ONE

1.0 INTRODUCTION

Hypertension is a global public health concern because of its high prevalence and associated risks of cardiovascular and kidney diseases (Kearney et al., 2005). Of all the degenerative diseases and preventable causes of death, the World Health Organization (WHO) ranks hypertension as the number one cause of mortality, accounting for about 17 million deaths per year worldwide (WHO, 2013).

A hypertensive individual is described as one with an average systolic blood pressure ≥140 mmHg, or diastolic pressure ≥90 mmHg. The clinical diagnosis of hypertension as measured now is based on the methodology of Russian scientist Nikolai Korotkoff; and this measure is the average of two or more seated systolic and diastolic measures taken on different occasions (Chobanian et al., 2003). Based on the classification proposed by the Seventh Joint National Committee (JNC 7) on Prevention, Detection, Evaluation and Treatment of Blood Pressure report, blood pressure is grouped into four, defined by various levels of systolic and diastolic blood pressures (Chobanian, Bakris & Black, 2003; Convertino, 2012). Normal levels are indicated by BP combination of < 120/80mmhg, Prehypertension with combinations 120-139/80-89 mmHg, Stage 1 hypertension with combinations 140-159/90-99 mmHg and Stage 2 hypertension with combinations ≥160/≥100mmHg (Chobanian et al., 2003; WHO, 2013).

For optimal blood pressure control, a class of drugs known as antihypertensive drugs together with other antihypertensive therapy initiatives have been designed purposely to prevent blood pressure complications. The drugs are usually recommended more frequently for individuals with Stage 1 or 2 hypertension; and work by either removing excess salt and fluids from the body, or by slowing the heart beat via relaxing or widening blood vessels to increase blood flow (WHO, 2013). Poor compliance to prescribed

antihypertensive drugs is a major contributor to poor blood pressure control (Gupta, Arshad, & Poulter, 2010). Research has identified factors such as patients concerns about the long term effects of the drugs as well as beliefs and perceptions about the necessity of the prescribed drug as predictors of compliance (WHO, 2013).

Illness perceptions and patient beliefs have by far outweighed other factors as major predictors for compliance (Sabaté, 2003). Patients have their individual perceptions about the prescribed therapy and services provided by the health personnel. They also have their own beliefs about treatment therapies especially in relation to the necessity of medication, the side effects of the drug and fear of complications (Aikens & Piette, 2009). These beliefs and perceptions are usually informed by knowledge gathered from an individual's background or culture. Exploring these factors will give insight into a patient's compliance behaviour with respect to antihypertensive medication.

1.1 Problem Statement

Although the benefits of antihypertensive drugs in controlling BP have been well established, some patients are still failing in keeping their BP levels normal. Poor compliance is usually the main reason for this problem. For a treatment to be effective, Haynes et al. (1979), proposed that a patient needs to be about 80% compliant to prescribed medication. In the USA, studies on patient compliance to antihypertensive drugs converge at 50% level of compliance (WHO, 2013). In Taiwan, a study determined a compliance level of 52.5%, and another in Pakistan determined compliance to be 53% (Al-Ramahi, 2014; Li et al., 2012). Information on the level of compliance in African countries is sparse, although one study carried out in Nigeria found only 31.2% of patients on antihypertensive drugs being compliant (Busari et al., 2010).

The ultimate outcome of poor compliance is treatment failure and its associated morbidity with regards to blood pressure complications like strokes and kidney diseases (WHO, 2013). These adverse outcomes place a burden on individual and government budgets because of the high costs that go into treatment of blood pressure complications. In 2001, the burden of healthcare costs placed by poor blood pressure control on Ghana alone was estimated at two billion dollars (Bosu, 2010). Thus, determining the factors that drive compliance behaviour among patients is an area for further scientific research.

Studies have identified a high number of perceived problems in the daily life of hypertensive people regarding their treatment. Patients differ in their behaviour towards the treatment in terms of beliefs, attitudes and perceptions about antihypertensive therapy (Nilsson, 2009). In the treatment of hypertension, patient perceptions about the disease and treatment therapies can influence blood pressure control, prognosis of the disease and thus the mortality of the patient (WHO, 2013).

Haynes et al. (1979), carried out a study to improve patient compliance when a high medical and economic burden was placed on government and individual budgets as a result of the increase in hypertension morbidities. Poor medication compliance is a general problem the world over but for countries like Ghana, with a weak health system, this problem is more severe. Several decades of research into compliance has not been successful in solving this problem; and today, noncompliance remains a universal challenge in treatment therapies (WHO, 2013).

1.2 Rationale for Study

There has been a commendable advance in treatment for hypertension; however, adequate blood pressure control has not been attained in real life practice. BP is poorly controlled in Ghana, and one possible reason for this is poor compliance. Despite several probes into

the issue of non-compliance, questions still exist as to why patients fail to comply with treatment therapies and measures that can be put in place to curb this health behaviour for the better.

Healthcare providers overlook the problem of poor compliance in their patients. Should this problem be detected, it could be corrected. Most of the studies into the issue of compliance are focused on Caucasians but the rate of poor medication compliance must be assessed and measured reliably in the Ghanaian setting in order for an effective intervention to be put in place (Aggarwal & Mosca, 2010; Baroletti & Dell'Orfano, 2010; Grigoryan, Pavlik, & Hyman, 2012). Patient compliance behaviour can be assessed by health personnel at every visit, through self-reports, pill counts or using Medication Adherence Questionnaire or adherence scales like the Morisky-8 among others (Aggarwal & Mosca, 2010). For a more thorough understanding of the health behaviour of patients, researchers delve deeper into the psyche of patients via qualitative studies.

In light of this, the study is using a mixed methods approach at the Outpatient Department (OPD) of the Achimota Hospital, to assess perceptions of antihypertensive drugs and the level of compliance among hypertensive patients attending the hospital. The findings can be used to increase awareness about the risk of noncompliance to the effectiveness of antihypertensive drugs as a control for Hypertension.

1.3 Conceptual Framework

The assessment and measurement of medication compliance is not a new phenomenon in terms of theory and research. To answer proposed research questions, the study adopted Ajzen and Fishbein's Theory of Planned Behaviour or Reasoned action (TRA) as complementary conceptual framework.

This is a psychological model which focuses on patient attitudes and beliefs to explain and predict health behaviour. The core assumptions of the model are that attitudes, subjective norms and perceived behavioural controls together shape behavioural intention (Ajzen & Fishbein, 1980).

Using this model as the conceptual framework of the study, a hypertensive patient's attitude towards compliance is influenced by a combination of the patient's beliefs about antihypertensive drugs and what he perceives as challenges in accessing these drugs. Subjecting norms are also influenced by the patient's perception of whether or not his beliefs are upheld by other people close to him, or whether or not they approve his behaviour towards the treatment. The more clinicians understand how attitudes and norms affect intent, the more accurately interventions can be designed to motivate compliance.

1.3.1 Schematics for TRA

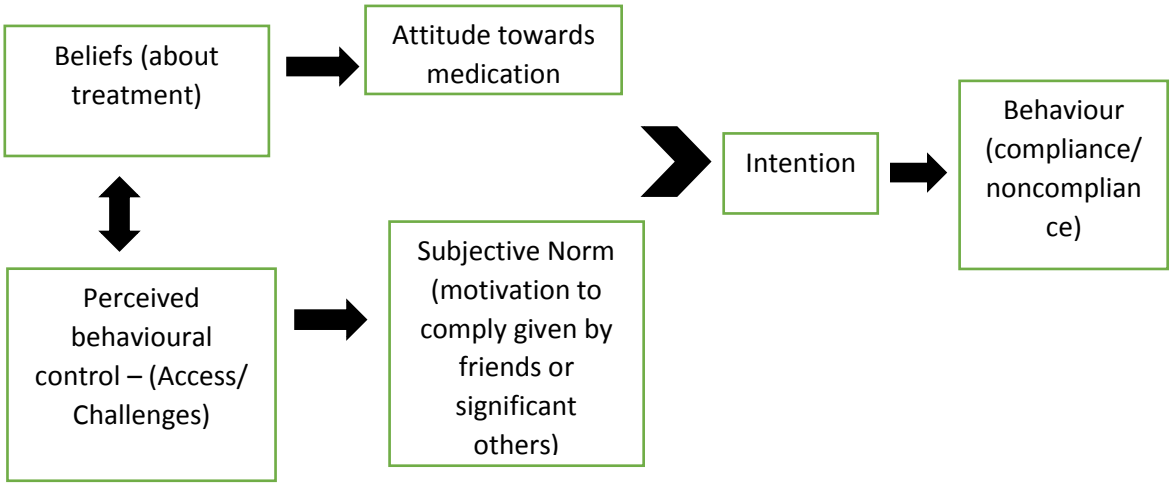

Figure 1.0: conceptual framework.

