SCHOOL OF PUBLIC HEALTH,
COLLEGE OF HEALTH SCIENCES,
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USE OF HERBAL MEDICINE AMONG HYPERTENSIVE PATIENTS IN THE GA EAST DISTRICT, GREATER ACCRA.

By

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CANDIDATES DECLARATION

I, Afua Animwaa Asante, declares, that except for other people's investigation which have been duly acknowledged, this work is the result of my own original research and that this dissertation, either in whole or part has not been presented elsewhere for another degree.

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Supervisor's Name: Dr. Phillip Baba Adongo

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Abstract

Hypertension is a growing public health problem in Ghana and Africa as a whole. In recent times hypertensive patients have resorted to the use of herbal medicine. The objective of this study is to investigate the use of herbal medicine among hypertensive patients in Ga East district. This study assessed the extent of use, factors associated with the use of herbal medicine, and the type of herbal medicines being used among hypertensive patients in Ga East district.

This was a cross-sectional study carried out at two hypertension clinics of the Ga East district. Two hundred and three participants were randomly selected from May 2012 to June 2012. Data was collected using an interview-administered structured questionnaire.

From the study the prevalence of herbal medicine use was 66%. The most common herbal medicines the respondents used were dandelion, moringa, bitter leaves, garlic, dawadawa, soboro, prekese and other herbal concoctions. Patients who believed that hypertension can lead to complications were more likely to use herbal medicine (OR=3.80, 95% CI 1.66-8.70).Those who had information from relatives and friends were also likely to use herbal medicine (OR= 3.00 95% CI 1.56-5.76). The belief that hypertension can be cured was also a risk factor for the use of herbal medicine (OR= 2.70 95% CI 1.32-5.49) as well as the level of hypertension (OR= 1.68 95% CI 1.15-2.47).

Dandelion and moringa are the most used herbs. The study concludes that perception about severity (knowledge about the complications of hypertension and level of HPT), perception of susceptibility (belief that hypertension is curable), perception of benefits and cost (Control of blood pressure), and cues for action (Information from relatives) can help predict whether a hypertensive patient will take herbal medicine or not.

Dedication

I dedicate this work to my husband Franklin, my children Maame Yaa, Asantewaa, Konadu and Kusiwaa.

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Last but not the least, I will like to thank my husband for his support and encouragement throughout the entire duration of the Master's programme.

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List of Abbreviations

1. CAM - Complementary alternate medicine
2. BP - Blood pressure
3. OM - Orthodox medicine
4. NHP - Natural health products
5. HM - Herbal medicine
6. HPT - Hypertension
7. HBM - Health belief model
8. WHO - World Health Organization
9. NHIS - National health insurance scheme

Definition of Terms

1. Herbal Medicine - Herbal medicines include herbs, herbal materials, herbal preparations and finished herbal products that contain as active ingredients parts of plants, or other plant materials, or combinations. They are used to treat disease and help maintain good health (WHO 2002-2005).

2. Abnormally high arterial blood pressure that is usually indicated by an adult systolic blood pressure of 140 mm Hg or greater or a diastolic blood pressure of 90 mm Hg or greater, is chiefly of unknown cause but may be attributable to a preexisting condition (Merriam-webster2012).

3. Use of herbal medicine- A respondent who uses herbal medicine alone or together with the prescribed hypertensive drugs or stopping the prescribed drugs for a while and using the herbal drugs.

4. Complementary and Alternative Medicine (CAM) is the term for medical products and practices that are not part of standard care. Complementary medicine means nonstandard treatments that you use along with standard ones. Examples of CAM therapies are acupuncture, chiropractic and herbal medicines (NCCAM 2011).
5. Standard care is what medical doctors, doctors of osteopathy and allied health professionals, such as registered nurses and physical therapists, practice.
6. Alternative medicine means treatment that are used instead of standard ones.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Globally, nearly one billion people have hypertension. Two-thirds of these are in developing countries. It is one of the most important causes of premature death worldwide and the problem is still growing (Cooper et al., 2003). Hypertension is one of the leading causes of disability and death, due to stroke, heart attack and kidney failure in the United States (Khosh and Khosh, 2001).

Ghana has a 28.7% prevalence of hypertension. (Cappuccio et al., 2004). The number of reported new cases of hypertension in outpatient public health facilities in Ghana increased more than ten-fold from 49,087 in 1988 to 505,180 in 2007 (Centre for Health Information Management: Ghana Health Service; 2008). Over the same period, hypertension relative to the total reported outpatient diseases increased from 1.7% to 4.0% in all ages. In most regions, hypertension ranks as the fifth highest cause of outpatient morbidity (Centre for Health Information Management: Ghana Health Service; 2008).

Globally the control of blood pressure is a challenge as only 20% of hypertensive patients in the USA have blood pressure control and about 5% of hypertensive patients in Africa (Seedat, 2000). There are social, economic, and cultural factors which impair the control of hypertension in developing countries (Seedat, 2000).

There are a lot of outlets where hypertensive patients go for treatment apart from the clinics. Hypertensive patients also do self treatment using herbal medicine prescribed by

friends. Unfortunately much is not known about the range of herbal medicine and their effects on the control of blood pressure. Herbal medicines include herbs, herbal materials, herbal preparations, and finished herbal products that contain parts of plants or other plant materials as active ingredients. Since the beginning of civilization herbs have always been with us, and have been used since then for medical treatments. Many herbal medicine used today have not gone through any scientific assessment (Firenzuoli and Gori, 2007). Some herbal medicines have the ability to cause drug to drug interactions and also cause serious side effects (Mashour et al., 1998).

Majority of herbal medicine users use herbal medicine not because they are dissatisfied with conventional medicine rather they largely do so because they find these health alternatives to be more congruent with their own beliefs, values and philosophical orientation towards health and life (Astin, 1998).

Many people believe that because herbal medicines are natural or traditional, they are safe (or carry no risk for harm). Increased patient awareness about safe usage is important, as well as more training, collaboration and communication among providers of traditional and other medicines (WHO, 2008).

Certain herbal remedies have blood pressure-lowering components that may well be effective in treating hypertension and another major problem with most herbal treatments is that their contents are not standardized.

At the WHO Congress on Traditional Medicine, Dr Margaret Chan, Director-General of the World Health Organization, stated that in the views of some commentators the rise of alternative medicine is a quest for more compassionate, personalized, and comprehensive

health care. Indigenous cultures such as the African and Native American used herbs in the healing and prevention of diseases (WHO 2008)

1.2 Problem Statement

According to the Ghana Health Service, 70 percent of all deaths at the Korle Bu Teaching hospital are caused by hypertensive conditions and hypertension affects nearly one out of every five Ghanaian adults. Many have it for years without realizing it. It silently damages the brain, the heart, the kidneys and the eyes. From the Ghana Health Service data it is the second most reported medical condition in the Greater Accra Region for 2007, in 2006 it was the fifth.

In the Ga East district hypertension has been the third disease among the top ten diseases for three years continuously, from 2008 to 2011. It was the fifth in disease in 2007. As a result of the lack of public health facilities in the district, they rely on the private sector for health care. Health care at the private facilities are more expensive. The numbers of hypertensive patients in the District, like the rest of Ghana, is on the increase. There are a few health facilities in the districts to attend to them. The patients therefore fall on herbal medicine that is easily accessible and affordable.

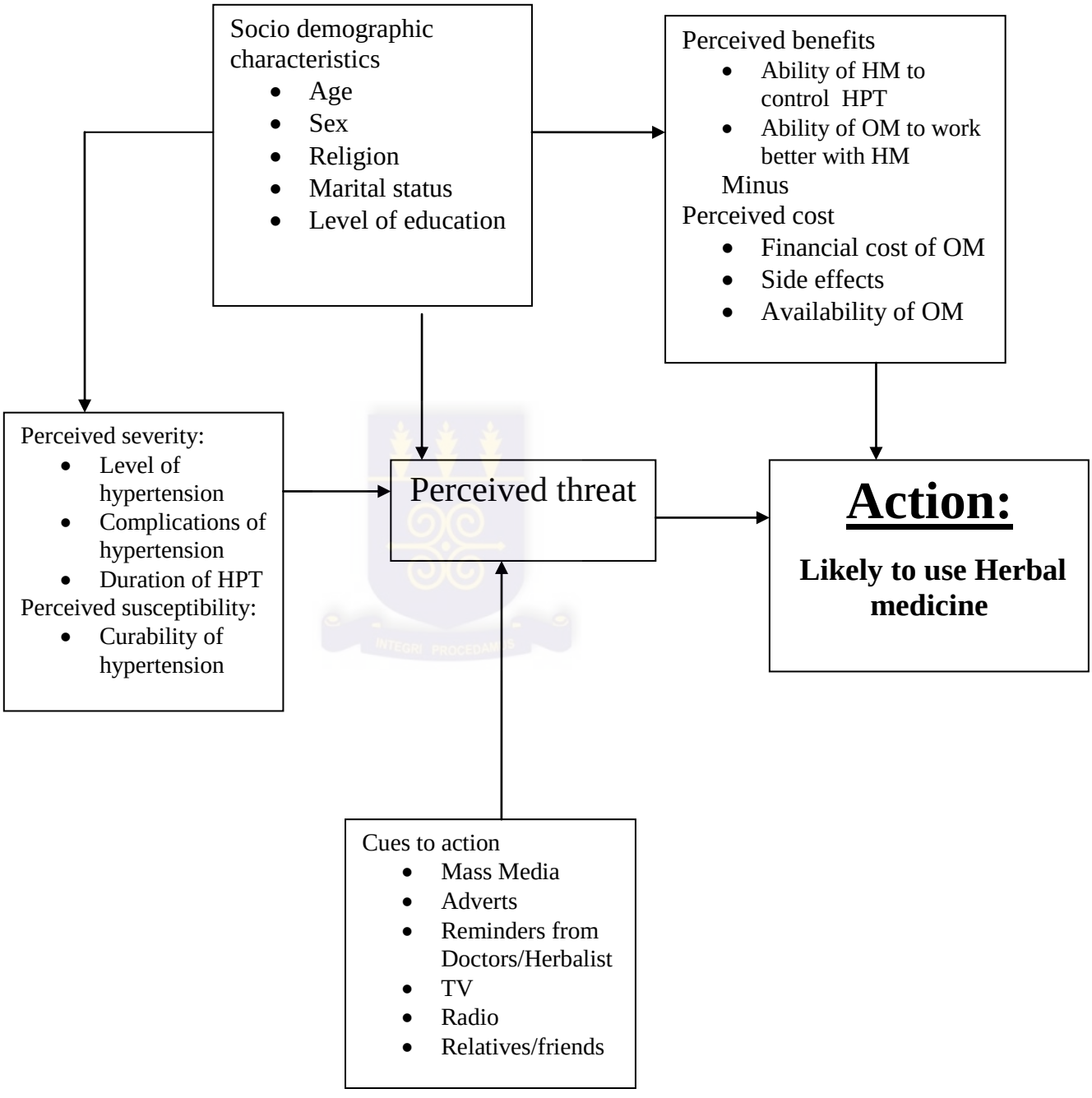
This leads to non-adherence to their hypertensive drugs and drug interactions. This finally results in poor blood pressure control, which eventually leads to complications.

