Garlic and African Olive used as Traditional Herbs for Hypertension in the Western Cape

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ABSTRACT

Hypertension is a common chronic health problem worldwide due to contributing factors such as obesity, physical inactivity, unhealthy diet and changes in lifestyle. The standard of care for hypertension in South Africa is prescription medication, as well as a stepwise programme; this treatment approach is for the treatment of hypertension according to severity using diuretics, beta-blockers, vasodilators in a stepwise progressive manner. In South Africa, traditional herbal medicines have been used to treat many ailments especially hypertension. Garlic and African olive has been reported as herbal medicines that have anti-hypertensive properties and may be used to control hypertension, either individually or in combination.

The objective of this study is to 1) prevalence of these traditional herbal medicines will be investigated and 2) determine the prevalence of garlic and/ or African olive use among hypertensive patients lieu of/or in combination with prescription medication.

The study design was cross-sectional, comprising of two phases. Phase one was the administration of questionnaires concerning the participants' demographics, medical/clinical history, chronic illness and traditional herbal treatment. One hundred and eighty participants from Prospective Urban Rural Epidemiological study (PURE) cohort were administered questionnaires. Of the 180 participants, 139 indicated that they are hypertensive, 30 hypertensive participants were selected to participate in the in-depth interviews. Phase two was divided into two parts which were detailed interviews including in-depth interviews and a focus group discussion. The focus group discussion was conducted with a convenience sample of 10 hypertensive patients who were available on the day of data collection. The questionnaire data was analysed with the Statistical Package for the Social Sciences (SPSS) and the interviews and focus group discussion was analysed using thematic content analysis.

The results show that the participants with hypertension who are on prescription medication are also using traditional herbs, garlic and African olive as part of a dualistic health care

treatment for their hypertension. The use of garlic is more prevalent than the use of African olive, as African olive was not well known among the participants.

The results will facilitate in the acknowledgment of traditional herbal medicine use for hypertension, as either a home remedy for (other) chronic conditions or treatment in combination with prescription medication. It also highlights the necessity to educate participants and healthcare providers in the use of traditional herbal medicine. Furthermore, healthcare workers needs to be trained about THM and should also be obligated to ask about traditional herbal medicine among their patients.

KEYWORDS

Hypertension

Prescription medication

Traditional herbal medicine

Traditional herbs

Garlic

African olive

Adherence

Dualistic healthcare treatment

DEFINITIONS

Burden of disease:

It is a measurement of the gap between current health status and an ideal situation where everyone lives into old age, free of disease and disability (WHO, 2008).

Disability-adjusted life years (DALYs):

A disability-adjusted life year is defined as one lost year of 'healthy' life (WHO, 2008).

DECLARATION

I declare that *Garlic and African Olive as Traditional Herbs used for Hypertension in the Western Cape* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Tarryn Alicia Blouws November 2012

Signed.....

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Chapter 1

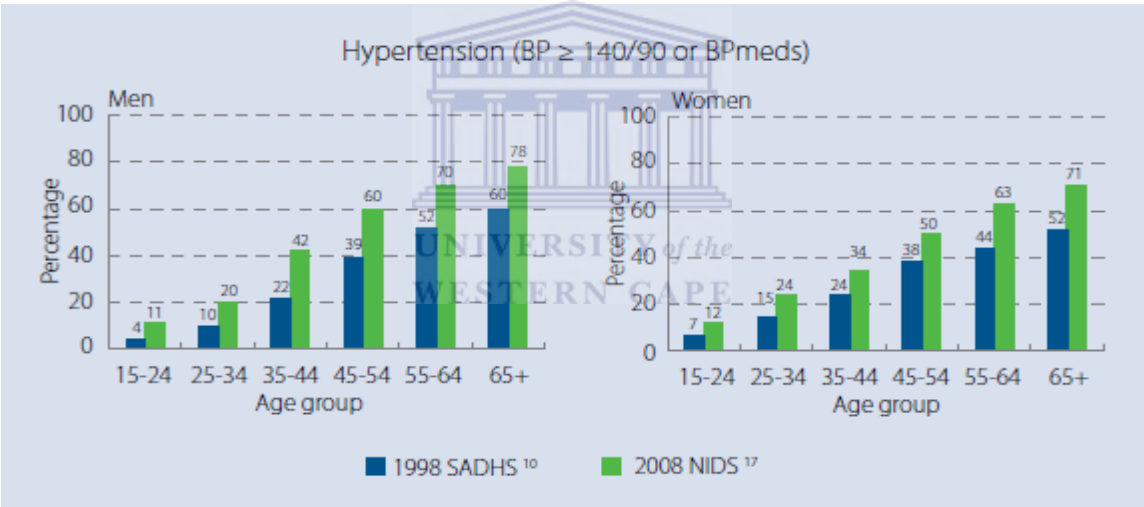
Introduction

Hypertension, also known as high blood pressure is a medical condition characterised by having a blood pressure ≥ 140/90 mmHg. Hypertension is a highly prevalent non-communicable disease and can be thought of as a "silent killer" because the majority of these people live with the condition for a long time without knowing that they are affected. It is estimated to affect approximately 1 billion people worldwide and this number is expected to increase to 1.56 billion people by the year 2025 (Bradshaw *et al*, 2011). Hypertension has been the leading risk factor for deaths attributed to non-communicable diseases and it is ranked third as the cause for disability adjusted life years, after ischaemic heart disease and stroke (Seedat, 2012). In 2003, hypertension was estimated to cause 7.1 million premature deaths, with a disease burden of 4.5% annually (WHO/ISH, 2003).

The prevalence of hypertension is expected to increase by 80% in developing countries. In 2005, over 20 million people in sub-Saharan Africa were hypertensive (Opie & Seedat, 2005). The increase in the prevalence of this disease in the continent has been attributed to changes in the lifestyle of the people due to Westernization and industrialization. For example in South Africa, the transition from the apartheid era to the current democratic dispensation has resulted in major changes in lifestyle including the consumption of energy dense food (high fat, high salt and sugars) and decrease in physical activity (Olayiwola, 2004). Presently in South Africa, approximately 6.3 million people are hypertensive and only 4% of this has controlled blood pressure (Mungal-Singh, 2012). However, based on race, black South Africans are more at risk of becoming hypertensive than all other races. Connor *et al* (2005) reported that the age standardized prevalence of hypertension was 59% for blacks, 55% for Indians and coloureds and 50% for whites. Furthermore, several reports also

exist in South Africa on the prevalence of hypertension among men and women (Steyn *et al*, 1996; Metcalf *et al*, 1996 & Bradshaw *et al*, 2011). In 2000, there were more deaths attributed to high blood pressure in females than in males (11.2% female and 7.0% male) in South Africa (Norman *et al*, 2007). However, according to Bradshaw *et al* (2011) an upward trend was observed in the prevalence of hypertension between South African men and women over a period of 10 years (Figure 1). Between 1998 and 2008, the figure showed that hypertension was higher in women between the ages of 15-34 compared to men. This trend was reversed from the ages of 34-65+ where hypertension became more prevalent in men compared to women.

Figure 1: Hypertension Increase over 10 Years in Men and Women in South Africa



(Source: Bradshaw *et al*, 2011)

Adequate management of hypertension is dependent on an effective health service approach, as well as on the approaches of health promotion and primary prevention. In South Africa, the national guidelines for control and management of hypertension have been produced by the Department of Health to assist health workers in diagnosing and treating these conditions (Seedat & Rayner, 2012).

The high costs of anti-hypertensive drug treatment and the overcrowded health facilities have made the use of traditional herbal medicine easily accessible and acceptable among hypertensives. In South Africa, traditional herbal medicines have been used to treat many ailments, especially hypertension. Peltzer & Mngqundaniso (2008) reported that hypertensive patients consult with traditional healers after visiting general practitioners in the Northern Province of South Africa. Furthermore, Lokita (2009) investigated the reasons why hypertensive patients consult traditional healers in the Gauteng Province and found that the perceived effectiveness of traditional herbal medicines compared to Western medicines as well as the low cost of such medicines endeared the patients to the use of traditional herbal medicines. Pagán & Pauly (2005) argues that the increased use of complementary and alternative medicines such as traditional herbal medicines has taken place at the same time when Western medicine has generally been thought to have improved effectiveness. According to the World Health Organization, about 80% of the population in Africa make use of traditional medicine (Ritcher, 2003), thus making this form of medicine an integral part of the public healthcare systems in Africa as synthetically produced medicine is not always affordable or used (WHO, 2008).

Worldwide, there is an insatiable demand for natural products, organic living and healthy lifestyle today. South Africa has a rich plant biodiversity which offer a wide range of uses for medicinal properties. The use and knowledge of medicinal plants to treat various ailments and diseases by indigenous communities is a long standing practice in South Africa (Ritcher, 2003). Aston Philander *et al* (2011) reported that approximately 60-80% of South Africans regularly depend on traditional herbal medicine. This has led to increased scientific studies to validate the efficacy and safety of traditional herbal medicine for the human consumption. According to numerous studies, several medicinal herbs such as parsley, cinnamon, ginger, buchu, garlic and African olive are being used in the treatment and management of

hypertension; and these traditional herbs show interesting combinations of therapeutic effects (Craig, 1999; Ghayur & Gilani, 2005; Ginter & Simko, 2010; Wang, 2007; Preuss *et al*, 2006 & Thring & Weitz, 2006). There is therefore a huge potential for such herbs to serve as lead sources of new drugs (Gilani & Rahman, 2005).

Most interestingly is the everyday use of herbs such as garlic either for cooking or used as a medicinal treatment. Garlic (*Alluim sativum*) has been used for thousands of years for culinary, medicinal and spiritual purposes. The origin of this herb is unknown however, it is grown globally. Several studies have reported the therapeutic benefits of garlic (Capraz *et al*, 2007; Ginter & Simko, 2010 & Edwards *et al*, 2005). With regards to hypertension, a study showed that garlic is a diuretic that may lower potassium levels in the bloodstream and reportedly improves the blood circulation therefore lowering blood pressure and also relaxes muscles around the blood vessels (Edwards *et al*, 2005).

Another herb for hypertension, African olive is a relatively less known compared to garlic. African olive is also known as the wild olive (*Olea europaea* subspecies *africana*) is found in Africa and southern Africa. However, the more common species Olive (*Olea europaea*) has been used widely in traditional remedies in European Mediterranean islands and countries such as Spain, Italy, France, Greece, Israel, Morocco, Tunisia, and Turkey. Unlike the Mediterranean olives, the fruits of African olives are not edible however; the leaves, roots and stem barks possess medicinal properties. The leaves of the African olive are mainly used to lower blood pressure and treat related cardiovascular diseases (Wang, 2007). It contains a very complex makeup of substances that act as vasodilators, which lowers blood pressure. African olive's action has been studied for more than two decades, and studies show that it can provide significant decrease in blood pressure, without side effects (El & Karakaya, 2009).

1.1 Definition of the Problem

The standard of care for hypertension in South Africa is prescription medication, as well as a stepwise programme. There are several drug classes that have been used in the treatment of hypertension, these include diuretics, beta-blockers (β-blockers), calcium channel blockers (CCB's) and angiotensin converting enzyme (ACE) inhibitors (Wang, 2007). Despite the availability of these Western medicines, traditional herbal medicines are still being used in the treatment of hypertension. Evidence exists in the co-utilisation of Western medicines with traditional herbal medicines by hypertensive patients (Katz & Ali, 2009). Even though these hypertensive patients adhere to prescription medication, they however, often use traditional herbs to alleviate symptoms of the anti-hypertensive treatment. There is limited literature or information regarding the co-utilization of both prescription drugs and traditional herbal medicine among hypertensives.

1.2 Research Question and Objectives

Do hypertensive patients use traditional herbal medicine in lieu of/or in combination with prescription medication?

The objectives of the study are:

- To identify individuals who use garlic and/or African olive among PURE (Prospective Urban Rural and Epidemiology study) participants.
- To identify participants diagnosed with hypertension that use garlic and/or African olive and adhere to their prescription medication.
- To determine the prevalence of garlic and/or African olive among hypertensive participants.

- To explore the reasons, as well as, experiences of hypertension for and the use of traditional herbs—African olive and garlic.

1.3 Research Approach

The research utilised a cross-sectionally designed study, with both quantitative and qualitative data collection methodology. Quantitative research method consisted of a questionnaire that was administered to participants from the PURE (Prospective Urban Rural and Epidemiology study) database. Qualitative research method included in-depth interviews and a focus group discussion which was used to generate detailed information. Both the quantitative and qualitative research methods complemented each other, with qualitative methods substantiating findings from the quantitative methods.

1.3.1 Theoretical Framework: Embodiment

Epidemiological models provide limited information and often fail to address the socio-cultural context mediating the relationship between psychosocial stressors and disease outcomes. Although measures of stress have persistently been associated with multiple disease outcomes, little attention had been given to the role of culture (Trostle & Sommerfeld, 1996). The theoretical framework relevant is embodiment. The central point of this argument is that the world is manifested through our bodies, or that the world in all facets is embodied in our bodies. The notion of embodiment is lived experience, like memories of suffering can thus be embodied through an illness i.e. hypertension. The lifestyles of black people within urban townships are related to modernized lifestyles, which includes fast foods, increased alcohol consumption and associated stressor; due to poverty and circumstance (memories of suffering). It is thought that, hypertension, is an outward manifestation of this suffering due to poverty (Jaye, 2004).

This theory is used to explain hypertension as an embodied state as a result of the participants' circumstances. Through thematic content analysis, themes referring to the aetiology of hypertension were explored and are referenced to the embodiment theory.

1.3.2 Prospective Urban and Rural Epidemiology (PURE) Study

The study participants were recruited from the Prospective Urban and Rural Epidemiology (PURE) Study cohort in Cape Town - Langa - which was established to monitor the influences that may lead to cardiovascular diseases over a period of 10 years.

(Source: Researcher's photograph)

The Prospective Urban and Rural Epidemiology (PURE) Study is a large scale epidemiological study that has established both urban and rural cohorts to track changing environments, societal influences on lifestyle risk factors and cardiovascular diseases, utilizing multiple periodic standardized data collection in multiple communities from 17 countries (Teo *et al*, 2009).

PURE study has 2 main objectives:

1. To examine the relationship between societal influences and prevalence of risk factors and chronic non-communicable diseases measured at baseline; and
2. To examine the relationship between societal determinants and incidence of chronic non-communicable disease events and on changes in rates of selected risk factors.

1.4 Scope of the Thesis

- **Chapter 1**: Introduction – This chapter will provide context for hypertension as burden of disease and use of traditional herbal medicine; also describe the objectives of this study.

- **Chapter 2**: Literature Review – This chapter frames the knowledge of hypertension – prevalence, morbidity and mortality; and traditional herbal medicine and traditional herbs specifically garlic and African olive.

- **Chapter 3**: Methodology – This chapter describes study design, setting as well as population sampling, inclusion/exclusion criteria; analysis plan and ethics approval Furthermore, both qualitative and quantitative methods used in collecting data for the study is detailed.

- **Chapter 4**: Results – This chapter provides study findings from both quantitative (questionnaire administered) and qualitative (in-depth interviews and focus group) analysis.

- **Chapter 5**: Discussion – This chapter provides context of the results obtained in the study by drawing inferences from the literature and current knowledge. In addition, it will further discuss the theoretical underpinning, and contextualize the limitations of the study.

- **Chapter 6**: Conclusion – The final chapter presents a summary of significant findings and recommendations.

Chapter 2

Literature Review: Framing the knowledge of hypertension, traditional herbal medicine and traditional herbs used for hypertension

This chapter provides an overview of hypertension, traditional herbal medicine as well as traditional herbs used in the treatment and management of hypertension. Specifically, this chapter discusses hypertension as a disease: its definition, epidemiology, risk factors, measurements and treatments; the use of traditional herbal medicines for the treatment of non-communicable diseases and traditional herbs used in the treatment and management of hypertension.

2.1 Hypertension

2.1.1 Definition

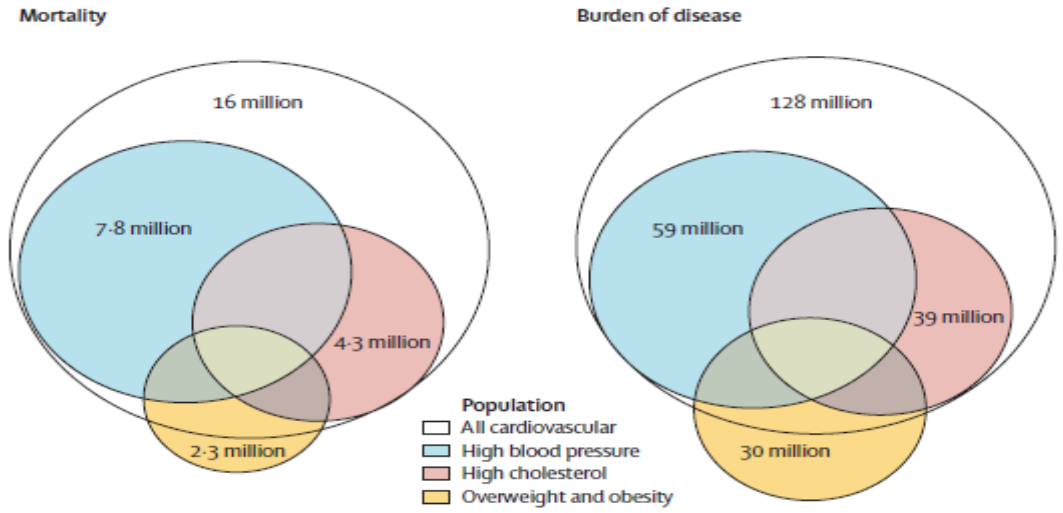
Hypertension and high blood pressure are two terms that are almost used interchangeably. It is a chronic, non-communicable disease of the cardiovascular system whose most common sign is a persistently elevated blood pressure. Medically, according to the South African Hypertension Guidelines (2012), the ideal blood pressure is 120/80 mmHg or less. The systolic pressure (120) measures the force that blood exerts on the artery walls as the heart contracts to pump blood, while the diastolic pressure (80) measures the force when the heart relaxes to allow blood flow into the heart (Buckman & Westcott, 2006). A patient is diagnosed to be hypertensive when the blood pressure reading is greater than 140/90 mmHg. Based on blood pressure readings, hypertension can be grouped into two stages: Stage 1 and stage 2 hypertension. Stage 1 hypertension has a blood pressure reading of 140-159/90-99 mmHg and stage 2 has a reading of 160 or higher over 100 or higher, which is dangerous and can lead to organ failure (WHO, 2002). Based on the origin of development, hypertension can also be classified into two categories: primary and secondary hypertension. Primary

hypertension is referred to as essential hypertension, which means that the condition has no identifiable source. Whereas, secondary hypertension is result of another medical condition, and often treatable (Strahl, 2003). For example, renal damage from diabetes has been found to result in hypertension (Viera & Neutze, 2010). According to Strahl (2003), hypertension is primarily a symptom-free disease that can go unnoticed by patients until the appearance of severe complications such as cardiovascular disease or stroke. Although many people consider high blood pressure to be a mild condition, if left untreated it can lead to a number of serious medical complications.