1.4 Research Questions

The study seeks to answer the questions –

(1) What beliefs and perceptions do hypertensive patients have with regards to antihypertensive drugs?

(2)What is the level of compliance of patients to antihypertensive drugs?

(3) What is the relationship between patient perception and medication compliance?

1.5 General Objective

The general objective of the study is to describe patient perception of antihypertensive drugs and how it affects medication compliance.

1.5.1 Specific objectives:

(1) To examine the beliefs and perceptions of patients on antihypertensive drugs

(2) To assess the compliance of patients to antihypertensive drugs

(3) To assess the relationship between patient perception and medication compliance.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Hypertension – A Global epidemic

Hypertension is a public health challenge that is faced by both developed and underdeveloped countries. As the most common chronic non communicable disease in the world, it affects an estimated twenty five percent of the world's population (Burtnett & Lederer, 2013). According to a 2013 WHO global brief, a total of one billion cases of hypertension had been reported in the year 2000; with a projected increase in cases of about thirty percent by the year 2025 (WHO, 2013).

An American statistical fact sheet indicates that one out of three Americans is hypertensive and estimates that by the year 2020, the number affected by chronic conditions requiring medication will reach 157 million (WHO, 2013). A similar situation has been realized in Africa where prevalence rate is higher at about 46% of the population. In both regions, the disease tends to cluster in areas of lower economic status, affecting people of lower social class and education more than their higher social class counterparts (Nilsson, 2009). To compound their poor health state, many hypertensive patients usually suffer comorbidities such as chronic kidney disease, high cholesterol and diabetes mellitus - the most common of disease conditions associated with hypertension.

Early detection and treatment commencement of hypertension can reduce the course of the disease and hence the occurrence of complications. Unfortunately, the global increase in morbidity reflects inadequate methods of detection, treatment and control of the condition (Kearney et al., 2005; Addo et al., 2013). McMahon et al. (2008), stated that globally, about 9.4 million people die each year because of complications associated with hypertension, with low and middle income countries contributing about 8% to this disease burden. The WHO's global brief also mentions that 45% of deaths due to cardiovascular

diseases, and 51% of deaths due to strokes are as a result of blood pressure complications (WHO, 2013).These global statistics are indicative that over the years, measures in hypertension control have not been very effective in terms of public health.

As at now, studies have not been able to significantly link hypertension to any single cause. Nonetheless, increased occurrence of hypertension cases has been attributed to behavioural risk factors such as poor dietary habits, physical inactivity, alcohol and nicotine abuse and persistent exposure to stress (WHO, 2013). Adverse social factors usually linked to poor lifestyle choices like smoking and unhealthy diets, serve as predictors of the risk of hypertension (Nilsson, 2009; WHO, 2013). In addition to this, socioeconomic factors such us globalization, income and education act as drivers of health behaviours that increases or decreases one's risk of developing hypertension and its complications (Saounatsou et al., 2005; WHO, 2013).

The most frequently discussed risk factors of hypertension are usually with regards to poor lifestyle choices. The ingestion of alcoholic and nicotinic substances has a vaso-constrictive effect which increases pressure required to move blood through blood vessels. Obesity, which is usually as a result of poor dietary habits and physical inactivity, increases the load placed on the heart because of the increased body mass thereby increasing cardiac output and blood pressure in the process (Thayer, Yamamoto, & Brosschot, 2010).

Apart from these risk factors, an individual with a family history of hypertension or coronary arterial disease such as myocardial infarctions also stands a higher risk of attaining the disease. Research states that a person is at a 45% risk when both parents are hypertensive and about 30% when only one parent is hypertensive (Ezzati et al., 2002).

2.2 Antihypertensive therapy

There is no cure for hypertension however effective management can modify its course. To target this global public health problem, a class of drugs and other initiatives together known as Antihypertensive therapy are being explored. Antihypertensive drugs are prescribed to patients with medium to high risk hypertension (Stage 1 and stage 2), and they are required to take one or more essential antihypertensive medicines. The medicines include a thiazide diuretic, an angiotensin convertor enzyme inhibitor, long acting calcium channel blockers, beta blockers, a statin and aspirin (WHO, 2013). Also, because of the fear of the development of complications, it is recommended that hypertensive patients with risks for other coronary heart diseases be given prompt and optimum antihypertensive therapy to reduce their overall risk (WHO, 2013)

Unfortunately, these drugs tend to be very expensive and this has been cited as one of the primary reasons behind poor compliance behaviour concerning medication (Gupta et al., 2010). To combat the economic challenge of acquiring antihypertensive drugs, integrated non-communicable disease programmes have been developed and implemented through primary healthcare, as cost effective ways for lower income countries to tackle hypertension. These programmes utilize non pharmacological methods such as changing patient lifestyle, knowledge and health beliefs in the management of hypertension (Spencer, Phillips, & Ogedegbe, 2005, WHO, 2013). One of such lifestyle related initiative is the salt reduction initiative, carried out successfully by countries like Finland, the United Kingdom, the United States of America and more recently launched in several developing countries (WHO, 2013). A reduction of salt intake is accompanied by a reduction of both systolic and diastolic blood pressures of about 10mmHg or more (Aggarwal & Mosca, 2010; WHO, 2013). Other lifestyle modification recommendations are weight reduction which reduces BP by about 5-20mmHg per 10kg of weight lost,

regular aerobic activities which reduces BP by 4-9mmHg and moderation of alcohol consumption which reduces BP by 2-4mmHg

2.3 Medication Compliance

Hypertension involves long-term management and compliance to treatment is a key component to management. Compliance in healthcare has been defined as the extent to which "patient's behaviours (in terms of taking medication, following diets or executing lifestyle changes) coincide with healthcare providers' recommendations for health and medical advice (Haynes et al., 1976; Sever & Messerli, 2011). Studies on the effectiveness of hypertensive medication and patient compliance dates as far back as 1976 when Haynes et al. reported that for adequate control of hypertension, a patient must take at least 80% of prescribed medication.

Poor compliance has been recognized as a problem globally and though rooted in patient forgetfulness, several factors tend to influence patient behaviour towards treatment. Factors that have been explored as the general determinants of compliance include socio-demographic and behavioural features of patients like, patient literacy or level of education, the disease and treatment regimen as well as patient beliefs and illness perceptions (Duah et al., 2013; Cooper et al., 2005).

Poor compliance can lead to disease complications as well as treatment failure. In the USA, poor compliance causes about 30% of treatment failure and 125,000 deaths annually (Gupta et al., 2010). Globally, the rate at which patients undergoing long-term therapy comply with medication has been found to drop after the first six months with studies converging at 50% compliance level (Glader, Sjölander, Eriksson & Lundberg, 2010; Nilsson, 2009; Mathers, 2008; Al-Ramahi, 2014; Li, Kuo, Hwang & Hsu, 2012).

Compliance is poor even for conditions that can result in severe adverse outcomes (Loghman-Adham, 2004). Poor compliance is usually associated with people living with chronic conditions like hypertension, epilepsy, asthma, and people who undergo organ transplants and chronic haemodialysis among others (WHO, 2013). Compliance rates for patients with hypertension are reported to be 50% after 1 year and 85% after 5 years (Sabaté, 2003). Patients who do not adequately go through their medication become vulnerable to long term consequences like increased risk of acute myocardial infarctions and other cardiovascular complications.

Generally, epileptics are about 30% - 40% non compliant to their medication. A study conducted in Malaysia showed the prevalence of non compliance to be 52.2% despite the risk of seizures and sudden death that are associated with the condition (Shaaban, Ishak, & Ismail, 2011). Although consistency has not been achieved in the role played by poor medication compliance and the occurrence of sudden unexpected death in Epilepsy, one cannot conclude that noncompliance does not contribute to it (Hesdorffer & Tomson, 2013).