Non- adherence to drugs and non- hospital attendance seemed to be the reasons of the lack of control of blood pressure amongst hypertensive patients. This finally affects the

ability to control the blood pressure of patients, predisposing them to complications of hypertension. Hypertensive patients also do not take their prescribed medicines alone but take them together with herbal medicine. The patients tend to be inconsistent in taking their prescribed drugs which results in uncontrolled blood pressures. This further predisposes the patient to complications of hypertension, eventually increasing morbidity and mortality.

Also all medicines have the potential for side effects; therefore, it is obvious that incidence of adverse drug reaction and interactions are increased with the more medicines one uses. Patients use herbal medicines and their orthodox medicine concurrently. Clinicians therefore must enquire about their patients' use of herbal medicine, since knowledge of concurrent use can help identify patients at risk for potential interactions. There is therefore the need to find the prevalence of herbal medicine use among hypertensive patients, the type of herbal medicine they use and the factors associated with herbal medicine use.

1.3 Conceptual Framework



The health belief model is a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals. The health belief model was developed in the 1950s as part of an effort by social psychologists in the United States Public Health Service to explain the lack of public participation in health screening and prevention programs (Glanz et al., 1997). Since then, it has been adapted to explore a variety of long- and short-term health behaviors. According to the model, the likelihood that someone will take herbal medicine depends upon the individual's perception that: they are personally vulnerable to the condition; the consequences of the condition would be serious; the precautionary behavior effectively prevents the condition; and the benefits of reducing the threat of the condition exceed the costs of taking action.; cues to action and self efficacy are the six constructs of the model (Glanz et al., 1997).

The study used five of the six constructs to find out the factors that influence herbal medicine use. They are perceived susceptibility, perceived severity, cost, effectiveness of herbal medicine and cues to use herbal medicine.

The likelihood that the hypertensive patients will take any drug to control the blood pressure depends on how much they believe they are vulnerable to the disease or how they accept that they have the disease; and their belief that it is curable. A hypertensive patient is more likely to take action to manage or control his or her blood pressure if she or he believes that possible negative physical, psychological, and/or social effects resulting from not controlling their blood pressure, pose serious consequences (e.g.,

reduced independence, pain, suffering, disability, or even death). The combination of perceived susceptibility and perceived severity constitute a threat to the patient.

Motivation to take action to change a behavior requires the belief that the precautionary behavior effectively prevents the condition. If the hypertensive patient is not convinced that there is a causal relationship between taking of orthodox medicine or herbal medicine and control of blood pressure, he or she will not take any form of drug.

The combination of perceived effectiveness and perceived costs constitute the notion of outcome expectation. Belief alone is not enough to motivate an individual to act. Benefits of taking herbal medicine have to outweigh the costs (side effects, financial cost) involved. The hypertensive patients weigh between the side effects and the cost of the herbal medicine or the orthodox medicine and the control of blood pressure to decide to take either herbal medicine or orthodox medicine.

External cues such as a relative having hypertension or the death of a parent may also trigger health behavior changes in an individual who was not otherwise considering taking herbal medicine. Adverts, information from the media, advice from relatives are also cues that will influence the use of herbal medicine. Mediating factors such as socio demographic characteristics have also been explored in applying the health believe model. They indirectly affect behavior by influencing an individual's perceptions of susceptibility, severity, benefits, and barriers.

This study therefore sought to find out whether the likelihood that someone will take herbal medicine depends upon the individual's perception that, they are personally vulnerable to the complications of hypertension and the consequences of the condition would be serious.

It also looked at the ability of herbal medicine helps to control hypertension and prevents complications as perceived benefits. A questionnaire was developed to measure the participants' perception on the complications of hypertension and whether hypertension can either be controlled or cured. The study also sought to investigate whether herbal medicine's ability to control hypertension exceeds the associated side effects. A questionnaire was used to measure the perception of the effectiveness of herbal medicine. It also looked at whether the participants were aware that herbal medicine had side effects.

These four factors, which are influenced by mediating variables, indirectly influence the probability of using herbal medicine. The mediating factors that were looked at in the study were advertisement on the use of herbal medicine, advice from friends and relatives and information from the radio and the television

1.4 Justification

Hypertension is a major risk factor for heart failure, renal failure, blindness, and stroke. The control of blood pressure is important in the management of hypertension. Therefore there should be knowledge as to the types of herbal medicine used for the treatment of

hypertension in Ghana. There should also be knowledge about the perceptions of patients who use herbal medicine regarding its efficacy. Physicians must therefore improve their knowledge and attitude about herbal medicine. This will enable them be more effective in educating patients on the use of herbal medicine. Physicians also need to have the knowledge about herbal medicine to help them manage patients.

The study will also help in knowing the types of herbs being used by hypertensive patients and will foster more research in this area. Studies have been done in other countries especially in the USA on the use of herbal medicine in the management of chronic diseases (Gardiner et al., 2007, Namuddu et al., 2011). Other studies have also been done on herbal medicine and cardiovascular diseases. In Africa studies have been done in South Africa, Nigeria and North Africa on the use of herbal medicine on cardiovascular diseases and hypertension (Seedat, 1996, Osamor and Owumi, 2010, Eddouks et al., 2002). Most of the studies done have been done on CAM of which herbal medicine is a type. In Ghana most studies are done on the use of herbal medicine among patients having other diseases like malaria and HIV (Kohler et al., 2002, Asase et al., 2010). Not much has been done on the use of herbal medicine among hypertensive patients. This study will therefore provide data on the prevalence of herbal medicine use, the types of herbal medicine used and the factors that are associated with herbal medicine use.

1.5 Objectives

1.5.1 Research Questions

1. What is the prevalence of herbal medicine use among hypertensive patients?

2. What are the factors associated with the use of herbal medicines among hypertensive patients?

3. What are the types of herbal medicines that are usually taken?

1.5.2 General Objectives

To investigate the use of herbal medicine among hypertensive patients.

1.5.3 Specific Objectives

1. To document the types of herbal medicines used by the hypertensive patients.

2. To identify factors that are associated with the use of Herbal Medicine among hypertensive patients

3. To determine the prevalence of the use of Herbal Medicine among hypertensive patients.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Burden of Hypertension

Non-communicable diseases already contribute substantially to the burden of disease in sub-Saharan Africa and also there is little doubt that for the next 10–20 years non-communicable diseases will continue to be a problem in sub-Saharan Africa (Osamor and Owumi, 2010). The prevalence of hypertension in various African communities has varied widely but has generally been higher in urban than in rural communities, with a few exceptions.

In Ghana some population-based studies on hypertension have been carried out. In a recent study of two urban communities and one rural community, the hypertension prevalence was 28.4% (Addo et al., 2006). Amoah (2003) also did a study to determine the prevalence of hypertension, and the extent to which it is treated and controlled. The study was done among 6300 adult Ghanaians, aged 25 years and older. The crude prevalence of hypertension was 28.3%. Of the 1337 subjects with hypertension, 34% were aware of their condition, 18% were treated, and 4% had it controlled. Another study done in 6 villages and 6 cities in the Ashanti region by Cappuccio et al., (2004) also showed an overall prevalence of hypertension of 28.7%. These values are much higher than the 14.5% found in Nigeria and 16.9% in Cameroon, but lower than the value of 32.6% for blacks in the United States (Cooper et al., 1997).

In the Cooper study, hypertension was more common in the semi-urban areas compared with the rural areas. Other studies also shows show a consistent increase prevalence rates with age in men and women in both rural and semi-urban villages.(Cappuccio et al., 2004).

Data used from different regions of the world to estimate the overall prevalence, absolute burden of hypertension in 2000 concluded that more than a quarter of the world's adult population totaling nearly one billion had hypertension in 2000, and that this proportion will increase to about 1.5 billion by 2025 (Kearney et al., 2005).

In 2000, the number of people estimated to be living with hypertension was 972 million, with 333 million living in economically developed countries, and the remaining 639 million in economically developing countries (Kearney et al., 2005). In West Africa hypertension is common and is regarded as a major public health issue. There is a high prevalence of hypertension, even in rural areas, but with worrisome low rates of detection, treatment, and control (Cappuccio et al., 2004).

2.2 Complications Associated with Hypertension

There is the need for hypertension control programs aimed at improving the detection of hypertension, and importantly addressing the issues inhibiting the effective treatment and control of people with hypertension in the population (Addo et al., 2009). The adverse effects of hypertension, affect the blood vessels, retina, nervous system, the heart and the kidney (Ike, 2009).

Amoah et al., (2003) did a study to determine the prevalence of hypertension, and the extent to which it is treated and controlled among adult Ghanaians. The study found out that hypertension is a major public health problem, and is associated with relatively low levels of awareness, drug treatment, and blood pressure control. Cardiovascular and renal diseases which are complications of hypertension are important contributors to morbidity and mortality among acute medical admissions to large city hospitals in Ghana (Plange-Rhule et al., 1999).

Among out-patient hypertensive patients, renal disease is an important complication, especially in those with the more severe hypertension (Plange-Rhule et al., 1999). This finding is also similar to a study done in Nigeria which sought to define the morbidity and mortality pattern of hypertension at the University of Port Harcourt teaching Hospital. The study, which was done by reviewing secondary data, indicated that stroke was responsible for 39.9% hypertensive complications, heart failure occurred in 22% cases, while renal failure and encephalopathy accounted for 9.4% and 1.7% hypertensive complications respectively (Onwuchekwa and Chinenye, 2010).

2.3 Herbal Medicine Use

Herbs have always been with us, since the beginning of civilization, and have been used for several medical treatments (Mashour et al., 1998). Initially the knowledge of herbal medicine and its use was disseminated through generations by word of mouth. Now some countries are adding acquisition of herbal knowledge through academic qualification.

Formal training is taking place at universities. Approximately 75 percent of the Ghanaian population depends on traditional medicine for primary health care (Abel and Busia, 2005).