2.1.2 Epidemiology of Hypertension

Of the approximate 1 billion people who are hypertensive worldwide, nearly 8 million die annually (WHO, 2011). Hypertension is one of the most important contributors to the overall burden of diseases globally. The prevalence is expected to increase by 24% and 80% respectively in both developed and developing countries (Bakris & Ritz, 2009). Presently, two thirds of people who have hypertension worldwide are living in developing countries (WHO, 2011).

Figure 1: Global Mortality and Morbidity of the Burden of Cardiovascular Disease and Major Risk Factors



(Source: Kaplan & Opie, 2006)

Figure 1 depicts the morbidity and burden of cardiovascular disease globally. Fifty nine million people have hypertension as a burden of disease. It remains the most common risk factor for cardiovascular disease morbidity and mortality (Kaplan & Opie, 2006). The WHO (2002) reported that the number of disability adjusted life years (DALYs) lost to cardiovascular disease in sub-Saharan Africa rose from 5.3 million for men and 6.3 million for women in 1990 to 6.5 million. According to Addo *et al* (2007), high blood pressure has contributed 92 million disability-adjusted life years worldwide in 2001 and it is estimated to cause 4.5% of the current global disease burden (Osamor & Owumi, 2010). Therefore, it has become increasingly evident that hypertension is a major public health problem in all parts of the world.

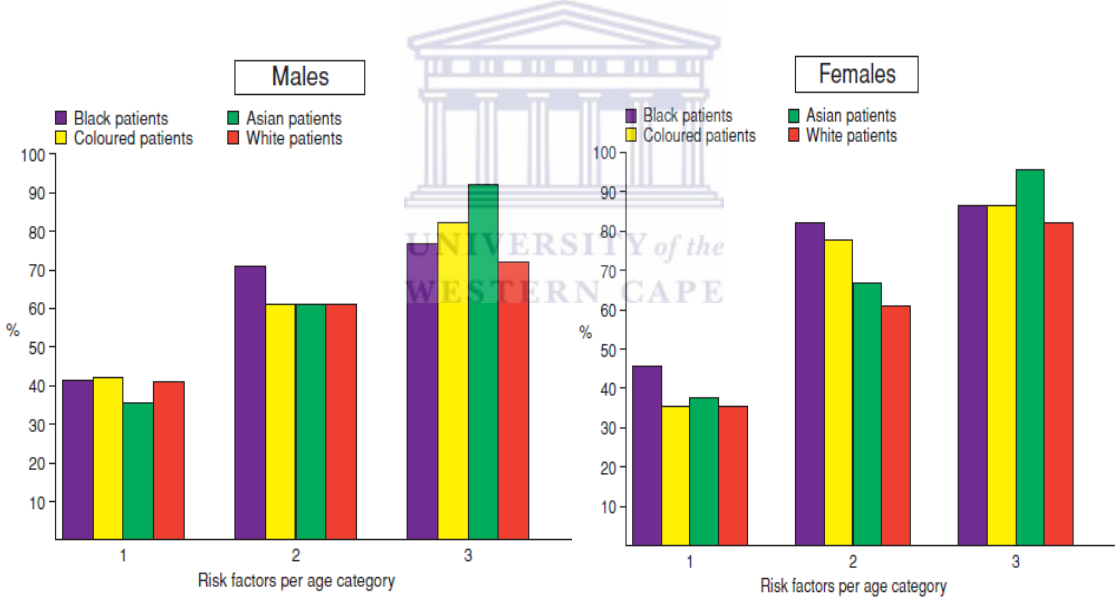
2.1.2.1 Africa

Africa bears a significant proportion of the global burden of chronic diseases, along with other developing countries in Asia and Latin America (Aikins *et al*, 2010). Africa's chronic disease burden is attributed to many factors including increased life expectancy, changing lifestyle practices, poverty, urbanisation and globalisation. Rising morbidity and mortality from chronic diseases co-exist with an even greater burden of infectious disease, which still accounts for at least 69% of deaths on the continent (Aikins *et al*, 2010). In Africa, the prevalence of hypertension is estimated at 20 million people (Osamor & Owumi, 2010) and this disease has been recognised as the greatest health challenge to the continent next to HIV/AIDS (Kluger, 2002). Moreover, the prevalence of hypertension has been found to be greater in urban societies compared to rural communities in sub-Saharan Africa (Addo *et al*, 2007). Uncontrolled and untreated hypertension, which is prevalent in Africa, has been found to lead to stroke while the victims are still relatively (Addo *et al*, 2007).

2.1.2.2 South Africa

Burden of disease estimates in South Africa suggested that the non-communicable disease hypertension caused 28% of the total burden of disease measured by DALYs in 2004 (WHO, 2002; Mayosi *et al*, 2009). According to Steyn (2008), hypertension is often spoken of as a "silent epidemic" in South Africa. It has been estimated that more than 6.2 million South Africans have a blood pressure higher than 140/90 mmHg. Medical Research Council (MRC) reported that 1 in 4 people between the ages of 15 and 64 suffer from high blood pressure (Bradshaw *et al*, 2003). Connor *et al* (2005), shows the prevalence of hypertension in South African men and women by racial population (Figure 2).

Figure 2: Prevalence of Hypertension by Age group and Population Group



(Source: Connor *et al*, 2005)

Figure 2 depicts the prevalence of hypertension in South African males and females by ethnic group and age; each group (1-3) represents an age group. Age group 1 = 30 - 49, age group 2 = 50 - 69, age group 3 = 70+. Hypertension is clearly the most common risk factor in all population groups but stands out as the major risk factor in black patients in age group 2 for both males and females in 50-69 age groups. However, regional, gender and racial

differences exists in the prevalence of hypertension across South Africa. For example, the South African Demographic Health Survey (SADHS) conducted in 2003 demonstrated the difference in the prevalence of hypertension in men and women, by province and also whether the participants were resident in either an urban or rural area (Figures 3 and 4). These figures are important to understand the significant prevalence of hypertension in South Africa.

Figure 3: Hypertension Prevalence and Treatment Status for Men, 2003

Percentage of men aged 15 and over who report having hypertension, percentage who are measured as being hypertensive using cut-off points of 140/90, and of those with hypertension: the percentage who report being hypertensive, who use medication, who have controlled their hypertension, according to selected background characteristic, South Africa 2003

	Prevalence of hypertension			Among those with any hypertension, using cut-off of 140/90 mmHg (percentage)			
Background characteristic	Self-reported hypertension	BP ≥ 140/90 mmHg +treatment	Number of men	Who reported hypertension	Who use medication	With controlled BP <140/90 mmHg	Number of men
Province							
Western Cape	14.8	18.3	337	54.7	33.6	14.8	62
Eastern Cape	9.1	10.9	367	40.6	27.1	8.1	40
Northern Cape	13.9	17.7	60	40.0	43.8	15.9	11
Free State	13.3	11.6	224	41.9	42.5	21.3	26
KwaZulu-Natal	6.3	9.7	781	27.4	29.6	18.6	76
North West	9.0	11.2	248	33.4	30.3	21.4	28
Gauteng	9.2	17.3	914	40.0	33.1	17.8	158
Mpumalanga	3.1	6.2	209	31.2	45.4	36.3	13
Limpopo	6.6	5.4	282	45.8	31.9	15.1	15
Residence							
Urban	10.2	14.5	2 289	45.0	35.7	18.6	331
Non-urban	6.0	8.5	1 133	21.1	23.5	13.4	97

(Source: SADHS, 2007)

Figure 3 indicates that men living in the Western Cape had the highest prevalence of self-reported hypertension (14.8%) and the second lowest prevalence after the Eastern Cape for controlled hypertension (14.8%). Moreover, majority of men predisposed to hypertension reside in urban areas.

Figure 4: Hypertension Prevalence and Treatment Status for Women, 2003

Percentage of women aged 15 and over who report having hypertension, percentage who are measured as being hypertensive using cut-off points of 140/90 and of those with hypertension: the percentage who report being hypertensive, who use medication, who have controlled their hypertension, according to selected background characteristic, South Africa 2003

Background characteristic	Prevalence of hypertension			Among those with any hypertension, using cut-off of 140/90 mmHg (percentage)			
	Self-reported hyper-tension	BP ≥ 140/90 mmHg ±treatment	Number of women	Who reported hyper-tension	Who use medication	With controlled BP <140/90 mmHg	Number of women
Province							
Western Cape	23.4	21.4	573	64.1	59.2	28.0	122
Eastern Cape	22.0	19.2	562	49.9	50.7	19.3	108
Northern Cape	25.1	27.9	92	57.0	49.6	22.3	26
Free State	26.6	23.9	313	49.0	55.0	23.8	75
KwaZulu-Natal	11.1	12.9	888	43.9	31.3	15.4	115
North West	20.7	18.7	373	49.1	58.1	25.8	70
Gauteng	21.2	20.7	1 074	53.1	46.4	21.1	223
Mpumalanga	14.7	14.8	300	41.8	31.4	12.0	44
Limpopo	14.3	11.0	519	39.2	36.3	24.0	57
Residence							
Urban	21.0	19.8	2 995	56.0	49.7	23.1	594
Non-urban	15.2	14.4	1 697	38.5	40.8	17.6	245

(Source: SADHS, 2007)

However, in figure 4, the Western Cape (23.4%) had the third highest prevalence of self-reported hypertension for women after the Free State (26.6%) and the Northern Cape (25.1%) provinces. Western Cape Province appears to have been able to control hypertension in women (28.0%) compared to men (14.8%). Also, coinciding with the men, women who reside in urban areas are more at risk of being hypertensive.

Prior to the HIV/AIDS epidemic, as the largest contributor to mortality in South Africa, but in 2000, over 500 000 deaths were recorded in South Africa, of which 37% were as a result of chronic diseases of lifestyle such as hypertension, 30% were a result of HIV/AIDS, 12% injuries and 21% were a result of infectious diseases and other conditions related to underdevelopment (Bradshaw *et al*, 2006).

Table 1 shows the mortality rate per 100 000 for community syndrome of hypertension, atherosclerosis and diabetes (CHAD) related causes among population groups in South

Africa. For hypertension, mortality was highest among both male and female Black South Africans compared to other racial groups. CHAD is a community-orientated programme for the control of hypertension, atherosclerotic disease, and diabetes (Bradshaw *et al*, 2006).

Table 1: Age-standardised Mortality Rates per 100 000 population for CHAD-related Causes of Death by Population Group and Sex, 2000

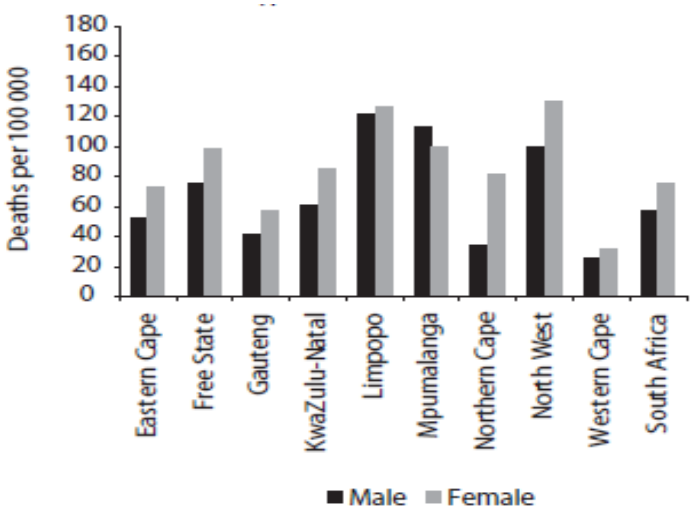
	African		White		Coloured		Indian		South Africa	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Stroke	145	160	72	84	143	156	136	121	125	124
IHD	85	66	323	187	203	169	497	364	169	102
Hypertension	72	115	7	15	19	56	34	30	48	70
Diabetes	48	66	22	19	40	80	74	140	43	54

(Source: Bradshaw *et al*, 2006)

2.1.2.3 Western Cape

The Western Cape is the third highest (14.1%) grossing province in South Africa after KwaZulu-Natal (15.8%) and Gauteng (33.7%) provinces. Collectively, these three provinces contribute nearly two-thirds to the economy (SA Info Reporter, 2012). However, the prevalence of self-reported (14.8%) and reported (54.7%) hypertension in the Western Cape in men is the highest across all nine provinces in the country (SADHS, 2003). Moreover, women living in the Western Cape have highest reported hypertension (59.2%) and the third highest self-reported hypertension (23.4%) in South Africa (Figures 3 and 4, SADHS 2003). More recent data shows that the prevalence of hypertension has increased in the province for both men (66.7%) and women (76.5%) (Bradshaw *et al*, 2008). However, across all the provinces in South Africa, the Western Cape has the lowest mortality rates for both men and women (Figure 5) (Bradshaw, *et al* 2008).

Figure 5: Hypertensive Heart Disease Men and Women, 2000



(Source: Bradshaw *et al*, 2006)

2.1.3 Hypertension in South Africa

Literature indicate that population differences in renal physiology and socio-economic status seem to be an explanation for blood pressure differences between racial population groups (Schutte *et al*, 2003). Currently, the South African black population and hypertension has typically behaved in "an explosive manner" with death occurring frequently from cerebral haemorrhage, uraemia or congestive heart failure (Opie & Seedat, 2005). This indicates a need for population-based approaches to change dietary behaviour in order to prevent and manage the risk of developing hypertension (Charlton *et al*, 2008).

Fast paced adaption to urbanisation in developing countries has increased the development of the urban-poor and inequality within cities. This has produced environmental and psychosocial health problems for the majority of urban people. The degree of urbanisation among black South Africans predisposes them to the development of hypertension, suggesting that it may increase with continued trends towards urbanisation (Mayosi *et al*, 2009). Consequently, a traditional rural black African lifestyle disappears rapidly with urbanisation. Moreover, black South Africans living in rural communities have significantly

less risk of developing hypertension than those urban black African people (Schutte *et al*, 2003). The Transition and Health Urbanisation in South Africa (THUSA) study centred its focus on the characteristics in relation to hypertension in a black community experiencing a health modification. The study was conducted in the North West Province and the results showed that blood pressure was the highest in groups of "newcomers" to the urban setting (Schutte *et al*, 2003). As a result, it can be stated that aspects relating to urbanisation can be confidently associated with hypertension.

Some researchers suspect that people who lived in equatorial Africa developed a genetic predisposition to being salt sensitive, which means their bodies retain more sodium. This condition increases volume of blood, which, in turn, raises blood pressure. Salt sensitivity can be beneficial in a hot, dry climate because it allows the body to conserve water (Steyn, 2008). Genetic factors, personal characteristics, autonomic nervous system function, cardiac function, and various environmental factors have been examined in hypertensive black Africans and contrasted with hypertensive whites (Steyn, 2008). According to Steyn (2008), the records on the relation between high salt intake and hypertension in black people from Africa have been summarized as people who have a different transportation mechanism of sodium and a rennin (regulatory enzyme for blood pressure) activity. The black hypertensive population have been shown, by Schutte *et al* (2003), to be sodium sensitive and also more likely to have a number of abnormalities that may increase their risk of cardiovascular and renal consequences of hypertension.

2.1.4 Perceptions of Hypertension: How do the people know?

There is an urgent need for prevention and control of hypertension. There are many ideas and perceptions of what hypertension really is and many people have formed their own view of hypertension. Sometimes this view coincides with the biomedical explanatory model and often times it is created by what is experienced. It is not known how communities perceive

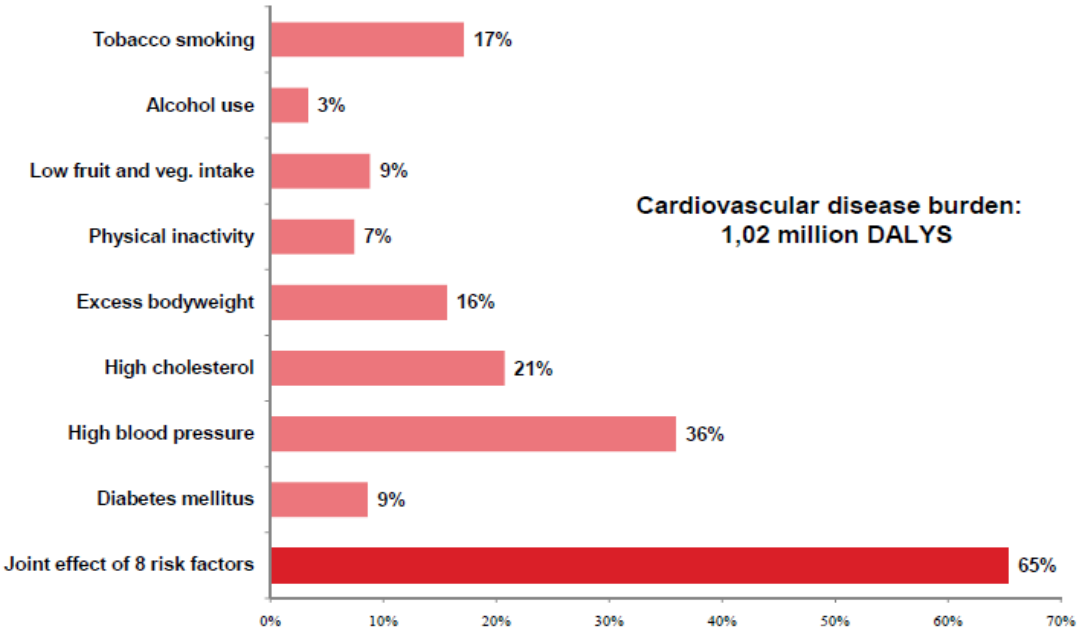
and view the problem of hypertension. Therefore, understanding the lay beliefs and perceptions are important as prevention and control of hypertension which requires a lifelong adoption of healthy lifestyles.

The results of a study done in Tanzania showed that the local people interpreted the problem of high blood pressure on the deterioration of the surrounding environment, the decline of the country's infrastructure and the economic uncertainty (Strahl, 2003). Changes in body weight were seen as a result of the environmental and social changes within the country. This is indicative of the theory of embodiment. In this theory it is assumed that the world is manifested through people's bodies. An ill health is not in isolation from the body but rather through the body as an integrated part of culture and the world (Csordas, 1990). In fact this may be what South Africa is experiencing with the urbanization in the black communities, which has greatly altered their environmental and social relations. It is important to understand how psychosocial and behavioural factors interact with pathophysiologic and regulating mechanisms to produce hypertension (Oparil *et al*, 2003).

2.1.5 Risk Factors of Hypertension

According to the hypertension guidelines of 2012, an individual is at a higher risk of being hypertensive, if they are obese, often stressed or anxious, live a sedentary lifestyle, consume excessive amounts of sodium (salt) and alcohol in their diet, have a family history of high blood pressure (hereditary) or is an active smoker. Other factors such as age and urbanization have also been linked to the development of hypertension (Steyn, 2008). According to Bradshaw *et al* (2011), a combination of all these risk factors increases the likelihood of cardiovascular diseases cardiovascular disease; however, being hypertensive is rated to be 35% in South Africa (Figure 6).

Figure 6: Cardiovascular disease attributable to 8 risk factors in South Africa in 2000



(Source: Bradshaw, 2011)

2.1.5.1 Obesity

People who are overweight or obese are also more likely to develop diabetes, heart disease, arthritis, gallstones, sleep apnoea, gout, and some cancers. High blood pressure is about six times more common in people who are obese and insufficient physical activity increases the risk of death by 20-30% (Mungal-Singh, 2012).