Similarly, poor compliance has been reported in patients suffering from asthma. Misuse of metered-dose inhalers, and failure to maintain a therapeutic level of medication has been linked to asthma-related deaths, a dire consequence of poor compliance. Compliance rates for asthma medication differs between age groups ranging from about 17% to about 80% in adolescents and about 90% in adults (Opedun, Ehlers & Roos, 2011).

The direct cost of poor compliance is estimated to fall between $100 billion to about $289 billion annually. It costs a patient an average of $2000 per physician visit annually (Mathers, 2008). These costs are usually as a result of expensive surgeries such as cardiac bypass surgery, carotid artery surgery and dialysis (WHO, 2013). In sub-Saharan Africa,

the healthcare costs attributable to issues of blood pressure control as at 2001 was estimated to be $200 billion (Addo et al., 2013). The clinical outcomes of non-compliance include stroke, mortality, hospitalization, treatment failure and other associated cardiovascular related disease. In the absence of the necessary measures to control blood pressure, the prevalence of hypertension will continue to rise (Addo et al., 2013).

2.4 Patient Perceptions and Compliance

Patients have better compliance behaviour when they are made active participants in the decision making process concerning their therapy. They are also more likely to comply when they have good perceptions about the treatment (Baroletti & Dell'Orfano, 2010). Factors which were highly associated with compliance in hypertensive patients include patient denial of their condition, forgetfulness , health beliefs and illness perceptions (Aggarwal & Mosca, 2010).

A patients' inability to perceive health benefits from the use of a drug removes a powerful incentive for compliance. At first diagnosis, patients have the difficulty of accepting and coping with their condition and it has been shown that this negatively affects compliance. Saounatsou et al. (2001), link patient denial, mistrust of health provider and the perception that chronic conditions are hopeless to poor compliance behaviour.

A study carried out by Aikens et al. (2009), found that for antihypertensive drugs, patient perception about the necessity of medication is usually associated with the satisfaction or dissatisfaction with medication information. Health personnel must ensure that patients are provided with adequate information about prescribed medication. Other aspects related to medication, like the unpleasant side effects of the drug may also lead to patients discontinuing medication. Some patients perceive certain conditions like nausea and

dizziness to be associated with medication and discontinue when these side effects occur. Hypertension and its associated comorbidities require a medication regimen that is usually a combination of several medications. Patients perceive this as a hassle and sometimes deliberately miss their daily dosage. Sabate (2003), states in the WHO reports that increasing the complexity of medication due to comorbidities, decreases patient compliance with treatment regimen.

Patient perception of the healthcare systems and providers also influences patient compliance to treatment. In 2010, the WHO and World Health Assembly on the issue of healthcare systems, urged all member states to "aim for affordable universal coverage and access for all citizens on the basis of equity and solidarity" and several countries have developed policy proposals to achieve this goal (Mills et al., 2012). Many countries still struggle however, to effectively balance access to healthcare with quality and cost efficiency. Countries in sub Saharan Africa have done a great deal in improving access to health in general but patient satisfaction with regards to the quality of care is minimal (Kayima et al., 2013). There is still a large inflow of patients per facility and the stress associated with the visit makes the experience very unfriendly. Apart from that, there is a huge disparity between regions in terms of health provider distribution and because of this; patient-provider interaction is very low reducing the likelihood of comprehensive care. Medication compliance relies heavily on service received in health facilities and it has come up that patients go home and shun medication because of dissatisfaction with service provided by health personnel (Lubaki et al., 2009).

Not only does the problem lie with provider competence, Mills et al. (2012), cites the inequity in distribution of healthcare as a factor that undermines effective use of antihypertensive drugs for blood pressure control. It has been well documented that hypertension tends to cluster in people from lower social class (Nilsson, 2009). The

weaker health systems of low to middle income countries are often devoid of effective treatment strategies. People of lower socioeconomic class usually tend to rely on traditional methods like herbal alternatives because of the lower monetary aspects associated with these alternatives, discontinuing medication provided by physicians in the process (Abel & Busia, 2009; Busari et al., 2010). Apart from the evident economic disparity between the social groups, culturally diverse populations can pose challenges with regards to compliance. The different attitudes and beliefs can affect a patient's willingness to embrace a therapy and comply with treatment regimen (Busari et al., 2010)

2.5 Africa Hypertension Situation

Hypertension, which was previously considered extremely rare in African societies, has now emerged to be a for public health concern. WHO has estimated that over the coming decade, the greatest increase -27% - in deaths due to hypertension will occur in Africa (MacMahon et al., 2008). Worldwide, Africa has the highest prevalence and a study by Hendricks et al. (2012), showed that 30% to 40% of hypertensive patients in Sub Saharan Africa have medium to high risk hypertension, indicative that a large proportion of patients are on some medication.

Previously, hypertension had been more concentrated in urbanized areas and was often described as a disease for the affluent (Addo et al., 2013). However, the rate in rural Africa has gradually increased to about 28% of the population, meaning the disease has crossed the boundary drawn by economic status (Spencer et al., 2005). Hypertension has been noted as the main risk factor for cardiovascular diseases which cause as many deaths as HIV, malaria and tuberculosis in Sub Saharan Africa (Kayima et al., 2013; Hendriks et al., 2012). Management of the complications of hypertension is very difficult to sustain mainly because the African economy is not strong enough to withstand the resource-

intensive care that is associated with hypertension complications (Addo, Smeeth, & Leon, 2007).

Over the past years, the primary focus of developing countries has been to tackle communicable diseases like HIV and Malaria, which have plagued the continent for years (WHO, 2013). The epidemiological shift has moved non communicable diseases into focus and now diseases like hypertension, are being tackled through primary prevention. This approach promotes health by making the individual and community understand and develop the skills to improve and maintain health; and has been launched via education campaigns in several African countries (WHO, 2013). Primary prevention's cost effectiveness makes it feasible with Africa's lower income status.

A systematic review carried out on hypertension in Africa reports low levels of awareness of hypertension status. Lowest levels were seen in rural communities in Nigeria (8%), Uganda (10%) and Gabon (9%) and highest awareness levels were found in Tunisia (81%) (Addo et al., 2007). Generally, Western and Central Africa had the lowest levels and Northern Africa had the highest levels of awareness. Education played a major role in awareness and control of blood pressure. Subjects with higher formal education were found to be better at controlling their blood pressure. They also embrace treatment therapies more readily as opposed to subjects with lower education and literacy levels (Kayima et al., 2013).

In a study by Hendricks et al. (2007), African patients were asked what hypertension means to them. Some mentioned the physical characteristics like rapid heart rates, increased blood volume, fatigue and headaches; whereas others had no knowledge whatsoever about the disease. Some people associate hypertension with imminent death, and others see no long term effects associated with the condition (Agyemang et al., 2012).

Another very frequent response with respect to treatment was that antihypertensive drugs potentially cause impotence; as such this treatment therapy was rejected by several male patients (Agyemang et al., 2012; Hendricks et al., 2007; Spencer et al., 2005).

2.6 Ghana Hypertension Situation

Since the 1950s, when hospital and community based studies started in Ghana, information has been provided about the prevalence and morbidity trends for hypertension and other noncommunicable diseases (NCDs). Unfortunately the information gathered has not been sufficient to effectively convince experts and lay communities about how to tackle this public health problem, mainly because of the nation's weak health systems and the assumption that NCDs remain rare and are of less importance compared to infectious diseases (de-Graft Aikins, 2007). As at now, there is still no national policy or plan to address NCDs.

The number of reported new cases of hypertension in Ghana's health facilities increased from 49,807 in 1988 to 505,180 in 2007 and has been anticipated that morbidity and mortalities from this disease will increase over the coming decade (Addo et al., 2013; Bosu, 2010). A national survey conducted in 1998 quantified the national prevalence of hypertension in Ghana to be 28.7% (Bosu, 2010). The survey also showed higher prevalence across different groups and in different regions; 28.7% in Kumasi, 32% in Bawku/Zebilla, 36.9% in Keta-Dzelukope, and 47.8 amongst a cohort of women in Accra (de-Graft Aikins, 2007).