In the last three decades, a lot of concerted efforts have been channeled into the research of local plants with hypertensive and antihypertensive therapeutic values. There has been an increasing use of CAM of which herbal medicine is part of. In Africa up to 80% of the population use traditional medicine, 40% in China, 48% Australia , 70% Canada, 42% USA , 38% Belgium and 75% in France (WHO 2002-2005). There was a study in India to find out the prevalence and pattern of use of CAM in patients with essential hypertension. They interviewed 521 consecutive patients visiting the hypertension clinic at the Postgraduate Institute of Medical Education and Research, Chandigarh, India, over a 6-month period. This study found out that 63.9% of patients used CAM. Ayurveda was the most commonly used CAM (56.7%), followed by herbal medicines 14.4% (Shafiq et al., 2003).

The use of CAM of which herbal medicine forms part has a long history. Unfortunately it has been relegated to the background due to the evolution of modern medicine. However Herbal Medicine therapy has been growing in popularity in recent times. It is also getting increasing attention and interest.

2.4 Efficacy and Safety of Herbal Medicine

In many countries herbal medicines are minimally regulated (Fong, 2002**).** Many hypertensive patients that take herbal medicine are ignorant of their effects, both negative and positive. Clinicians do not enquire from their patients whether they use herbal medicines or not. They therefore do not take into account the possibility of drug-herb interaction.

Though several specific herbal extracts have been demonstrated to be efficacious for specific conditions, herbal medicine needs to be tested for efficacy using conventional clinical trials and methodology. The public is often misled to believe that all natural treatments are inherently safe. However herbal medicine does carry some risks (Firenzuoli and Gori, 2007).These include the possibility of drug-herb interaction as indicated above, plus the multiplicity of names under which each bioactive substance is sold.

Herbal medicine may also cause indirect harm such as potential delays in conventional treatment which compromises treatment outcomes, quality of life and eventually survival (MacLennan et al., 2002). It has been found that Natural Health Product (NHP) use is common in patients admitted with acute cardiovascular diseases (Alherbish et al., 2011). Mansoor (2001) states that alternative medicine of which herbal medicine is an example, may cause significant interactions or effects on hypertension and needs to be considered by clinicians. Several problems hinder our complete awareness of these effects, one of them being patients not informing physicians about their use of alternative treatment or

herbal medicine use. Furthermore herbal medicines, including Ma huang, St. John's Wort, Yohimbine, Garlic, and Licorice all may cause important consequences in the hypertensive patients (Mansoor, 2001). Some hypertensive patients replace their hypertensive drugs with other herbs. These herbs may not do what they are supposed to do. An example is Garlic. Garlic is a common form of herb taken by hypertensive patients. Trials suggest possible small short-term benefits of garlic on some lipid and anti-platelet factors, insignificant effects on blood pressure, and no effect on glucose levels (Ackermann et al., 2001).

Also some herbal remedies like Ephedra, Licorice, and Ginseng, St. Johns Wort and Ginger that are used by many patients, can significantly elevate blood pressure or cause interactions with cardiovascular drugs (Vora and Mansoor, 2005). Herbal medicine may also be contaminated at various points of production. They may be contaminated with pesticides, heavy metals, bacteria, and other pharmaceutical agents (Cohen and Ernst, 2010). Patients that use herbal supplements to treat chronic cardiovascular conditions often combine herbal ingredients with cardiovascular medications. Although often considered harmless by patients, herbal supplements may cause adverse cardiovascular effects from an herbal ingredient, a contaminant, or an herb–drug interaction (Cohen and Ernst, 2010). Some of these herbal ingredients have been linked to adverse cardiovascular events. In addition to listed ingredients, herbal supplements may become contaminated at a number of stages during production (Cohen and Ernst, 2010).

2.5 Social and Cultural Aspects of the Use of Herbal Medicine

Knowledge of herbal medicine has developed over the years. This information has been handed down by word of mouth and a form of practical training. It does not separate the physical world from the supernatural world and it is deeply rooted in traditional religion (Amira and Okubadejo, 2007b).

Health seeking behavior of hypertensive patients is complex. There are many sources of help outside the orthodox health system. Studies have shown that the use of a particular health care is based on the availability, affordability, social structures, beliefs and the personal characteristics of the user (Eddouks et al., 2002). Even though patients are aware of orthodox medicines, they prefer to use herbal medicine because they believe it is accessible, acceptable to them and cheaper than orthodox medicine (Bamidele et al., 2009). A patient's inability to pay for the utilization of the formal health care system can also lead to the use of herbal medicine. The decision to use herbal medicine is often influenced by perception of their effectiveness and the availability of affordable medicine (Osamor and Owumi, 2010). Gender, marital status, occupation, sex, belief in supernatural causes of hypertension, lack of belief that hypertension is preventable and having a family history of hypertension are all associated with the use of CAM (Osamor and Owumi, 2010).

Common herbal medicines used in Ashanti region (Ghana) to treat hypertension are Prekese (*Tetrapleura tetraptera*), nyamedua (*Alsotonia boonei*), bontodee (*Anthocleista nobilis*), kuntan (*Uapaca guineensis*), garlic (*Allium sativum*), hawthorne (*Crantaegus*

oxycantha) and dandelion (*Taraxacum officinalis*) (Abel and Busia, 2005). Clement et al., (2007), also found out in their study that garlic was the most popular herb used; it was also used in 20% of hypertension patients (Clement et al., 2007). Some of the most common herbal products used in a study done in Lagos were garlic, native herbs, ginger, bitter leaf (*Vernonia amygdalina*), and aloe vera (Amira and Okubadejo, 2007b).

A study done in Nigeria among pregnant women, found out that reasons for taking herbal medications were varied and included reasons such as herbs being natural, safer to use, low efficacy of conventional medicines, easier access to herbal medicines, traditional, cultural belief in herbal medicines and low cost of herbal medicines (Fakeye et al., 2009). Marital status, geopolitical zones, and educational level also have significant effects on views on side effects of herbal medicines (Fakeye et al., 2009).

Education sometimes plays a role in the use of herbal medicine. Patients who have attained primary and secondary education prefer herbal medicine to orthodox medicine. Those who are more educated (attained tertiary level of education) more often preferred Western medicine to herbal medicine (Galabuzi et al., 2010). Poor pharmacy service and unavailability of conventional medicines are also some of the reasons that patients resort to herbal medicine (Singh et al., 2004). Herbal medicine users find these herbal medicine to be more congruent with their own beliefs, values and philosophical orientation towards health and life (Astin, 1998).

Herbal medicines may be beneficial but not completely harmless. Some patients may resort to herbal medicine, presumably with no side effect (Shafiq et al., 2003). Herbal medicine is also considered as natural but some side effect that are acknowledged are vomiting, headache, dizziness, malaise, rashes, and diarrhea (Galabuzi et al., 2010).

The lack of knowledge of potential harms of herbal medicines has encouraged this practice. Also safety of herbal medicines, are erroneously attributed to their natural sources (Oreagba et al., 2011). Some patients who use herbal medicine are aware of side effects from herbal medicine and these include diarrhea, abdominal pain and vomiting (Bamidele et al., 2009). Some patients stop their orthodox, antihypertensive drugs due to their side effects such as erectile dysfunction in men.

Even though hypertension is common in Ghana it is disturbing to acknowledge that hypertension detection, treatment and control is low (Cappuccio et al., 2004). The success of attaining a good blood pressure control is a good compliance to antihypertensive drugs. Poor medication-taking behavior has been identified as a major problem among hypertensive, these results in failure to achieve adequate control of blood pressure. They are therefore at risk of complications like stroke, heart failure, and kidney failure. It results in premature death, hospital admissions and reduced productivity (Burnier, 2006). Treatment with appropriate medication is a key factor in the control of hypertension and reduction in associated risk of complications. Osamor and Owumi et al., (2011), did a study to investigate the factors associated with self-reported compliance among hypertensive subjects in a poor urban community in southwest Nigeria. The study

revealed that almost half of the respondents reported high compliance with treatment with drugs. Eighty six percent of the respondents also claimed high compliance with keeping their appointments with doctors. Reasons given for compliance with treatment include fear of the complications of hypertension and the desire to control blood pressure. Non compliance to the taking of antihypertensive drugs and hospital appointment affects the control of blood pressure (Burnier, 2006).

Singh et al., (2004), discussed in their study that patients considered herbal medicine to be more effective. They preferred to take herbal medicine together with orthodox medicines. This was different from the study done by Fakeye et al., (2009), which found out that patients preferred not to take herbal medicine and orthodox medicines at the same time. Clement et al., (2007) concluded that concomitant use of herbs and allopathic medicines was relatively high and most users did not inform their attending physician. This was also observed in a study done in Lagos University Teaching hospital to find out the frequency and pattern of use of complementary and alternative medicine (CAM) in patients with essential hypertension. The compliance rate to conventional anti-hypertensive drugs was similar among patients who used CAM and those who did not, thus indicating that most patients used alternative therapies along with their orthodox medications (Amira and Okubadejo, 2007b).

The prevalence of herbal medicine use varies from place to place. In Africa up to 80% of the population use traditional medicine, 40% in China, 48% in Australia , 70% in Canada, 42% in USA , 38% in Belgium, and 75% in France (WHO 2002-2005).

This study sought to look at the prevalence of herbal medicine use in Ga East district. With the knowledge from other studies showing that herbal supplements may cause adverse cardiovascular effects from an herbal ingredient, a contaminant, or an herb–drug interaction (Cohen and Ernst, 2010), this study sought out to find out whether the participants were aware of the complications of hypertension, the adverse effects of herbal medicine, and their perception of the effectiveness of herbal medicine.

The study also looked at the influence of socio-cultural factors on the use of herbal medicine and related it to other studies. With hypertensive patients taking both herbal medicine and orthodox medicine together as documented in the study done by Clement et al., (2007), this study also looked at the pattern of herbal medicine use in the Ga East district.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

The Ga East Municipal Assembly is located at the northern part of Greater Accra Region. It is one of the ten (10) Districts in the Greater Accra Region and covers a Land Area of 166 sq km. The capital of the Municipal Assembly is Abokobi. The Assembly is boarded on the west by the Ga West Municipal Assembly (GWMA), on the east by the Adentan Municipal Assembly (AdMA), the south by Accra Metropolitan Assembly (AMA) and the north by the Akwapim South District Assembly. The Municipality falls in the savannah agro-ecological zone. Rainfall pattern is bi-modal with the average annual temperature ranging between 25.1^{oc} in August and 28.4^{oc} in February and March. February and March are normally the hottest months.