2.1.5.2 Sedentary lifestyle

Compared with the physically active, sedentary people are significantly more likely to develop hypertension and suffer heart attacks. A stronger heart pumps more blood more efficiently, with less force, through your body (Mungal-Singh, 2012).

2.1.5.3 Salt consumption

Excess salt is the most important modifiable risk factor for hypertension. High sodium diet has been found to cause retention of fluid in the body which ultimately causes an increase in blood pressure (Reddy & Katan, 2004). Scientific evidences strongly suggest an association between salt intakes and elevated blood pressure (Feng & MacGregor, 2003). Increases in

blood pressure have been found to be directly proportional to high salt intake and advancement in age (Beevers, 2002).

2.1.5.4 Hereditary

A family history of heart attack, stroke, diabetes, kidney disease, or high cholesterol increases the risk of developing high blood pressure. Research on twins suggests that up to 40% of variability in blood pressure may be explained by genetic factors (Williams *et al*, 2004).

2.1.5.5 Excessive alcohol consumption

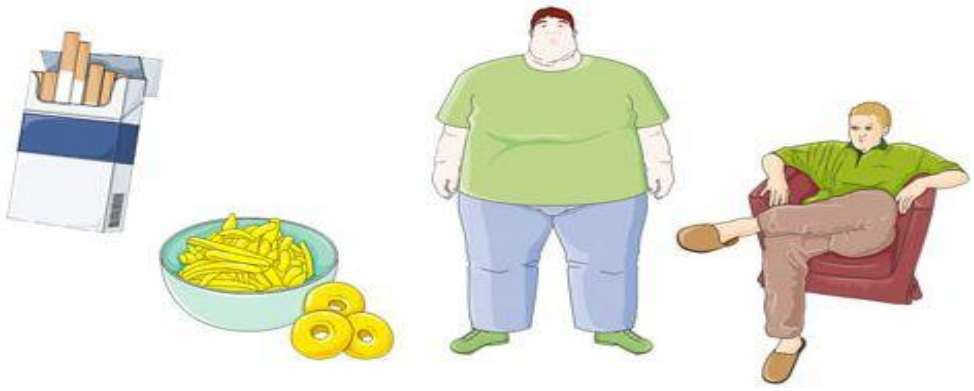
Excessive drinking is a factor in some of hypertension cases. While a low-to-moderate habitual consumption of alcohol is associated with a lower risk of cardiovascular disease, heavy alcohol use is a well-established risk factor for hypertension (Klatsky, 1999). Blood pressure rises when large amounts of alcohol are consumed, in some cases to dangerous levels, particularly when 'binge-drinking' (Hart *et al*, 1999).

2.1.5.6 Active Smoking

Cigarette smoking raises blood pressure. This increase occurs because nicotine (a compound found in tobacco), constricts small blood vessels, forcing the heart to work harder to circulate blood. Also, other chemicals found in tobacco can damage the lining of artery walls, resulting in the heart speeding up, thus raising the blood pressure (Reddy & Katan, 2004). Second hand smoke has also been found to increase the blood pressure (Maepe & Outkhoff, 2012).

2.1.5.7 Age

Although aging does not invariably lead to hypertension, high blood pressure becomes more common in later years of an individual. Through early middle age, high blood pressure is more common in men; however women are more likely to develop high blood pressure after menopause. According Kornitzer *et al* (1999), there is a strong association between increasing age and increasing systolic blood pressure and this association is thought to reflect the length of time that people are exposed to modifiable lifestyle risk factors.



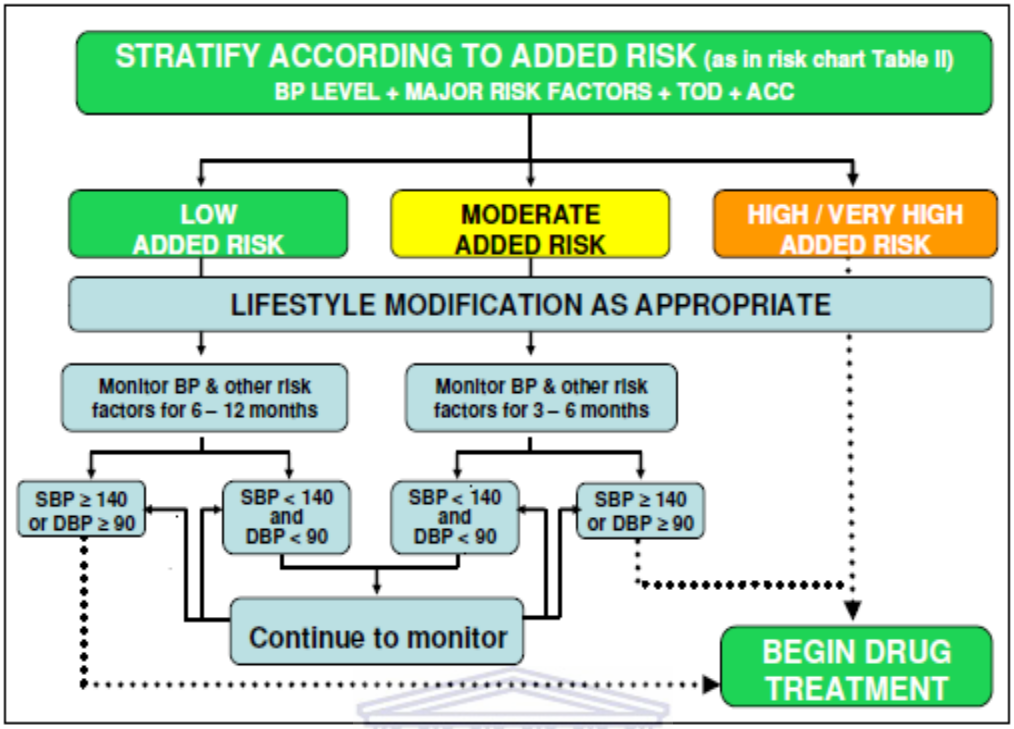
(Source: Hypertension, Nursing Care & Treatment Management, 2006)

2.1.6 Measurement and Treatment of Hypertension

People are usually unaware that they have hypertension, unless their blood pressure has been measured by a physician. However, it may not always be possible to have one's blood pressure measured by a physician or clinical nurse because these services and facilities are not always available in some are areas of Africa. There is therefore an insufficient system to detect hypertension, thereby ultimately affecting its treatment and management in Africa (Seedat, 2012). For those who have access to medical facilities and have measured their blood pressure, treatment decisions are based on the severity of hypertension.

The prevalence of hypertension can greatly be reduced when lifestyle modifications are made.

Figure 7: Hypertension Therapy According to Severity



(Source: South African 2012 Guidelines for Hypertension Therapy)

2.1.6.1 Lifestyle Modifications

The lifestyle modifications may include: reductions in the consumption of high salt and fat diets as well as alcohol drinking and cigarette smoking; increase in physical activity and an adherence to a detailed diet plan (SA Pharmaceutical Journal, 2006). The following modifications are stated in the South African Hypertension Guidelines (2012):

Weight reduction

Losing 5-10% total body weight can result in a meaningful reduction in blood pressure. Achieving and maintaining an ideal weight (Body Mass Index of 18.5kg - 24.9kg).

Diet plan

Follow the nutrition guidelines published by the WHO, which emphasise a diet that is low in total fat, with a high intake of fruit and vegetables (five portions per day), regular low-fat dairy products, a high intake of high-fibre wholegrain foods, fish rather than red meat,

products that are low in saturated fat and low in salt, and sparing use of sugar and sugar containing foods.

Physical exercise

Regular moderate intensity exercise for at least 30 minutes on most days of the week is required. Early adaptations from a sedentary lifestyle to becoming moderately active have the greatest effect. Patients with uncontrolled hypertension should only commence on exercise training after evaluation and initiation of therapy.

Decrease sodium consumption

High sodium levels are found not only in table salt, but also in packet soups, stock cubes and gravies. Reducing the intake of such foods is crucial. Limiting total sodium intake to <2 400 mg/day (<1 teaspoon of salt).

Decrease alcohol consumption

Limit alcohol intake to two standard drinks per day for men, and one standard drink per day for women and small men. A standard drink (approximately 10 g of ethanol) is equivalent to 25 ml of liqueur or spirits, 125 ml of wine, 340 ml of beer, or 60 ml of sherry.

Decrease smoking

Avoid the use of all tobacco products, including snuff. Nicotine replacement therapy should be used for a patient with hypertension, while under medical supervision.

2.1.6.2 Drug Therapy

In designing a treatment schedule, it is important to keep it simple and convenient to review compliance and reinforce the latter (Taylor & Fortmann, 1983). A range of medication is prescribed if a lifestyle modification is not evasive enough. Prescription medication includes diuretics, beta-blockers (β-blockers), calcium channel blockers (CCB's) and angiotensin converting enzyme (ACE) inhibitors. Diuretics are used to relax the blood vessels and help the body get rid of excess fluid and salt. Beta-blockers block the effects of adrenaline, which

eases the force and rate of the heart's pumping action. Calcium channel blockers have two functions, some relax the arterioles, while other types ease the force and the rate of the heart's pumping action. ACE inhibitors relax arteries by reducing the body's production of angiotensin, this is a chemical that makes the arteries narrow (Seedat, 2012). Vasodilators such as Aspirin, relax blood vessels which makes it easier for blood to flow through the circulatory system (South African Hypertension Guidelines, 2006). Even though the stepwise programme is widely used, it is and has become appropriate to consider an individualized patient profile in the treatment of hypertension (Seedat, 1993). According to the new hypertension guidelines (2012), combination therapy should be considered from the onset if there are co-morbidities to consider such as diabetes, chronic kidney disease or evident cardiovascular disease. An adequate observation of hypertensive patients may include adherence to lifestyle changes and compliance with the drug schedule. However, the costs of interventions could be so much lower if generic medications were used instead of the current model use of both patented and generic drugs in South Africa. Thus, the high cost of hypertension treatment has invariably led to patients seeking alternative therapy (Strahl, 2003).

According to Seedat (1993), race should constitute an added criterion when an anti-hypertensive agent is chosen. This is because different races have different mechanisms of transportation of sodium and rennin (Steyn, 2008). Thiazide diuretic was the most frequently used antihypertensive drug and recommended as first-line drug treatment among hypertensive black patients with sodium metabolism abnormalities. ACE inhibitors are used more in white patients compared to blacks, because rennin-angiotensin over-activity is the predominant underlying pathology in white hypertensive patients (Onwukwe & Omole, 2012).

2.2 Traditional Herbal Medicine (THM)

2.2.1 Definition

Herbal medicine (HM) is derived from whole plants or part of plants. Therefore herbal medicine include crude plant materials such as leaves, flowers, fruit, seed, stems, roots, rhizomes or other plant parts which may be whole, portioned or powered (WHO, 2000). These herbs may be dried or made into a tincture or herbs that have been powdered to make tablets or capsules (Phytotherapy Herbal Practitioners SA, 2011).

According to the WHO (2012), traditional medicine is the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. It is a holistic approach, that is, processes of the physical body, mind, emotions and spirit working together in determining good health or ill health (Mandel, 2009). The equation of good health or ill health also includes the interaction and relationship between nature, the cosmos and human beings (Mandel, 2009). However, for this study, the focus is traditional herbal medicine.

2.2.2 Historical Background of Traditional Herbal Medicine

Medicinal plants are the oldest known healthcare products and their use is well established and widely acknowledged to be safe and effective (WHO, 2012). The importance of medicinal plants is still growing, although it varies, depending on the ethnological, medical and historical background of each country. Scientists began to purify active extracts from medicinal plants which date back to as early as the nineteenth century (Kong *et al*, 2003). For example, Friedrich Serturner isolated morphine from the opium poppy in 1806 (Maoela, 2005). Medicinal plants are also important for pharmacological research and drug development, not only when the plant constituents are used directly as therapeutic agents but also when they are used as templates for the synthesis of drugs or as models for

pharmacologically active compounds (Maoela, 2005). A good example is aspirin; the lead compound in the development of this drug is salicyclic acid which is isolated from the bark of willow tree (Salix alba). Throat lozenges, nasal sprays contain menthol, are isolated from the herb mint (Nova, 2006).

Renewed interest in traditional pharmacopoeias has meant that researchers are concerned not only with determining the scientific rationale for the plants' usage, but also discovery of novel compounds of pharmaceutical value (Fennell *et al*, 2004). Hence, Bodeker & Kronenberg (2002) suggests that there is a renewed interest in anything "natural". This interest in the "natural" has led to an increase in markets for herbal products, thus leading to new economic possibilities, research and business interests.

In South Africa, more than 20 000 tonnes of plant material were harvested, processed and sold annually as traditional herbal medicine (Taylor *et al*, 2001). The sale of medicinal plants had also led to increased commercial farming and employment of farm workers. Traditional medicine trade in South Africa is a large and growing industry. Complementary and alternative medicine proved herbal medicines trade as a large and contributing trade, with an estimated R2.9 billion contributing to the national economy (Mander *et al*, 2007), suggesting that herbal treatment is perceived as promoting optimal health and wellness (Smith, 2003).

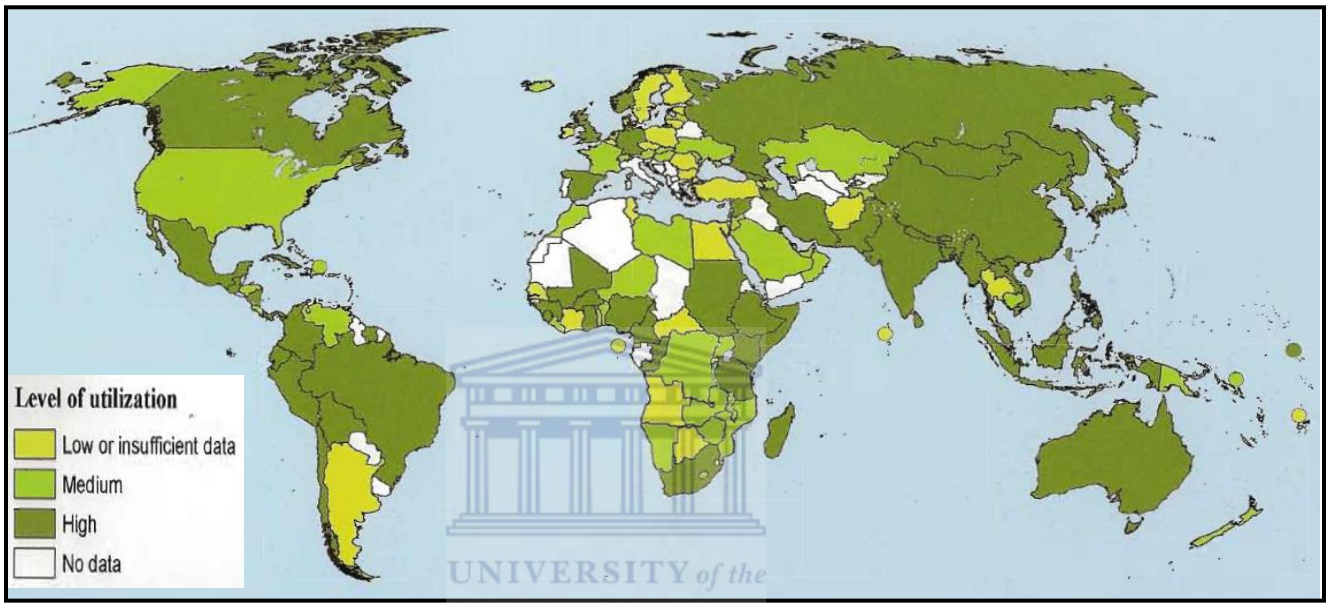
The amount spent represents 5.6% of the National Health budget, and the average frequency of traditional medicine use per consumer is 4.8 times per year (Mander *et al*, 2007). The use of traditional herbal medicine is a choice made by consumers, who are often prepared to pay a premium price for these products and services, even when this exceeds the cost of Western medicine.

2.2.3 Use of Traditional Medicine

2.2.3.1 Prevalence of Traditional Medicine Use

The prevalence of traditional medicine is estimated to be almost 80% of the world's population in some Asian and African countries depend mainly on traditional medicine, which is largely plant-based (WHO, 2008).

Figure 8: WHO Global Atlas of Traditional, Complementary and Alternative Medicine



(Source: Ong *et al*, 2005)

In Africa, WHO estimated that between 60 and 90% of its population rely on medicinal plants to totally or partially meet their healthcare needs (Smith, 2003). Recent estimates in South Africa indicate 60–80% of the population use or regularly depend on plants for healthcare (Aston Philander *et al*, 2011).

2.2.3.2 Utilization of Traditional Herbal Medicine in Africa

The common determinants of traditional herbal medicine use include socio-economic status and cultural acceptance of users. According to Osamor & Owumi (2010), there are other complex psycho-social and cultural factors. Firstly, THM is more socially and culturally accepted because it focuses on the user as a whole human being and not only on the biological aspects of the disease (Furnham & Bhagrath, 2011). Dissatisfaction with Western

medicine and the lack of trust in the healthcare system is another reason (Pagán & Pauly, 2005). Also, people dislike biomedical model and hospital treatment culture because it is time-consuming to see the doctor. Oftentimes in resource constrained African countries upon receipt of prescriptions; patients are unable to afford to purchase the medication (Osamor & Owumi, 2010). Although, traditional herbal medicine has often been critiqued as being an uncivilized practice during the colonial era, it has continued to thrive because it is culturally accepted by the African population (Elujoba *et al*, 2005). For some communities, it is the only medical system available because Western healthcare medicine is too expensive and most of the time unavailable to poorer communities. Smith (2003) stated that traditional herbal medicines remain an important and vital part of both the formal and informal health care sectors in South Africa.

2.2.3.3 Traditional Healers versus Self medicated use of Traditional Herbal Medicine

Traditional healers are often part of the local community, language and culture. Prior to modernization, the culture of visiting traditional healers was common and they were amongst the main gatekeepers for traditional knowledge of plant use (Pretorius, 1999).

According to Peltzer (2009), near the end of the 1990s, the sum total of traditional health practitioners in South Africa was estimated to be approximately 350 000 and an estimated 70-80% of South Africans consult traditional healers. Although, there are so many traditional healers and herbalists, the practice of self medication of traditional medicine has been acknowledged (Kayne, 2009). People either self medicate or are prescribed traditional herbal medicine by family and friends who have some form of knowledge on medicinal plant use (Cocks & Møller, 2002). A study on the utilization of traditional healers in South Africa revealed that only 1.2% of the 4762 households visited traditional healers (Nxumalo *et al*, 2011). Reasons for reduction in traditional healer visits include religion, socio-economic status and urbanization.

Religion is an important contributory factor in the choice of choosing traditional healers or self-medication. Christianity and traditional beliefs are the two main systems that have shaped traditional medicine to what it has become today (Franklin, 2011). Self medication coincides with personal beliefs and this includes prayer, drinking herbal mixtures made by the individual or consuming medicinal plants. Nxumalo *et al* (2011), reported in their study that visits to traditional healers can costs households more than 10% of their household expenditure. Moreover, the urbanization of resource constrained countries has seen tremendous migration of people to urban cities, which do not have a large population of traditional healers; therefore, many people resort to preparing their own herbal remedies and self-treat because of their need for individual empowerment and personal control over their healthcare (Smith, 2003).

2.2.3.4 Challenges of Traditional Herbal Medicine use

Not many countries have national policies for traditional herbal medicine. Regulating traditional medicinal products, practises and their practitioners is difficult due to variations in definitions and categorizations of traditional medicinal therapies (Van Wyk, 2005). However, according to the new definition of traditional and complementary and alternative medicine (WHO, 2012), these difficulties have now been minimized because the definition because the definition includes a broader spectrum of what traditional and complementary and alternative medicine includes. South Africa has made progress towards institutionalising the practise of traditional healers. Healers are legally recognized in South Africa as 'traditional health practitioners', under the *Traditional Health Practitioners Act of 2007 (Act. 22 of 2007)* as diviners alongside with herbalists, traditional birth attendants, and traditional surgeons. The act calls for the establishment of a national council of traditional health practitioners to

regulate and register sangomas[1] in the country (Traditional Health Practitioners Act 22 of 2007).

There is a lack of scientific proof in the validation of the efficacy and safety of traditional herbal medicines. The challenge with THM is that it does not keep pace with scientific and technological advancement and its methods, techniques, medicines and training are kept secret (Taylor *et al*, 2001). Standardization of herbal products is very difficult due to the secrecy surrounding their composition, thus making it impossible to scientifically validate their therapeutic effects.

The prescription and use of traditional herbal medicines in South Africa is currently not regulated. This has resulted in several cases of toxicity from the use of herbal products (Fennell *et al*, 2004). In 2000, between 8 000 to 20 000 deaths were recorded from acute poisoning from traditional herbal medicine use (Thomson, 2000). There has seldom been effective collaboration between traditional and Western medical practitioners, largely due to the perceptions that the use of THM has no scientific basis. Renewed interest from Western countries in herbal remedies and the increasingly urgent need to develop new effective drugs, has made traditionally used plants to receive the attention of the pharmaceutical and scientific communities (Taylor *et al*, 2001). Furthermore, the expanding market for traditional herbal medicine could cause over-harvesting of plants, thus threatening the biodiversity. Efforts to preserve both plant populations and knowledge on how to use them for medicinal purposes is needed to sustain traditional herbal medicine.

[1] *Sangomas* is the iXhosa term for spiritual diviners (traditional healers)

2.3 Traditional Herbs Used for Hypertension

Worldwide, of traditional herbal medicines literatures exists in the treatment and management of hypertension. However, the literature on the use of THM for hypertension in South Africa is virtually non-existent.

Table 2 indicates literature found on use of traditional herbal medicine for hypertension from studies completed in other countries.

Table 2: Published Literature on the use of THM for Hypertension

Author	Description	Findings
P.E. Osamor & B.E. Owumi	Use of CAM in the management of hypertension in Nigeria.	Use of CAM was common among hypertensive subjects. 21% of them used garlic.
A. Tahraoui, J. El-Hilaly, Z.H. Israili & B. Lyoussi	Ethnophramacological survey of THM plants used for hypertension and diabetes in Morocco.	Garlic and wild olive was most commonly among 11 other plants used for hypertension treatment.
M. Rahmatullah, D. Ferdausi, Md. A.H. Mollik, R. Jahan, M.H. Chowdhury & W.M. Haque	A survey of various medicinal plants used in a Bangladesh (Khulna district).	50 species of plants were used as THM and wild olive (*Olea europaea*) for hypertension.
E. Noumi, F. Houngue & D. Lontsi	Twenty-six plants traditionally used to treat hypertension in the Bafia region, Cameroon, were reported.	All 26 plants were recorded and garlic was indicated to treat hypertension.
N. Koffi, T. Marie-Solange, A. Emma & Z. Noël	Ethnobotanical study of plants used by traditional healers to treat hypertension in Côte-d'Ivoire, West Africa.	There were 60 traditional healers who used 33 species of plants to treat hypertension with one being garlic (*Allium sativum*).
I.O Lawal, N.E Uzokwe, D.O Ladipo, I.O Asinwa & A.B.I Igboanuga	Ethnophytotherapeutic information for the treatment of high blood pressure among the people of Ilugun, Ilugun area of	There were 6 medicinal plants used for the treatment of high blood pressure. The blending of garlic (*Allium sativum*) and

	Ogun State, South West Nigeria.	coconut (*Cocos nucifera*) are used traditionally for the treatment of high blood pressure.
D. Picking, N. Younger, S. Mitchell & R. Delgoda	The prevalence of herbal medicine home use and concomitant use with pharmaceutical medicines in Jamaica.	Concomitant herb-drug use is the highest for conditions of respiratory system, gastro-intestinal tract and hypertension. Herbs taken with anti-hypertensive drugs included garlic with reserpine and captopril.

The table shows 7 studies in which medicinal plants have been indicated for hypertension; 5 studies are from North and West Africa and remaining from South America and the Caribbean. Dearth of information exists on traditional herbal medicine for hypertension in South Africa. Even more evident is the consistent indication of garlic and African olive for the treatment of hypertension in the studies mentioned above.

2.3.1 Mechanism of Action of Anti-hypertensive Herbs

The widespread use of anti-hypertensive herbs is unbelievable as their benefits are sometimes unknown to the user. The mechanism of action of these herbs refers to the specific biochemical interaction through which a substance produces its pharmacological effect; hence these herbs possess the ability to lower and control blood pressure. Table 3 indicates 6 studies on several herbs and their lowering blood pressure pharmacological action, both garlic and African olive is indicated in this table.

Table 3: Traditional herbs used for hypertension

Traditional herbal medicine	**Pharmacological action**
Parsley (Craig, 1999)	Diuretic – lower potassium levels in the bloodstream

Ginger (Ghayur & Gilani, 2005)	Vasodilator – improves blood circulation and relaxes muscles around the blood vessels
Garlic (Ginter & Simko, 2010)	Vasodilator - improves blood circulation and relaxes muscles around the blood vessels
African olive (Wang, 2007)	Vasodilator - improves blood circulation and relaxes muscles around the blood vessels
Cinnamon (Preuss, Echard, Polansky & Anderson, 2006)	Reduce the levels of LDL cholesterol in the body, due to its antioxidant properties. It is truly a healing herb that helps use the hormone insulin in the body more efficiently
Buchu (Thring & Weitz, 2006)	Diuretic, antimicrobial, anti-inflammatory

However, the most interested traditional herbs are garlic and African olive. This is because garlic is an everyday herb that everyone uses and it is consumed as a food seasoning for cooking. In contrast, African olive is the lesser know herb of the two. It is highly recognisable by its fruit but also has benefits that people are unacquainted with especially from the leaf and not its fruit as people would expect it to be.

2.3.1.1 Garlic

Allium sativum

(Source: Researcher's photograph of garlic)

Allium sativum commonly known as garlic is a member of the *Alliaceae* family. It is a perennial plant composing of flat leaves that may grow from 1-3 feet in height. The garlic

plant may contain greenish-white flowers and consists of bulbs made up of cloves in a papery white or pinkish-white casting (Edwards *et al*, 2005). The odour is weak when the plant is intact, when damaged it has a pungent smell (Maoela, 2005). *Allium* species contain mostly sulphur compounds, such as allyl sulphides, propionthiol and vinyl disulfide in their essential oils (Maoela, 2005). These volatile sulphur-containing flavour compounds are responsible for the characteristic smell and taste of the *Allium* species.

Garlic dilates the muscles of blood vessels, which helps in lowering blood pressure. It consists of a compound called adenosine, which helps in vasodilatation and is also a muscle relaxant (Edwards *et al*, 2005). According to Ginter & Simko (2010), the entrant compounds of garlic promoting its beneficial effect include, among others, the bioactive allicin and several other compounds. They concluded that the effect of garlic preparation on blood pressure is comparable to the hypotensive effects of much commonly prescribed blood pressure medication.

A variety of biological activities have been reported for garlic including effects on tumorigenesis, atherosclerosis, microbial growth and blood sugar modulation (Thamburan, 2005). Garlic inhibits enzymes involved in lipid synthesis, decreases platelet aggregation, prevents oxidation of LDL and increases antioxidant status (Ginter & Simko, 2010). Although both raw and cooked garlic can benefit blood pressure, raw garlic is more potent and acts faster as an herbal medicine. Garlic also interferes with the formation of blood clots and helps in reducing cholesterol. However, garlic's interactions with aspirin and other blood-thinning agents such as warfarin or heparin and anti-platelet drugs may result in the increased risk of bleeding (Edwards *et al*, 2005). Garlic can be taken in a tablet and capsule form or it can be consumed in, with or separately from food.

2.3.1.2 African Olive

Olea europaea spp. *africana*

(Source: Researcher's own photograph)

Olea africana also known as African olive is a subspecies of *Olea europaea*, which is indigenous to Africa (Wang, 2007). *Olea europaea* spp. *africana* comes from the family *Oleacae*. The tree grows between 3-15 metres in height and may assume a bushy habit if it is stunted; and is an evergreen tree and bares olive fruit. In southern Africa, it is regarded as one of the most important traditional medicinal plants.

The traditional use of African olive dates back to several hundred years. The dried leaves are most often used, followed by the roots and stem bark. It is mainly used to lower blood pressure and to treat unrelated cardiovascular diseases by using the dried leaves and sometimes the roots and/or bark in a decoction. The leaves have a variety of biological activity. In 1969, researchers demonstrated that the olive leaf constituents were powerful in the in vitro inhibition of numerous viruses, including herpes, pseudo rabies and some forms of polio and thereby being antimicrobial. Oleuropein found in African Olive exhibited vasodilating properties. The leaf extract also possesses anti-inflammatory properties (likely attributable to anti-complement activity) and inhibition of platelet aggregation (Olive leaf monograph, 2009).

According to Steyn (2008), in an investigation that studied triterpenoids isolated from *Olea Africana*; the compound prevented the development of severe hypertension on insulin-resistant rat genetic model. Dugmore & van Wyk (2008) explained that Oleuropein and oleacein, two chemical substances found in African olive work in combination on different mechanisms of the body either by lowering blood pressure by increasing coronary flow or inhibiting the ACE enzymes. Due to the hypotensive and anti-platelet aggregating properties of olive leaf, associated use with blood thinning agents may have an adverse effect; so caution is advised (Olive leaf monograph, 2009).

In conclusion, hypertension is one of the leading chronic diseases. It is important to understand other complementary and alternative treatment options within rural and urban communities. Based on the literature related to commonly used herbs for lowering blood pressure and importance of traditional medicine among black African population, both garlic and African olive were selected to investigate use by an urban population in the Western Cape.

Chapter 3

Methodology

This chapter details the methods utilised in the study including: study design, study location, participant recruitment, questionnaire, data collection process, analysis and the theoretical framework. Both quantitative questionnaire and qualitative method of in-depth interviews and a focus group discussion was utilised.

3.1 Cohort Study: The Prospective Urban Rural and Epidemiology (PURE) Study

The Prospective Urban and Rural Epidemiology (PURE) Study is a large scale prospective epidemiological study that has established both urban and rural cohorts to follow changing environments, societal influences on lifestyle risk factors and cardiovascular diseases, using multiple periodic standardized data collection in multiple communities from 17 countries (Argentina, Bangladesh, Brazil, Canada, Chile, China, Columbia, India, Iran, Malaysia, Pakistan, Poland, South Africa, Sweden, Turkey, United Arab Emirates and Zimbabwe) representing every major region of the world involving a total of about 120 000 individuals, with a minimum follow-up of 10 years planned (Teo *et al*, 2009).

The PURE premise is that mal-adaption to urbanization (with increased energy intake and decrease energy expenditure) is the proximate cause of obesity, which leads to elevated traditional risk factors (dyslipidemia, dysglycemia, hypertension), and the risk factors interact with genetic and psycho-social factors resulting in increased cardiovascular diseases.

According to Teo *et al* (2009), the PURE study has 2 main objectives:

1. To examine the relationship between societal influences and prevalence of risk factors and chronic non-communicable diseases measured at baseline.

2. To examine the relationship between societal determinants and incidence of chronic non-communicable disease events and on changes in rates of selected risk factors.

Recruitment of the participants started in 2003 and 139 506 participants in total has been enrolled into the study by 31 March 2009, in the various countries taking part in the study. The current total enrolment for participants in the study is 153 996 individuals (Diaz & Ertl, 2012). The choice and number of countries selected in PURE reflects a balance between a large number of communities at different economic levels with substantial heterogeneity in social and economic circumstances, policies and the feasibility of centres to successfully achieve long term follow-up (Teo *et al*, 2009). The reason for the inclusion of both rural and urban communities is that for many countries, urban and rural environments exhibit distinct characteristics in social and physical environment. By sampling both, it ensures considerable variation in societal factors across PURE communities.

3.1.1 PURE in South Africa

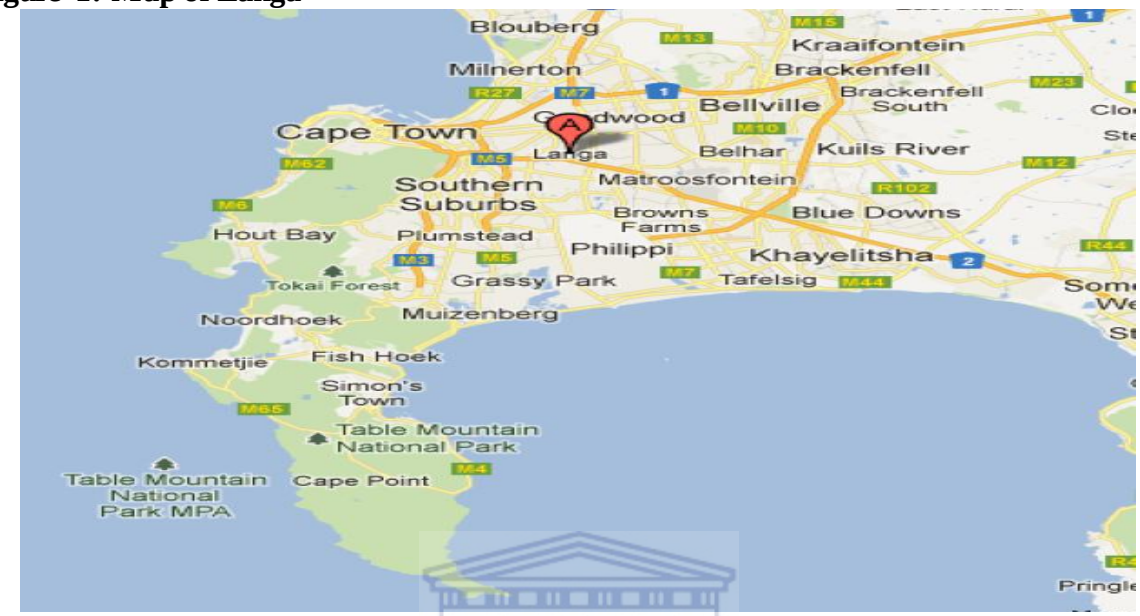
Presently, the PURE study in the South Africa is a longitudinal epidemiological study which has recruited 1000 rural and 1000 urban South Africans; thus, the rural South African participants were recruited from Mount Frere, in Eastern Cape and the remaining urban participants recruited from Langa, in Western Cape.

3.2 Study Setting

Participants were recruited from Langa, an urban township in Cape Town within the Western Province. Langa is Cape Town's oldest township, established in 1923. Similar to the nearby communities of Gugulethu and Khayelitsha, Langa is one of the many areas that were established prior to the apartheid era designated for black South Africans (Siviwe, 2010). Culturally, Langa is relatively homogeneous and the community started with very little

planned infrastructure however it is rapidly developing and growing. Figure 1 shows location of Langa in the Western Province.

Figure 1: Map of Langa



(Source: Google maps – Langa, Western Cape)

This research project was conducted in Langa only because the demographics and population dynamics were ideal for study question and aims of study, practical location and logistics, time constraints, and minimizes research cost.

Langa Recreational Park in Washington Street

(Researcher's photograph)

3.3 Study Design

The research utilized cross-sectional study design, whereby the frequencies of hypertension as well as the use of garlic and African Olive was recorded among black South Africans living in Langa in the Western Cape Province. A cross-sectional design depicts a description of diseases, health, medical and psychosocial phenomena as they exist at a particular point in time. It can be thought of as providing a "snapshot" of the frequency and characteristics of hypertension and use of traditional herbal medicines - garlic and African olive. Data obtained from cross-sectional studies can be used to assess the prevalence of chronic conditions in a population as well as being cost effective (Timmreck, 2002).

The research project established the prevalence of hypertension and the use of specific traditional herbal medicine to treat this condition. This study is a two-phase study based on both quantitative and qualitative data collection methods.

Phase one was a quantitative data collection method which consisted of a questionnaire to obtain the following information: participants' demographics, household dynamics, medical history, hypertension history and the use of traditional herbal medicine. This provided quantitative description of study participants, prevalence of hypertension and use of garlic and African olive. The second phase of the study comprised of 30 in-depth interviews and one focus group discussion. The purpose of this phase was to obtain detailed information from hypertensive participants and their use of traditional herbal medicine specifically garlic and Africa olive.

The qualitative phase support the quantitative phase, therefore resulting in a holistic illustration of findings captured. Questionnaires had been completed to obtain the basic information about participants' socio-economic status, medical history, the use of traditional herbal medicine and their knowledge about traditional herbs, garlic and African olive. The

"what and when" was answered by the questionnaire. Thereafter, participants reported to have hypertension in the quantitative questionnaire were identified and interviewed. The "how and why" was addressed by the use of in-depth interviews and a focus group discussion.

3.4 Quantitative Data Collection

According to Timmreck (2002), one of the most common approaches to cross-sectional research design is the use of surveys and questionnaires. This research project used a questionnaire, to describe and obtain a better understanding and prevalence of hypertension and the traditional herbal medicine use among hypertensive participants.

Questionnaire Development

The questionnaire developed came from review of existing models of questionnaires found from literature involving studies on traditional medicine (Patterson & Arthur, 2009; Horne *et al*, 1999; Saw *et al*, 2006; Ezeome & Anarado, 2007). The questionnaire was divided into 5 sections - demographics, socio-economic factors, medical history, hypertension and herbal medicine use (traditional medicine use and the use of garlic and/or African olive) and consisted of 27 questions. The questionnaire was translated into the mother language of the study population which is isiXhosa and back translated into English to ensure accuracy and clarity.

Training/Pilot Test

Before administering the questionnaires, four fieldworkers were trained in research methodology and understanding the purpose of the questionnaire questions. This training consisted of understanding the background of the research project, the questions in the questionnaire and also the data collection procedures. This was done over the course of a week.

Thereafter, a pilot study of 20 hypertensive participants was conducted to pre-test the instrument. This proved beneficial because some challenges were encountered, whereby a few questions were not clear and ambiguous. Also, the pictures of the traditional herbs (garlic and African olive) provided were not depicted clearly. Therefore, adequate corrections were made to ensure appropriate understanding, communication and appropriate data collection. The questionnaire administration commenced on the 28 April 2012 through to the 20 May 2012.

Response Rate

Response rate refers to the number of people who participated in the study excluding those who refused or where unable to participate. The response rate is the percentage of participants who have completed the questionnaire. The target population within the PURE study for this project was hypertensive participants. Out of the 180 participants, 139 participants were self reported (diagnosed) hypertensive. Therefore the response rate was 77.2% (139÷180×100). Forty-one participants were those who self reported they were not diagnosed hypertensive but had other medical conditions. These participants were retained for the analysis of traditional herbal medicine use, but further excluded from the study because they did not use garlic and/ or African olive.

3.4.1 Sample Procedure and Sample Size

Convenience sampling was used because given the stated aim and objectives of this type of study, this sampling procedure allows for basic descriptive data. Convenience sampling also has an advantage, because it allows for detecting relationships among different phenomena.

The larger the sample, the smaller the error in predictability (Timmreck, 2002). The calculated sample size was 141 participants, however, 180 questionnaires was administered

and collected in order to oversample and ensure sufficient participants for generalizability if findings and draw valid conclusions thereof.

According to Ashton Philander *et al* (2011), recent estimates indicate 60-80% of the population use or regularly depend on plants for health care. This literature provided the prevalence of traditional herbal medicine for the general population of South Africa. Based on this figure, the sample size was calculated using the statistical package programme Epi Info version 7.0.97 (2012) on the assumption that 70% of the population use traditional medicine (expected frequency). The confidence limit was set at 7%, with the assumption that people may or may not use traditional herbal medicine. Hence, the calculated sample size was 141 at a confidence level of 95% with a 5% non-response rate.

Figure 2: Population Survey

Population survey or descriptive study using random (not cluster) sampling

Population size: 1000

Expected frequency: 70 %

Confidence limits: 7 %

Confidence Level	Sample Size
80%	**66**
90%	**104**
95%	**141**
97%	**168**
99%	**221**
99.9%	**317**
99.99%	**394**

(Source: Epi Info 7.0.97 – StatCalc _Population Survey, 2012)

3.4.2 Sample Population

3.4.2.1 Participant Recruitment

The study population were selected from the South African PURE study and specifically recruited from the Langa study location. The study participants were initially located from the PURE database specifically from Langa site. The database was reviewed from all participants in Langa and complete search performed for self-reported hypertension. Given the sample

size calculation, oversampling was performed to ensure sufficient participants in the study; an additional 41 participants were recruited.

3.4.2.2 Inclusion and Exclusion Criteria

The overall PURE study has only black South Africans, both female and male; in addition the following criteria was used for the inclusion criteria: 1) all participants had to be between the ages of 30 -75 years old; 2) participants had to have a blood pressure reading of 140/90 mmHg and above; 3) hypertensive participants had to be on prescription medication or adhering to a prescribed lifestyle modification; 4) reside in Langa and 5) willingness to participant. In addition, the exclusion criteria used was all participants who did not meet the criteria as stipulated. This information had already been pre-recorded by the PURE study. Table 1 reflects both inclusion and exclusion criteria.

Table 1: Inclusion and Exclusion Criteria (Quantitative)

Characteristic	**Inclusion**	**Exclusion**
Age	30-75 years old	< 30 years old & > 75 years old
Race	Black South African	Black Foreign, Coloured, White & Indian South African
Language	Afrikaans, English, isiXhosa & isiZulu	IsiNdebele, Sesotho, Setswana, siSwati, Tshivenda & Xitsonga
Condition	Hypertension & non-hypertension	No known medical conditions
Traditional Herbal Medicine	Use of traditional herbal medicine	Non use of traditional herbal medicine
Location	Langa	Areas outside Langa
Participation	Willingness to participate	Unwillingness to participate

3.4.3 Data Collection

The first phase of the study consisted of questionnaire administration to 180 participants recruited from the Langa location of the South African PURE study. The questionnaires were administered by the trained fieldworkers under the supervision of the researcher.

Fieldworkers administered the questionnaires over the weekends which made the availability of the participants more accessible. If participants were unavailable, they were contacted and followed up for enrolment into the study after several attempts. The data collection occurred during the period of 28 April 2012 – 20 May 2012.

3.4.4 Data Analysis

The data obtained from the questionnaire was analysed using Statistical Package for the Social Sciences (SPSS) IBM 20.0 2011. All questionnaires were reviewed for completeness and then entered into SPSS data management and analysis. Data analysis plan involved using descriptive statistics predominantly by means of frequency distribution and for exploratory purposes bi-variate cross tabulations analyses were implemented. Cross tabulations were done to asses differences between the all variables and the use of traditional medicine. Accuracy was maintained by having the data reviewed by a biostatistician. All data is currently retained in SPSS data management system.

Pearson Chi-Square Test

This research project only utilized uni-variate and bi-variate analysis. Uni-variate analysis is described as frequency distribution of a single variable. Bi-variate analysis can be expressed as the analysis of two variables simultaneously. In bivariate analysis the Pearson chi-square test was used. The Pearson chi-square test is the best known of several chi-squared tests. In statistical significance testing, the p-value is equal to or less than 0.005. This p-value is important in the bi-variant data analysis because it is commonly used to compare observed data with data that would expected to be obtain according to a specific hypothesis. It is safe to say that low chi-square values indicate a high probability that the observed deviations could be due to random chance alone and high chi-square values indicate a low probability that the observed deviations are due to random chance alone. In SPSS, Pearson chi-square test indicates the statistical significance and is used to discover if there is a relationship between

two variables. It is basically an approximation of the results from the exact test and can be easily interpreted (O'Neil, 2009).

3.5 Qualitative Data Collection Methods

Qualitative research methodology has a high regard for the understanding as to why people behave as they do: their knowledge, attitudes, beliefs and perceptions. It gives valuable insights which might have been missed in the quantitative analysis it provide valuable information to certain research questions in its own right but it also complement quantitative research methods. It authenticates the quantitative data, giving more meaning descriptively to what has been asked in questionnaire thus providing for a more detailed understanding of participants and research findings. Therefore, only hypertensive participants were used for this study phase.

3.5.1 Sample Procedure and Sample Size

Study participants were recruited from the South Africa (Western Cape) PURE study specific to Langa. Participants, who enrolled self reported hypertension, consented and completed the questionnaire. Hypertensive participants were screened for use of traditional herbal medicine. In addition, the participants who indicated their hypertension status and the use of traditional herbs, garlic and African olive were selected for the in-depth interviews and focus group discussion. Therefore, 30 hypertensive participants were selected for in-depth interviews and from the 30 participants, the focus group discussion was open for the 30 hypertensive participants to attend.

3.5.2 Sample Population

3.5.2.1 Participant Recruitment

Participants were recruited from the quantitative cross-sectional phase of the study. The selections of these participants were from the 139 participants that identified themselves as hypertensive and indicated use of traditional herbal medicine (garlic and African olive).

3.5.2.2 Inclusion and Exclusion Criteria

The same inclusion and exclusion criterion was used as the quantitative study. All participants were within the ages of 30-75 years old; both female and male. All the participants included in the study were self reported and being diagnosed with hypertensive as indicated in the PURE study and also verified in the phase one study using administered questionnaire. Table 2 indicates both inclusion and exclusion criteria of qualitative phase of the study.

Table 2: Inclusion and Exclusion Criteria (Qualitative)

Characteristic	**Inclusion**	**Exclusion**
Age	30-75 years old	< 30 years old & > 75 years old
Race	Black South African	Black Foreign, Coloured, White & Indian South African
Language	Afrikaans, English, isiXhosa & isiZulu	IsiNdebele, Sesotho, Setswana, siSwati, Tshivenda & Xitsonga
Condition	Hypertension & non-hypertension	No known medical conditions
Traditional Herbal Medicine	Use of traditional herbal medicine	Non use of traditional herbal medicine
Knowledge, perceptions & opinions	Willingness to share personal information.	Unwilling to share personal information.
Location	Langa	Areas outside Langa
Participation	Willingness to participate	Unwillingness to participate

3.5.3 Data Collection

The second phase of the qualitative study includes both in-depth interviews and a focus group discussion.

In-depth interviews: The purpose of in-depth interviews is to provide much more detailed information which substantiates the qualitative questionnaires. It gives an insight into the participants' individual perception on hypertension and traditional herbal medicine use; thereby revealing their story in their own words for a richer expression and better understanding. This method allowed participants to give their view without feeling limited and also put the participant at ease because it is a one-on-one interaction because certain participants may feel overwhelmed by group dynamics.

The participants were selected from the 139 participants who indicated from the quantitative phase of the study that they were hypertensive. As a result of the numerous factors that can determine sample sizes in qualitative studies, many researchers wince from suggesting what constitutes a sufficient sample size in contrast to quantitative studies (Manson, 2010). However, according to Green & Thorogood (2009) the experience of most qualitative researchers is that in interview studies little that is "new" comes out of transcripts after you have interviewed 20 or so people. For this study 30 hypertensive participants were randomly recruited for the in-depth interviews; furthermore, hypertensive participants had to indicate their use of garlic and/ or African olive. The participants were divided according to their age and the gender of the participant was not a prerequisite. Data was obtained through individual in-depth interviews. In-depth interview topics included hypertension (perceptions and experiences), traditional herbal medicine (use, non-use, medicinal plants) and traditional herb use.

Interviews took place at the participant's home, for convenience and were conducted in English. An interpreter facilitated with translating in the local language of isiXhosa. The interviews lasted from thirty minutes to one and a half hours; and all interviews were tape-recorded with the permission of the participants and notes were taken by researcher.

Focus group discussion: The intention of a focus group discussion was to understand the participants' opinions in a group setting because the response to the researcher's questions differs between individual reaction and a group reaction. The interaction in a focus group discussion often creates a cuing occurrence that has the potential for extracting more information.

The focus group discussion participant selection was purposeful, as all those who were interviewed were invited to join the discussion. There was no participant recruitment for the focus group discussion but the discussion was open to all 30 hypertensive participants that were interviewed. However, only 9 participants (1 male and 8 female) attended and participated in the discussion. This discussion took place within one of the participant's residences in Langa.

Before conducting the 30 in-depth interviews and one focus group discussion, participant information sheets were provided as well as consent forms in the local language of the study population which is isiXhosa was provided. The focus group discussion lasted one and a half hours and all conversations were tape recorded with the permission of the participants and notes were taken by the researcher. Both in-depth interviews and focus group discussion was conducted by the researcher with an appropriate translator who was fluent in both English and isiXhosa.

3.5.4 Data Analysis

The in-depth interviews involved a translator who assisted with translating the interview questions into the participant's local language, isiXhosa, and also translating the participants' response into English to the researcher. In the focus group discussion, the same procedure was followed with the translation as it was in the in-depth interviews. Even though the interviews were conducted in Xhosa, those participants who desired to communicate in

English were able to express themselves in English or Xhosa based on their preference. The in-depth interviews and focus group discussion were facilitated with a question guide encouraging a broad discussion related to the aetiology, experiences and treatment of hypertension, experiences with traditional herbal medicine, the use thereof and the use and knowledge of traditional herbs – garlic and African olive (Appendix VII). Both in-depth interviews and focus group discussions were tape recorded and notes were taken by the researcher. The discussions were transcribed verbatim and translated into English and checked for accuracy.

Transcripts were read by the researcher to identify phrases and assign codes. Both the in-depth interviews and focus group discussion were coded and analysed by means of thematic content analysis. Codes were developed from the content of each transcript and used to label the most common key themes in the data. Comparisons were made among participants to classify themes that recur or are common in the data. Initial codes were based on key themes reflected in the topic guide and in participant's accounts.

Thematic Content Analysis

Thematic content analysis is a descriptive presentation of qualitative data and an approach where various data from different participants are compared with each other to classify those "themes" that recur or are common in the data (Anderson, 2007). The purpose of thematic content analysis is to develop a valid framework in which it is possible to make reproducible inferences from the text.

3.6 Study Limitations

Cross-sectional studies are limited to what data have been gathered at one point in time (Timmreck, 2002) and it only represent individuals who completed the questionnaire and participated in the study. Therefore, using qualitative data collection methods (in-depth

interviews and a focus group discussion) substantiates the questionnaire by providing detailed understanding of the participants' perceptions about hypertension and traditional herbal medicine.

As a result of convenience sampling from the PURE study, there was no randomization therefore the study sample is biased and not necessarily generable to PURE study cohort or Langa community.

Langa Residences next to Vanguard Drive

(Researcher's photograph)

Another limitation of this study is that the sample size is small; this influences the statistical significance of the study. If the sample size was larger it would have yielded more statistical value. The larger the sample size, the more realistic the statistical value of the study and the frequency of error would be minimized. During the recruitment process of the participants, there were more females than males, and findings of this study cannot be generalized to

males due to the limited number included in the study and to all populations who have hypertension because this involved self reported hypertension and unknown length of hypertension, and year's diagnosis with the condition.

3.7 Study Bias

The most obvious criticism about convenience sampling is sampling bias and that the sample is not representative of the entire population. This may be the biggest disadvantage when using a convenience sample because it leads to more problems and criticisms.

According to Choi & Pak (2005), information bias occurs in the data collection stage. There have been some participants who did not complete the questionnaires entirely, for example, participants may not know their actual diagnosis or the prescription medication they are on. Thus, information bias has occurred. Not all participants have completed all the sections in the questionnaire, even though it was administered by the fieldworkers, participants are entitled to enforce their right to privacy on certain sections within the questionnaire therefore the field worker could not complete all the questions. The sections of the questionnaires that were completed were used as data.

Fieldworkers who were not able to consistently locate the hypertensive participants completed their quota of questionnaires using non-hypertensive participants who used traditional herbal medicine. The non-hypertensive participants with other medical conditions were enrolled into this study due to their reported use of traditional herbal medicine use for chronic conditions. This biased the study because data on non-hypertensive participants were also included in the quantitative data analysis.

3.8 Validity and Reliability

Quantitative Findings

The validity and reliability of quantitative findings were ensured by developing an instrument that directly addressed the research interest. The instrument was also pilot tested to ensure clarity and research objectives were met. The questions in the questionnaire were adopted from standardized instruments from other studies (Patterson & Arthur, 2009; Horne *et al*, 1999; Saw *et al*, 2006; Ezeome & Anarado, 2007). The data that was obtained from this questionnaire was analysed and the process of analysis was supervised by a biostatistician.

Qualitative Findings

The validity and reliability of qualitative findings is important. People's experience cannot be measured or tested. Thus, they are always in the process of becoming and changing as a person (Head, 2000). An interview is a negotiation between the participants who interprets their life to the researcher. The participant is the expert of their life and obtaining certain knowledge is dependent on that participant. Specifically, in interviews or focus group discussions, it is imperative to record everything that the participant discloses, their body language and inflection of voice; to be able to analyse the interview within this holistic context; s because non-verbal cues are often as important as what has been said (Boulton & Hammersley, 1993); hence, researchers select from the most informative interpret and perform analysis. According to Head (2000), the researcher is the intermediary between the participants and the readers of the final research report.

3.9 Ethical considerations

Ethical approval for this study was granted by the Senate Research Committee of the University of the Western Cape on the 13 April 2012.

At the commencement of the fieldwork, before any questionnaires were administered or in-depth interviews conducted or focus group discussion, verbal consent was obtained for the participation in the study; thereafter were provided with participant information sheets and

informed consent forms. During the administration of questionnaires, the consent form was returned to the fieldworker and during the in-depth interviews and focus group discussion, the forms were returned to the researcher. The participant information sheet described the study and its objectives; informed the participants about their rights to withdraw from the research at any time, withhold any information which they feel is too intrusive and that their participation was voluntary. Participants were offered the option of using pseudonyms to protect their identity if they so wish. They were informed of the methods of conducting research and the research tools, such as making notes and audio recorders which could possibly be used in the study and further that such information may be published. They were adequately informed of this both in writing and verbally and permission to take any photographs was permitted. Since no service or treatment was offered to them, their withdrawal would not affect their health care services. This information was provided within the participant information sheet and a consent form.

Confidentiality was ensured since the questionnaires, hard copies and research results were safely locked away in a file cabinet at the institution and only the researcher had access to the research material. In addition, participant ID numbers were used when entering data into the computer thereby ensuring confidentiality.

Chapter 4

Results

Chapter four will provide results of both quantitative and qualitative findings of the study. The quantitative data was analysed with SPSS 20.0 2011 and the qualitative data was analysed with thematic content analysis. This chapter is divided into two sections: quantitative results and qualitative results.

4. 1 Quantitative Data

4.1.1 Participant Demographic Characteristics

Table 1 provides the total of 180 participants enrolled into this study. Seventy-seven percent of the participants self reported being hypertensive while remaining (23%) were non-hypertensive; however one participant is missing from some of the data (N=179). Hypertensive participants were primarily female (83%) while they were between the ages of 36-65 years of age. The mean age and median age was 55 years.

Fifty percent were unmarried, while overwhelming majority were Christians (95%) and 78% had secondary education. Sixty-eight percent employment status was either unemployed or retired, reported income was 45% earning between R1000-R2000 per month while the remaining earned less than R1000 (35%) and more than R2000 (15%). Hypertensive participants had a history of smoking at 14 % and an estimated 14% consume alcohol.

Table 1: Participant Characteristics (Hypertensive and non-hypertensive participants)

Characteristic	Total (N=179)	Hypertensive (N=139, 77%)	Non-hypertensive (N=40, 23%)
Gender	***177****	***137***	***40***
Female	142 (79.32)	116 (83.45)	26 (65.00)
Male	35 (19.55)	21 (15.10)	14 (35.00)
Missing	2 (1.11)	2 (1.44)	0 (0.00)
Age	***175****	***135****	***40***

25-35 years old	22 (12.29)	20 (14.38)	2 (5.00)
36-45 years old	54 (30.16)	40 (29.62)	14 (35.00)
46-55 years old	60 (33.52)	48 (34.53)	12 (30.00)
56-65 years old	34 (18.99)	27 (14.42)	7 (17.50)
66-75 years old	5 (2.79)	0 (0.00)	5 (12.50)
Missing	4 (2.23)	4 (2.87)	0 (0.00)
Marital Status	***176****	***137****	***39****
Living together/ married	46 (25.69)	37 (26.61)	9 (22.50)
Widow/ divorce	35 (19.55)	30 (21.58)	5 (12.50)
Unmarried	95 (53.07)	70 (50.35)	25 (62.50)
Missing	3 (1.67)	2 (1.43)	1 (2.5)
Religion	***178****	***138****	***40***
Christian	171 (95.53)	132 (94.96)	39 (97.50)
Traditional	7 (3.91)	6 (4.31)	1 (2.50)
Missing	1 (0.55)	1 (0.72)	0 (0.00)
Educational Level	***176****	***136****	***40***
Primary	38 (21.22)	28 (20.14)	10 (25.00)
Secondary	138 (77.09)	108 (77.69)	30 (75.00)
Missing	3 (1.67)	3 (2.15)	0 (0.00)
Employment Status	***155****	***134****	***21****
Working	45 (25.13)	39 (28.05)	6 (15.00)
Unemployed	77 (43.01)	63 (45.32)	14 (35.00)
Retired	33 (18.43)	32 (23.02)	1 (2.50)
Missing	24 (13.40)	5 (3.59)	19 (47.5)
Monthly Income	***169****	***132****	***37****
Less than R1000 per month	56 (31.28)	48 (34.53)	8 (20.00)
R1000-R2000 per month	85 (47.48)	63 (45.32)	22 (55.00)
More than R2000 per month	28 (15.64)	21 (15.10)	7 (17.50)
Missing	10 (5.58)	7 (5.03)	3 (7.5)
Smoking history	***171****	***131****	***40***
Yes	35 (19.44)	20 (14.38)	15 (37.50)
No	136 (75.97)	111 (79.85)	25 (62.50)
Missing	108 (60.33)	8 (5.75)	0 (0.00)
Consume Alcohol	***168****	***128****	***40***
Yes	36 (20.11)	19 (13.66)	17 (42.50)
No	132 (73.74)	109 (78.41)	23 (57.50)
Missing	11 (6.14)	11 (7.91)	0 (0.00)

Note: Percentages are computed for non-missing cases only.

*Missing values in variables.

The medical history of all the participants is shown in Table 2. A list of participant medical conditions and the frequency of medical check-up is presented. The more prominent conditions reported are hypertension (72%, N=139), diabetes (14%, N=25) and arthritis (13%, N=24). Approximately 58% of participants (N=104) reported they go one a month for their regular medical check-ups.

Table 2: Participant Medical History

Description	All participants (N=180)	Percentage
Conditions		
Hypertension	139	77.2
Diabetes	25	13.8
Kidney problems	1	0.5
Chronic lung disease	2	1.1
HIV/AIDS	5	2.7
TB	3	1.6
Cancer	1	0.5
Arthritis	24	13.3
Other conditions	17	9.4
Regular medical check-ups		
Once a month	104	57.8
Twice a month	20	11.1
Every few months	14	7.8

Note: Percentages are computed for non-missing cases only.

4.1.2 Participants' Traditional Herbal Medicine Use

Table 3 indicates participants' use of traditional herbal medicine. Of the 179 participants of the study, only 172 participants answered the question on THM use. Eleven percent of hypertensive participants reported traditional herbal medicine use (N=15) and 15% of the non-hypertensive participants indicated their use of THM (N=6). The reason reported for THM use was equally reported as follows: improves emotional well-being (4%). beliefs and inner self (3%) and relief of symptoms (3%). Four hypertensive participants (3%) reported the frequency of THM use as twice a day, while two (2%) reported daily and also

occasionally. Eight hypertensive participants reported using THM as a tea (6%) while an estimated 2% as a tincture (N=2).

Table 3: Traditional Herbal Medicine use among Hypertensive & Non-hypertensive Participants

Characteristics	Total (N=179)	Hypertensive (N=139)	Non-hypertensive (N=40)
Traditional Herbal Medicine Use	***175***	***136***	***39***
Yes	21 (11.73)	15 (10.79)	6 (15.00)
No	154 (86.03)	121 (87.05)	33 (82.50)
Missing	4 (2.23)	3 (2.15)	1 (2.50)
Reasons for THM Use	***20***	***14***	***6****
It is in keep with beliefs and inner self	5 (2.79)	4 (2.87)	1 (2.50)
It relieves symptoms of Western medicine	5 (2.79)	4 (2.87)	1 (2.50)
It improves emotional well-being	10 (5.58)	6 (4.31)	4 (10.00)
Missing	159 (88.82)	125 (89.92)	34 (85.00)
Frequent use of THM	***18***	***14***	***4***
Daily	3 (1.67)	2 (1.43)	1 (2.50)
Twice a day	5 (2.79)	4 (2.87)	1 (2.50)
Once a week	1 (0.55)	1 (0.72)	0 (0.00)
Twice a week	1 (0.55)	1 (0.72)	0 (0.00)
Monthly	1 (0.55)	1 (0.72)	0 (0.00)
Occasionally	4 (2.23)	2 (1.43)	2 (5.00)
Monthly	3 (1.67)	1 (0.72)	0 (0.00)
Missing	161 (89.94)	125 (89.92)	36 (90.00)
Form of THM	***14***	***12***	***2***
Tea	8 (4.46)	8 (5.75)	0 (0.00)
Powder	2 (1.11)	1 (0.72)	1 (2.50)
Tincture	3 (1.67)	2 (1.43)	1 (2.50)
Other	1 (0.55)	1 (0.71)	0 (0.00)
Missing	165 (92.17)	127 (91.36)	38 (95.00)
Use of Garlic	***177***	***137***	***40***
Yes	46 (25.69)	37 (26.61)	9 (22.50)
No	131 (73.18)	100 (71.94)	31 (77.50)
Missing	2 (1.11)	2 (1.43)	0 (0.00)
Reasons for Garlic Use	***44***	***35***	***9****
Lowering blood pressure	22 (12.29)	22 (15.82)	0 (0.00)
Influenza	6 (3.35)	2 (1.43)	4 (10.00)
Arthritis	3 (1.67)	1 (0.72)	2 (5.00)
Immune booster	3 (1.67)	2 (1.43)	1 (2.50)
Other ailments	8 (4.46)	6 (4.31)	2 (5.00)
Recommended by others	2 (1.11)	2 (1.43)	0 (0.00)
Missing	135 (75.41)	104 (74.82)	31 (77.50)
Use of African Olive	***176***	***136***	***40***
Yes	2 (1.11)	2 (1.43)	0 (0.00)
No	177 (98.88)	134 (96.40)	40 (100.00)

Missing	3 (1.67)	3 (2.15)	0 (0.00)
Reasons for African Olive Use	***2***	***2***	***0***
Lowering blood pressure	1 (0.55)	1 (0.72)	0 (0.00)
Used but not for illnesses	1 (0.55)	1 (0.72)	0 (0.00)
Missing	177 (98.88)	137 (98.56)	40 (100.00)
Healthcare Provider's Knowledge of THM Use	***17***	***14***	***3***
Yes	2 (1.11)	2 (1.43)	0 (0.00)
No	15 (8.37)	12 (8.63)	3 (7.50)
Missing	162 (90.50)	125 (89.92)	37 (92.50)

Note: Percentages are computed for non-missing cases only.

*One participant did not complete the questionnaire.

While a small percentage of hypertensive participants reported the use of African olive (<2%), approximately 27% reported the use of garlic; reasons for garlic was primarily for lowering blood pressure (16%) and for other ailments (4%), while reports were made for other reasons such as influenza (1.4%), arthritis (1%) and as a immune booster (1%). The hypertensive participants (9%) did not disclose to the healthcare providers about their use of traditional herbal medicine.

4.1.3 A Comparison between Hypertensive and Non-hypertensive Participants

The hypertensive and non-hypertensive participants had similar finding however (Refer to Table 1 – non-hypertensives); the following demographic characteristics for non-hypertensives were reported: non-hypertensive participants were primarily female (65%) and between the ages of 36-55 years of age. Sixty-two percent were unmarried, Christians (98%) and 75% had secondary education. Thirty-eight percent employment status was either unemployed or retired, with a reported income was 55% earning between R1000-R2000 per month while the remaining earned less than R1000 (20%) and more than R2000 (18%). Non-hypertensive participants had a history of smoking at 43% and an estimated 43% consume alcohol.

Participants indicated the use of traditional herbal medicine, however, comparing the hypertensive and non-hypertensive participants respectively, only 11% (N=15) and 17% (N=6) of these participants used THM. Furthermore, non-hypertensive participants were excluded from further analysis because non-hypertensive participants did not indicate the use of traditional herbs (garlic and/ or African olive) and does not form part of the research objectives.

4.1.4 Bi-variate Analysis of Hypertensive Participants

Table 4 represents bi-variate analysis of selected variables and the variable use of garlic and/ or African olive. The table shows the degree of the relationship between the use of garlic and/or African olive with various other variables that proved to be most significant with Pearson value ($p \leq 0.05$). Only the age ($p=0.007$), types of hypertension medication ($p=0.025$) and healthcare provider knowledge of THM use ($p=0.020$) proved to be the most significant.

Table 4: Bi-variate Variables with P-values

	The use of Garlic and/ or African olive		P-values
	No	Yes	
Gender			
Male	27 (77.10)	8 (22.90)	
Female	105 (73.40)	38 (26.60)	***0.653***
Age			
25-35 years old	2 (100.00)	0 (0.00)	
36-45 years old	28 (82.40)	6 (17.60)	
46-55 years old	30 (56.60)	23 (43.40)	
56-65 years old	47 (85.50)	8 (14.50)	
66-75 years old	23 (71.90)	9 (28.10)	***0.007****
Marital Status			
Living together/married	33 (70.20)	14 (29.80)	
Widow/Separate	22 (62.90)	13 (37.10)	
Unmarried	75 (78.90)	20 (21.10)	***0.154***
Religion			
Christian	125 (72.70)	47 (27.30)	
Traditional	7 (100.00)	0 (0.00)	***0.107***
Education			
Primary	31 (81.60)	7 (18.40)	
Secondary	101 (72.70)	38 (27.30)	***0.263***

Employment			
Working	46 (75.40)	15 (24.60)	
Unemployed	58 (73.40)	21 (26.60)	
Retired	26 (74.30)	9 (25.70)	***0.965***
Monthly Income			
Less than R1000 per month	45 (80.40)	11 (19.60)	
R1000-R2000 per month	57 (66.30)	29 (33.70)	
More than R2000 per month	23 (82.10)	5 (17.90)	***0.094***
Use of Hypertension Medication			
No	14 (93.30)	1 (6.70)	
Yes	84 (70.00)	36 (30.00)	***0.056***
Types of Hypertension Medication used			
Diuretic	32 (80.00)	8 (20.00)	
Calcium Channel Blocker (CCB)	4 (66.70)	2 (33.30)	
Beta-blocker	1 (100.00)	0 (0.00)	
ACE Inhibitors	0 (0.00)	2 (100.00)	
ACE Inhibitors & Diuretic	20 (90.90)	2 (9.10)	
Combo: CCB, Beta-blocker, ACE Inhibitors & Diuretic	23 (59.00)	16 (41.00)	
Combo: Anti-hypertensive & Anti-coagulants	5 (62.50)	3 (37.50)	***0.025****
Healthcare Provider Knowledge about THM use			
No	12 (80.00)	3 (20.00)	
Yes	0 (0.00)	2 (100.00)	***0.020****

Note: Percentages are computed for non-missing cases only.

In table 4, age depicts the comparison of the different age groups with the use of garlic and/ or African olive as traditional herbs used in the treatment and management of hypertension. The degree of the relationship between age and the use of garlic and/or African olive was significant (p=0.007). Of all the age categories, 43% (N=23) participants between the age 46-55 years old indicated using garlic and/ or African olive. Moreover, only 28% (N=9) of the participants within the ages of 66-75 years indicated the use of the traditional herbs either garlic or African olive. Interestingly, none of the participants in the youngest age category (25-35 years) used of any of these traditional herbs.

The relationship between prescription medication and the use of garlic and/ or African olive is shown in Table 4 and it represents the use of specific anti-hypertensive medication

(diuretic, CCBs, beta-blockers, ACE Inhibitors, as well as combinations of these medications) and traditional herbs. There was a significant association between participants who adhered to their specific prescription medication for the treatment of hypertension and the use of the traditional herbs: garlic and/or African olive for the management of hypertension (p=0.025). The name of the prescription medication the participants used was asked in the questionnaire and each of these medications, were categorized into the various classes of anti-hypertensive medications. These categories were then compared to the use of both traditional herbs. A total of 33 participants used any form of anti-hypertensive medication in conjunction with garlic and/or African olive. Forty one percent (N=16) of these participants indicated using a combination of CCBs, beta-blockers, ACE inhibitors and diuretics and garlic and/ or African olive and about 20% of these participants indicated using diuretics in combination with garlic and/ or African olive.

The association between the knowledge of THM use by healthcare providers and garlic and/ or African olive used for hypertension was reported. The Pearson chi-square (p=0.020) signifies that participants who use garlic and/ or African olive do not inform their healthcare provider about the use of these traditional herbs. Only 5 participants reported using garlic and/ or African olive. Of the 5 participants using garlic and/ or African olive, only 2 participants indicated that their healthcare provider is aware of their use of these traditional herbs.

4.2 Qualitative Data

4.2.1 Participant Demographic Characteristics

4.2.1.1 In-depth Interviews

The participants for the qualitative study were selected from the 139 participants who indicated their health status as being hypertensive from the overall sample size of 180. Only 30 hypertensive participants were selected for the in-depth interview. Majority of the

participants for the in-depth interviews which 25 were females (83%) with only 5 males (17%). The average age of the interviewed participants was 55 years old.

Table 5: Demographic Characteristics of Hypertensive Participants for In-depth Interviews

Characteristics	Hypertensive Participants (N=30)
Gender	
Female	25 (83.00)
Male	5 (17.00)
Age	
35-46 years old	6 (20.00)
46-55 years old	13 (43.33)
56-65 years old	7 (23.33)
66-75 years old	4 (13.33)
Educational Level	
Primary	7 (23.33)
Secondary	23 (76.66)
Employment Status	
Working	7 (23.33)
Unemployed	16 (53.33)
Retired	7 (23.33)

4.2.1.2 Focus Group Discussion

Thirty hypertensive participants were eligible and able to participate in the focus group however only 10 attended the session (9 females and 1 male) which was held in Langa. The average age for the focus group discussion was 55 years old. These participants had the same demographic characteristics as those participants in the in-depth interviews.

4.2.2 Themes from In-depth Interviews and Focus Group Discussion

Table 6 represent the themes that were apparent in the thematic content analysis. The in-depth interview questions were the framework for the interviews and focus group discussion. The responses from the 30 in-depth interviews and focus group discussion had resulted in similar responses. The questions were grouped according to the type of question, the themes resulting from these questions and the hypertensive participants' responses through illustrative quotes in the in-depth interviews and focus group discussion.

Table 6: Themes and Illustrative Quotes from In-depth Interviews & Focus Group Discussion

Types of Questions	Themes	In-depth Interviews	Focus Group Discussion
Aetiology of Hypertension	Understanding Hypertension	"My mother had and my father had hypertension so maybe I got it from them otherwise." "It's through stress, because what happened in my life long time ago. It upsets me, it's working in me."	"You feel, you sweat alot and you feel very warm even when it's cold... You become dizzy at times, your body feels tired." "We attend the clinic once a month and we are told there are certain food we cannot eat but because you are poor, you cannot afford those things, we eat everything."
Experiences with Hypertension	Family as Stressors for Hypertension	"Maybe stress but I won't say. It can be because that time I had a bad time with my family, my wife. I think that is the cause of it." "Maybe stress or there is problematic kids at home..."	"Sometimes you cannot control it because sometimes when it comes, the doctor also tells you no you mustn't stress. There is no way you can't stress, you a woman. You've got children and responsibilities..."
	Hypertension as a Chronic Case	"... You've got to use your medication, you got to use the medication. Though I don't sometimes for a week, you know I get fed up but I always get my tablets." "Because I'm tired of using tablets as a result I don't drink in the morning and night. I only drink in the morning because I don't want to drink it every time."	"... You know it's not nice to live off tablets everyday because sometimes all of us can't swallow tablets..." "Same like the injection, you cannot get used to it because it's sore to inject yourself even how small or little that needle is."
Traditional Herbal Medicine Use	Medication Regimen	"I take three medicines in the morning. My tablets, then the aloe and Sutherlandia[2] and the garlic. First drink the pills in the morning, then after thirty minutes I drink the garlic. Every day I drink but maybe two weeks I stop." "I use herbal medicine on an empty stomach. Then after some hours I use the other medication." "... the high blood pressure I manage it because I drink the tablet at night and during the day I make myself a mixture. So during the day I drink that mixture."	
	Dualistic Healthcare Treatment	"I chop the clove then swallow it with water. I am using garlic for everyday but forgot to take today,	

[2] *Sutherlandia* is a traditional herbal medicinal plant used for various ailments.

		otherwise its treatment and the garlic day and night". They say its [herbal medicine] good for high blood. I take it in the morning. I take three medicines in the morning: my tablets, then the aloe and Sutherlandia and then the garlic". "Yes I use herbal medicine on an empty stomach. Then after some hours I use the other medication". "So I use that garlic, I use it for quite some time with my medication".	
	Fear & Reliability of THM	"... The other I don't trust, I think they take straight from outside and put in the pot. Nobody check it." "I'm in fear of using herbal medicines, though I hear sometime on media of herbal medicine. I am fearing using them."	"We so in fear of these herbs, we read they are good herbs but don't come from traditional healers. That's why most of us are very reluctant to use these herbs because we always associate them with so-called healers."
	Traditional Healers	"... Because they always guarantee those things, like if you use this it will help, it you use this it will help. I never use traditional what-what."	"Sometimes it's not always good to use this traditional medications because we talk about herbs, it's something different. But herbs is much healthier then these traditional medications because traditional medication you must always pay for it, you don't pay little money you pay lots of money." "There is a difference between traditional medicine and the chemist. The herbs that traditional healers claim to have, like for example they claim they can cure high blood, diabetes and so on and so on... I know there is no cure for high blood pressure. It can be controlled but not this traditional healer's claim they can cure."
Traditional Herbs	Lack of Knowledge of Traditional Herbs	"So I've never heard of [African olive] it but if I can find it, I'll use it or I go to the sangoma[3] or herbalist when I need it." "The other lady who was here from	"Another thing is we not exposed to these herbs and that knowledge. That is why we can't go buy because we don't know what to buy, what to make."

[3] *Sangomas* is the iXhosa term for spiritual diviners (traditional healers)

		the city told me about African olive. I told her I was thinking of the olives, the normal one. She explained to me but it was the first time she told me about that but I don't know."	
	Garlic and/ or African olive	"I peel garlic and I chop it into small pieces and I drink it like a tablet, I want to use it on the food but my son doesn't like it so I only for myself. I chop it. Not regularly. Thrice or twice a week." "I hear when the other sangomas are around. Yes I use African olive and I even eat garlic for myself."	"So if we could only live off herbs, I would say thank you God. Those things are there for us to heal ourselves and live longer."

Chapter 5

Discussion

This chapter discusses both the study findings of the quantitative and qualitative results as presented in chapter 4 and the limitations of the study. In the discussion of the results, the focus will be on the following: the identification of PURE participants who are hypertensive, prevalence of the use garlic and/or African olive among PURE participants, prevalence of the co-utilisation of anti-hypertensive medication and traditional herbs, garlic and/ or African olive and explore the reasons, as well as, experiences of hypertension and the use of traditional herbs. Specifically, with regards to qualitative analysis, the thematic content analysis and emanating themes will be described, as well as integrating the theoretical framework of embodiment in the hypertension model.

Prior to this study, there was a dearth of literature regarding traditional herbal medicine used in the treatment of hypertension in South Africa. However, literature exists in other parts of Africa (Nigeria, Morocco, Cameroon, Côte-d'Ivoire and other African countries).

5.1 Identification of Hypertensive Participants

The study showed that majority of the hypertensive participants were females. Both quantitative and qualitative methods had consisted predominantly of women. Women living in the Western Cape Province had the highest reported hypertension rate in South Africa (SADHS, 2003). Furthermore, our observation was similar to the results of Connor *et al* (2005), who reported that black female South Africans were more at risk of developing hypertension (SADHS, 2003; Bradshaw *et al*, 2008). Their study also corroborated our findings that black South African between the ages of 46-65 years and more at risk of developing hypertension. Interestingly most of these participants reported that they do not smoke or consume alcohol, however, studies have shown that excessive consumptions of

alcohol and a lifestyle of smoking are risk factors to the development of hypertension (Hart *et al*, 1999; Klatsky, 1999; Reddy & Katan, 2004). Although, the study showed that nearly half of the hypertensive participants were unemployed and had a monthly income of R1000-R2000 per month, studies have shown that hypertension is more prevalent in affluent people living in developing countries (Gulliford, 2003).

5.2 Prevalence of Traditional Herbal Medicine use

The study showed that the prevalence of traditional herbal medicine among the PURE hypertensive participants was 11% which is relatively lower compared to Hughes *et al* (2012) in which 15% use of traditional herbal medicine was reported and Peltzer *et al* (2008) 29.6% use of herbal therapies where indicated in his study. The difference in the prevalence of traditional herbal medicine use might be the sample size of the study population, geographic regional differences and religious preferences. Since 95% of the study participants were Christians, it is reasonable to understand that there is no belief in the use of this treatment system. Christianity and traditional beliefs are the two main systems that have shaped traditional herbal medicine to what it has become today (Franklin, 2011).

The study indicated that the use of traditional herbal medicine is not prevalent among hypertensive participants in Langa in the Western Cape. However, in other regions in South Africa such KwaZulu Natal, THM use in more prevalent and more studies of its kind had been conducted (Peltzer *et al*, 2008; Peltzer & Mngqundaniso, 2008). In the study, the use of THM by hypertensive participants was reported to improve their emotional well-being (4%); this is in line with reports by Cocks & Møller (2002) and Peltzer *et al* (2008) that indicated that the majority of traditional herbal medicines sold in South Africa were for the enhancement of emotional well-being. According to Smith (2003), THM use empowers individuals to have personal control over their own healthcare. Furthermore, the participants used THM to alleviate the side-effects of Western medicine (3%) and also to adhere to

cultural beliefs. Similar findings were reported by Correa-Velez *et al* (2005) and Molassiotis *et al* (2005). Traditional herbal medicine was used twice a day (3%) among the participants the frequency of THM use is an indication that either THM was used as a replacement or a complement to Western medication (Molassiotis *et al*, 2005). It is important to note that majority of the participants reported the lack of awareness of THM use by their healthcare providers (9%). Furthermore, several participants, in the interview process, reported that it was not necessary to disclose the use of THM to healthcare provider. Moreover, hypertensive participants assumed that if the healthcare provider does not ask then disclosing their use of traditional herbal medicine was seen as irrelevant.

Interestingly, hypertensive participants indicated that traditional herbal medicine use is associated with traditional healers. *"We so in fear of these herbs, we read they are good herbs but don't come from traditional healers. That's why most of us are very reluctant to sue these herbs because we always associate them with so-called healers."* Participants do not believe in traditional healers as a result of negative media reports (Pinkoane *et al*, 2008). Although majority of the participants use the traditional herbs, garlic and African olive, their view of THM is one of scepticism. A study by Ismail *et a*l (2005) reported that participants expressed considerable scepticism about the effectiveness of these traditional. Participants do not readily go to traditional healers and prefer to self-medicate themselves. Knowledge of self-medication is given through families or friends.

5.3 The use of Garlic and/or African Olive among PURE Participants

It was found that the use of traditional herbal medicine among hypertensive participants was not as prevalent as other studies have found (Peltzer *et al*, 2008; Hughes *et al*, 2012). Among the PURE participants, 26% used garlic and/ or African olive as a traditional herb and other studies reported the use of these traditional herbs (Noumi *et al*, 1999; Tahraoui *et al*, 2007; Rahmatullah *et al*, 2010) and 74% were not using these traditional herbs. However, the

prevalence of use of garlic among hypertensive PURE participants was 26%. Moreover, garlic was most often used in the treatment for the lowering of high blood pressure. Studies have shown garlic to posses' anti-hypertensive properties used in the treatment of hypertension (Ginter & Simko, 2010; Edwards *et al*, 2005). Furthermore, garlic was also used for other ailments and studies by Leak (1999) and Kemper (2000), reported the use of garlic in the treatment of inflammation and cholesterol. In the qualitative study, it was found that some participants use garlic in their cooking and consume it as a culinary herb and not as a medicinal herb (Edwards *et al*, 2005). As reported, participants used traditional herbal medicine in a tea form (6%), however, in the qualitative results participants referred to their use of garlic as taking a tablet. This meant they would chop the garlic into small cubes and then swallow it with drinking water after to avoid the bad taste and smell. The THM used in a tea form, as reported by the participants, are as follows: Sutherlandia[4] in boiling water and drink as a tea; imphepho[5], African potatoe, Cancer bush, aloe in boiling water and drink as a tea and garlic, cinnamon and cayenne pepper as a tea. All these remedies are for the treatment of hypertension.

On the other hand, African olive seemed to be a relatively unused medicinal herb. The study showed that only 2 participants indicated using African olive, of which one participant reported using the herb for lowering blood pressure. This result is similar to findings of other studies who reported the traditional use of African olive in treatment and management of hypertension in Bangladesh (Rahmatullah *et al*, 2010). Although scientific studies have been done to validate the anti-hypertensive properties of this medicinal herb (Long *et al*, 2010; Nekooeian *et al*, 2011), the popularity of African olive as a medicinal herb remains a

[4] *Imphepo* is a dried medicinal plant called Helichrysum odoratissimum

[5] *Sutherlandia* is a traditional herbal medicinal plant used for various ailments.

challenge in South Africa, nonetheless, the use of African olive is more prevalent in West African countries South America, Caribbean, and Asia (Tahraoui *et al*, 2007; Rahmatullah *et al*, 2010; Picking *et al*, 2011). From the 30 hypertensive participants interviewed, it was found that only 2 participants used African olive.

5.4 Dualistic Healthcare Treatment

A dualistic healthcare treatment includes self-administration of traditional herbal medicine while continuing the use of Western medicine. A few participants admitted using THM with their prescription medication; however it was expressed that the use of traditional herbs were apparent by hypertensive participants.

Most chronic diseases including hypertension are treated with multiple drug therapies (Bressler & Bahl, 2003). Additions of herbal medicines to such combinations of drugs have the potential for herb-drug interactions (Ernst, 2002). The study showed that 41% of the hypertensive participants were on multiple drug therapies (CCBs, beta-blockers, ACE inhibitors and diuretics) used garlic and/ or African olive. This poses a healthcare challenge to the health of participants because of the potential of serious adverse effects (Ernst, 2002). As a result of all the medication participants use and the use of traditional herbal medicine, they have developed a medication regimen for themselves to facilitate the use of both THM and prescription medication. The development was initiated from the awareness that participants have of prescription medication and traditional herbal medicine in combination may be dangerous. Studies such as Delgoda *et al* (2010) reported that the overwhelming majority of respondents did not consider the associated use of both types of medicine to be harmful. The participants were not knowledgeable if there were not any side-effects when using both treatments nor did they want to take risk of having side-effects. The regimen is to avoid any dangers of combining the two treatments for hypertension. An old man explained, *"Teaspoon of vinegar, olive oil, honey, you take garlic and grate it; but I do use my*

medication" while another woman said "*I use herbal medicine on an empty stomach. Then after some hours I use the other medication*." Everyone expressed the use of anti-hypertensive medication and traditional herbs or other traditional herbal medicine, together as their treatment for hypertension (Picking *et al*, 2011).

Another possible challenge with regards to traditional herbal medicine use with prescription medication is the increased likelihood of non-adherence. Ho *et al* (2009) reported that people suffering from cardiovascular diseases have been known not to adhere to their prescription medication. Non-adherence might be as a result of lack of access to healthcare, poor relationship with healthcare providers and side-effects and complexity of drug regimen (Ho *et al*, 2009). Furthermore, hypertensive patients with more than one medical condition have been known not to adhere to prescription medication (Berke & Ockene, 2001). The issue of adherence to prescription medication came up during the in-depth interview. The participants expressed their feelings on the monthly clinic visits to collect their medication. A middle aged man explained his experience, *"Hospitals here has confusion. You go there early morning; you leave that hospital at four o' clock. They don't even explain what you must do with the tablets. He just give the tablets and you must go, after spending the whole day there wondering. So honestly, not helpful."* This influences the participants' views on clinics and their use of medication. Similar findings were reported by Dennison *et al* (2007) that failing to assist and inform patients of their hypertension status may have a negative influence on patient empowerment and treatment compliance. Therefore, the use of traditional herbal medicine does not necessarily affect participants' non-adherence to their prescription medication but is a factor.

Two studies have found an association between the use of traditional herbal medicine and age (Picking *et al*, 2011; Namuddu *et al*, 2011). The research study showed that more than half of the hypertensive participants who used garlic and/ or African olive were between the ages of

46-55 years old (43%), found to be the highest and 66-75 years old (28%) as the second highest age group using the traditional herbs. This was associated with the type of participants who were unemployed, had a lower level of education and a low income per month. Older participants are more likely to follow the traditions of their cultural and use traditional herbal medicine or seek treatment from traditional healers; however this is not a culture in the younger participants due to a Western culture. The findings reported by Picking *et al* (2011), was in contrast to the study. His study showed the prevalence of herb use alone was lowest in people aged 65 years and older and highest in 35-54 year-olds because due to age related chronic diseases and the increased prescription of prophylactic drugs those aged 65 and over receive a disproportionate number of drugs.

5.5 Hypertension and Traditional Herbal Medicine Experience

One of the objectives of the study was to understand the perception of the hypertensive participants on hypertension, its causes, experiences and the use of traditional herbal medicine to treat and manage this disease.

5.5.1 Understanding the Perception and Experience of PURE Participants on Hypertension

To control chronic diseases such as hypertension, an understanding of the perceptions and beliefs of communities is required (Iyalombe & Iyalombe, 2010). Participants described their understanding of hypertension through the means of symptoms. Explanations about their symptoms gave illustrations to how they understood hypertension. Many described it as sweating a lot, having hot flushes, feeling dizzy and always feeling tired. This description is closely related to the biomedical definition of symptoms. However, there are no exact symptoms to hypertension but there are common symptoms participants have experienced. According to Kusuma (2009), hypertension is said to be asymptomatic but the description participants gave hypertension as being symptomatic.

Participants expressed that hypertension is not contagious; instead they describe this condition as an open disclosure without shying away from one another and it is a condition that most of the residents in Langa have. As one participant said that if they are out of hypertension medication, the neighbour will have and will know exactly what medication is needed. It was inferred that high blood pressure is a common condition within Langa. That confirms similar findings by Dennison *et al* (2007), that hypertension is prevalent at 59% with it being the most common cardiovascular disease risk factor among black South Africans.

Participants' lay perceptions of the model cause of hypertension is supported by Kusuma (2009), who suggested that the medical model of hypertension is mainly centred around the physical aspects whereas the lay perspectives are centred on the social aspects such as unemployment, disharmony in the community, rising prices and insecure livelihood (financial instability and poverty in the community). Explanatory models of a sickness or treatment differ from person to person and healthcare providers (Helman, 2007; Kusuma, 2009). It was unanimous amongst the hypertensive participants that stress, wrong diet (fatty and salty foods), non-adherence to their treatment, it is hereditary, old age, financial instability and poverty in the community were risk factors to developing hypertension and is seen as the aetiology of hypertension. Several studies have found that wrong diet (fatty and salty food) (Mungal-Singh, 2012), genetic predisposition (Williams *et al*, 2004), age (Kornitzer, 1999) and poverty (Seedat, 2007) leads to hypertension.

Stress as the primary cause of the development of hypertension was mentioned several times during the course of the in-depth interviews and focus group discussion. Life event stresses such as abusive marriages, delinquent children or unemployment have been linked with the onset of hypertension (Tennant, 2001). Participants accounted the majority of their stress to the family circumstances within their homes. In the focus group a lady stated *"Sometimes you*

cannot control it because sometimes when it comes, the doctor also tells you 'no you mustn't stress'. There is no way you can't stress, you a woman. You've got children and responsibilities, you've got responsibilities of what you going to put on the table, you know. So those things definitely affect you". Among other things, the family is one of the top cause of hypertension and the participants' notion of why they have hypertension today. Some participants revealed that the leading cause of their hypertension was undesirable circumstances of a previous life (example: death of a child or member of the family) which lead to the development of hypertension. An old lady expressed her grief by saying "*I think I've got high blood pressure because I've been involved in many things, you know that caused me to stress. For instance I had children. They all passed on, so I think that worked on me all".* This is maintained by Dennison *et al* (2007), that taking of the participants' own health is often times limited by death of other family members.

In financially improvised communities like the study population, people strive for food. Participants in this study indicated their inability to afford the healthier foods; hence they consume the cheaper kinds of food which are invariably unhealthy. A middle aged woman said *"We are told there are certain foods we cannot eat but because you are poor, you cannot afford those things, we eat everything. We eat fats and so on; it's the only foods available to you. We don't have money to but all these fancy things. That's why our high blood is not controllable".* This puts them at risk of developing serious health issues. Reports confirmed what participants expressed, by Puoane *et al* (2005) that once people got settled in the city, their expenses increased, leaving them with little money for food. They resort to cheap unhealthy food, such as tripe, chicken skins, and pig's feet, which is readily accessible in their environment.

5.5.2 An Exploration of the Reasons and Experience of PURE Participants on the Use of Traditional Herbal Medicine

Although there is a dualistic healthcare system, there is a lack of knowledge with regards to the use of traditional herbs since there is not much familiarity to the utilization of these herbs as treatment and management of hypertension as reported by hypertensive participants. A participant who is hypertensive and diabetic inquired about traditional herbs that can help for the diabetes as well. Thus, the interest is at large but the knowledge is lacking. *"Another thing is we not exposed to these herbs and that knowledge. That is why we can't go buy because we don't know what to buy, what to make."* Participants have the need to be educated by the healthcare providers. There is a need to be knowledgeable to make informative decisions but admittedly, participants are responsible for their lack of knowledge. One study reported that educational intervention is required to reduce the lack of knowledge so that healthcare providers would be adequately equipped to communicate with their patients on this modality of treatment (Clement *et al*, 2005).

5.6 The Embodiment of Hypertension

In understanding the hypertension, it is imperative to acknowledge the lay perceptions of this chronic disease. Embodiment is related to the aetiology of hypertension, in which hypertensive participants perceive their chronic disease as an outward manifestation of a psycho-social environment. A basic claim of the embodiment framework is that all psychological processes are influenced by body morphology, sensory systems, motor systems and emotions (Glenberg, 2010). This lived experience refers specifically to the way that individuals negotiate their everyday lives by the utility of their bodies, and how they medicate, interpret and interact with their physical and social environments (Jaye, 2004). Hypertension is an embodied illness experience which is a reminder of the entangled consequences of diverse forms of social inequality.

Most of the participants reported that they have hypertension because they stress too and the environment they find themselves in pushes up their blood pressure and they can literally feel

their blood pressure increase because serve headaches come after the confrontation of certain situations they are in. Similar findings were reported by Kusuma (2009), Ford *et al* (2009) and Dela Cruz (2008). The environment includes various facets of their lives. These facets include: the household, the financial situation and the ever changing lifestyles, these all form part of this environment.

Participants' feel stressed due to two aspects, if there are delinquent children in participants' life and those who are at the workplace, being over-worked and this all leads to high blood pressure. There are certain problems that occur within the participants' household due to family disputes or delinquent children. According to the hypertensive participants these aspects leads to the development of hypertension. The financial position participants find themselves in, makes for a constant worry about the stability of income. The fear of having to live from hand to mouth is ever present. The changing lifestyles portrays participants' diet with includes both high fat and high salt diets because those types of food are cheaper, less expensive than vegetables. This is similar to findings by Mungal-Singh (2012).

5.7 Limitations of the Study

Due to the nature of the study, medical records could not be obtained; therefore the self-reported hypertension by participants could not be verified. Participants could not always remember the duration and severity of their hypertension status and as a result of this, recall bias had occurred. The hypertensive sample population, 139 participants, does not represent all populations and their behaviours. Participants were afraid to disclose their use of traditional herbal medicine with regards to prescription medication.

The study design was a cross-sectional research study; however, this type of study design is limited because it captures data at one specific point in time. Therefore the period of this research was a short time span. In order to gain more data there should be a longer time

period of data collection. The short time period has influenced the findings with regard to its more accurate understandings of how people understand hypertension and traditional herbal medicine. As a result there were missing variables, where participants did not fully complete the questionnaire. Therefore, large numbers data were missing in some variables and this has affected the analysis of the quantitative results.

Another limitation includes the small sample size during the qualitative process. More participants could have been interviewed. This influenced the findings by limiting the accuracy and generalization of the population because generalizations could not be made, as a result of the small sample size and duration of the study.

One of the main limitations is that the population was not evenly divided into females and males. This was the outcome of the PURE database, because the database had an even distribution of females and males who were enrolled into the PURE study. Families were recruited to participant in the PURE study and some nuclear families or even extended families have more females than males, more female headed households. The population was not an example of both females and males. This has skewed the study, because more females were in the study therefore it does not represent hypertensive males in Langa.

Intersection at Church Street

(Researcher's photograph)

Chapter 6

Conclusions and Recommendations

6.1 Conclusion

Hypertension is a major public health problem as it contributes to the development of extensive disease and disability. Hypertension has been perceived as a serious condition. The study speaks to the inaccuracies of public understanding of hypertension and its consequences contributes to low levels of perceived susceptibility, seriousness and self-efficacy to bring lifestyle changes in preventing hypertension. Western medicine is faced with the challenge of decreasing the alarming rate of non-communicable diseases. Traditional herbal medicine offers an effective way to decrease the rising number of people with high blood pressure in combination with the prescription medication.

Although the prevalence of traditional herbal medicine was relatively low (11%), the study adds to the small but growing literature about the use of traditional herbal medicine in hypertension in Cape Town. It provides important insight into the use of traditional herbal medicine in urban communities in the Western Cape, South Africa.

The general aim of this study was to describe and document the knowledge, practices and beliefs that people have about hypertension and traditional herbal medicine. The research question was: *Do hypertensive patients use traditional herbal medicine in lieu of/or in combination with prescription medication?* The research data has shown that there is a positive relationship between participants who have hypertension and are on prescription medication as well as using traditional herbs to treat their hypertension, indicating the use of a dualistic healthcare treatment for their hypertension.

The traditional herbs were seen as harmless with regards to drug-herb interactions which may occur, however participants considered the traditional herbs to beneficial for their overall well-being. The use of garlic is evident by participants with hypertension. However, African olive is still unfamiliar to many participants but the need to have this traditional herb available has increased because there is a consciousness to treat hypertension with traditional herbs as a supplement to the prescription medication. Even though the use of traditional herbs, garlic and African olive, were in use by evidence of the participants; participants also emphasised adherence to the prescription medication and a healthy lifestyle is also key to improving the blood pressure.

6.2 Recommendations

Based on the findings, questionnaire, in-depth interviews and focus group discussion, there is a lack of education with regards to non-communicable disease specifically hypertension and the lack of knowledge of traditional herbal medicine among the participants. Many participants said that they did not know how they got hypertension or even diabetes. There is a need to better educate people about chronic diseases and the knowledge of traditional herbal medicine, it is necessary to do this because it will reduce the severity of certain chronic diseases if participants can identify it and the use of traditional herbal medicine to reduce the risk of herb-drug interactions. Healthcare workers needs to be trained about THM and should also be obligated to ask about traditional herbal medicine among their patients.

Research is needed to further investigate uncontrolled hypertension and non-adherence as a of traditional herbal medicine use. Further research is needed to investigate the use of traditional herbal medicine for chronic conditions such as hypertension, especially in conjunction with prescription medication in a larger study sample. There is a need to monitor the use of a dualistic healthcare treatment and seek the prevalence of this treatment process.

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APPENDICES

Appendix I: Ethical Clearance

UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

13 April 2012

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Prof G Hughes (SAHSMI)

Research Project:	Garlic and African olive as traditional herbs used for hypertension in the Western Cape.
Registration no:	12/2/23

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

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E: pjosias@uwc.ac.za
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Appendix II: Participant Information Sheet

U.W.C

South African Herbal Science and Medicine Institute
University of the Western Cape
Faculty of Science

SAHSMI

Private Bag X17, Bellville 7535, South Africa
Tel: +27 21 959 3043

Fax: +27 21 959 3029

Participant Information Sheet:

Garlic and African Olive as Traditional Herbs for Hypertension in the Western Cape

This letter is an invitation to consider participating in a study being conducted for my Master's degree at the South African Herbal Science and Medicine Institute at the University of the Western Cape under the supervision of Professor Gail D. Hughes. I would like to provide you with more information about this project and what your involvement would entail if you decide to take part.

Why are we doing this study?

We hope to learn the frequency of traditional herbs used to treat illnesses, more specifically hypertension. Hypertension is a common chronic health problem and the standard of care in South Africa is prescription medication, as well as a stepwise programme. In South Africa traditional herbal medicines have been used to treat many ailments, especially hypertension. These herbal medicines are easily available and cheaper than synthetic drugs. Garlic and African olive have been reported as herbal medicines that have anti-hypertensive properties (lower blood pressure) and may be used to control hypertension, either individually or in combination thereof. However, increasingly, people tend to self-medicate and traditional herbal treatments are readily available. Thus this study investigates whether diagnosed hypertensive patients use traditional herbal medicine in lieu of/or in combination with prescription medication.

Who are the participants?

The participants are people who have been selected from an ongoing study called the Prospective Urban Rural Epidemiology study (PURE). The inclusion criteria for this selection was participants who are hypertensive with a blood pressure reading of 140/90 mmHg and higher.

What do we expect from the participants in this study?

The first stage of the study will involve completing a questionnaire. From the results of this questionnaire, participants will be chosen for an interview. It will involve an interview of approximately a half an hour to an hour in length. You may decline to answer any of the interview questions if you so wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With your permission, the interview will be audio recorded to facilitate collection of information, and later transcribed for analysis

What can the participants expect?

Shortly after the interview has been completed, I will deliver a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. This will be made possible if you would like to see the transcript.

Can you withdraw from the study?

Participation in this study is voluntary. All information you provide is considered completely confidential. Your name will not appear in any thesis or report resulting from this study, however, with your permission anonymous quotations may be used. Your decision whether or not to participate will not prejudice your future relations with the University of the Western Cape.

Do you have any further questions?

Any further questions you have about this study will be answered by Miss Tarryn Blouws (researcher) on 072 650 5601 or Prof. Gail D. Hughes (supervisor) on 021 959 3397. If you are willing to participate in the study, please read and sign the consent form.

Thank you!

Appendix III: Consent Form (English)

U.W.C

South African Herbal Science and Medicine Institute
University of the Western Cape
Faculty of Science

SAHSMI

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Consent Form:

Garlic and African Olive as Traditional Herbs for Hypertension in the Western Cape

The study has been described to me in the language that I understand. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason and discontinue without penalty.

I am aware that I have the option of allowing my interview to be audio recorded to ensure an accurate recording of my responses. I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I agree to take part in the above study.

Participant's Name: .....

Participant's Signature: .....

Date: .....

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the researcher or supervisor:

Researcher's Name: Tarryn Alicia Blouws on 072 650 6501

Supervisor's Name: Prof. Gail D. Hughes on 021 959 3397

Appendix IV: Consent Form (isiXhosa)

U.W.C

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SAHSMI

Iphepha-mvume lomthathi nxanxeba:

Garlic and African Olive as Traditional Herbs for Hypertension in the Western Cape

Oluphando lucacisiwe kum ngolwimi endiluvayo. Ndiyavuma ukuba ndiyifundile kwaye ndayiva yonke inkcukhaca emalunga nophando. Ndilifumene nethuba lokubuza imibuzo. Ndiyaqonda kakuhle ukuba ndiyithatha inxaxheba ngokuthanda kwam ndikwavumelekile ukuyeka nanini na ndifuna ngaphandle kokunika izizathu kwaye kungekhonto inokundichaphazela.

Ndiyaqonda ndinelungelo ekukhetheni ukuba udliwano-ndlebe lwam lushicilelwe ukuqinisekisa umgangatho wenkcazelo yam. Ndiyaqonda kwakhona ukuba inkcazelo yam ingashicilelwa kwincwadi engoluphando iinkcukacha zam zingadandalaziswanga elubala.

Ndiyavuma ukuthatha inxaxheba koluphando

Igama lomthathi-nxaxheba: …….

Tyikitya: .....……..

Umhla: .....……..……..

Inombolo yesazisi somthathi-nxaxheba: .....

Ukuba unemibuzo okanye ingxaki malunga noluphando, qhakamshelana nomphandi okanye umphathi-ntloko.

Igama lomphandi: Tarryn Alicia Blouws on 072 650 6501

Igama lomphathi-ntloko: Prof. Gail D. Hughes on 021 959 3397

Appendix V: Questionnaire (English)

U.W.C

South African Herbal Science and Medicine Institute

University of the Western Cape
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SAHSMI

Use of Garlic and African Olive for Hypertension Questionnaire

This questionnaire has been designed to obtain information from participants who use garlic and/or African olive as traditional herbal medicines for their hypertension (high blood pressure). In addition, this study would like to ascertain whether hypertensive participants use garlic and/or Africa olive in lieu of/or in combination with their prescribed medication. The research findings of this study will help in understanding the usage pattern of garlic and African olive. Participation is voluntary and withdrawal from the study is allowed without penalty at any time. Your confidentiality and anonymity will be kept at all times.

Participant Name: .....

Participant Number: .....

Date of interview: .....

Name of interviewer: .....

Please tick the answers to the questions where it is relevant

Section A: Demographic Data

1. Sex: Male ☐ Female ☐
2. Age: ..... Date of Birth: .....
3. Marital Status: Married ☐ Living together ☐
   Widowed ☐ Divorced/Separated ☐
   Not married ☐

4. Religion: Christian ☐ Islam (Muslim) ☐
Traditional ☐ Other (Specify) .....

Section B: Socioeconomic Factors

5. Education Level: Primary ☐ Secondary ☐
Tertiary ☐ None ☐
Other (Specify) .....

6. Employment Status: Working Full-time ☐
Working Part-time ☐
Self-employed ☐
Unemployed ☐
Retired ☐

7. Monthly income (household): Less than R1000 per month ☐
R1000 – R2000 per month ☐
R2000 – R3000 per month ☐
R3000 and more per month ☐

8. How many people currently living in your household?
Number of people .....
How many are children? .....
How many are adults? .....

9. Lifestyle habits:
Smoking: Yes ☐ No ☐
Alcohol: Yes ☐ No ☐

Section C: Medical History

10. What type of condition do you have and for how long? (Please fill in the relevant conditions).

Disease	Duration	Medication used	Disease	Duration	Medication used
Hypertension			Epilepsy		

Cardiovascular problems			Cancer (skin, lung, breast, prostrate)		
Diabetes			Gastrointestinal disturbances		
Kidney problem			Neurological (Psychosis)		
Chronic lung disease (Asthma)			Thyroid problem		
HIV/AIDS			Arthritis		
Diarrhea			Systematic lupus erythematous		
Tuberculosis			Colds and Flu		

11. What other conditions are being treated with medication? (List them please)

    ....

    ....

    ....

Section D: Hypertension

12. Do you have hypertension/high blood pressure?

    Yes ☐ No ☐ (If no, skip to question 19)

13. Is your hypertension / blood pressure self-reported or diagnosed?

    Yes ☐ No ☐ Self-reported

    Yes ☐ No ☐ Diagnosed

    If diagnosed, by who: Doctor ☐

    Clinic ☐

    Traditional healer ☐

14. When was your hypertension / high blood pressure diagnosed?

    Date: .....

15. Are you taking any supplements for hypertension / blood pressure health?

Yes ☐ No ☐

If yes, please specify.

.....

If no, why not?

.....

16. What type of hypertension / blood pressure medications are you taking?

Enalapril ☐

Carvedial ☐

Amlodipine ☐

Hydrochlorothiazide ☐

Other (Specify) .....

17. Who monitors your hypertension and your follow up?

Clinical nurse ☐ Doctor ☐

Pharmacist ☐ Other (Specify) .....

18. How regularly do you go to the clinic for check up for you hypertension?

Weekly ☐

Once a month ☐

Twice a month ☐

Every few months ☐

Section E: Herbal Medicine Use

19. Do you use herbal/traditional medicine?

Yes ☐ No ☐ (If no, skip to question 22)

20. Why do you use herbal/traditional medicine?

You were disappointed that conventional medicine is not working ☐

Conventional medicine is too toxic or too mutilating ☐

☐

It is in keeping with your beliefs and your inner self

It allows you to relax/sleep ☐

It relieves the symptoms of conventional medicine you are receiving ☐

It improves your psychological/emotional well-being (hope, optimism) ☐

It improves your physical well-being ☐

21. How often do you take/use of herbal/traditional medicine?

Daily ☐ Twice a day ☐ Occasionally ☐

Once a week ☐ Twice a week ☐ As needed ☐

Monthly ☐ Other (Specify) .....

22. Are you using any herbal/traditional medicine for hypertension / high blood pressure?

Yes ☐ No ☐

If yes, please specify what you are using.

.....

.....

23. Are you using any herbal/traditional medicine for other conditions?

Yes ☐ No ☐

If yes, please specify what you are using.

.....

.....

24. In what form are you taking the herbal/traditional medicine?

Tea ☐ Powder ☐ Tincture ☐

Tablet/ Capsule ☐ Ointment ☐

Other (Specify) .....

25. Have you ever told your healthcare provider about your use of herbal medicine?

Yes ☐ No ☐

If no, why not?

.....

.....

26. Have you used garlic as herbal medicine before?

    If **no**, why not?

    .....

    If **yes**, please specify for what condition(s).

    .....

27. Have you used African olive as herbal medicine before?

    If **no**, why not?

    .....

    If **yes**, please specify for what condition(s).

    .....

Garlic

African Olive

Thank you for participating!

Appendix VI: Questionnaire (isiXhosa)

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SAHSMI

Iphepha lemibuzo ngokusetyenziswa kwe Garlic ne Olive yase Afrika ukunyanga isifo soxinzezelelo lwegazi (High-High)

Eli phepha lemibuzo lilungiselelwe ukuqulunqa iinkcukacha kubathathi nxaxheba abasebenzisa igarlic okanye/ kunye ne olive yase Africa njengengcambu zamayeza esintu ukunyanga isifo soxinzezelelo lwegazi (High-High). Ukwaleka, singathanda ukuqonda ukuba abathathi nxaxheba abanesifo soxinzelelo lwegazi bayayisebenzisa na igarlic okanye i-olive yase Africa ndawonye okanye beyidibanisa namayeza abawenzelwe ngugqirha. Iziphumo zoluphando zizakuthi zincede ekuqondeni ubungakanani bokusetyenziswa kwe garlic okane i-olive yase Afrika ngabathathi nxaxheba. Umthathi nxaxheba angarhoxa ngokuzithandela koluphando ngaphandle kokuthi ohlwaywe nangaliphi na ixesha efuna ukurhoxa. Iinkcukacha zakho namagama akho akayi kubhengezwa esidlangalaleni, ayakugcinwa eyimfihlo ngalo lonke ixesha.

Igama lomthathi-nxaxheba: …….

Tyikitya: .....……..……..

Umhla: .....……..……..

Inombolo yesazisi somthathi-nxaxheba: .....

Yenza unxa (X) kwimpendulo eyiyo

Inqanaba A: Inkcukacha ngawe

28. Isini: Indoda ☐ Umfazi ☐

29. Iminyaka: ..... Usuku lokuzalwa .....

30. Isimo somtshato: Utshatile ☐ Umasihlalisane ☐
Ungumhlolokazi ☐ Nohlukene ☐
Awutshatanga ☐

31. Ezenkolo: UngumKrestu ☐ Isilamusi ☐
Ngesintu ☐ Ezinye (nika ingcangciso) .....

Inqanaba B: Ezentlalo nezimali

32. Imfundo: Amabanga aphantsi ☐ Amabanga aphezulu ☐
Idyunivesithi ☐ Awufundanga ☐
Ezinye (nika ingcangciso) .....

33. Umsebenzi: Usebenza ixesha eliphele leyo ☐
Usebenza manqaphanqapha ☐
Uyazisebenzela ☐
Awusebenzi ☐
Udla umhlala phantsi ☐

34. Imali yengeniso endlini: Ingaphantsi kwe R1000 ngenyanga ☐
R1000 – R2000 ngenyanga ☐
R2000 – R3000 ngenyanga ☐
R3000 nangaphezulu ngenyanga ☐

35. Bangaphi abantu abahlala kulendlu?

(a) Inani labantu? .....

(b) Bangaphi abantwana? .....

(c) Bangaphi abantu abadala? .....

36. Ezolonwabo:

Uyatshaya: Ewe ☐ Hayi ☐

Uyasela utywala: Ewe ☐ Hayi ☐

Inqanaba C: Ezempilo

37. Zeziphi izigulo eninazo kwaye ninexesha elingakanani ninazo? (Bhala ezakho ezigulo).

Isigulo	Ixesha	Iyeza olisebinzisiayo	Isigulo	Ixesha	Iyeza olisebinzisiayo
Ihayi-hayi			Isifo sokuxhuzula		
Isifo sentliziyo			Umhlaza (wesikhumba, wemiphunga, webele, wempahla yangaphantsi)		
Iswekile			Utyatyazo ngenxa komphaza-miseko emathunjini		
Izintso			Ukugula ngengqondo		
Isifo semiphunga (uminxano lwesifuba)			Umqala		
Ungawulayo nesa-			Isifo samathambo		

nduleli sawo					
Utatyazo lwethutyana			Izifo zomzimba eg iLuphasi nesifo segazi		
Isifo sephepha			Ingqele ne fiva		

38. Zeziphi ezinye izifo ezinyangwa ngamayeza? (zidwelise)

....

....

....

Inqanaba D: Ihayi-hayi

39. Unayo ihayi-hayi?

Ewe ☐ Hayi ☐ (ukuba hayi tsibela kumbuzo 19)

40. Ingaba lehayi-hayi uyazazela okanye uxelelwe ngomnye umntu? (uxilongiwe)

Ewe ☐ Hayi ☐ Uyazazela

Ewe ☐ Hayi ☐ Uxilongiwe okanye uxelelwe ngomnye umntu

Ukuba uxilongiwe, ngubani: Ngugqirha ☐

Yiklinikhi ☐

Lixhwele ☐

41. Waxilongwa nini wafunyanwa unesifo soxinzelelo lwegazi (High-high)?

Umhla: .....

42. Zikhona izinto ozisebenzisayo ukuthomalalisa lehayi-hayi?

Ewe ☐ Hayi ☐

Ukuba ewe, nika ingcangciso.

.....

Ukuba hayi, kutheni?

.....

43. Ngawaphi amayeza owaselayo ehayi-hayi?

Enalapril ☐

Carvedial ☐

Amlodipine ☐

Hydrochlorothiazide ☐

Okanye amanye (nika ingcangciso)

.....

44. Ngubani okujonga lehayi-hayi ukuba iphezulu okanye iphantsi?

Ngumongikazi eklinikhi ☐ Ngugqirha ☐

Ngusokhemesti ☐

Okanye omnye umntu (nika ingcangciso) .....

45. Uya kangaphi uyokuhlolwa lhayi-hayi eklinikhi?

Iveki ☐

Kanye enyangeni ☐

Kabini enyangeni ☐

Emva kwenyanga ezimbalwa ☐

Inqanaba E: Usetyenziso lwamayeza esintu

46. Uyawasebenzisa amayeza esintu?

Ewe ☐ Hayi ☐ (ukuba hayi tsibela kumbuzo 22)

47. Kutheni usebenzisa amayeza esintu nje?

Uphoxhwe kungasebinzi kwamayeza kwagqirha ☐

Okanye ubone uba anga kagqirha anetyhefu okanye ukungcola ☐

Anga esintu akwenza uphumle okanye ulale kamnandi ☐

Aphelisa iintlungu eziinziwe ngala ubuwanikwe ngugqirha ☐

Okanye akuphilisa engqondweni nasemphefulweni (enika nethemba) ☐

Okanye akunika amandla uzive udlamkile ☐

48. Uwasela kangaphi okanye ulisebenzisa njaie eliyeza lesintu?

Ngosuku ☐ Kabini ngemini ☐ Ngamaxesha athile ☐

Kanye ngeveki ☐ Kabini ngeveki ☐ Okanye xa ulifuna ☐

Ngenyanga ☐

Okanye ngenye indlela (nika ingcagciso) .....

49. Uyalisebenzisa iyeza lesintu ukunyanga ihayi-hayi?

Ewe ☐ Hayi ☐

Ukuba "ewe" nika inkcazelo ngalonto uyisebenzisayo.

.....

.....

50. Uyawesebenzisa amayeza esintu kwezinye izigulo?

Ewe ☐ Hayi ☐

Ukuba "ewe" nika ingcaciso ngoko ukusebenzisayo.

.....

.....

51. Hlobo luphi lwamayeza esintu owasebenzisayo?

Iti ☐ Umgubo ☐ uQatshulo ☐

Ipilisi ☐ Into yothambisa ☐

Okanye olunye uhlobo (nika ingcagciso) .....

52. Ukhe wamxelela ugqirha okanye umongikazi into yokuba usebenzisa amayeza esintu?

Ewe ☐ Hayi ☐

Ukuba "hayi" kutheni?

.....

.....

53. Ukhe wayisebenzisa igarlic nje ngeyeza lesintu?

Ukuba **hayi**, kutheni?

.....

Ukuba **ewe**, kweziphi izigulo? (nika ingcaciso).

.....

54. Ukhe wayisebenzisa iAfrican olive nje ngeyeza lesintu?

Ukuba **hayi**, kutheni?

.....

Ukuba **ewe**, kweziphi izigulo? (nika ingcaciso).

.....

iGarlic

iAfrican Olive

Siyabonga ngentsebenziswano yakho!

Appendix VII: Interview Questions

U.W.C

South African Herbal Science and Medicine Institute
University of the Western Cape

Faculty of Science

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In-depth Interview & Focus Group Questions:

Garlic and African Olive as Traditional Herbs for Hypertension in the Western Cape

The following qualitative questions allows for further probing. Interviews may be as long as a half an hour to an hour, and may continue for more than one interview per person.

The questions are as follows:

1. What do you think is the cause of hypertension / high blood pressure?
2. Why do you think you have hypertension?
3. How has your experience been with hypertension? Any stigma?
4. Do you use traditional herbal medicine? (Explore reasons why)
5. What traditional herbal medicines are you using?
6. Are you using these medicines for your hypertension?
7. Is your health practitioner aware of your traditional herbal medicines use? (Explore reasons why)
8. Do you take these traditional herbal medicines with your hypertension medication?
9. Have you ever used garlic and/or African olive used for hypertension? If yes, please describe.
10. Would you try these medicinal plants if they were readily available? If yes, please describe.