Like other countries, the disease is more prevalent in urban areas than in rural areas and in the Greater Accra Region, hypertension has risen to be the second highest cause of admissions in individuals over forty-five years, next to malaria which remains number one

(Bosu, 2010). At the Achimota hospital, hypertension is the leading non-communicable disease, reporting about 623 inpatient admissions in 2012 alone. Similarly, it is ranked as the highest cause in cases of morbidity and accounts for about 7% of total healthy years of life lost nationwide (Addo et al., 2013; Agyemang et al., 2012).

Awareness of the hypertension has increased because of several initiatives that have been put in place to address the disease. Nonetheless, attaining optimal BP is still minimal and a study shows that about 33% of Ghanaians were aware of their diagnosis however, only 4% had optimal blood pressure control (Spencer et al., 2005).

The health system in Ghana is not only structured purposely to treat acute infectious disease but also operates with inadequate human and financial resources, reducing the efficiency of tackling the double burden of infectious and chronic NCDs (de-Graft Aikins, 2007). The health system lacks guidelines for chronic care and is equipped with poorly trained health professionals with inadequate knowledge about some chronic diseases (Abel, 2005). Apart from the poor health systems, health policy changes since 1990 have compounded the burden of living with a NCD like hypertension. There are various user fees in the health facilities and drugs are charged at full price. Also, the current National Health Insurance Scheme (NHIS) does not provide coverage for all antihypertensive drugs, thus treatment for hypertension has become very expensive (Tagoe, 2012).

The economic challenge has drawn many hypertensive patients towards other remedies and currently, many patients control their blood pressure through the fusion of biomedical techniques (antihypertensive drugs) and traditional herbal techniques (Abel & Busia, 2009). The herbal remedies for hypertension are prepared by Traditional Medical Practioners (TMP's) from naturally growing plants or by the patients at home. The traditional healers are widely accepted as alternative healthcare providers and form part of

the local communities (Meli et al., 2009). It is believed that wild-crafted plants or plants from the 'bushes' are more effective than plants cultivated in a home garden (Abel, 2005). In Ghana, the most potent herbs for hypertension are believed to be from Northern Ghana, and these herbs usually come pre-prepared and in powdery forms (de-Graft Aikins, Anum, Agyemang, Addo, & Ogedegbe, 2012). Treatment may form part of a diet; for example, the fruit of *Tetrapluera tetraptera* locally known as prekese in the Akan language, prepared in soup. The bark of trees like *Anthocliesta nobilis*, locally called '*bantodee*' and *Alstonia boonei* locally called '*nyamedua'* are also brewed into decoctions and are drunk daily to help control blood pressure (Abel, 2005).

Studies show that the mode of treatment adopted by a patient is driven by his/her causal theories about the disease (Meli et al., 2009). Patients who adopt the fusion of ethno medicine and biomedicine come from all social classes. Patients from lower social class are drawn more towards ethno medicine; they are also seen to frequent diviners for treatment. Patients who frequent diviners believe that hypertension is caused by purely unnatural causes such as witchcraft, the displeasure of ancestors and sometimes disrespect for traditional rites (Meli et al., 2009). They visit diviners for rites to be performed to pacify the ancestors or nullify whatever witchcraft is at play. Different people have different explanations for their health condition and what causes it. A patient's attitude to his/ her condition is influenced by his/her background and as such it's important to explore patient knowledge acquired outside the hospital settings as well.

2.6.1 Some Health belief systems and illness perceptions that affect compliance in Ghana

Due to the increasing awareness of hypertension in Ghana, many lay people are now aware of the role played by stress and describe it as the primary cause of the disease. They

are seen to adopt lifestyle changes more often abandoning the pharmacological approach. People in rural Ghana where farming is dominant believe that such a chronic condition is due to hard labour jobs like farming and as such will only advise time of work as cure for the disease. Although true that stress causes hypertension, believing in it as the sole culprit is discordant with the traditional medical paradigm of hypertension - (Spencer et al., 2005).

In a qualitative study carried out in Accra, Nkoranza and Kintampo, patients perceived their chronic conditions as incurable with the rural groups referred to it as '*koa Nkoro*' literally translated as 'difficult to fight' (de Graft Aikins et al., 2012). This perception leads to the lay belief that hypertension can only be managed but never cured, it underplays the importance of medication as a mode of treatment. In the same study, some of the communities described hypertension as the devil's disease ('*abonsam yare'*) or a spiritual disruption caused by an enemy through sorcery and witchcraft because of jealousy; whereas others believed that moral transgressions are legitimate reasons for illness and as such hypertension could be some form of punitive justice meted out to them because of prior transgressions (de Graft Aikins et al., 2012). Generally, spiritual causal theories have generated debate and conflict between biomedicine, and ethno medicine. Patients who believe that chronic conditions are rooted under spiritual causes do not believe in the efficacy of biomedicine.

CHAPTER THREE

3.0 METHODS

3.1 Study Design

This was a cross-sectional study among hypertensive patients, to assessing the level of compliance with antihypertensive drug therapy and factors influencing it; using the prevalence of medication adherence as a proxy measure for compliance.

3.2 Study Area

The study was conducted at the outpatient department (OPD) of the Achimota Hospital. This hospital is located in the Greater Accra region and in the Accra Metropolitan area. Considered as 'Accra city proper', with a population of 1,848,614 according to the 2010 census, the district is predominantly urban and serves the more affluent of the Ghanaian populace.

Achimota Hospital is located on the grounds of the Achimota School. It is a government-owned hospital under the Ministry of Health and provides primary healthcare to the Achimota School as well as the surrounding community. A twenty-four hour facility with a 45 beds, the hospital offers general medical, surgical and laboratory services. It also has a well managed diabetic clinic on Thursdays, and patients with other chronic comorbidities like hypertension are seen between 9am and 2pm. However patients come in at will on the other days of the week for regular hospital visits.

3.3 Variables

Dependent variable

The main outcome variable of the study was Compliance among hypertensive patients. This was defined as scoring above six on the Morisky Adherence Scale.

Independent variables

The exposure variables included perception quantified using a Likert scale as well as factors that have been linked with compliance, namely illness perception, patient socio-demographic characteristics, comorbidities, length of hypertension diagnosis, physical Activity last BP check (JNC 7 classification), number of Antihypertensive pills, dietary Habits

For the Qualitative study, themes that were explored are patient perceptions about antihypertensive drugs, patient beliefs about antihypertensive drugs and patient attitudes towards treatment

3.4 Study population

The study sampled hypertensive patients attending the Achimota Hospital, Accra, Ghana. On Average, annual OPD attendance at the hospital is about 3,000 and a total of 320 patients were included in this study.

Inclusion Criteria: The criteria for inclusion for this study were hypertensive patients who had been on antihypertensive medication for not less than six months.

Exclusion criteria: The criteria for exclusion were patients on admission and who had been on medication for less than six months.

3.5 Sampling

3.5.1 Sample Size

Sample size was determined using the formula:

$N=Z^2 P(1-P) / D^2$

Where N = sample size

P = assumed prevalence of compliance

D = significant level at 95% confidence interval

Sample size was estimated using the prevalence of compliance. For a reported prevalence of 32.1% (Busari et al., 2010) in Nigeria and a margin of error of 5% at 95% confidence level, a sample size of 318 was obtained. For budgetary and time constraints, the study was able to recruit 300 subjects.

A total of twenty patients were included in the in-depth interviews, at which point no new concepts arose in participant's response, indicative that saturation had been reached.

3.5.2 Sampling Method

With the help of the nurses, a daily attendance list was generated using the files of hypertensive patients reporting at the OPD. Using the inclusion and exclusion criteria as guide, participants were selected from the list by simple random sampling. Ten to twenty patients were sampled daily based on the hospital turn up of patients. Participants included in the in-depth interviews were selected using convenient sampling. Data was collected for a total period of four weeks between August and September 2014.

3.6 Data Collection

The perception score for each hypertensive patient was measured using the likert scale of the modified illness perception questionnaire. This structured questionnaire had four components namely Identity, Consequence, Cure control and Self-efficacy. The components were graded on a five-point Likert scale ranging from 'strongly agree' to 'strongly disagree'. The highest possible score was 20 (good perception) and the lowest score was 4 (bad perception).