The 2000 National Population and Housing Census put the Municipal Assembly's population at 201,542 with a growth rate of about 2.3%. The projected population for the year 2008 is therefore 241,752.

The Ga East Municipal Assembly is a district that wears a cosmopolitan hat. Almost all the ethnic groups in Ghana exist in the district although Akans seem to have a slight majority over Gas and Ewes in that order. Others are Dangbes and the Gurs. In the rural and peri-urban communities like Abokobi, Oyarifa and Danfa however, Gas form an

overwhelming majority though other ethnic groups continue to reside amongst them. Though the Municipality has a strong Islamic presence especially in and around Madina, Christianity remains the most dominant form of religion for the people of the district. Pockets of people however maintain they are traditionalists and Krishnas, whilst others profess no religion at all. The urban/peri-urban population constitutes 82% of the Municipality's total population.

The district has a total of thirty six health facilities, both public and private with public facilities constituting only 12 %(i.e. 4), the remaining 88 %(i.e. 32) being private. All the public health facilities provide only out-patient services. More serious cases are referred to hospitals outside the district therefore information on mortality is not available. Deaths, which occur in the communities, go unreported. There are two hypertension clinics run by the two polyclinic in the district. They are the Madina poly clinic kekele and Madina poly clinic Rawlings circle.

The Municipal Health Management Team is responsible for health service delivery in the Municipality. The Municipality is divided into four sub-districts for the organization of primary health care services namely; Madina, Danfa, Dome and Taifa. A sub-municipal health management team, which comprises health workers and community members is responsible for the delivery of health services to defined areas and population, and has at least a health center with either one or two community clinics. Curative and preventive health services are provided at these facilities and outreach points.

There two hypertension clinics run by the two main public health facilities in the district.

Twenty (20) trained traditional birth attendants are present in the various communities. Other health care providers such as traditional healers, drug sellers and maternity homes are in operation in the district. The doctor to population and nurse to population ratios are given as 40,246:1and 2,012: 1.

The ten top diseases are Malaria, Acute Respiratory Infection, Hypertension, Skin diseases, Diarrhea, Anemia, Gynecological diseases, Rheumatism, Urinary Tract Infection, Eye Infection, in descending order.

Potable water supply in the urban/peri-urban areas of the municipality has been a major challenge to the Assembly, especially when the Assembly has no direct control over urban water supply. People living areas like Madina, Dome, Taifa, Agbogba, Adenta West and Ashongman Musuko have limited or no access to pipe-borne water. Others depend on tanker services and a few hand dug wells. In general therefore, the price of water is fairly high in these urban communities. The rate of waste generation and management in the municipality is a matter of concern to the Assembly. With the increasing influx of people and the rapid urbanization, huge amounts of human and industrial waste are generated at an alarming rate.

Access to adequate housing is an important ingredient in the Municipal Assembly's efforts to improve the livelihood and environmental sanitation of the people living in the

District. This has resulted in the development of slums in areas like Madina and Adenta West.

3.3 Type of Study

A cross-sectional survey was conducted among 203 hypertensive patients at two hypertensive clinics at Ga East district.

3.4 Sample Size Estimation

The minimum sample size was determined by using the statistical formula of Fisher (Araoye, 2003)

$[Z_{(1-\alpha)}^2 - p\ (1-p)] / d^2$

With the following considerations:

- $Z_{(1-\alpha)}$ =1.96
- P(1-p) using the worst scenario of 50% prevalence = 0.5(1-0.5)=0.25
- d for 5% margin of error = 0.05
- Total population of the target population N=400
- Sample size n =$[(1.96^2)*0.25)]/0.05^2$=384.2=385
- Modified sample size of finite study population. The formula is N_f = nN / n + (N-1)
- Where N_f is the corrected sample size using finite population factor

- n=uncorrected sample size, and N is the study population
- A total of 100 patients visit both clinics a week (60 patients at Madina Poly Clinic Kekele and 40 patients at Madina polyclinic Rawlings Circle). Each patient visits the clinic once months. Target population therefore will be = 100*4=400
- Modified sample size of finite study population.

  The formula is $N_f = nN / n + (N-1)$

n_f=nN/n+(N-1)=400*385/385+(520-1)=133749.1/733.37 =184.55=185

Allowing for 10% non-response, the final sample size =185*1.1=203=203

The sample size therefore was 203.

3.5 Sampling

The target population was hypertensive's that attend the two polyclinics in the district. There are two hypertensive clinics in the district. Purposive sampling was used to select the two clinics that run the hypertension clinics in the Municipality. In the clinical setting it is easier to get access to a group of hypertensive patients who have already been diagnosed. This is why purposive sampling was used to select the two polyclinics.

The inclusion criteria were patients who have been diagnosed with hypertension and have been attending hypertension clinic for at least six months. The patient should not have any other chronic disease. The hypertension patients that attend the clinic were used as the sample frame. Madina poly clinic Kekele attends to averagely 60 hypertensive patients who do not have any other chronic disease like diabetes per day and the second facility Madina poly clinic Rawlings Circle also attends to 40 of such patients per day.

Each facility has hypertension clinics weekly. Madina Polyclinic Kekekle does its hypertension clinic every Thursday and Madina polyclinic Rawlings Circle does its clinic on Fridays. The data collection lasted for four weeks. There were therefore eight days in collecting the data. For the four weeks, the total number of hypertensive patients out of which the sample was taken from, was 400. This was therefore the sample frame. From this sample frame the sample of 203 was selected by using systematic random technique to select the sample size.

The sample size calculated was 203 and the study population was 400. Four hundred patients was divided by 203 to get the interval for choosing the patients. This gives an average of 2. The first patient in the queue for each of the two consulting rooms, were included in the study. Then every other patient was then included. The patients that didn't fall into the inclusion criteria were excluded and the next patient was taken if he or she qualifies. The essence of the research was explained to the patients by the prescribers and the interviewer. Patients who were seriously ill were not included in the study.

Variables

The following are the variables that were investigated under the study:

1. Dependent variable - herbal medicine use
2. Independent variable(s) - marital status, religion, socio-economic factors, age, educational level, cost of hypertension drugs, accessibility of herbal medicine, whether hypertension can be cured, knowledge about complication of hypertension, side effects of herbal medicines , level of hypertension, number of

antihypertensive drugs taken, effectiveness of HM, source of herbal medicine, ability of herbal medicine to cure hypertension

3.6 Data Collection Tools

A structured questionnaire was used and a sphygmomanometer was used to take the blood pressures. The blood pressure of the patient was first taken at the triage point by a nurse. It was again taken at the consulting room by the consulting room nurse. The average was then calculated. This then becomes the patient's blood pressure.

3.7 Quantitative Data Collection Technique

A structured questionnaire was used to interview the respondents. The questionnaires were pre-tested. It was pretested in Alpha hospital in Madina. Corrections were made after the pretesting. Two research assistants were trained to conduct the interview.

The selected patients were interviewed after they had been attended to by the prescribers. Consultation of the hypertensive patients started at 7o'clock in the morning. The researcher also helped in the consultation. These things were done to help reduce the waiting time of the patients thus making them willing to answer the questions.

The purpose of the study was explained to the patients. They were assured of confidentiality. They were assured that their answers would not be used against them. The patients in the sample for the study had their blood pressures checked in the facility and recorded. The questionnaire was used to obtain the following information: socio-demographics of the participant, age, gender, level of educational, monthly income,

duration of high blood pressure, duration of current hypertension clinic attendance and current blood pressure. The history of present use of herbal medicine, and the types used was also documented. Information was also obtained on the sources and adverse effects of the herbal medicines used. Each participant was interviewed by research assistant (specifically employed and trained for the study). The contents of the questionnaire were explained to them in their native language Twi or Ewe or Ga (illiterate participants) or English (literate participants).

The structured interview adopted in this study allowed us to explain each of the terminologies used in the questionnaire to the participants. Also, the method enabled us to eliminate biases that characterized self-administered questionnaires. Our method of interview also eliminated incomplete filling-in of the questionnaires by participants.

Sphygmomanometers were used to take the blood pressure of the patients. Two different blood pressures were taken, one at the triage point and the next one in the consulting room. The average of the two was then taken.

Participants who used herbal medicine at least once in the last six months were regarded as herbal medicine users; those who have never used it at all were considered non-users.

3.8 Ethical Considerations

This study sought approval from the Ethical Review Board of the Ghana Health Service. Permission was also sought from the Ga East Health Directorate and Medical officers in charge of the two polyclinics the study was done at. The study was explained to them and

their questions were answered. The questionnaires that were used were translated into Twi, Ga, Ewe and Hausa. The terms in the questionnaire were explained to them. The participants were given consent forms. They had the right to refuse to participate at any point of the interview. They were also assured of utmost confidentiality of the information given in the interview.

3.9 Quality Control

For the sake of uniformity in this study, herbal medicine was defined as being freshly prepared or reformulated from any plant part, or containing plant extracts for medicinal purposes. The study could have been affected by information bias. The interviewers may not have written everything they are told or may not have asked the question well. The interviewers were therefore trained. In order for the participants to feel comfortable and give out the information, the purpose of the study was explained to them.

Consultation was started at 7.00 a.m. Secondly the researcher helped in the consultation. This was to help reduce the waiting time in the facility so that the patients would be willing to answer the questionnaires. Patients who were too ill were excluded from the study. The patients may also not have known the names of the herbal medicines. There might have been recall bias. The patients might have been intimidated by being interviewed in the hospital settings. This was reduced by using assistants that had good people skills and also the patients were assured of confidentiality. Selection bias was another bias for this study. The patients may have had other underlying diseases. To try

and reduce this, patients who regularly visit the hospital were used. In this case they would have been diagnosed with any other disease if they actually had them.

The ability to do a population study would have been costly and time consuming. The study was therefore done at the two facilities that run the hypertensive clinics, where there would be hypertensive patients. This therefore made the study not representative of the population.

3.10 Analysis Plan

The data was entered using SPSS (Statistical Package for Social Sciences, SPSS Inc).Descriptive statistics were used to summarize baseline characteristics and to determine the prevalence of herbal medicine use. Bivariate analysis was used to determine socio demographic factors associated with herbal medicine use, appropriately using either chi-square tests or Fisher's exact tests. A p-value less than 0.05, was considered significant. Multiple regression models were used to estimate adjusted ORs of association, taking into account potential confounding by other variables. Significant variables identified from univariate analyses were selected for multiple logistic regressions modeling, Both the full model with all variables entered in the model and the forward stepwise selection modeling using p values < 0.05 for entry, were used to determine a final model of predictor variables. The two models yielded similar results.