Identity referred to the illnesses that patients associate with antihypertensive drugs. Consequence referred to the improved life that hypertensive patients expected to live because of antihypertensive drugs. Cure control addressed the significance that hypertensive patients attached to antihypertensive drugs as a cure for their condition. Finally, self-efficacy addressed the role or responsibilities that hypertensive patients felt they had with respect to their condition. The higher the score, the better the perception a patient has of the antihypertensive drug.

Permission was obtained from Donald Morisky, to use the Morisky 8-item Medication Adherence Scale. The questionnaire is a self-reporting tool often used for screening medication adherence in patients. It is made up of eight yes or no questions where a 'yes' scores '0' and a 'no' scores '1'. In this study, medication adherence was used as a proxy measure for medication compliance. A maximum score of eight constitutes high compliance, a score of six and above, but less than eight constitutes medium compliance; and a score less than six constitutes low compliance.

Both questionnaires were interviewer-administered to the study participants.

Although the use of questionnaires makes it difficult to assess the motivation behind participant's response, the advantages of this measurement tool makes it a beneficial component in this study.

The advantages of using a questionnaire as a data collection tool are that they are economical and allow for a uniformity of questions across participants. The amount of money spent in training interviewers to conduct the interviews was reduced when questionnaires were administered. Data collected were also more comparable using the structured questionnaires, this was because all participants are asked the same questions which could be answered in the same way (Dawson, Fitzpatrick, & Carr, 1996; Marshall, 2005)

The interview guide used to assess beliefs and perceptions held by the patients towards antihypertensive drugs covered the following domains - patient knowledge about hypertension and treatment, perceptions and compliance behaviour towards antihypertensive drugs, perceived challenges towards antihypertensive drugs, cultural beliefs about hypertension and antihypertensive drugs and perception about traditional and pharmacological methods of treating hypertension. Using this tool helped in seeking further clarification on participant's response, to give some validity to the data collected using the structured questionnaires.

3.7 Quality Control

The methods and tools that were used in the study had been previously validated in other studies as fit for the purpose for which they were used. Respondent information was kept private and confidential during data collection and all data were stored electronically and

password protected. Data collected were checked and cross checked to ensure the absence of errors and distortions of participant's answers.

3.8 Data Processing and Analysis

3.8.1 Data Analysis

Data from the illness perception questionnaire and Morisky 8-item Adherence questionnaire was analyzed using STATA version 11. All tests were set at a significant level of 5%. Three hundred participants with complete data were included in the analysis.

Patient compliance to medication, using medication adherence as a proxy measure, was scored dichotomously as good compliance (adherence score of >6) and poor compliance (adherence score <6). This was the primary outcome of interest. The primary independent variable of interest, Patient perception, was scored on the Likert scale from 'strongly agree' (5) to 'strongly disagree' (1). Likelihood ratio test was used to check for linearity between perception and compliance. To incorporate all the components of the questionnaire, patient perception was therefore analyzed on a continuous scale. Likelihood ratio test was also used to test for linearity between age, length of diagnosis, number of pills and compliance. These exposure variables were therefore used as continuous variables. The other independent variables – Patient education, Sex, Physical activity, Stage of hypertension, Employment status, Religion, Dietary habits and Comorbidities were analyzed in their natural state.

Significant associations between each of the various independent variables were determined using the Pearson's Chi square test. The purpose of this step is to determine which variables to include in constructing the logistic regression model. Each variable was a candidate for inclusion provided that when it was considered singly, the p value of

association was equal to or less than 0.05. Similarly, variables were removed if the p-value for the likelihood ratio test was more than 0.05. Although results of the chi square analysis yielded no associations for each of the exposure variables, those that had been stated in literature to have significant relationships with the outcome variable were put into a logistic regression model to obtain the adjusted odds ratios. Variables that were put into the model were Age, Sex, Education, Employment status, Length of diagnosis, Perception, and Comorbidities. The results from the analysis were presented in tables.

A thematic content analysis of participant's responses from in depth interviews was carried out and results were presented as narratives. Appropriate quotes from participant's responses were selected to for presentation

3.9 Ethical Consideration

Ethical clearance was sought from the Review Committee of the Ghana Health Service. Approval was sought from the Chief Superintendent of the Achimota Hospital and voluntary consent forms were obtained from the study participants. The study had no potential risks and the benefits were clearly spelled out to the participants as well as the authorities of the facility. There was no compensation for any participant and participants reserved the right to withdraw from the study at any point in time. All data collected were confidentially kept and stored electronically under password protection. Hard copies were stored and were only accessible by the principal investigator.

The principal investigator did not have any conflict of interest in the conduct of this study. The study was self-funded.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of study participants

The study participants were made up of 136 (45.33%) males and 164 (54.67%) females with a mean age (SD) of 62 (± 12.8) years ranging from 31years to 95years. Fifteen (5%) had never been married, 239 (79.67%) were married, 19 (6.33%) were divorced and 27 (9%) were widowed. The literacy profile of the study participants was such that 14.33% had no education, 11.67% had primary education, 28.33% had secondary education and 45.67% had tertiary education. Over half of the patients (56.7%) were working, 93(31%) were retired, and 37 (12.33%) were unemployed. Table 4.1.1 summarizes the socio-demogra phic characteristics of the study participants.

Table 4.1.1: Background characteristics of study participants.

Variable	Number of participants	Percentage
Sex		
Male	136	45.33%
Females	164	54.67%
Age (years)		
Less than 50	66	22%
50 - 70	132	44%
70+	102	34%
Marital Status		
Never	15	5.00%
Married	239	79.67%
Divorced	19	6.33%
Widowed	27	9.00%
Working Status		
Retired	93	31.00%
Unemployed	37	12.33%
Working	170	56.67%
Education		
None	43	14.33%
Primary	35	11.67%
Secondary	85	28.33%
Tertiary	137	45.67%
Religion		
Christian	284	94.67%
Muslim	16	5.33%

4.2 Background characteristics and activities to control hypertension

The average BP of the patients was 135/85mmHg and over half of them (59.33%) were on less than four antihypertensive drugs. An assessment of participant dietary habits following diagnosis of hypertension showed that more than half of the participants (52.3%) had increased intake of fruits and vegetables and 26.67% had not made any changes to their diet. When asked how long participants had been living with hypertension, only a few (11%) had been living with the condition for over 30 years. Table 4.2.1 gives details of the information gathered with regards to patient characteristics and activities to control hypertension.

Table 4.2.1: Background characteristics and activities to control hypertension

Variable	Number of participants	Percentage
Last BP Check (mean = 135/85 mmHg)		
Normal	38	12.67 %
Prehypertension	107	35.67%
Hypertension Stage 1	83	27.67%
Hypertension Stage 2	72	24.00%
Number of Pills		
< 4	178	59.33%
4 +	122	40.33%
Exercise		
Never	76	25.33%
Once in a while	90	30.00%
Sometimes	82	27.33%
Usually	40	13.33%
All the time	12	4.00%
Diet		
Balanced	2	0.67%
Diary	1	0.33%
F&V	157	52.33%
F&V and Grains	56	18.66%
F&V/Diary	1	0.33%
F&V/Prot	3	1.00%
NC	80	26.67%
Length of diagnosis (years)		
Less than 10	104	34.67%
10-20	90	30.00%
20-30	73	24.33%
30+	33	11.00%

4.3 Perceptions, knowledge and compliance with antihypertensive drugs

The level of compliance among the patients was 32.67% and over 80% had a good perception of the antihypertensive drugs (perception score above 16). The comorbidity profile of respondents showed that 38.7% had no comorbidities, 58.67% had one chronic condition in addition to the hypertension and 2.67% had two. Table 4.3.1 gives a more detailed summary of the comorbidities suffered by the respondents as well as the distribution of compliance and perception scores.

Table 4.3.1: Distribution of respondent's by level of compliance, perception score and comorbidity profile

Variable	Number of participants	Percentage
Compliance		
High	0	0
Medium Compliance	98	32.67%
Low Compliance	202	67.33%
Perception Score		
Less than 16	5	19.0%
16+	2	81.0%
Comorbidities		
None	1	38.7%
1	176	58.67%
2	8	2.67%

Comorbidity Profile

Disease	Number of participants	Percentage
None	116	38.67%
AIDS	2	0.67%
Asthma	4	1.33%
CKD	4	1.33%
Diabetes	136	45.33%
Heart disease	8	2.67%
Muscle/Skeletal disease	1	0.33%
Prostate Cancer	11	3.66%
Pulmonary Kochs	1	0.33%
Stomach Ulcer	1	0.33%
Stroke	6	2.00%
Depression	2	0.67%
CKD/Diabetes	4	1.33%
Diabetes/Asthma	1	0.33%
Diabetes/Liver disease	1	0.33%
Diabetes/Osteoporosis	1	0.33%
Diabetes/Stroke	1	0.33%

Almost all of the patients referred to hypertension in the local dialect as "Mogya brosoo" – "excess blood", or an elevated blood pressure. Lifestyle causes were attributed to the disease and these included obesity, stress and alcohol abuse. Some participants on the other hand expressed grievances and attributed their hypertension to health system related causes.