3.9 Limitations

There were some limitations in this study. The study could have been affected by information bias, such as the definition of herbal medicine, which could have affected the patients in the giving of accurate information.

The interviewers may not have written everything they were told or may not have asked the questions well enough. The patients may not have known the exact names of some of the herbal medicines they were using.. Furthermore the patients might have been intimidated by being interviewed in the hospital settings.

Some of the patients may have had other underlying diseases. To try and reduce this, patients who regularly visit the hospital were used. In this case they would have been diagnosed with any other disease if they actually had them. Since the study was not done in the population the study may not be representative of the population.

RESULTS

CHAPTER FOUR

4.1 Demographic Characteristics

The total number of 203 respondents was studied. Of the 203 patients who agreed to participate in the survey, all the 203 completed the questionnaire.

The background characteristics of the study sample are summarized in Table 1. The respondent comprised of 87.7% women and 12.3% men. The minimum age was 30 years and the highest age 90 years. The mean age was 61 years with a standard deviation of 12.4 years. Age group 60-69 was the age group with the highest representation. The age group with the lowest representation was the under 40-year group.

Of the total respondents, Christians were 84.2 %, Moslems were 15.3% and traditionalists were about 0.5%. Respondents that had the MSLC educational level were 25.6% and they happened to be the highest. Those with primary education level were 19.2%. Those with secondary education were 16.3%. About 5.4% of the respondents were single, 36.9% were married, 27.6% were separated, and 30% were widows. From the income distribution of the respondents, it was noted that 46.3% were unemployed, 19.2% were in the GHC 150-200 income bracket being the lowest and only 6% earned over GHC 1000.

Table 1: Background characteristics of hypertensive patients

Demographic characteristics	Frequency N=203	Percentage %
Sex		
Male	25	12.3
Female	178	87.7
Age		
< 40	7	3.4
40 – 49	34	16.8
50 – 59	48	23.7
60 – 69	55	27.1
70 – 79	50	24.6
80+	9	4.4
Religion		
Christian	171	84.2
Moslem	31	15.3
Traditionalist	1	0.5
None	52	25.6
Educational level		
Primary	39	19.2
MSLC	49	24.1
Vocational	18	8.9
Secondary	33	16.3
Tertiary	12	5.9
Marital Status		
Single	11	5.4
Married	75	37.0
Separated/Divorced	56	27.6
Widowed	61	30.1
Income		
Unemployed	94	46.3
GHC 150-200	39	19.2
GHC 200-500	41	20.2
GHC 500-1000	17	8.4
GHC more than 1000	12	5.9

4.2 Prevalence of Herbal Medicine Use

From the survey results, the prevalence of herbal medicine use among the respondents is 66%. Out of this proportion the prevalence among male respondents is 64%, whiles that among female respondents is approximately 66.3%. A summary of the prevalence of herbal medicine use from the survey is presented in the Table 2 below.

The age group that use herbal medicine the least was the under 40-year group. The age group that used herbal medicine the most was the 60-69 year group (70.90%). The percentage of Muslims and Christians who used herbal medicine was almost the same, 61.3% and 66.7% respectively.

Of the respondents with secondary education 78.8% used herbal medicine. That was the highest representation, followed by those with middle school living certificate 71.4% of which use herbal medicine.

There was not much difference in the percentage of respondents who used herbal medicine with respect to marital status. Those who were married had the highest percentage, 68%.Seventy five percent of those who earned more than a thousand Ghana cedis used herbal medicine. It was the highest, followed by those who earn between GhC150 - 200. This is represented in table 2.

Table 2: The prevalence of herbal medicine use among hypertensive patients by background characteristics.

Background characteristics	Prevalence HM use %	95%CI
Overall HM use	66.0	0.59-0.73
Sex		
Female	66.3	0.05-0.12
Male	64.0	0.51-0.65
Age		
<40	42.9	0.00-0.04
40-49	67.7	0.07-0.17
50-59	66.8	0.11-0.26
60-69	70.9	0.14-0.25
70-79	66.7	0.11-0.21
80+		0.01-0.06
Religion		
Moslem	61.3	0.06-0.14
Christian	66.7	0.49-0.63
Traditionalist	100.0	0.00-0.03
Education		
MSCL	71.4	0.12-0.23
Primary	59.0	0.07-0.17
Secondary	78.8	0.09-0.18
Vocational	55.56	0.02-0.09
Tertiary	66.7	0.02-0.08
None	61.6	0.11-021
Marital Status		
Single	54.6	0.01-0.06
Married	68.0	0.19-0.32
Separated/Widowed	66.0	0.13-0.24
Widowed	65.6	0.14-0.26
Income		
Unemployed	67.0	0.25-0.38
GHC 150-200	74.4	0.10-0.20
GHC 200-500	53.7	0.07-0.16
GHC 500-1000	64.7	0.03-0.09
More than 1000	75.0	0.02-0.08

4.3 Perceptions and Patterns of Herbal Use

Herbal medicines were used for various purposes indicated in Table 3. The reasons given by the study subjects for herbal medicine use included presumed efficacy (58.6%), the fact that it is natural (31.3%), and it is accessibility (3.8%). Among the herbal users, 62.7%% reported taking herbs on a daily basis, and 13.4% reported taking it 5-6 days per week as indicated in Table 4.

Among the respondents 91% of said they had not informed their prescribers. The reasons given for nondisclosure generally fell into two main categories: "Wasn't necessary to tell the prescriber", 18.4%, and "They didn't know it was necessary to tell the prescriber", 74.4%. About 44.8% of the respondents had taken herbal medicine for more than a year, while 23% had used it since diagnosis of hypertension (this is shown in Table 3).

From the respondents 12.9% use garlic, 14.1% use bitter leaves, 31.25% use dandelion, 29.4% use moringa, 7.4% use prekese, 1.2% use soboro, 0.4% represented dawadawa users. The remaining 5.9% represented those respondents who used herbal concoctions but cannot remember their names.

Also 67.2% of herbal medicine users obtained them from their back yard, 16.4% from the hawkers, 9.7% from herbal clinics, 6% from the herbalists and 0.8% from chemists.

Table 3: Use of herbal medicine among hypertensive patients

Use of herbal medicine	Frequency n=134	Percentage %
HM and antihypertensive taken together	111	82.8
HM and antihypertensive not taken together	23	17.2
Source of HM		
Herbal Clinic	13	9.7
At home/backyard garden	90	67.2
Chemist	1	0.8
Herbalist	8	6.0
Hawkers	22	16.4
Types of HM used		
Garlic	33	12.9
Bitter Leaves	36	14.1
Dandelion	75	29.4
Moringa	73	28.6
Prekese	19	7.5
Soboro	3	1.2
Dawadawa	1	0.4
0ther	14	5.9
Duration of Herbal Medicine use		
1 week	9	6.7
1-3 months	17	12.7
3-6 months	17	12.7
More than 1 year	60	44.8
Since diagnosis	31	23.1
Reasons for use of HM		
Cheap	2	1.5
Natural	42	31.3
Accessibility	5	3.8
Efficacy	78	58.2
Long waiting time in Hospital	7	5.2
Preference of HM to OM		
Do not prefer HM to OM	66	49.3
Prefer HM to OM	31	23.1
Not decided	37	27.6

Table 4: Practices related to herbal medicine use among hypertensive patients

Practices related to HM	Frequency n=134	Percentage %
Did inform my physician	12	9.0
Didn't inform my physician	122	91.0
Frequency of use		
Daily	84	62.7
5-6 days per week	18	13.4
1-4 days per week	14	10.5
1-3 days per month	4	3.0
less than once a month	14	10.4
Reasons for not informing the prescriber		
Didn't know they had to inform the prescriber	93	74.4
Afraid of physicians reaction	6	4.8
Forgot to tell prescriber	3	2.4
Doesn't think it is important to tell physician	23	18.4
Use HM and OM		
Use HM and OM together	23	17.2
Do not use HM and OM together	111	82.8
Source of information		
Relatives/friends	124	62.9
Herbalist	16	8.1
Radio	116	58.9
TV	110	55.8
Hawkers	36	9.0
Numbers of HM used		
1 drug	36	26.9%
2 or more	98	73.1%

Friends and relatives influenced 62.9% of the respondents to use herbal medicine (Table 4). The respondents' other sources of information about herbal medicine included their herbalist 8.1% radio 58.9%, television 55.8%, and hawkers 9%. Among the 134 (66%) respondents who take herbal medicine, 73.1% take two or more herbal medicines (Table

4). Furthermore among those who take two or more herbal medicines 83.7% also take in addition, two or more anti hypertensive medicines.

Table 5: Belief and knowledge about herbal medicine among hypertensive patients

Belief and knowledge about herbal medicine	Frequency N=203	Percentage, %
View towards advert on HM		
They are true	20	9.8
May be true	97	47.8
They are false	53	26.1
I don't know	33	16.3
Beliefs HM and OM work better together	98	48.3
Beliefs HM or OM work better either alone	68	33.5
Doesn't know	37	18.2
Beliefs whether HM can cure hypertension or not		
Beliefs HM can cure HPT	25	12.3
Do not belief HM can cure HPT	94	46.3
Doesn't know HM can cure HPT	84	41.4
Perceived effectiveness of Herbal Medicine		
Less effective	85	41.9
More effective	22	10.8
Equally effective	33	16.3
Don't Know	63	31.0
Awareness of side effects		
Aware	12	5.9
Not aware	191	94.1

As shown in Table 5, 26.1% believe that adverts on herbal medicine are false, whiles the rest of them believe they are true, may be true or not sure. Furthermore, 41.9% believe herbal medicine is less effective, the rest believe herbal medicine is either equally effective, more effective or they do not know as shown in Table 5. Out of the all the 203

respondents, 10.8% found herbal medicines more effective, 41.9% less effective, 16.3% equally effective, 31% while 10.8.0% didn't know (Table 5).

A high proportion (94.1%) of the 203 respondents was not aware that herbal medicines had adverse effects (table 5). Also 5.9% of the respondents had experienced one or more adverse effects following the use of herbal medicines which included skin rashes (1%), vomiting (1%), dizziness (1%), diarrhea (1%), and abdominal pain (1%).

Table 6: Association between socio-demographic characteristics and the use of herbal medicine.