> *"My hypertension was pregnancy induced. I got diagnosed two weeks after delivery. My labour was very stressful and prolonged and the nurses were not of much help*." (Female, 50-70years)
>
> *"I had lost blood and the doctor gave me malaria tablets which caused the BP to go high. When I went to the hospital, the doctor didn't check for BP. The Doctor gave BP medicine which was very high and that gave me the BP. If he had checked well he wouldn't have given me the type of pills he gave me. After I changed the doctor they saw that I didn't even have malaria so they started to stabilize BP"* (Female, <50years)

Using the MMAS8 (Table 4.3.2), the level of compliance amongst the hypertensive patients attending Achimota hospital was only 32.67% and most was routed in patient forgetfulness. Upon probing into the issue, it was realized that family played an important role in possibly reducing prevalence of forgetfulness. One patient summarized how she has been able to keep up with her medication because of the role her children play as medication reminders.

> *"My children call me every morning to always ask me if I have taken my medicine. They ask me when I'm travelling to make sure that I have packed it. Because of my old age, I forget very easily so they help me remember"* (Female, 50-70 years)

It also came to light that the costs of antihypertensive medication was a challenge to some of the patients and was reported by 29% of respondents as reason for missing their dosage over the past two weeks. The current health insurance does not cover all of these antihypertensive medications and one patient who was almost at retiring age expressed her worry about how she was going to cope after retirement.

> *"They are expensive, because I'm on two. One month dosage is 164 Ghana cedis for one. So for only the BP it comes up to 200 Ghana cedis. Currently it's not really a challenge but I'm about to go on pension so I'm thinking about how I'm going to do that. Every month it goes up...when you think its one price, you go and it's gone up. And for me the NHIS does not cover it so you can imagine. The generic ones don't work for me. And in fact the doctors say that the efficacy is low."* (Female, 50-70years)

Patients who have been prescribed drugs that are covered by NHIS are saved from this hassle whereas those who haven't have to once again rely on family members for help or resort to traditional methods as supplements to the orthodox medicines.

Other challenges that arose in participant response were the issue of drug availability in the rural parts of Ghana. When travelling, patients have to make sure they carry enough antihypertensive drugs to last them the entire duration of their travel because there is the possibility that one might not find the drugs at these areas.

> *"When I travel to my hometown and I run out, there is nowhere to buy the medicine"* (Male, 50-70years)

Table 4.3.2: Summary of MMAS-8

Item	Number of participants Yes (%)	No (%)
1. Have sometimes forgotten to take your medicine	210 **(70**	90 **(30)**
2. Have forgotten medicine in last two weeks	87 **(29)**	213 **(71)**
3. Have reduced dosage because of side effects without doctor's knowledge	34 **(11.3)**	267 **(88.7)**
4. Have forgotten medicine when travelling	26 **(91.3)**	274 **(8.7)**
5. Took medicines yesterday	284 **(94.7)**	16 **(5.3)**
6. Have had treatment interruptions because he/she considers hypertension under control	15 **(5.0)**	286 **(95)**
7. Feels hassled about sticking to treatment plan	77 **(25.7)**	223**(74.3)**
8. Difficulty in remembering to take medicine		
A. Nevver	216 **(72)**	84 **(28)**
B. Once in a while	31 **(10.3)**	269 **(89.7)**
C. Sometimes	53 **(17.7)**	247 **(82.3)**
D. Usually	0	300 **(100)**
E. All the time	0	300 **(100)**

Summary Score	Number of Participants	
< 6 = low adherence	202	**Mean score = 4.83**
6 - 8 = medium adherence	98	
0 = high adherence	0	

As presented in table 4.3.3 below, illness perception scores ranged from 14 to 20, with a mean (SD) score of 17.8 (± 2.04). Over half of the participants (63%) did not identify any side effects due to the drug and all of them (100%) strongly agreed to have control of their illness. Most of participants' responses clustered around the first three points of the likert scale – strongly agree, agree and satisfactory- indicating that in general, patients had positive perceptions of antihypertensive drugs as a standard of treatment for hypertension.

It was discovered during the in depth interviews that this was usually as a result of improvement in symptoms upon commencement of treatment. For example, an elderly woman when questioned about how she felt when she took her drugs answered:

> *"...before, if I walk from here to here... (*Indicating a distance from the nurses' station to the consulting room...*) I'll be so tired; and my heart will be beating. Doctor said it was because of this BP. And it's true, when I take my drugs, I don't get tired easily"* (Female, 70+)

To further explore their perception of the drug, patient knowledge of the drug was found to be very minimal and majority of the participants described the drug in reference to what their doctors had told them.

> *"...the Doctor said if I take the medicine, my blood pressure will go down"* (Female, <50years)

Table 4.3.3: Summary of Graded Illness Perceptions held by Study Participants

Component	Likert Scale Grade Frequency (%)				
	Strongly Agree 5	**Agree 4**	**Satisfactory 3**	**Disagree 2**	**Strongly Disagree 1**
Identity	190(**63**)	39(**13**)	69(**23**)	2(**0.67**)	0(**0**)
Consequence	107(**35.7**)	70(**23.3**)	123(**41**)	0(**0**)	0(**0**)
Cure Control	190(**63.3**)	49(**16.3**)	61(**20.3**)	0(**0**)	0(**0**)
Self-Efficacy	300(**100**)	0(**0**)	0(**0**)	0(**0**)	0(**0**)

Score summary

Mean	**17.8**
SD	2.04
Min	14
Max	20

When asked what they thought caused their hypertension, in effort to determine which course of treatment they would prefer, most of the participants described hypertension to be caused by patient related factors such as obesity, physical inactivity and stress. However no significant relationship was found between compliance and exercise or diet ($p>0.05$)

A few patients made mention of cultural beliefs as an influence of their compliance behaviour. Some antihypertensive drugs have been linked to a reduction in libido and in this study; those participants had mixed feelings about its effect. One participant didn't have a negative perception of the drug in relation to his libido –

"It is rumoured that the drugs will reduce my libido, but the Doctor told me that with increased exercise, my blood circulation will be improved and because of this, I don't have a problem with my libido if I couple medication with exercise" (Male, 70+years)

On the other hand, another respondent did not have such good thoughts about the drug. His culture imposed a gender role on him which he perceived as being threatened by the drug. As such, he was less likely to comply with the medication.

"Too much of a drug will bring all manner of things. This drug, I hear can make me impotent. I am a chief in my town and you know how a chief must be....so how can I take a drug that will make me less of a man?" (Male, <50years)

In relation to the traditional methods of blood pressure control versus the use of prescribed antihypertensive drugs, the patients did not have affinity to one over the other.

4.4 Univariate analysis

When Pearson's chi-square test was conducted, no significant associations were found between any of the participant background characteristics and compliance. Nonetheless, noteworthy trends in compliance were discovered. Married participants were the most compliant (79.59%) as compared to patients who had never been married. Patients who were above 70 years old had a higher (41%) as well as those who were working (55.1%). Patients on fewer antihypertensive drugs (<4) were more compliant (60.20%) and patients with one comorbidity had the highest level of compliance (59.18). Finally, compliance was seen to drop in patients who had been living with hypertension for longer than thirty years (14.29%) and increase with increasing perception score.

Table 4.4.1 summarizes results from the test conducted.

Table 4.4.1: Univariate Analysis of Compliance by Patient Characteristics using Pearson's Chi-square Test.