Demographic characteristics	% of Those using HM, n = 134 (%)	% of Those not using HM, n = 69 (%)	Total, N = 203 (%)	Unadjusted odds ratio (95% CI)	P value
Sex					
Male	16(64.0)	9(36.0)	25(12.3)	1	
Female	118(66.3)	60(33.7)	178(87.7)	1.10(0.46-2.65)	0.821
Age					
<40	4(57.1)	3(42.8)	7(3.4)	1	
40-49	23(67.8)	11(32.4)	34(16.7)	2.79(0.53-14.67)	0.226
50-59	32(66.7)	16(33.3)	48(23.6)	2.67(0.53-13.38)	0.233
60-69	39(70.9)	16(29.09)	55(27.1)	3.25(0.65-16.19)	0.150
70-79	31(62.0)	19(38)	50(24.6)	2.18(0.44-10.80)	0.342
80+	3(33.3)	3(34.0)	9(4.4)	2.67(0.35-20.51)	0.346
Religion					
Islam	19(61.3)	12(38.7)	31(15.3)	1	
Christian	114(66.7)	57(33.3)	171(84.2)	0.79(0.36-1.74)	0.562
Traditionalist	0(0)	1(100)	1(0.5)		
Education					
MSCL	35(71.4)	14(28.6)	49(24.1)	1	
Primary	23(59.0)	16(41.0)	39(19.2)	0.90(0.38-2.10)	0.805
Secondary	26(78.8)	7(21.2)	33(16.3)	1.56(0.68-3.60)	0.295
Vocational	10(55.6)	8(44.4)	18(8.9)	0.78(0.26-2.31)	0.656
Tertiary	8(66.7)	4(33.3)	12(5.9)	2.32(0.85-6.34)	0.1
None	32(61.5)	20(38.5)	52(25.6)	1.25(0.33-4.70)	0.741
Marital Status					
Single	6(54.6)	5(45.4)	11(5.4)	1	
Married	51(68.0)	24(32.0)	75(36.9)	1.80(0.49-6.38)	0.382
Separated/Widowed	37(66.1)	19(33.9)	56(27.6)	1.62(0.44-6.01)	0.469
Widowed	40(65.6)	21(34.4)	61(30.0)	1.59(0.43-5.82)	0.486
Income					
Unemployed	63(67.0)	31(33.0)	94(46.3)	1	
GHC 150-200	29(74.4)	10(25.6)	39(19.2)	1.43(0.62-3.30)	0.405
GHC200-500	22(53.7)	19(46.3)	41(20.2)	0.57(0.27-1.20)	0.141
GHC 500-1000	11(64.7)	6(35.3)	17(8.4)	0.9(0.30-2.67)	0.852
More than 1000	9(75.0)	3(25.0)	12(5.9)	1.48(0.37-5.84)	0.579

4.4 Hypertension

With regards to hypertension, 82.3% of the respondents believe that hypertension can lead to complications while 65.0% of the respondents believe that hypertension can be cured (Table 7).

Also 21.1% took one antihypertensive drug, 58.1% took two and 20.7% took more than three drugs. It was noted that out of the 203 respondents 23.7% have had hypertension for 6-24 months, 24.6% have had it for 2-5 years, and 51.7% have had it for more than 5 years (Table 7)

As indicated in Table 7 most of the respondents (87.1%) use NHIS and (96.6%) of them go for regular monthly check ups. Thirty six percent of them have borderline hypertension, 37.9% have moderate hypertension, 17.2% of the respondents have severe hypertension and 7.9% of them have controlled blood pressure. Among the people who use herbal medicines 84.0% have uncontrolled blood pressures (Table 7). Also it was noted that 48.3% believe that antihypertensive drugs works well in the presence of herbal medicine, 33.5% thought otherwise, and 18.2% did not know (Table 5).

Of the respondents who had normal blood pressure 35.3% use herbal medicine, 65.5% of the respondents who had borderline hypertension, use herbal medicine, 75.8% of those with moderate hypertension use herbal medicine and 63.6% of those with severe hypertension use herbal medicine (Table 7).

4.5 Bivariate Analysis

In the bivariate analysis the background characteristics, that is age, level of education, sex, income and marital status, did not have a significant p-value. In the logistic regression analysis, Table 7, respondents who believed that hypertension leading to complication are twice more likely to use herbal medicine with a p-value of 0.028.

Respondents who believed that hypertension is curable are twice more likely to use herbal medicine, with a p-value of 0.006, CI 1.3-4.95. With the bivariate analysis of the hypertension related factors, only six out of the fourteen factors showed association with herbal medicine use. Table 7 shows the analysis. Respondents who believed hypertension has complications and those who believe that hypertension can be cured showed significant association with herbal medicine use with p values 0.028 and 0.006 respectively.

All the patients with hypertension were more likely to use herbal medicine with those with moderate hypertension showing the most significant p value of 0.000.They were also about eight times likely to use herbal medicine. This was followed by those with severe hypertension. They were about four times likely to use herbal medicine, with a p value of 0.026.

The level of hypertension, normal blood pressure, borderline hypertension, moderate hypertension and severe hypertension, had a significant association with herbal medicine use. This is shown in Table 7. Information from relatives and friends also appear to have

an association with herbal medicine use, with a p value- 003.The belief that the adverts on herbal medicine are false or not knowing whether they are true or not also have a significant association with herbal medicine use.

Table 7: Bivariate analysis of hypertension Factors associated with herbal medicine use among hypertensive patients.

Practices related to hypertension	Frequency (%)	Crude Odds Ratio	P value	95% CI
Frequency of hospital checkups				
Every months	184(90.6%)	1		
Every other months	12(6.0%)	2.67	0.214	0.57-12.54
Irregular	7(3.4%)	0.711	0.662	0.15-3.28
Cost of antihypertensive drugs				
less than GHC10	14(6.9%)	1		
GHC10-29	6(3.0%)	2.03	0.496	0.27-14.70
More than GHC30	6(3.0%)	1.51	1.000	0.05-19-36
NHIS	117(87.1%)	1.11	0.214	0.67-5.97
Numbers of antihypertensive drugs patients take.				
1	43(21.1%)	1		
2	118(58.1%)	0.88	0.735	0.41-1.86
3+	42(20.7%)	061	0.284	0.25-1.50
HPT complication				
HPT cannot lead to complications	36(17.7%)	1		
HPT can lead to complications	167(82.3%)	2.27	0.028*	1.09-4.73
HPT is curable				
HPT is not curable	132(65.0%)	1		
HPT is curable	71(35.0%)	2.53	0.006*	1.30-4.95
Level of Hypertension				
Normal blood pressure	16(7.9%)	1		
Borderline hypertension	75(36.0%)	3.30	0.043*	1.04-10.46
Moderate hypertension	77(37.9%)	8.38	0.000*	2.55-27.62
Severe HPT	35(17.2%)	4.21	0.026*	1.19-14.97
Duration of Hypertension				
6mths - 2years	48(23.7%)	1		1
2years - 5years	50(24.6%)	1.39	0.434	0.61-3.19
More than 5 years	105(51.7)	1.37	0.386	0.67-0.278

*Variables with significant association with HM

Table 8: Bivariate analysis of herbal medicine related factors associated with herbal medicine use among hypertensive patients.

Herbal medicine related factors	Crude Odds ratio	P value	(95%CI)
Perceived effectiveness of HM			
Less effective	1		
More effective	1.31	0.61	0.46-3.71
I don't know	0.36	0.02*	0.16-0.83
Equally effective	1.44	0.32	0.70-2.98
Source of information on HM			
Relatives/friends	2.49	0.003*	1.37-4.51
Herbalist	3.91	0.077	0.86-17.72
Radio	1.36	0.305	0.76-2.44
TV	0.66	0.171	0.37-1.20
Hawkers	0.58	0.147	0.28-1.21
View towards advert on HM			
They are true	1		
May be true	0.39	0.161	0.11-1.45
They are false	0.25	0.042*	0.06-0.95
Don't know	0.24	0.047	0.06-0.98
Belief that HM cannot cure HPT	1		
Belief that HM can cure HPT	1.00	0.987	0.40-2.52
Don't know	1.26	0.463	0.68-2.36
Belief that OM and HM are not better than either alone	1		
Belief that OM and HM are better than either alone	0.50	0.049*	0.26-1.00
Don't know	0.62	0.274	0.26-1.47
Not aware that HM has side effects	1		
Aware that HM has side effects	0.65	0.243	0.32-1.34

*Variables with significant association with HM

The p values are 0.042 and 0.047 respectively for the factors of "Not knowing whether herbal medicine is effective" and "The belief that herbal medicine and orthodox medicine are better than either alone", both have associations with herbal medicine use with p-values 0.020 and 0.049 respectively.(table 8)

Table 9: Risk factors of herbal medicine use among hypertensive patients

Risk factors	Crude OR	p value	Adjusted OR (95%CI)	Adjusted LR p-value
Level of Hypertension	1.62	0.008	1.68(1.15-2.47)	0.008
Hypertension can be cured	2.59	0.005	2.70(1.32-5.49)	0.007
Hypertension can lead to complications	2.27	0.028	3.80(1.66-8.70)	0.002
Information on HM from relatives/friends	2.49	0.003	3.00(1.56-5.76)	0.001

4.6 Multivariate Regression

In the multivariate logistic regression it is seen that **p**atients who believed that hypertension can lead to complications were more likely to use herbal medicine (OR=3.80, 95% CI 1.66-8.70).Those who had information from relatives and friends were also likely to use herbal medicine (OR= 3.00 95% CI 1.56-5.76).

The belief that hypertension can be cured was also a risk factor for the use of herbal medicine (OR= 2.70 95% CI 1.32-5.49) as well as the level of hypertension (OR= 1.68 95% CI 1.15-2.47). They had the following p values 0.002, 0.001, 0.007, 008 respectively. (Table 9)

Those who believe hypertension can lead to complications are about four times more likely to use herbal medicine. Those who got their information about herbal medicine from relatives and friends were also almost three times likely to use herbal medicine.

The key findings of the study were:

1. The study showed that 66% of the respondents used herbal medicine such as dandelion, moringa, bitter leaves, garlic, prekese, dawadawa and soboro to treat hypertension.

2. Patients who believed that hypertension can lead to complications were more likely to use herbal medicine (OR=3.80, 95% CI 1.66-8.70). Also those who had received information about the use of herbal medicine from relatives and friends were likely to use herbal medicine (OR= 3.00 95% CI 1.56-5.76). The belief that hypertension can be cured was also a risk factor for the use of herbal medicine (OR= 2.70 95% CI 1.32-5.49) as well as the level of hypertension (OR= 1.68 95% CI 1.15-2.47). They had the following p values 0.002, 0.001, 0.007, 008 respectively.
3. Although most respondents used herbal medicine for the control of their blood pressure 58.2% of them were unsure of the efficacy of the herbal medicine they use.

   Clinically about 45.2% of the respondents had poor blood pressure control although they regularly visited the hypertension clinic.

CHAPTER 5

DISCUSSION

From the time of our fore fathers, the use of herbal medicine has increased dramatically. This phenomenon was initially thought to be a practice in the rural areas however this trend has however seeped into the urban communities. The result of this study shows that, 66% of the respondents use herbal medicine out of which 66.29% of the women respondents use herbal medicine while 64% out of male respondents use herbal medicine. The 66% obtained in the study was similar to other studies done in Nigeria (Oreagba et al., 2011). It was however higher than the study in the United States where 36% of the respondents use herbal medicine (Kuo et al., 2004). From the survey the age group that used herbal medicine the least was those more than 80 years. The age group that used herbal medicine the most was the 60-69 group (70.9%).

Most herbal medicine users did so concomitantly with orthodox medicines without the knowledge of their attending physician. This was also reported by Er et al., (2008) in Central Anatolia, Tumori. They also indicated that concomitant herb-drug use was more beneficial than when either herb(s) or drug(s) were used alone (Clement et al., 2007). This practice could further consolidate the perception that this potentially dangerous practice is safe and encourage further 'uninformed' herb-drug concomitant use.

This trend was noticed from the survey where 74% of herbal medicine users used more than one herbal medicine and 83% use herbal medicine together with their anti-

hypertensive drugs. Furthermore 91% of herbal medicine users hadn't disclosed it to their physicians. Seventy four percent of them didn't know they had to tell their physicians and 18% didn't think it was important. Another study done in the United States also showed that respondents who used herbs did not tell their physician about their herbal medicine use (Gardiner et al., 2007). Previous studies have demonstrated that doctor-patient barriers to effective communication exist and these may contribute to nondisclosure (Clement et al., 2007).

From the survey 58% used herbal medicines because they believed it was efficient and 31% used herbal medicine because they believed it was natural, 2% thought it was cheaper and 4% thought herbal medicine was more accessible. Other studies also suggest that herbal medicine is used because it is cheaper, socio-culturally accessible and acceptable (Bamidele et al., 2009). One of the major reasons cited by the respondents for taking herbal remedies included higher presumed efficacy of herbal medicines. We observed that most users believed that herbal remedies were either equally or more efficacious than conventional medicines, and about half of the respondents suggested that herbs were more efficacious than conventional medicines as observed in others studies done among herbal medicine users in Trinidad (Clement et al., 2007). Garlic was not as common as suggested in other studies in treating hypertension. (Mansoor, 2001).

In this study dandelion was the most used herb representing 31.25%. However in other studies mistletoe, garlic, dandelion and hawthorne were the common herbs used to treat hypertension (Abel and Busia, 2005). Respondents also believe that orthodox medicine

and herbal medicine give better results when taken together. This confirms why 82.8% of the respondents take their herbal medicine with their orthodox medicine.

In developing countries, laws regulating sales and distribution of herbal medicines are poor while access to herbal medicine is largely unrestricted. There is indiscriminate use of herbal medicine with the side effects poorly understood. This is shown in this study as only 18.7% of the respondents were aware of the side effects of herbal medicine.

Herbal medicine unlike orthodox medicine is easily accessible. It can easily be picked up from gardens. This is confirmed by this study, where 67.2% of the respondents could easily get the herbs from their back yards. Herbal medicines used by most respondents were reported to be free of side effects. However for those who reported side effects (18.7%) the side effects included vomiting, dizziness, malaise, rashes, headache and diarrhea. This was similar to another study where the side effect observed was as above (Galabuzi et al., 2010).

About 82.4% of the respondents in the present study did take their herbal medicine with prescribed orthodox medicines. Among the 66% respondents who use herbal medicine 73.1% of them take two or more herbal medicines. Furthermore out of those who take two or more herbal medicines 83.7% also use, in addition two or more orthodox medicines. However 48.3% believed that orthodox medicine and herbal medicine work together to give better results (Singh et al., 2004). In other studies however, this was quite the opposite. They believed that it shouldn't be taken together (Fakeye et al., 2009).

These findings underscore the worry about herb-drug interactions and whether these possible interactions have a negative effect on the control on blood pressure.

In the present study, sex, marital status, religion, income and level of education were not significantly associated with herbal medicine use. This is quite different from what has been reported from similar studies that examined such factors (Ng et al., 2003, Osamor and Owumi, 2010). Factors such as the stage (level) of HPT, whether HPT can be cured and whether HPT had complications were significant predictors of the use of herbal medicine. Out of the 203 respondents, 44.8% had controlled blood pressure. Of the 134 participants who used herbal medicine 37.3% of them had controlled blood pressure. However 90.6% of the respondents went for checkups regularly and 89.6% of the respondents who used herbal medicine go for monthly checkups. This can explain the anxiety of the patients, and the quest to find solutions from any source that can help them get their blood pressures controlled. Since the respondent expects their hypertension to be controlled they will try all solutions that friends, relatives, radio and television tell them.

From the study the respondents whose blood pressures had not been controlled were more likely to choose herbal medicine. This was similar in other studies done in the United States where respondents who had fair or poor health status were more likely to use herbs (Gardiner et al., 2007). Unlike the previous studies where the cost of the drugs was a significant predictor of the use of herbal medicine, this study showed a different result. Most of the respondents did not pay out of pocket because they had health insurance (NHIS). The cost of the orthodox medicine was therefore not a problem for the

hypertensive patients in this study. The duration of hypertension, what hypertension meant, the number of drugs respondents take, were all not significant predictors of the use of herbal medicine.

The study also shows that the patient's anxiety with the control of their blood pressure and the belief that hypertension can be cured coupled with the enormous availability of information on herbal medicine influence the choice to use herbal medicine.

From the logistic regression model, the belief that hypertension can be cured is also another predictor of use of herbal medicine. The belief that hypertension has some complication is also another predictor.

Relatives, friends, herbalists, advertisement on our radios and television usually suggest a high efficacy of the herbal medicines. This is a powerful temptation for consumers. This is shown in this study where the main reason for using herbal medicine was the belief of its efficacy, and not the cost (Bamidele et al., 2009). This is also quite different from the study done by Oreagba et al., (2011), in which cost accessibility and acceptability were given for the use of herbal medicine. The majority of the respondents used NHIS and that may account for the fact that cost wasn't an issue in this study. Secondly the two most used herbal medicines, dandelion and moringa, were obtained from their backyard.

Even though the majority of the respondent who used herbal medicine said they did so because of its efficacy, they were not sure of its effectiveness. Out of the respondents

41.9 % believed herbal medicine was less effective, 10.84% said it was more effective and 31% of them believed the effectiveness was equivalent to orthodox medicine.

Even though 66% of the respondents take herbal medicine, 46% of them believed herbs cannot cure hypertension and 47.78% of the respondents believed that the advertisements on herbal medicine may be true. These results showed that the patients were not sure of the efficacy of the herbal medicine. They might have been responding to the excessive pressure of advertisements on television, radio, friends and relatives. This is also confirmed in the study that showed that the respondents mostly got their information from friends, relatives, radio and then from the television.

The influence of relatives, friends and neighbors on health-care seeking preferences for herbal medicines has been reported globally in both adults and children (Bennett and Brown, 2000). The high percentage of 62.9% of respondents in this study who were influenced by relatives and friends to use herbal medicine is lower than the 86% previously reported in Nigeria (Danesi and Adetunji, 1994), but higher than the 51.4% reported in the United States (Bennett and Brown, 2000). Nevertheless, these findings further confirms the fact that knowledge of herbal medicines are handed down from parents, relatives and friends (Amira and Okubadejo, 2007a).

Knowledge may not necessarily require any formal education according to the WHO national policy on traditional medicine and regulation of herbal medicines- report of a WHO Global Survey 2005. Most of the herbal medicines they were taking were not

concoctions prepared by herbalist but herbs they could pick from their garden. These were herbs they had heard on radio, television and from friends that they were effective. Only about 11.6% of the herbal medicines they were taking were preparations from the herbal clinics. Almost half of the hypertensive patients do not have their blood pressure controlled, even thou**u**gh they go for regular checkups. About eighty two percent of them believed that when blood pressure is not controlled it can lead to complications.

However, because there is so much information on herbal medicine, from friends, relatives, television and the radio, they tend to use the herbal medicine hoping it will control their blood pressure and avoid complications. The study shows that though the participants used herbal medicine because they believed it was efficacious, they did not belief it could control blood pressure when it is not used concomitantly with orthodox medicine.

The study also showed that only four constructs of the health belief model influences the choice to use herbal medicine. Perceived severity which looked at the level of hypertension and the perception of complications of hypertension had a significant influence on the use of herbal medicine.

Perceived susceptibility also looked at whether the participant believed that hypertension can be cured. The study showed it had an effect on the use of herbal medicine.

Perceived benefits outweighed perceived cost in influencing the decision to use herbal medicine or not.

The patients were not aware that herbal medicine has side effects but they believed that their hypertension can be cured. The influence of information had a significant effect on the use of herbal medicine. This proved that in this study cues to action is significant in determining the use of herbal medicine by hypertensive patients. Socio-demographic factors didn't have any significant influence on the use of herbal medicine as shown by the study.

In conclusion, only four out of the six constructs in the health belief model had significant effect on the use of herbal drugs by hypertensive patients. They were perceived susceptibility, perceived severity perceived benefits and cues to action.

CHAPTER SIX

CONCLUSIONS

6.1 Conclusions

This study set out to investigate the use of herbal medicine in the Ga East district. From the results it is noted that the use of herbal medicine in Ga East district is high, (66%). Dandelion and moringa are the most popular herbs. The level of hypertension, source of information, curability of hypertension and the complications of hypertension are the risk factors of hypertension. The patients are in search of a remedy to cure according to their beliefs, a dangerous illness that they expect to be cured. They therefore are in search for information from people they can trust (such as relatives and friends) to help them control or cure their hypertension. Doctors must therefore equip themselves with knowledge of the common herbal medicines and also remember to ask their patients whether or not they use herbal medicines.

The respondents were taking too many drugs at a time and were also combining orthodox medicine with herbal medicine. This study also emphasizes the importance of clinicians inquiring about their patients' use of herbals/supplements, since knowledge of concurrent use of herbal and orthodox medicine can help identify patients at risk for potential interactions.

The study concludes that perception about severity (knowledge about the complications of hypertension and level of HPT), perception of susceptibility (belief that hypertension

is curable), perception of benefits and cost (Control of blood pressure), and cues for action (Information from relatives) out of the five constructs of HBM can help predict whether a hypertensive patients will take herbal medicine or not.

6.1 Recommendations

The Ghana Health Service

The Ghana Health Service should step up its health programs in educating the populate on hypertension. Health policy makers should realign the heath system to focus on the use of herbal medicine by hypertensive patients, with emphasis on drug- interactions and side effects of herbal medicine.

Policies should be in place to help regulate the sale and marketing of herbal products. The Ghana Health Service should collaborate with herbalist and herbal clinics to see how best they can work together to manage hypertension.

Physicians should ask their patients whether they take herbal medicine. They should make their patients comfortable enough to ask their physicians questions about their health. All public hospitals and clinics should run hypertensive clinics that disseminate the right knowledge about herbal medicine, and to give adequate health care to their patients.

The Ga East District Health Directorate should collaborate with the media, religious bodies, market women and cooperate bodies as channels of education on the use herbal medicines, its side effects, possible drug interactions and hypertension.

The Directorate should also arrange with the radio stations to negotiate for a fixed time during which education on herbal medicine use and hypertension can be discussed.

There should be regular evaluation and monitoring of the medical doctors running the clinics to see whether the proper management of the hypertensive patients is being done.

Hypertensive patients

Hypertensive patients should inform their physicians about the herbal medicines they use to manage their hypertension. They should ask their physicians question about hypertension the medications they use.

Research

It is recommended that more studies should be done to find out why the hypertensive patients are not having their blood pressure controlled despite their regular attendance at the hypertension clinic.

More research should also be done to ascertain the effect of dandelion and moringa on hypertension and possible herbal-drug interactions.

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APPENDIX

Appendix 1: Informed Consent Form

Project Title

The use of Herbal Medicine among hypertensive patients in Ga East District

Department of Social and Behavioral Science: School of Public Health, College of Health Sciences, University of Ghana, Legon.

Background

Dear Participant, my name is Dr. Afua Asante Twumasi. I am a student from the School of Public Health, University of Ghana. I am conducting a study on the use of Herbal Medicine among hypertensive patients in Ga East District. The aim of this study to access the use of herbal medicine among hypertensive patients in Ga East

Procedures

The study will involve answering questions from a questionnaire on individual knowledge on herbal medicine and its use. Participants' medical records will be accessed to cross-check medical information. In addition each participant's, blood pressure will be measured. There will be no invasive procedures to obtain samples from participants. I will very much appreciate your participation in this study. This is purely an academic research which forms part of my work for the award of a Masters Degree.

Risks and Benefits

The procedure of body measurements will be non-invasive and will not cause any discomfort to participants. The results of the study will be used to advice the Municipal health directorate on ways to get clinicians involved in the use of herbal medicine. It will also give the knowledge on the types of herbal medicines being used. It will also help in further research

CONSENT

I,……....

declare that the purpose, procedures as well as risks and benefits of the study have been thoroughly explained to me in English language and I have understood.

I hereby agree to answer the questionnaire

Signature of participant …….

Date……. / …… / ……..

I agree to take part in the blood test

Signature of participant …….

Date……. / …… / ……..

Interviewer's statement:

I, the undersigned, have explained this consent form to the subject in the English language that she/he understands the purpose of the study, procedures to be followed as

well as the risks and benefits involved. The subject has freely agreed to participate in the study the study.

Signature of interviewer ……..

Date ……. / …….. / …….

Address …….

Right to refuse

Participation in this study is voluntary and you can choose not to answer any individual question or all the questions or submit to body measurements. You are at liberty to withdraw from the study any time. However, I will encourage you to fully participate since your opinions are important to help determine the prevalence of the Herbal medicine in Ga east.

Anonymity and Confidentiality

I would like to assure you that whatever information you will provide or measurement taken will be handled with strict confidentiality and will be used purely for research purposes. Your responses will not be shared with anybody who is not part of the study team. Data analysis will be done at the aggregate level to ensure anonymity.

Dissemination of Results

The results of this study will be mailed to you, if you provide your address below.

Before taking consent

Do you have any questions you wish to ask about the study? Yes ☐ No ☐

(If Yes, questions to be noted below)

……

……..……

……

……..……

……...……

…….

If you have questions later, you may contact Dr. Afua Animwaa Asante (Tel: 0243636913)

Appendix 2: Questionnaire

The use of Herbal Medicine among hypertensive patients in Ga East District

Survey Information		
	Location and Date	
1	**Respondent's ID**	☐ ☐ ☐
2	**Respondent's name**	
3	**Interviewer ID**	☐ ☐ ☐
4	**Date of completion Of the instrument**	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ **d m y**
5	**Consent Interview Language and Name**	
6	**Consent has been read out to participant**	**Yes** ☐ **No** ☐ **If No read consent**
	<u>Demographic information</u>	
7	**Sex (Record Male/Female as observed)**	**Male** ☐ **Female** ☐
8	**Age/Date of birth**	**Years/ …….**
9	**What is your religion?**	**Christian** ☐ **Islam** ☐ **Traditionalist** **atheist** ☐ **Other** ☐ ☐
10	**What is your current level of education?**	**MSLC** ☐ **Primary** ☐ **secondary** ☐ **Tertiary** ☐ **Vocational** ☐ **None** ☐
11	**What is your marital status?**	**Single** ☐ **Married** ☐ **Separated/Divorced** ☐ **Widowed** ☐

12	Income (monthly)	Unemployed ☐ GHC 150-200 ☐ GHC 200-500 ☐ GHC500-1000 ☐ more than 1000 ☐
13	Knowledge What is Hypertension?	Too much blood in the body ☐ Dirty blood ☐ Pressure in the blood ☐ Other ☐
14	Do you know about complications of hypertension	Yes ☐ No ☐
15	What are the complications you know of?	Stroke ☐ Kidney failure ☐ Heart failure ☐ blindness ☐ other ☐ Please specify…….
16	Is hypertension curable	Yes No
Knowledge and attitude towards Herbal Medicine use by the respondents.		
17	Do you use Herbal Medicine?	Yes ☐ No ☐ If No go to number 32
18	How often do you use Herbal Medicine?	☐ Daily ☐ 5-6 days per week ☐ 1-4 days per week ☐ 1-3 days per month ☐ Less than once a month
19	What is the source of Herbal Medicine?	Herbal clinic ☐ At home/backyard garden ☐ Chemist ☐ Herbalist ☐ hawkers ☐
20	Do you use more than one type of Herbal Medicine	Yes ☐ No ☐
21	Do you know the name of the Herbal Medicine you use?	Yes ☐ No ☐
22	Which of the following Herbal Medicine do you use?	Garlic ☐ Dawadawa ☐ Bitter leaves ☐ Dandelion ☐ Moringa ☐ Prekese ☐ Soboro ☐ Other Please specify…….

23	**Do you take Herbal Medicine together with your hypertensive drugs?**	**Yes** ☐ **No** ☐
24	**How long have use used Herbal Medicine to treat your hypertension?**	**1 week** ☐ **1-3 months** ☐ **3- 6 months** ☐ **More than a year** ☐ **Since diagnosis of hypertension** ☐
25	**Do you inform your physician about the Herbal Medicine you take?**	**Yes** ☐ **No** ☐
26	**Why didn't you tell your physician, if you didn't tell him or her?**	**Didn't know physician has to be told** ☐ **Afraid of physician's reaction** ☐ **Forgot to tell physician** ☐ **Does not think it is important to tell physician** ☐
27	**What was the reaction of your physician?**	**Angry** ☐ **No reaction** ☐ **Understanding** ☐
28	**Prefer Herbal Medicine to orthodox medicine**	**Yes** ☐ **No** ☐ **Not decide** ☐
29	**Reason for preferring Herbal Medicine.**	**Cheap** ☐ **Natural** ☐ **Accessible** ☐ **Presumed efficacy** ☐ **Long waiting time in hospitals** ☐ **Others** ☐ **Please specify…….**
30	**Have you ever shown any side effects to Herbal Medicine?**	**Yes** ☐ **No** ☐
31	**If yes what was the side effect?**	**Diarrhea** ☐ **Abdominal pain** ☐ **Vomiting.** ☐ **Skin reaction** ☐ **Headache** ☐ **dizziness** ☐ **other** **Please specify……**

32	**Aware of side effects of Herbal Medicine?**	**Yes** ☐ **No** ☐
33	**Possible side-effects of Herbal Medicine**	**Diarrhea** ☐ **Dizziness** ☐ **Headache** ☐ **Vomitting** ☐ **Skin reaction** ☐ **Abdominal pain** ☐ **Other** **Please specify……..**
34	**Think that Herbal Medicine can cure hypertension**	**Yes** ☐ **No** ☐ **Don't know** ☐ `
35	**View towards adverts on Herbal Medicine**	**They are true** ☐ **May be true** ☐ **They are false** ☐ **I don't know** ☐
36	**Rating of effectiveness of Herbal Medicine.**	**Less effective** ☐ **More effective** ☐ **I don't know** ☐ **Equally effective** ☐
37	**Do you think that orthodox medicine and herbal medicine can manage hypertension better than either alone?**	**Yes** ☐ **No** ☐ **Don't know** ☐
38	**Source of information on Herbal Medicine**	**Relative/friend** ☐ **Herbalist** ☐ **Radio** ☐ **TV** ☐ **Hawkers** ☐ **other** ☐ **Please specify…….**
History of Hypertension		
39	**Do you have hypertension?**	**Yes** ☐ **No** ☐
40	**How long have you had hypertension?**	**1-2 yrs** ☐ **2-5 yrs** ☐ **More than 5yrs** ☐
41	**Are you currently taking any treatments /advice for hypertension prescribed By a doctor or other health worker?**	**Yes** ☐ **No** ☐ **If No go to Question 43**

42	**How many different blood pressure medications do you take?**	**1** ☐ **2** ☐ **3** ☐ **4 or more** ☐
43	**Do you use Herbal Medicine due to non-availability of hypertensive drugs?**	**Yes** ☐ **No** ☐
44	**How much do you spend on blood Pressure medications monthly?**	**GHC 10** ☐ **GHC 10-29** **GHC30-40** ☐ **>GHC 40** ☐ **Don't know-** ☐
45	**Do you go for check-ups at the clinic?**	**Yes** ☐ **No** ☐
46	**How often do you go for check-ups at the hospital?**	**Every month** ☐ **Every other months** ☐ **Irregular** ☐ **None** ☐
47	**Current Blood pressure**	**<140/90** **140/90** **>140/90<160/90** **>160/90**