Variable	Compliance	x^2(p value)
Sex		
Male	50%	1.23 (0.258)
Females	50%	
Age (years)		
Less than 50	18.37%	
50 - 70	38.8%	4.09(0.130)
70+	41.84%	
Marital Status		
Never	3.06%	
Married	79.59%	3.15(0.370)
Divorced	5.10%	
Widowed	12.24%	
Employment Status		
Retired	33.67%	
Unemployed	11.22%	0.54(0.762)
Working	55.10%	
Education		
None	14.29%	
Primary	12.24%	3.63(0.30)
Secondary	34.69%	
Tertiary	38.78%	
Religion		
Christian	92.86%	0.94(0.331)
Muslim	7.14%	
Last BP Check		
Controlled	73.47%	0.16(0.693)
Uncontrolled	26.53%	
Number of Pills		
< 4	60.20%	0.05(0.831)
4 +	3 9.80%	
Exercise		
Never	22.45%	
Once in a while	35.69%	
Sometimes	24.49%	2.42(0.659)
Usually	13.27%	
All the time	5.10%	
Diet		
Balanced	1.02%	
Diary	0%	
F&V	44.90%	
F&V and Grains	16.33%	9.25(0.16)
F&V/Diary	0%	
F&V/Prot	0.50%	
NC	35.71%	
Length of diagnosis (years)		
Less than 10	29.59%	
10-20	31.63%	1.64(0.45)
20-30	24.49%	
30+	14.29%	
Comorbidities		
None	38.78%	
1	59.18%	0.23(0.891)
2	2.04%	
Perception score		
14 - 17	39.80%	2.44 (0.118)
17 - 20	60.20%	

4.5 Multivariate Analysis

Despite the fact that the Pearson's chi square test did not yield any significant results, a logistic regression model incorporating variables which that have been indicated by literature as factors predicting compliance was run. This showed a significant relationship between patient perception (p value of 0.04) and compliance; for every unit increase in patient perception score, patient compliance decreased by 13%. No significant relationship was found for any of the other independent variables ($p > 0.05$).

Table 4.5.1 summarizes results from the logistic regression that was conducted.

Table 4.5.1: Multivariate Analysis of Compliance by Patient Characteristics (logistic regression)

Variable	Adjusted Odds ratio	(p value)	95% CI
Age (years)	1.02	0.233	(0.985, 1.07)
Sex			
Female	1(ref)		
Males	1.37	0.274	(0.692, 2.325)
Marital Status			
Never	1(ref)		
Married	1.727	0.433	(0.441, 6.765)
Divorced	1.307	0.758	(0.238, 7.180)
Widowed	2.437	0.302	(0.449, 13.214)
Employment Status			
Retired	1(Ref)		
Unemployed	0.880	0.799	(0.331, 2.347)
Working	1.566	0.276	(0.699, 3.505)
Education			
None	1(ref)		
Primary	1.323	0.583	(0.487, 3.596)
Secondary	1.551	0.314	(0.660, 3.640)
Tertiary	0.921	0.850	(0.391, 2.170)
Number of Pills	1.036	0.690	(0.870, 1.235)
Length of Diagnosis (years)	1.008	0.744	(0.963, 1.054)
Comorbidities			
None	1(ref)		
1	0.912	0.747	(0.522, 1.594)
2	2.04%		
Perception Score	0.876	0.040	(0.773, 0.994)

CHAPTER FIVE

5.0 DISCUSSION

The aim of this study was to assess perceptions of antihypertensive drugs among hypertensive patients and to determine the level of compliance of patients in a hospital setting in Ghana, using medication adherence as a proxy measure.

The level of compliance determined in the study was 32.67% and this was different from that of studies carried out in Taiwan (52.5%) and Pakistan (53%) (Al-Ramahi, 2014; Li, Kuo, Hwang, & Hsu, 2012), but very similar to the level of compliance found in neighbouring Nigeria (32.1%) (Busari et al., 2010). Even though results of the chi square test did not yield any significant results, constructing a logistic regression model using variables that have been stated in literature as risk factors for compliance yielded a significant relationship between patient perception and medication compliance.

Patient response clustered around the first three scores of the likert scale, namely strongly agree, agree, and satisfactory, indicative that in general, patients positively perceived their antihypertensive drugs as a necessary treatment for their condition. This is a possible reason as to why the association with compliance is not strong; as perceptions did not differ extensively among the participants.

Undisputedly however, interpreting patient's self report must be done cautiously, as there can be a difference between stated behaviour and actual behaviour. Compliant patients will have no problem with reporting their compliant behaviour, whereas noncompliant patients are less likely to report their actual behaviour. Therefore, noncompliance although low in this study may still be under-reported.

There was no significant difference in compliance between males and females and this could be attributed to the study being carried under clinical or hospital settings. Such

settings inherently include health conscious people and as a result of this, both males and females were at par in terms of health habits and compliance behaviour for that matter.

There was an equivocal correlation between the length of diagnosis and compliance. This was different from what has been theorised in reports by Saounatsou et al. (2008), and Aggarwal and Mosca (2010). They infer that compliance to medication reduces with increasing length of diagnosis. However in this study, there was no significant association between length of diagnosis and compliance.

Similarly, age did not have a significant association with compliance, despite the negative correlation between compliance and age found in other studies (Cooper et al., 2005; Duah et al., 2013; Jin et al., 2008). Majority of the patients were above the age of 50 and possibly suffering similar impairments

Likewise, the study did not find any significant associations between physical activity and compliance; but results from the in depth interviews highlighted the role of physical activity in blood pressure control. Physical activity in itself is a form of antihypertensive therapy and studies support the notion that patients who engaged in physical activity were less likely to comply with medication (WHO, 2013). In this study, although participants were aware of the importance of aerobic physical activity, very few of them were engaged in regular physical activity. This may be due to the fact that the sampled population was skewed towards the elderly who have physical impairments and cognitive impairments due to old age. Apart from that, some of the patients also had other impairments brought on by comorbidities in the likes of stroke and cardiovascular disease, preventing frequent physical activity.

Healthcare related causes arose in the causal theories held by patients. Some participants reported negligence on the part of health personnel as causes of their hypertensive states.

Similarly, Mills et al. (2012), reported ill equipped facilities and personnel who were not properly trained for chronic care as the causes for improper diagnosis and treatment of hypertension. Post diagnosis, the health system normally, does not make provision for continuity of care and as such these patients are often not provided with the comprehensive care that they need. As a result of this patients are deterred from frequenting these facilities and this leads to the delay of treatment, hence the higher probability for complications to occur.

Similar to the study conducted by Busari et al. (2010), perceived challenges faced by patients with respect to drug acquisition was costs, availability and hospital waiting time. Most of the interviewed patients were under review and frequented the hospital on monthly basis. Some of them made it to the clinic as early as 6:30 in the morning and did not get to consult with the doctor until late afternoon. This longstanding issue of waiting lines at Ghanaian hospitals does not attract patients to seek professional help thus opting for over-the-counter and unorthodox drugs. These in turn place the patients at risk of BP complications due to drug interactions.

Costs as a challenge to antihypertensive acquisition has been realized in several studies as an important aspect to why hypertension may not be treated effectively (Busari et al., 2010; Cooper et al., 2005; Jin et al., 2008). Patients on generic types of amlodipine had no issues, as these were covered by the NHIS. Others on the original had to bear the costs out of their pockets. Looking at the compliance trend using employment status, compliance was higher in workers although insignificantly. Workers can afford their medication more than their retired and unemployed counterparts. As such, cutting back on medication to save money may be unnecessary for them, whereas in retired and unemployed patients, cutting back may be viewed as a ‘life saver’.

What was evident in this study was that despite the positive perceptions of antihypertensive drugs due to awareness of the therapy, level of education did not improve compliance to a large extent. Primary and secondary levels of education were seen to positively correlate with compliance in comparison with no formal education, albeit insignificantly. The insignificant association was unexpected especially because a larger number of patients had some level of formal education; and education is generally known to have positive impact on patient understanding of health states and health education programmes so as to bring about relevant compliance. But this was not so in the study. Hypertension was generally described as "pressure of the blood", "excess blood" or elevation of blood pressure among patients; similar to descriptions gathered by the qualitative study carried out by Spencer et al (2005). Very few of the respondents had knowledge about the mechanism of the disease, and often symptoms like tiredness and headaches were used to describe the hypertension. Similarly, Knowledge about antihypertensive drugs was also minimal and centred on education given by health personnel. Patient reliance on medical advice goes to show how much influence health personnel have with regards to educating patients on health conditions and treatment therapies. Physicians and other health personnel must therefore take advantage of this and properly carry out educational programmes at their various health facilities to significantly improve compliance to the treatment therapies.

5.1 Limitations

1. The study was carried out at the Achimota Hospital, a government owned hospital and as such patients attending private hospitals were not included in the study.

2. Patient self reports of compliance behaviour can be misleading because patients who do not comply are less likely to report such behaviour and as such, non compliance can be under-reported in this study

3. Some respondents were not forthcoming with some information because they doubted the true purpose of the study despite our efforts at explaining the purposes for which the study was being conducted.

CHAPTER SIX

6.0 CONCLUSIONS

Poor compliance to antihypertensive therapy is an issue of public health concern. The aim of the study was to investigate patient perception of antihypertensive drugs and how it affects medication compliance. The level of compliance was found to be 32.7%, a prevalence that is very low in comparison with what several studies report. Socio-demographic and bio- demographic characteristics did not affect compliance and perception was found to have a significant relationship ($p < 0.05$) with compliance.

Overall, patients had a very positive perception of antihypertensive drugs as a standard of treatment for hypertension. Although perceptions were positive, challenges in the acquisition of drugs undermined compliance. The major challenges faced by patients were costs of drugs and long waiting times at hospitals, a common phenomenon in the delivery of health in Ghana. Inadequate patient knowledge of hypertension and antihypertensives also undermined the effect of perception on compliance.

6.1 Recommendations

Implication for Public Health and Policy

- Health promotion programmes at the hospitals must provide more information on hypertension and its treatment so as to improve patient knowledge and compliance.
- Health delivery in Ghana must be conducted more efficiently. Clinicians need to reduce time wasted at health facilities.
- There should be a national effort to reduce the financial burden of hypertensive patients by extending the NHIS to cover more of the antihypertensive drugs that are not currently under coverage.

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APPENDICES

Appendix 1 – Consent Form

Project Title: PATIENT PERCEPTION OF ANTIHYPERTENSIVE DRUGS AND COMPLIANCE AMONG PATIENTS ATTENDING ACHIMOTA HOSPITAL

Institution Affiliated: School of Public Health, University of Ghana, Legon Accra

Information collected

Information to be collected in this study include background characteristics e.g. Age, sex, level of education and medical history. Information on perceptions, attitudes and beliefs about antihypertensive drugs will also be collected.

All information collected will be used purely for academic purposes.

Right to refuse

Participating in the study is voluntary and you can choose not to answer any questions you feel uncomfortable with. You are at liberty to withdraw from the study at any time. Participation is encouraged since it allows for your opinion to be heard.

Confidentiality

Any information given will be respected and kept confidential. Information provided will be used purposely for the study.

If you have any questions, please contact the researcher for further clarification with respect to the study on **050-939-2484 (Lady Christabel Botchway)**

Or the Administrator for Ghana Health Services Ethical Review Committee on

050-704-1223 (Hannah Frimpong)

Before taking consent

Do you have any questions to ask me? If yes, note questions below

……

……

……

CONSENT:

I…….declare that the purpose, procedure and benefits of participating in this study have been thoroughly explained to me in a language I am comfortable with. I agree to participate in the study.

Interviewer statement

I……..verify that the purpose, procedures, risks and benefits of this study have been thoroughly explained to the satisfaction of the subject. The subject has willingly agreed participate in the study.

Signature of interviewer……

Appendix 2 – Illness Perception Questionnaire

Project Title: PATIENT PERCEPTION OF ANTIHYPERTENSIVE DRUGS AND COMPLIANCE AMONG PATIENTS ATTENDING ACHIMOTA HOSPITAL

PART A: Patient Bio-demographic data

RES ID:	
1. Age:	**2. Last BP check :**
3. Sex ○ Male [0] ○ Female (2)	**4. Number of Antihypertensive pills:**
5. Physical Activity ○ Never (1) ○ Once in a while (2) ○ Sometimes (3) ○ Usually (4) ○ All the time (5)	**6. Education** ○ None (1) ○ Primary (2) ○ Secondary (3) ○ Tertiary (4)
7. Religion ○ Christian (1) ○ Muslim (2) ○ Traditional (3) ○ Other (4)	**8. Marital Status** ○ Never (1) ○ Married (2) ○ Divorced (3) ○ Widowed (4)
9. Employment Status ○ Working (1) ○ Unemployed (2) ○ Retired (3)	**10. Length of Diagnosis (in years)**
11. Wealth Quintile ○ Low (1) ○ Second (2) ○ Middle (3) ○ High (4) ○ Highest (5)	**12. Dietary habbits** ○ Low sodium (1) ○ High Potassium (2) ○ No change (3)
13. Comorbidities ○ Cancer (1) ○ Heart disease (2) ○ Diabetes (3) ○ Stroke (4) ○ Chronic Kidney disease (5)	

PART B: Patient illness Perceptions

Please circle the number which best corresponds to your views.

Component		**1 = Strongly agree** **5 = Strongly disagree**
1. Identity	I feel better when I take Antihypertensive drugs.	1…2…3…4…5…
2. Consequence	Antihypertensive drugs will improve my life.	1…2…3…4…5…
3. Cure-control	Antihypertensive drugs will control my blood pressure	1…2…3…4…5…
4. Self-efficacy	I have control over my illness	1…2…3…4…5…
		Score:

Appendix 3 – Morisky 8-item Medication Adherence Questionnaire

Project Title: PATIENT PERCEPTION OF ANTIHYPERTENSIVE DRUGS AND COMPLIANCE AMONG PATIENTS ATTENDING ACHIMOTA HOSPITAL

QUESTIONNAIRE

Question	**Patient Answer (Yes/No)**	**Score (Y=1, N=0)**
1. Do you sometimes forget to take your medicine?		
2. People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medicine?		
3. Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?		
4. When you travel or leave home, do you sometimes forget to bring along your medicine?		
5. Did you take all your medicines yesterday?		
6. When you feel like your symptoms are under control, do you sometimes stop taking your medicine?		
7. Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
8. How often do you have difficulty remembering to take all your medicine? (A = 0 B-E = 1)	A. Never/rarely B. Once in a while C. Sometimes D. Usually E. All the time	
Scores: >2 = low adherence 1 or 2 = medium adherence 0 = high adherence		

Appendix 4 – In-depth Interview guide.

Project Title: PATIENT PERCEPTION OF ANTIHYPERTENSIVE DRUGS AND COMPLIANCE AMONG PATIENTS ATTENDING ACHIMOTA HOSPITAL

Respondent ID:	
Age:	Highest level of education:

1. What is Hypertension?
2. What do you think has caused your hypertension?
3. Do you think hypertension can be cured?
4. What do you know about antihypertensive drugs?
5. Do you believe in the treatment for your condition?
6. How often do you take your antihypertensive drugs and why?
7. Do you sometimes not take your medicine for reasons other than forgetting? Please elaborate?
8. Do Antihypertensive drugs make you feel worse? (Probe)
9. Do you consort to other traditional methods for BP control?
10. How would you compare the traditional and modern methods of BP control?
11. Do you have any challenges with respect to acquiring antihypertensive drugs?
12. Do you have any cultural beliefs about your condition that drives your attitude towards these drugs?
13. Is there anything else you want to add?

Appendix 5: Ethical Approval

GHANA HEALTH SERVICE ETHICAL REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

My Ref. :GHS-ERC: 3
Your Ref. No.

Research & Development Division
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2nd July, 2014

Lady Christabel Botchway,
School of Public Health
University of Ghana
Legon

ETHICAL APPROVAL - ID NO: GHS-ERC 07/04/14

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol titled:

"Patient Perception of Anti-Hypertensive Drugs and Compliance Among Patients Attending"

This approval requires that you inform the Ethical Review Committee (ERC) when the study begins and provide Mid-term reports of the study to the Ethical Review Committee (ERC) for continuous review. The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Please note that any modification without ERC approval is rendered invalid.

You are also required to report all serious adverse events related to this study to the ERC within seven days verbally and fourteen days in writing.

You are requested to submit a final report on the study to assure the ERC that the project was implemented as per approved protocol. You are also to inform the ERC and your sponsor before any publication of the research findings.

Please always quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC VICE-CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra