REGIONAL INSTITUTE FOR POPULATION STUDIES (RIPS)

UNIVERSITY OF GHANA

LIFESTYLE, PERCEPTION OF HEALTH AND BLOOD PRESSURE AMONG ACCRA's URBAN POOR

BY

LAUD RAPHAEL SOWAH

THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL POPULATION STUDIES DEGREE.

JULY 2013

ACCEPTANCE

Accepted by the Faculty of Social Sciences, University of Ghana, Legon, in partial fulfillment of the requirements for the award of MPHIL POPULATION STUDIES

……

Prof. S.O. Kwankye

SUPERVISOR

Date …….

……

Prof. Samuel N. A. Codjoe

CO - SUPERVISOR

Date …….

DECLARATION

I hereby declare that this work is the result of my own research undertaken under supervision except for references made to other people's work and which have been duly acknowledged. Also, this work has neither in part nor whole been presented for another degree elsewhere.

SIGNED……

LAUD RAPHAEL SOWAH

(STUDENT)

DATE …….

DEDICATION

This thesis is dedicated to my aunty, Esperanza Wellington and my family whose consistent love and support has brought me this honour and also to the people of Ga- Mashie and Agbogbloshie.

ACKNOWLEDGEMENT

Thanks to God Almighty who has been my source of inspiration and has enabled me to finish this programme successfully.

I wish to express my heart-felt gratitude to my supervisors, Prof. S.O Kwankye and Prof. Samuel N. A. Codjoe for their guidance, attention and support throughout the study. I really appreciate their constructive criticisms, time and patience.

I am indeed grateful to the Staff of the Regional Institute for Population Studies (RIPS) for the opportunity to be part of their loving family.

I also wish to also thank all the PhD and MPhil students at RIPS for their assistance and support.

And to my colleagues (2011/2012 academic year), I appreciate their contributions to my work. I would also like to thank the Sackey family for the immense support they provided me through my academic year.

ABSTRACT

Lifestyle behaviors are the major determinants of risk factors such as high blood pressure and also a risk factor for cardiovascular diseases. These lifestyles include tobacco use, poor diet, physical inactivity and excessive alcohol consumption. Perception of health is an important and valid measure of people's general wellbeing. Perceived health status does not replace or substitute actual health outcomes but rather complements it. Now more than ever, hypertension is the single number one cause of heart and renal failure in Ghana with the Greater Accra Region recording hypertension as the second leading cause of outpatient morbidity in 2007. Studies have shown that Accra provides concrete evidence for the challenges in lifestyle pattern. Therefore, understanding how individuals who engage in unhealthy lifestyle perceive health and how it translates into their actual health status (measured by blood pressure) is central to developing and making practical policy on preventive lifestyle interventions.

The study relies on data from the 2011 Edulink urban health and poverty project round II survey. Simple percentages, bivariate and multivariate analyses are employed to identify the association between perception of health, lifestyle behaviours and blood pressure.

Ninety percent of the respondents perceive their health to be either good or excellent and 16 percent of the sample is hypertensive. However, more than 50 percent of the sample population who perceived their health to be good or excellent is either pre-hypertensive or hypertensive. In respect of the lifestyle behaviour, 70 percent of the respondents have poor dietary intake. Only 75 individuals currently smoke. The alcohol consumption rate is 45 percent while 90 percent are physically active.

However, after controlling for confounding variables, the multinomial logistic regression model indicates that age, sex, religion and dietary intake are the most important predictors of hypertension. The findings further indicate that females are 0.7 times less likely to be pre-hypertensive and 0.6 times less likely to be hypertensive than males. Individuals with poor dietary intake are 1.6 more likely to be pre-hypertensive and individuals aged 15-19 years are 0.8 times less likely to be pre-hypertensive compared to individuals aged 50 years and above. Among the religious groups, Other Religion, Christians and Moslems are 9.7, 10.7 and 12.9 times more likely respectively to be pre-hypertensive compared to Traditional Religion.

The study found disparity between individual's perceived health and blood pressure status. Therefore, there should be campaigns on the massive awareness and education about hypertension and more importantly this education should be targeted at promoting appropriate views of health and the need for improved health.

TABLE OF CONTENTS

List of tables Table page

List of Figures Figure Page

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Development, urbanization and modernization in every society are associated with significant changes in the patterns of health and disease. The spread of non-communicable diseases (NCDs) presents a global health crisis worldwide. This is the situation in almost all countries and cuts across every social and economic status and that males, females and children are all at risk of these diseases (WHO, 2005). Sub-Saharan African countries are currently experiencing one of the most rapid epidemiological transitions characterized by increasing urbanization and changing lifestyle factors (Fezeul et al., 2006). This has resulted in an increase in the incidence of non-communicable diseases especially cardiovascular diseases (Kadiri and Salako, 1997).

Lifestyle behaviors are the major determinants of risk factors such as high blood pressure, diets in saturated fats leading to elevated serum cholesterol level and physical inactivity (Reddy, 1998). Globally, certain risk factors have been found to account for up to 90% of myocardial infarctions and other poor cardiovascular diseases (CVDs) (Steyn et al., 2005). These risk factors include tobacco use, poor diet, low physical activity and harmful consumption of alcohol. The WHO (2005) describes unhealthy diet, physical inactivity and tobacco use as modifiable risk factors. Even though these risk factors are known or established they have varied effects in different settings. These risk factors are sometimes described as lifestyle risk factors. These poor lifestyles cause more than two-thirds of all new cases of non-communicable diseases and increase the risk of complications in people with non-communicable diseases.

Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity (WHO, 1948). Health and illness conditions are dynamic and change with time. Perceived health also referred to as perception of health is a personal assessment of an individual's views about his/her own health condition and in most cases used as a proxy or indicator of one's general health status (European Community Health Indicators and Monitoring, 2010). It is also important to note that perceived health status does not replace or substitute actual health outcomes but rather complements it (The European Commission, 2011). Perception of health is an important and valid measure of people's general wellbeing. Due to its importance it has been incorporated by the World Health Organization in its health targets and generally acknowledged and used as a health status in population studies.

Studies have shown that demographic, socio-economic and lifestyle characteristics have been found to be related to an individuals' perceived health status (Alves and Rodrigues, 2005; Molarius et al., 2007). Other studies also indicate the influence of chronic diseases and disability on individual's perception of health (Molarius and Janson, 2002; Cott et al., 1999). Hypertension and diabetes mellitus are considered to be the most prevalent chronic diseases in both developing and developed countries.

Hypertension is a major global growing public health problem. It is the highest contributor to the aggregate cases of cardiovascular morbidity and premature mortality worldwide. In 2000, over a quarter of the world's adult population suffered from hypertension and it is estimated to rise to about 60 percent in 2025, with nearly two-thirds of the patients residing in developing countries, especially low-income countries (Falkner et al. 2006; Agyemang, 2006; Isezuo et al. 2011).

Previously, the prevalence of hypertension in Africa was very low, especially in the rural communities ranging from 2 percent to 13 percent (Pobee, 1993; Shaper et al., 1969). Recent studies, however, reveal a contrasting trend indicating a rise in prevalence of approximately 78% in sub-Saharan Africa (Amoah, 2003; Cappuccio et al., 2004). The prevalence has increased so much so as to be compared to that of the African Americans (Chobanian, 2003). This increase in prevalence of hypertension has been strongly associated with poor lifestyles such as smoking, excessive alcohol intake, poor diet and lack of physical exercise.

Pobee et al., (1979) first described the epidemic of hypertension in Ghana. Since then the incidence and prevalence of hypertension have changed over the years. For example from 1988 to 2007 the incidence of hypertension among outpatients in Ghana has increased over ten times (GHS, 2008). Furthermore, in the period of 1975 to 1980 in Mamprobi, a suburb of Accra, out of the total number of deaths recorded almost one quarter was attributed to cardiovascular diseases. The incidence of hypertension is very common in all ten regions of Ghana but the Greater Accra Region recorded hypertension as the second leading cause of outpatient morbidity after malaria in 2007 (GHS, 2008). Now more than ever, hypertension is the single number one cause of heart and renal failure in Ghana (Owusu, 2007; Plange-Rhule, 1999).

A study done by Agyei-Mensah and De-Graft Aikins (2010) suggests that the epidemiological transition in Accra reflects a protracted polarized model. This is the situation where the population experiences both the co-existence of infectious and non-communicable diseases, where differences exist between social classes with the poor being the most vulnerable. The study further suggests that urbanization, urban poverty and globalization underpin the protracted polarized model in Accra. The fast changing pace in lifestyles of urban dwellers in Accra such as shift in diet, more sedentary lifestyle (Amoah, 2003) and the emergence and increase in the

prevalence of non- communicable diseases (Bosu, 2007) provides enough basis for researchers to focus on this topic. Studies have shown that Accra provides concrete evidence for the challenges in lifestyle pattern. These changes in lifestyle patterns are increasing the incidence of lifestyle diseases and their risk factors especially among the poor communities (De-graft Aikins, 2007; Amoah, 2003). Understanding how individuals who engage in unhealthy lifestyle behaviour perceive health and how it translates into their actual health status (the study uses blood pressure as a proxy for actual health status) is central to developing and making practical policy on preventive lifestyle interventions.

1.2 STATEMENT OF THE PROBLEM

Poor lifestyle such as poor diet and physical inactivity is leading to the incidence of non-communicable diseases and worsening the situation of non-communicable patients (Yusuf, 2004). This has consequences for the individual mostly leading to deaths after prolonged periods of disability. For example, excess consumption of salt causes up to 30 percent of all cases of hypertension (Joffers et al., 2007). Physical inactivity which leads to obesity causes about 3 million or 8 percent of all deaths per year from non-communicable diseases (Carswell et al., 2007). Alcohol consumption leads to 2.3 million deaths each year, 60% of which are due to non-communicable diseases (Leon et al., 2007). Two of three deaths each year are attributed to non-communicable diseases and four-fifths of the deaths are in low income countries (WHO, 2009). By 2020, studies indicate that mortality by cardiovascular diseases (CVDs) is expected to increase by 120 percent in females and 137 percent in males (Yach et al., 2004).

Hypertension is an important and a major risk factor of many diseases (Werko, 2006). Hypertension is the leading cause of cardiovascular diseases, which displays a clear upward

trend. According to the WHO, more than 20 million people have hypertension in Africa, with a prevalence ranging from 25 percent to 35 percent in adults aged 25-64 years (WHO, 2002). High blood pressure could lead to several hazardous complications that include congestive heart failure, myocardial infarction, stroke and multi-organ failure (WHO, 1996; Kannel, 2003). It can affect the quality of life of an individual.

Generally, there is a low level of detection, treatment and control of hypertension in sub-Saharan Africa which emphasizes the difficulty in managing chronic health diseases. This is further aggravated by the fact that individuals and households pay for the utilization of services and treatment of hypertension. As a result, hypertension receives little attention as a health condition. Furthermore, the care or treatment of hypertension is very expensive. For example in 2001 the direct health care cost attributable to non-optimal blood pressure in sub-Saharan Africa was estimated at two billion US dollars (WHO, 2002).

The burden of non-communicable diseases is increasing in low income and middle income countries and it is becoming one of the major threats to development in these countries and contributing to poverty to these countries (World Economic Forum, 2011). Non-communicable diseases over the years have also been a cause of poverty. This is as a result of its chronic nature that leads to continuous expenditures, which can financially handicap households and place them in a cycle of debt.

This is further aggravated when non-communicable diseases place heavy burden on health systems which are already resource–deficient. In Accra where majority of both public and private health facilities are present, access to health care services from these health facilities is problematic for the poor communities and quality of care in terms of non-communicable diseases

is poor for all social groups. This double burden of communicable and chronic non-communicable diseases have long-term impact on the health system of these nations since it undermines their health care systems. In addition research has shown that sub-Saharan African countries already have resource-deficient health systems.

If individuals perceive their health to be good when indeed their actual health is poor they will do nothing about their current lifestyle especially if they lead a poor lifestyle. This could consequently affect their health and may probably predispose them to becoming hypertensive. To prevent diseases there is the need for individuals to perceive themselves to be susceptible to contracting hypertension in order for them to change their unhealthy lifestyles. For example Griffith et al., (2011) found that respondents perceived their health to be good when indeed they led an unhealthy lifestyle and this subsequently affected their actual health. This is because hypertension may not be considered a health issue in Accra's urban poor until this condition causes functional limitations to the individual.

In the light of the above mentioned problems, this study seeks to answer the following research questions.

i. How do individuals in urban poor areas perceive their own health?
ii. How different is the actual health status of the people (measured by blood pressure) from their personal assessment of their health?
iii. What are the lifestyle behaviours engaged in by Accra's urban poor?
iv. What is the relationship between the lifestyle behaviour of respondents and their blood pressure status?
v. What can be done to help in the prevention of high blood pressure through the promotion of healthy lifestyles?

1.3 RATIONALE OF THE STUDY

The development of every nation is a key element to the life of its people. Development over the years is characterized by an increased rate in urbanization, industrialization and globalization. Research globally and in sub-Saharan Africa has shown that these characteristics of development have negatively influenced the lifestyle patterns and behaviour of the people. Research so far done has sought to find the determinants of blood pressure (hypertension) which they mostly attribute to poor lifestyles such as smoking, alcohol consumption, poor diet intake and physical inactivity.

Most studies indicate that developing countries mostly the urban populations have the highest levels of non-communicable diseases. These studies further indicate that non-communicable diseases which were evident among the wealthy groups or communities are now prevalent among poor communities which are also faced with infectious diseases making them more vulnerable. To understand why the prevalence of non-communicable diseases is high among the population, studies have been done on self-rated health among respondents. These studies mostly focus on persons who are suffering or living with the chronic diseases. This is quite unacceptable because those living with the conditions might be informed of the cause and subsequently told what to do to avoid complications. Therefore, results of these studies are channeled into policies that are mostly concerned with curative measures and they also recommend policies for preventive measures. The fact is that for policy implementations more needs to be done in terms of preventive intervention.

It is worth noting that for preventive interventions to be effective there is the need for individuals to have the craving for behavioural change. That is individuals should have the desire to change an existing lifestyle for one that will prevent them from contracting diseases. This implies that the views of individuals concerning their health and the lifestyle they engage in is of great importance. This is because some behavioural change models have explained that if individuals do not perceive there is a problem (in this context perceive their health to be poor or consider themselves vulnerable to a particular condition) they will be unwilling to change their current behaviour especially if that behaviour can affect their health in the long run. It is in this light that the current study incorporates perception of health as a key component in the analysis of blood pressure status.

Furthermore, the current study in its unit of analysis identifies respondents who have not been diagnosed of any non-communicable diseases. This is because individuals living with non-communicable diseases are not preventing the disease rather they are either treating or avoiding complications. To have more meaningful insight into how preventive measures will be effective the choice of unit of analysis considered by the current study becomes important. This, the current study have found to be a major gap in most of the earlier studies whose work have sought to find an association or relationship between one's perception of health and their actual health outcome.

The gap identified by this study is that very little or no attempt is made by literature to investigate people's perception of their own health and how that translates into their actual health status with emphasis on the lifestyle they lead. It is important to note that the study uses blood pressure instead of hypertension even though the two are used interchangeably in most instances. The reason for this is that, hypertension (which is more of a technical term) is widely regarded as

a diagnosed state of an individual by a doctor, health care professional or medical practitioner and this diagnosis is usually based on monitoring the blood pressure readings of an individual over a period of time. Therefore, blood pressure status would be used as a proxy for actual health status of respondents.

Therefore, the study goes beyond that and investigates how individuals assess their own health and also find out their actual health status, paying particular attention to their lifestyle. This will enable the study recommend practical interventions to policy makers which will help in the prevention of non-communicable diseases (hypertension). This study is timely since the Ministry of health has introduced the Regenerative Health and Nutrition Programme (RHNP), which aims to transform the health of Ghanaians (MOH, 2005, 2007). This they intend to achieve through a paradigm shift of a health service emphasis on a curative care to more of preventive health system. The programme is also in line with international health perspectives on preventing diseases especially chronic conditions, through healthy lifestyles (WHO, 2005).

Developing countries have made several health policies and adopted interventions to help improve the lives of their people. However, most of these policies have failed due to implementation problems and non-adherence to recommended healthy lifestyles or behaviours. Even in Ghana, after the introduction of the Regenerative Health and Nutrition Programme, Tagoe and Dake (2011) reveal that there has been an increase in risky lifestyles among males and a decrease among females. They further found that urban areas were more at risk to unhealthy lifestyles as compared to rural.

Therefore, the current study seeks to find the relationship between individuals' assessment of their blood pressure and the kind of lifestyle they engage in. This will add knowledge to existing

literature and will also inform policy, programme and the strategies formulated to reduce the incidence of hypertension and promote healthy lifestyle.

1.4 OBJECTIVES

The general objective of the study is to examine how individuals who engage in unhealthy lifestyle perceive health and how that translates into their blood pressure status.

The specific objectives are to:

i. Compare perception of health to actual health status
ii. Describe the lifestyle pattern of Accra's urban poor
iii. Find the association between lifestyle and blood pressure prevalence
iv. Make recommendation that could help in the prevention of high blood pressure through the promotion of healthy lifestyles.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews the literature on blood pressure and its relation to lifestyle risk factors such as smoking, alcohol, physical activity and diet. It also examines the relationship between blood pressure and two non-modifiable factors that are age and sex in Ghana. It further investigates perceived health and some theory of behaviour change models that explain perception and behaviour change.

The prevalence of non-communicable diseases is increasing globally and this is as a result of a rapid rise in the developing countries. Globally, the world has experienced major health transitions which have been as a result of demographic shifts with altered population age profiles and changes in lifestyle patterns. There has been significant change in the lifestyle and socio-economic status of people. People residing in developing countries are adopting Western lifestyles. Development, urbanization and globalization are fast becoming characteristics of developing countries. All these play significant roles in the fast changing epidemiological transition in these countries, leading to the rise in the incidence of non-communicable diseases especially hypertension.

2.2 Perception of health

Perceived health is an indicator of overall health status. It can reflect aspects of health not captured in other measures. Perceived health refers to a person's health in general, either by the person or in the case of proxy response, by the person responding. Most studies conducted on perception of health have sought to determine whether self-rated health has a unique effect on subsequent health and health-related behaviour. Most often these studies have found a high correlation between an individual's own perception of his/her health and his/her actual health status (Mossey and Shapiro, 1982). In addition, previous studies, in a wide variety of population have demonstrated that self-rated health is an accurate reflection of a person's health and a valid predictor of the incident of mortality and chronic morbidity (Baronowski et al., 2003; Ajzen et al., 1991; Prochaska et al., 1994; Paradis et al., 2008; Rohrer et al., 2007).

The gap identified in most of these studies concerning perceptions of health is the fact that in their sample or unit of analysis they include patients or individuals suffering from a particular condition. Therefore it is not surprising to have patients perceiving their health to be very poor and subsequently have their self-rated health to correlate with their actual health status. For example, Frinkelstein (2000) found hypertensive patients with poor perceived health to have more visits to health care centers. Garrity (1973) after controlling for clinical status found self-rated health to predict the level of morale and return to employment after respondents have had a first myocardial infarction. Likewise, Brown and Rawlinson (1975) found self-rated health positively associated with morale and the tendency to relinquish the sick role among persons who had experienced open heart surgery.

Another study done by Rhorer et al., (2007) where self-related health was used as an outcome indicator revealed that self-rated health is significantly related to health behaviour among primary care clinic patients. They further suggested that to improve health outcomes among patients, self-related health appears to be a valid quality indicator. Rhorer et al., study consisted of 500 veteran patients who were followed by primary care providers in the VA facility in Amarillo.

Furthermore, a study done by Mossey and Shapiro (1982) sought to test the hypothesis that self-rated health is a predictor of mortality independent of actual health status. The study found that the risk of mortality of persons whose self-rated health was poor were 2.92 and 2.72 times that of those whose self-rated health was excellent. Therefore, they suggested that the findings provide empirical support for the long health belief that the way a person views his health is importantly related to subsequent health outcomes. The observed health status of respondents in Mossey and Shapiro's study was provided by physicians.

A study conducted by Yu et al., (1998) included respondents with hearing impairments, the blind and individuals with arthritic/rheumatic condition or artificial limbs. Yu et al., found that poor perceived health increased the relative risk of death by almost twice compared to excellent health among urban Shangai residents.

In contrast to the above studies where self-rated health reflected an individual's actual health status a study done by Griffith et al., (2011) reported that perceived health was incongruent with actual health and health behaviours among rural Appalachia known to have poor health behaviour, poor health status and poor health disparities even though the study included respondents who were on blood pressure medications.

This current study is very crucial in the sense that most policies proposed by these studies (where self-rated health reflected an individual's actual health status) are mostly centered on the curative interventions. For policy implementations more needs to be done on the preventive aspect. Most studies have indicated that poor lifestyles such as smoking, alcohol consumption, poor diet and physical inactivity have significant associations with our actual health including blood pressure. Moreover, programmes and interventions targeted to promote healthy lifestyles and preventive diseases such as blood pressure have failed. Undoubtedly, the intended outcomes of these programmes and interventions are greatly dependent on the individual behaviour change.

1.5.2 Theory of behaviour change

Baronowski et al., (2003) suggest that there is a common theme that seems to exist in almost all the different major behaviour change models. That is, for an individual to have a successful behavioural change, he/she must first have a realistic perception of the behavioural issue. This is further illustrated by the Knowledge-Attitude-Behaviour (KAB) Model which suggests that for the formation of healthier attitudes, there is the need for some form of knowledge concerning the healthy attitude which will eventually result in healthy behaviour change (Baronowski et al., 2003). In addition to the above is the Behaviour Learning Theory (BLT) which suggests that behaviour is the outcome of a costs-to-benefits evaluation (Baronowski et al., 2003). Applying this theory to the health behaviour before an individual engages in a healthy lifestyle, he/she must first believe or perceive that healthy behaviour is advantageous and overshadows any perceived cost of making the change. For example, to adopt eating a good diet, one must believe that eating a good diet is advantageous and overshadows any perceived cost of adopting the change.

Health Belief Model is based on six key concepts namely perceived susceptibility, severity, benefits, barrier, cue-to-action and self efficacy. It is based on the understanding that a person will take a health related action if (1) he feels a negative action can be avoided, (2) he has a positive expectation that by taking a recommended action he will avoid a negative condition and (3) he believes he can take a recommended health action. Applying this to the discussion of healthy behaviour, the Health Belief Model motivates health actions and to avoid a negative health consequence as a prime motivation.

Social cognitive theory also considers the importance of an individual's knowledge and attitude in influencing behaviour and behaviour change (Macdowell, Bonnell and Davies, 2006).

Similarly, perception is also embedded in two of the most popular theories of behaviour change - the Theory of Planned Behaviour and the Transtheoretical Model (stages of change). The theory of Planned Behaviour suggests that behaviour is directed by an individual's attitude toward that specific behaviour, the perceived social pressure to execute that behaviour (subjective norm), and the ease with which one can perform the behaviour i.e., perceived behavioural control (Ajzen, 1991). Thus, before an intention to execute a specific behaviour can be achieved, it requires the combination of a positive attitude, a favourable subjective norm, and a high level of perceived behavioural control. Similar to the above is the Transtheoretical Model which proposes that a person makes a successful behaviour change by progressing through certain stages of change (Prochaska, 1994). In the first two stages of the Transtheoretical Model, that is the pre-contemplation and contemplation stages, both stages argue that whether an individual perceives or does not perceive depends heavily on the fact that a problem exists or more precisely there is the need for behavioural change.

Applying these theories to perceived health, engaging in a healthy lifestyle and how that affects actual health irrespective of what model one tends to use, the underlying theme for behaviour change is individual perception; whether it be perception about the issue (attitude), perceived benefits/costs for performing the behaviour, perceived risks of disease, perceived impact of disease, perceived social pressure to participate in the health behaviour (subjective norm), perceived control of the health behaviour, or the perception of whether or not there is a health issue in the first place (Griffith et al., 2011:2). Therefore, the first step prior to behaviour change in any of the theoretical models is the perception that there is an issue.

If a person does not perceive health to be an issue (pre-contemplation), then he/she will never progress through the stages of change in the Transtheoretical Model. Similarly, if a person does not perceive health to be an issue, he/she will not acquire knowledge or attitudes to change behaviour in the Knowledge-Attitude-Behaviour Model, evaluate costs and benefits of behaviour change in the Behaviour Learning Theory, form perceptions necessary for change in the Health Belief Model, develop perceived behavioural control in the Theory of Planned Behaviour, etc. (Griffith et al., 2011:2).

Consequently, one's perception of health, or one's perceived health, is a critical step for an individual to enter the pathway to healthy behaviour change. This follows that if individual's residing in Accra's urban poor areas perceive themselves to be healthy, then interventions targeting health behaviour change are going to be ineffective. On the other hand, if they perceive their health to be poor then health behaviour interventions are more likely to be successful.

2.4 Hypertension

Globally, hypertension is known to be a multi-factorial disease (Castelli, 1984). It is experienced due to multiple risk factors and non-modifiable factors (Kornitzer et al., 1999, WHO, 1996; Kim et al., 2006). The prevalence and incidence of blood pressure, a risk factor of chronic condition is increasing globally. In developing countries and in Ghana the major cause of the incidence of blood pressure is poor lifestyles. This is however, not different from what happens in developed countries. These poor lifestyles can cause chronic health problems and worsen or complicate issues for those living with non-communicable diseases. Hypertension is a non-curable disease (Werko, 2006). Although it is a chronic condition, it can be prevented and complications avoided by modification of modifiable risk factors and drug therapy. Blood pressure is an important risk factor for cardiovascular diseases (Kim et al., 2006, Ghannem and Hadj, 1997; Elhadi et al., 2007). In 2012, hypertension still stood as the most diffused and principal risk factor for cardiovascular diseases worldwide (Danaei et al., 2011). Reliable information about the prevalence of high blood pressure in different world regions is crucial to the advancement of health policies for the prevention and control of this condition (Kearney et al., 2005).

According to the WHO, more than 20 million people have hypertension in Africa, with a prevalence ranging from 25 percent to 35 percent in adults aged 25-64 years (WHO/AFRO, 2006). In a study conducted among urban migrants newly settled in Nairobi in 1985, the result showed that their migration from rural areas to an urban setting was associated with a rise in blood pressure. This was notably explained by a marked change in diet of the new arrivals in Nairobi, with higher salt and calorie intake and a reduced potassium intake (Poulter et al., 1985). This is because literature indicates that Africa is experiencing one of the fastest rates in urbanization, with a growing proportion of rural areas becoming urbanized or semi-urbanized

(Opie and Seedat, 2005). It is quite interesting to note that the increasing prevalence of hypertension is also reaching rural areas in sub-Saharan Africa. For example, in a recent study conducted to analyze hypertension prevalence in three rural villages in Rwanda, Malawi and Tanzania, it was found that 22.8%, 15.9% and 26.8% respectively of the inhabitants were affected in the three respective countries (Stewart et al., n.d.).

Bosu (2010), shows that the crude prevalence of hypertension in Ghana is between 25 percent and 48 percent, using the newer threshold of 140/90 mmHg. Bosu's study further indicated that the prevalence of hypertension was higher in urban than in rural populations, where the mean systolic and diastolic blood pressures were higher in urban than in rural areas. Of the hypertensives identified in Ghana, only 22 percent to 54 percent were aware of their condition, 7%-31% were on treatment and less than 14 percent had their blood pressures controlled (Bosu, 2010). A study performed in 2004 in 12 villages in Ashanti, Ghana, also reported the hypertension prevalence to be 28.7 percent overall (Cappuccio et al., 2004).

Most studies in Ghana have reported a higher prevalence of hypertension among men than women though differences were frequently small when assessed and mostly not statistically significant (Cappuccio et al., 2004). Nevertheless some studies also have reported a higher prevalence of hypertension in females than males (Owiredu et al., 2008; Addo, Amoah and Koram, 2006; Amoah, 2008). Therefore, the prevalence of high blood pressure between males and females in Ghana is inconclusive. Age-specific mean blood pressures in Ghana have varied between studies and were higher in the older age groups (Bosu, 2010). Bosu's study further revealed that the mean age-specific blood pressures were generally higher in men in the younger age groups and higher in women from 55 years and over. In other studies conducted in Ghana, the mean systolic and diastolic blood pressure increased with increasing age (Owiredu et al.,

2008, Chukwuemeka et al., 1983; Addo et al., 2006; Addo et al., 2008; Kunutsor and Powles, 2009; Cappuccio et al., 2004; Pole et al., 1979). It is worth noting that, even in relatively young populations with a mean age of 36 years, 29% are hypertensive (Agyemang et al., 2006). Nevertheless, it still can be argued that in Ghana high blood pressure increases with age.

2.5 Lifestyle risk factors and blood pressure

2.5.1 Salt and blood pressure

Excessive consumption of salt causes hypertension in highly susceptible individuals. Salt sensitivity increases with age. This situation is both present in those with/without high blood pressure. In a situation of a hypertensive patient, overeating and extra salt intake worsens their condition. An increase in salt consumption has been one of the characteristics of the nutrition transition that is becoming evident in developing countries (Drewnowski and Popkin, 1997). Most research concerning dietary behaviour indicate that excess intake of sodium is a contributing factor to high blood pressure, which happens to be a major risk factor for non-communicable diseases such as hemorrhagic stroke and hypertensive heart disease. This phenomenon has been researched in animal experimental models, in epidemiological studies, controlled clinical trials and in population studies (Gibbs et al., 2000). In all studies, a direct correlation has been found with salt intake, mean blood pressure and prevalence of hypertension in many populations.

An INTERSALT study conducted among 52 population groups across 32 countries to investigate 24 hour urinary electrolyte excretion and blood pressure, adults aged 20-59 years had a significant positive relationship between their urinary sodium excretion and blood pressure (Elliot et al., 1996; INTERSALT Co-operative Research Giving, 1998). The influence of

urbanization on salt intake and its consequence on blood pressure levels was investigated among rural farmers whose salt intake was low but witnessed an increase in blood pressure levels when they migrated to urban areas. This rise in blood pressure levels is attributed to increase in salt intake and a reduced intake of potassium (Poulter et al., 1990). Another cohort study done in Finland on 1,173 men and 1,263 women who were aged 25-64 years on 24 hour urinary sodium and cardiovascular risk factor supported the evidence that links increased salt intake to adverse cardiovascular health outcomes (Tyomilehto et al., 2001).

In the Ashanti Region of Ghana, a community programme which was implemented to establish the possibility of salt reduction as a way of reducing blood pressure revealed that a reduction in average salt intake led to a reduction in systolic blood pressure even though this decrease was small (Cappuccio et al., 2006). Cappuccio, et al., (2000) conducted a small pilot study of a nutritional education programme targeted at reducing the intake of dietary sodium in one village in Ghana. The study revealed that there was a reduction in mean systolic blood pressure by 6.4 mmHg and diastolic by 4.5 mmHg within four weeks.

2.5.2 Fruits, vegetables and blood pressure

The World Health Report (2002) suggests that low fruit and vegetable consumption is responsible for 1.9% and 3.9% of DALYs respectively in developing countries with low mortality rates causing 2.7 million deaths per year globally (WHO, 2002; Werko, 2006). Consumption of fruits and vegetables has been accepted to promote good health; evidence of this has been presented in recent years (Nestle, 1999; Ness and Powles, 1997). Food that is low in calories but very high in fibre reduces an individual chance of being obese. These foods rather contain nutrients such as vitamins and minerals that reduce an individual's risk of getting non-

communicable diseases (Tamres et al., 2009). Salehi et al., (2010) confirm that fruit and vegetables are generally low in calories and very high in fibre. In the same way, dietary behaviour has changed and thus exposing people to many non-communicable diseases. An estimated 2.7 million die annually due to low fruit and vegetable consumption globally (WHO, 2008).

A study done by Joshpura et al., (1999) among men and women reported that fruit and vegetables consumption were inversely related to the ischemic stroke after adjusting for confounders. In addition, an increase in one serving per day of fruit and vegetables was associated with 6 percent lower risk of ischemic stroke for both men and women. They also revealed that the combination of fruits, vegetables and low fat diet lowered blood pressure but fruit and vegetables consumption alone lowered blood pressure compared to the combination of the three variables put together.

2.5.3Tobacco use and blood pressure

Smoking globally is known to be a risk factor for non-communicable diseases especially cardiovascular diseases. Globally, it is estimated that tobacco use alone accounts for one-sixth of all deaths attributed to non-communicable diseases. It is also estimated that more than one billion people use tobacco products all over the world. Out of that number 15,000 die from tobacco related diseases (Jha, et al., 2006). Not only do cigarettes kill, but expenditure on tobacco contributes to household poverty (WHO, 2004). Globally an estimated 10 million lives would be lost in 2025 due to tobacco use; out of which seven million would be from developing countries (Reddy, 2002).

Omvik et al., (1996) also document that tobacco smoking increases blood pressure acutely. Some studies have found the systolic blood pressure for current smokers to be higher than that of former smokers or those who have never smoked (Fogari et al., 2006). In addition, Primatesta et al., (2001), found that there was a higher systolic blood pressure among male current smokers than among former or never smokers who were aged 45 years or older, after adjustment for alcohol intake and body mass index.

In other studies where non-clinical samples were used, the results found were contrary to the above where the blood pressure for non-smokers and former smokers were higher than current smokers (Okubo et al., 2004; Lee et al., 2001; Green et al., 1986). This finding is similar to a study done by Green et al., (1986) which revealed that the proportion of individuals with high blood pressure was lowest among those who were current smokers (20 or more cigarettes per day) and highest among never and former smokers, even after controlling for body mass index and age. The effect of smoking on high blood pressure has thus been found to be inconclusive (John et al., 2006; Narnkiewicz et al., 2005).

The largest contributor to these tobacco related deaths would be those attributed to non-communicable diseases especially cardiovascular diseases (Reddy, 2002). Tobacco smoking has become one of the leading preventable causes of death for both the wealthy and the deprived (Beaglehole et al., 2003). However, the long-term effect of tobacco smoking on high blood pressure has not been fully assessed and explained (Whelton et al., 2002). In African countries, smoking is more prevalent in adults and it is mostly common among males and the poor (Pampel, 2002). Tobacco represents an important risk factor for cardiovascular diseases in Africa due to the prevalence of smoking on the continent, particularly among males: 50 percent of

males in Namibia smoke. Forty percent to 49 percent of the male population in Tanzania and South Africa, and 30 percent to 39 percent in Zambia and Zimbabwe, smoke (WHO, 2002).

2.5.4 Physical activity and blood pressure

Physical activity is an important independent risk factor for several non-communicable diseases such as hypertension, diabetes and heart diseases. Demographic changes have occurred with changes in lifestyle of people in general all over the world especially in sub-Saharan Africa. According to WHO (2002), an estimated 1.9 million deaths are attributable to physical inactivity every year, globally. Approximately, 3.3 percent of DALYs in developed countries are due to physical inactivity (WHO, 2002).

Research shows that regular endurance of physical activity produces cardiovascular adaptations that increase work capacity, endurance and vascular function (Thompson et al., 2003). Regular physical activity may improve an individual's cardiovascular risk profile by lowering blood pressure, modulating lipids, reducing insulin resistance, managing unhealthy body weight and enhancing psychosocial status/ mental wellbeing. Habitual physical activity also reduces the risk of developing coronary heart disease and ameliorates symptoms in those with the disease.

Regular, moderate physical activity has been recognized as an essential therapy to assist with risk reduction for the prevention and treatment of stroke and diabetes (Gordon et al., 2004; Bauman, 2004). Similar reductions in blood pressure lasting for many hours have also been demonstrated among hypertensive people following an isolated exercise session (Pescatello and Kulikowich, 2001). Kornitzer et al., (1999) also reveal that physical activity is inversely related to blood pressure and incidence of hypertension. Exercise lowers systolic and diastolic blood

pressure by 5-10mmHg (WHO, 1996). In addition, Lorraine (2000), suggests that exercise reduces sympathetic stimulation which ultimately leads to a reduction in blood pressure.

2.5.5 Alcohol and blood pressure

Alcohol has been found to be a major risk factor for non-communicable diseases especially for heart diseases. For instance, a study done on Nigerian patients who were dependent on alcohol found them to be two times more likely to have co-morbid heart disease compared to those patients who were not dependent on alcohol (Ormel et al., 2007).In addition, a study by Laabes et al., (2008), among Nigerian patients who had been treated for heart failure in a teaching hospital in Jos, reported that more than 24 percent of these patients were regular alcohol consumers. The study in addition found that heavy drinkers had a greater mortality than those considered as moderate drinkers or those who do not take alcohol at all.

Moderate alcohol consumers (1-2 drinks per day) were also found to be associated with a lower risk of ischemic stroke in both men and women. Other studies have shown beneficial effects of moderate alcohol consumption but this must be weighed against the dangerous risks associated with high intake of alcohol. These include higher risk of hypertension and hemorrhagic stroke. Studies have shown that excessive alcohol consumption is associated with blood pressure.

The Stanford Five City Project suggests that the association between alcohol and blood pressure varies on age and sex (Kornitzer et al., 1999). Several studies have been done to explain how alcohol can cause high blood pressure. Lorraine (2000) indicates that compared to those who do not consume alcohol, hypertension prevalence was 50 percent among individuals who consume 3-4 drinks per day and 100 percent in 6-7 drinks per day.

In summary, the earlier studies discussed under the section of hypertension were mostly centered on the prevalence of hypertension among the population (Bosu, 2010; Amoah, 2003, WHO/AFRO, 2006). Some of the earlier studies reviewed under hypertension further demonstrates the differences in the prevalence of hypertension between males and females, awareness of hypertension and control of hypertension. In addition, these earlier studies sought to identify the relationship between lifestyle behaviour and the incidence of hypertension.

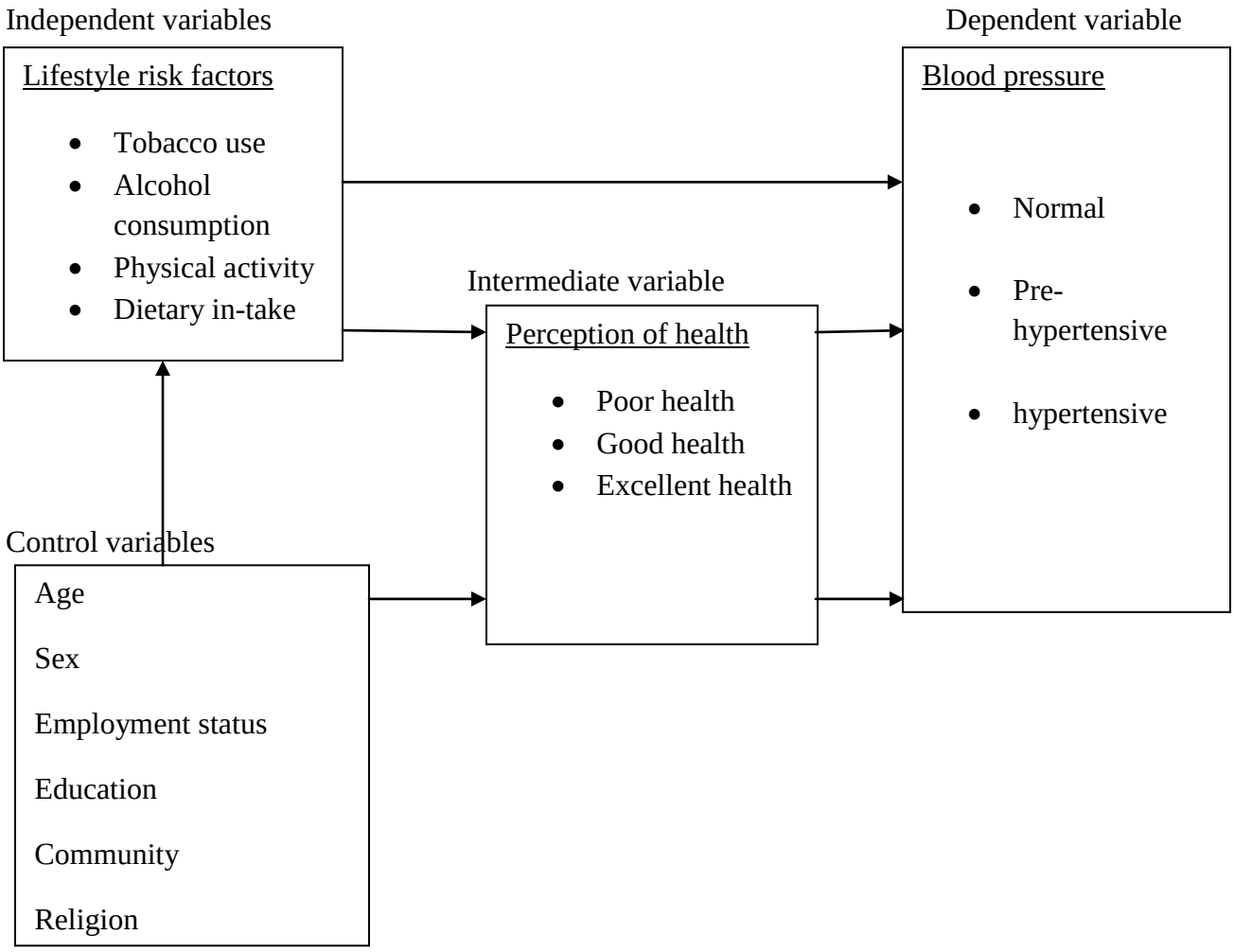
The current study identifies a gap in the above discussion of hypertension, there is very little or no attempt made to investigate people's self-rated health and how that translates into the prevalence of hypertension among the population with emphasis on the lifestyle they lead. In addition, most of the studies on hypertension also include individuals suffering from the disease in their study. Therefore, the purpose of this study is to evaluate the self-rated health of individuals who have not been diagnosed with any chronic conditions in Accra's urban poor in relation to their actual health status and current health behaviour. This is because hypertension may not be considered a health issue in Accra's urban poor until this condition causes functional limitations to the individual.

2.6 CONCEPTUAL FRAMEWORK

Most literature have indicated that diet in-take, physical inactivity, alcohol consumption and smoking are the most common and similar poor lifestyles that can affect one's probability of getting high blood pressure across the world. It is in the same light that some socio-demographic variables have also been identified to have a relationship with blood pressure. This study draws on the several researches that have explained the differentials in blood pressure levels and the

associated risk factors. Figure 1.1 gives the pictorial framework that guided the study; thus showing the relationships among the variables of interest.

Figure 1.1 conceptual framework showing the relationship between lifestyle and perception of health and blood pressure.



Author's own construct, 2013

Figure 1.1 shows the relationship between the independent and the control variables and how they influence the intermediate variables to affect the dependent variable. The study employs theories that help to explain the relationship among knowledge, attitudes, perceptions, social influences and behaviour. For example, the health belief model explains that in order for behaviour change to occur, the individual must believe that the change is both advantageous and feasible and that the advantages of the change should overshadow any perceived cost of making the change. That is, if an individual perceives his general health to be good, he/she is unlikely to make changes to improve his/her health (by engaging in healthy lifestyle) especially if they perceive their unhealthy lifestyle as a sign of good living or place prestige on it and this could adversely affect the blood pressure status of the individual.

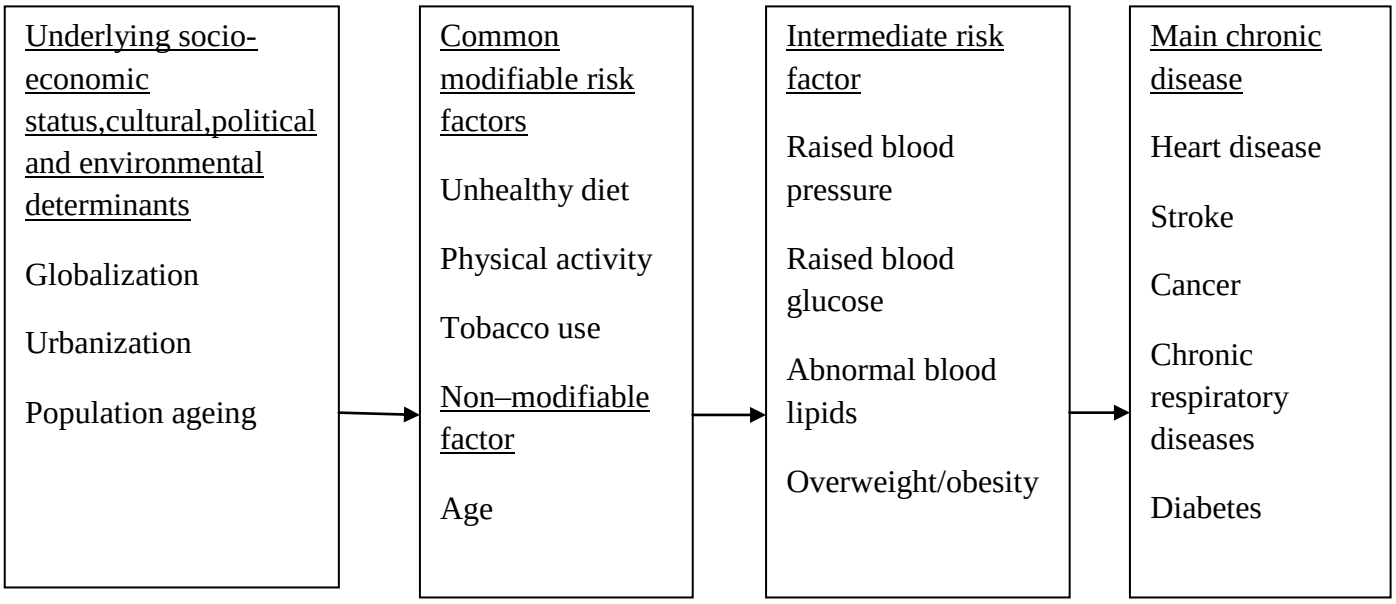
Social cognitive theory also considers the importance of an individual's knowledge and attitudes in influencing behaviour and behaviour change. In addition, it further recognizes the impact of external factors such as social and environmental influences on individual behaviour. For example, the probability of an individual to perceive his health to be good or bad and to even lead a healthy or unhealthy lifestyle will be influenced by social and demographic factors such as the community one finds himself, age, socio-economic status, education, etc. Therefore, from Figure 1.1., the Social Cognitive Theory helps to understand how the control variables affect the intermediate variable to influence the dependent variable.

Starting with age, most studies reveal that systolic and diastolic blood pressure rises as one ages or grows. It is at a late age that one becomes predisposed or vulnerable to high blood pressure. Thus, it is expected that there will be variations in the prevalence of blood pressure among the age groups with older age groups being highly vulnerable. Studies have shown that females during their reproductive age are less prone to hypertension compared to men at the same age.

The situation changes when a woman attains menopause. After menopause females are now at a higher risk of experiencing high blood pressure. Thus it is evident that hypertension prevalence and incidence varies among males and females. Employment status is highly correlated with one's socio-economic status. Most studies have shown that individuals with higher socio-economic standing are more likely to have high blood pressure. This is because income is very crucial when it comes to people's behavioural lifestyle. Education is a platform for the knowledge and prevention of many diseases including non-communicable diseases such as blood pressure. It is expected that the respondents with high educational status will be more likely to be conscious of the benefits of physical activity which can influence blood pressure positively.

Most studies have sought to identify the relationship between lifestyle behaviour and the incidence of hypertension. For example, excessive alcohol consumption is associated with blood pressure. The association between alcohol and blood pressure has been found to vary with age and sex of individuals. Even though, the long-term effect of tobacco smoking on high blood pressure has not been fully assessed, earlier studies suggest tobacco smoking is highly associated with blood pressure. Research shows that regular endurance from physical activity produces cardiovascular adaptations that increase work capacity, endurance and vascular function of individuals which helps lower blood pressure. It is in the same way, dietary behaviour has changed and exposing people to many non-communicable diseases. For instance, most research concerning dietary behaviour indicates that excess intake of salt is a contributing factor to high blood pressure.

Figure 1.2 Causes of non-communicable diseases



Source: World Health Organization, 2005

The conceptual framework in Figure 1.2 that is guiding the current study is modified from a conceptual framework developed by the WHO (2005), which shows the relationship between the determinants and the resultant causes of non-communicable diseases. Therefore, Figure 1.2 shows the interplay among socio-economic status, cultural, political and environmental determinants such as development, globalization and urbanization and how all these factors have led to the increase of non-communicable diseases. The figure first, shows how development and globalization affect lifestyle which has been classified as modifiable risk factors bearing in mind there is a non-modifiable risk factor (age) that is also associated to the influence of the intermediate risk factors. For example, high blood pressure, high blood glucose, and obesity which are determinants of the various main chronic diseases such as heart disease, stroke, cancer, diabetes etc.

2.7 HYPOTHESES

i. Respondents who perceive their health to be poor are more likely to be hypertensive than individuals who perceive their health to be good.

ii. Respondents who are physically inactive are more likely to be hypertensive than people who are more physically active.

iii. Regular alcohol consumers are more likely to be hypertensive than non-alcohol consumers.

iv. Tobacco users are more likely to be hypertensive than non-smokers.

CHAPTER THREE

METHODOLOGY

3.1 SOURCE OF DATA

The study adopts a quantitative method approach in its data analysis and relies on data from the 2011 Edulink urban health and poverty project round II survey. The data were collected in three urban poor areas of Accra, namely: Agbogbloshie, Jamestown and Ussher Town. The purpose of the survey was to understand the relationship between population, health and poverty in Ghana.

The sampling design consisted of selecting 29 enumeration areas (EAs) in these localities and consequently sampling 40 households from each EA. After informed consent was obtained, household interviews were conducted with household members; individual questionnaires were also administered to respondents of ages 15 – 49 (for females) and 15 – 59 (for males).

In addition to the usual questions on demographic, socioeconomic and cultural characteristics as well as those on sexual and reproductive health, there were questions on general health matters. These included questions on physical activity and diet, tobacco and alcohol intake. Respondents were asked questions concerning their health in relation to how they perceive their health and whether they had any non-communicable diseases (ten different types of non-communicable diseases were investigated). Blood pressure measurements were taken from respondents. The blood pressure measurements consisted of the average of the three readings from each respondent using an electric blood pressure monitor. Blood pressure of females who were pregnant was not taken. The blood pressure measurements consisted of two readings, that is, the systolic reading and the diastolic reading. The study categorizes blood pressure groups into the following:

- Normal: Systolic lower than 120 mm Hg, diastolic lower than 80 mm Hg
- Pre-hypertension: Systolic 120-139 mm Hg, diastolic 80-89 mm Hg
- hypertensive: Systolic of 140 mm Hg or more, diastolic of 90 mm Hg or more

Pre-hypertension is not a disease category. Rather, it is a designation chosen to identify individuals at high risk of developing hypertension, so that they are alerted to this risk and encouraged to intervene and prevent or delay the disease from developing. They should be firmly and unambiguously advised to practise lifestyle modification in order to reduce their risk of developing hypertension in the future.

Questions on how an individual perceives his/her own health were asked and based on that three categories of perceptions were computed namely poor health, good health and excellent health. The age of the respondents is classified into the following: 15-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49 and 50 years and above. For employment status, it was classified into unemployed and employed and for those working information on type of occupation was collected. Education status was classified into no education, primary, JHS, SHS and higher education. Community is classified into Ga Mashie and Agbogbloshie, where Ga Mashie consists of James Town and Ussher Town. Religion is classified into Christian, Moslem, Traditional Religion and Other Religion.

Questions on lifestyle behaviour were asked and based on that the following measurements were derived. For smoking status, it is classified into smokers and non-smokers. Out of the history of alcohol consumption collected from respondents the following categories of alcohol consumption were derived, regular alcohol consumers, occasional alcohol consumers and non-alcohol consumers. In measuring physical activity individuals are asked whether they engaged in

any moderate or vigorous activity that caused large increases in breathing or heart rate for at least ten minutes either at home, during leisure or their workplace. Based on this individuals are classified as physically active or physically inactive.

In measuring whether an individual has a good dietary in-take, the aggregate sum of the following questions are computed and used as a measure of having either a poor/good dietary in-take. Whether an individual controls his/her salt in-take, is used as a proxy for salt consumption; the number of fruits and vegetable serving eaten per day, is used to determine whether an individual consumes the required recommended intake of fruit and vegetables serving eaten per day.

3.2 UNIT OF ANALYSIS

A total representative sample of 974 individuals was eligible to be interviewed for the individual questionnaire out of which 617 individuals had their blood pressure measurements taken. In order to fill the gap identified by the study, the unit of analysis is respondents who are not suffering or living with any non-communicable diseases. Therefore, a total of 560 respondents were used in the study.

3.3 METHOD OF ANALYSIS

Simple percentages, ratios and cross tabulation of variables are used to analyze the background characteristics of the respondents. Both bivariate and multivariate analyses are employed to identify the association between perception of health, lifestyle behaviours and blood pressure. These analyses focus on three outcomes: “whether an individual has a normal blood pressure”; “an individual is pre-hypertensive” and “whether an individual is hypertensive”. In the bivariate

analysis, the chi-square test is employed to examine the association between each of the independent variables under study and blood pressure measurement with p-value less than 0.05 as level of statistical significance.

The chi-square bivariate analysis does not consider confounding effects; therefore the net effects of each independent variable are estimated controlling for the other factors using multivariate logistic regression analysis. The odds ratio, which is determined from the logistic regression coefficients, tells us the increased or decreased chance of hypertension given a set of independent variables while controlling for the effects of the other variables in the model. Estimates of odds greater than 1.0 indicate that the risk of hypertension is greater than the reference category of each variable. Estimates less than 1.0 indicate that the risk of hypertension is less than that for the reference category of each variable.

3.4 LIMITATIONS

One major limitation with the current study has to do with the intermediate variable, perception of health; this is because it happens to be a subjective measure. It is not very easy for individuals who have not been diagnosed of any disease to consider themselves as a having poor health. Especially in a society, where majority of the population frequently interpret health to be physical strength. It is not surprising that if you are up and doing; you are regarded as being healthy. Individuals in this circumstances rarely admit their health is poor only when the find themselves very weak. This is evident in the analysis where perception of health is skewed to having good health and excellent health.

The limitation of the measurement of age is that, the age category of respondents falls between the ages of 15-59 years. This age category eliminates all those aged 60 years and above, which is crucial for the analysis in the study. This is due to the fact that literature associates ageing (i.e. 60 years and above) to non-communicable diseases.

There are non-responses for some of the variables used in the study especially the lifestyle behaviour variables. Thus, this led to the reduction of the total number of the sample in some instances of analysis. Therefore, caution should be taken in the interpretation of results since it could affect the results of the analysis. The findings of the study cannot be generalized to the entire country. Therefore, caution should be taken in the interpretation of the results and it should be limited to the study area of concern.

3.5 ORGANIZATION OF THE STUDY

In accordance with the research objectives the study comprises of five chapters. The first Chapter begins with the introduction of the study, the statement of problem, research questions, rationale, objectives, literature review, conceptual framework, methodology, limitations and organization of the study. Chapter II presents perception of health, socio-demographic characteristics, lifestyle behaviours and blood pressure status of respondents. The socio-demographic characteristics, lifestyle and perception of health by their blood pressure status are presented in Chapter III. Chapter IV presents the multinomial logistic regression of the perception of health on blood pressure status of respondents controlling for lifestyle and the selected socio-demographic variables. Chapter V presents the summary, conclusions and recommendations.

CHAPTER FOUR

SOCIO DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

4.1 AGE DISTRIBUTION OF RESPONDENTS

The proportion of the lowest age group i.e., 15-19 years is 13 percent (Table 4.1). For all ages above 19 years, the analysis in Table 4.1 shows that the proportion of respondents decreases as the age of the individual increases. The proportion is significantly lower than 10 percent among age groups 40-44 years and 45-49 years which recorded almost the same proportion of 9 percent each. The proportion further decreases for respondents aged 50 years and above which happens to be the lowest proportion, that is, 6 percent. However, the highest proportion of 21 percent is among the age group 20-24 years and this is followed by respondents aged 25-29 years having 18 percent.

The mean age of the respondents is 31years. The median age is 29 years, this informs us that half of the respondents are either 29 years and above or below. The youthful nature of the respondents can influence their health greatly. The study therefore expects that individuals whose ages fall between 15-34 years may be more likely to have normal blood pressure compared to individuals aged 45 years and above.

Table 4.1 percentage distribution of respondents by age

Age (YEARS)	Total number	Percentage
15-19	71	12.7
20-24	115	20.5
25-29	102	18.2
30-34	75	13.4
35-39	64	11.4
40-44	52	9.3
45-49	50	8.9
50+	31	5.5
Total	560	100

Mean= 31years
Median= 29 years
Source: Edulink Round II Survey, 2011

4.2 SEX DISTRIBUTION OF RESPONDENTS

Sex of an individual is crucial in determining blood pressure. The distribution of respondents by sex is presented in Table 4.2. The results from Table 4.2 indicate that more than half of the respondentsare females (i.e. 55 percent) compared to 45 percent who are males. The finding from Table 4.2 is consistent with the report of The Ghana Statistical Service that per the 2010 Population and Housing Census, there are more females in Ghana than males

Table 4.2 percentage distribution of respondents by sex

SEX	TOTAL NUMBER	PERCENTAGE
Male	254	45.4
Female	306	54.6
Total	560	100

Source: Edulink Round II Survey, 2011

4.3 Employment status

As indicated in Table 4.3, 74 percent of the respondents are employed compared to 26 percent of respondents who are unemployed. The results from Table 4.3, clearly indicate that majority of the respondents are engaged in some form of economic activity. Under the category of occupation in Table 4.3, sales recorded the highest proportion of respondents in that occupation with 37 percent. This is followed by respondents working as skilled manual having a proportion of 21 percent. Nine percent of the respondents work in the service sector and 8 percent work in the agricultural sector. Respondents who work as professionals have the same proportion as respondents in the agricultural sector. The proportion of respondents in the rest of the occupation is significantly lower than two percent. The above analysis is very important because one's employment status can, to a large, extent be used to estimate the individual's income or economic status which can affect his/her lifestyle. In addition type of occupation can give us an idea of the kind of physical activities respondents engage in on daily basis.

Table 4.3 percentage distribution of respondents by their employment status

EMPLOYMENT STATUS	TOTAL NUMBER	PERCENTAGE
Employed	413	73.8
Unemployed	147	26.2
Total	560	100
Type of Occupation		
No occupation	65	12.7
Professional/technical	41	8.0
Managerial	1	0.2
Clerical	7	1.4
Sales	189	36.9
Agricultural/self employed	7	1.4
Agriculture	4	0.8
Service	48	9.4
Skilled manual	106	20.7
Unskilled manual	37	7.2
Other	6	1.2
Total	511*	100

Note: *There are 49 non-responses therefore; the total number reduces from 560 to 511.
Source: Edulink Round II Survey, 2011

4.4 EDUCATIONAL LEVEL

Table 4.4 shows that among the respondents who have no formal education to those who have attained Junior High School (JHS), the proportion of respondents increases as their educational level also increases but the proportion declines as one attains Senior High School (SHS) and further declines as one attains a higher form of education. Out of the total number of respondents 6 percent have no formal education, 22 percent have attained primary education.

The proportion further increases as one attains JHS (44 percent), then declines to 23 percent for SHS and further declines to 5 percent for those who have attained a higher form of education. It can also be observed from Table 4.4, that most of the sample have at least attained JHS, followed by SHS while a very few of them have attained a higher form of education.

Table 4.4 percentage distribution of respondents by their educational level

Educational level	TOTAL NUMBER	PERCENTAGE
No education	34	6.1
Primary	124	22.1
JHS	245	43.8
SHS	130	23.2
Higher	27	4.8
Total	560	100

Source: Edulink Round II Survey, 2011

4.5 RESIDENCE

The place of residence usually determines people's lifestyles and to an extent how long they would live (Eberhardt and Pamuk, 2004; UN, 1985). The community is classified into Ga Mashie and Agbogbloshie. The two communities are different in terms of the culture that exists in them. Data from Edulink round II survey, 2011, shows that 80 percent which forms majority of the sample reside in Ga Mashie while the remaining 20 percent of the respondents reside in Agbogbloshie (Table 4.5).

Table 4.5 percentage distribution of respondents by place of residence

Community	TOTAL NUMBER	PERCENTAGE
Agbogbloshie	115	20.5
Ga Mashie	445	79.5
Total	560	100.0

Source: Edulink Round II Survey, 2011

4.6 RELIGION

From Table 4.6, the results indicate that majority of the respondents are Christians (i.e. 77 percent). This is followed by Moslems who constitute 11 percent of the sample. Respondents who belong to the Other Religion make up 9 percent while Traditional Religion has the least proportion of respondents (i.e. 2 percent).

Table 4.6 percentage distribution of respondents by their religious affiliation

RELIGION	TOTAL NUMBER	PERCENTAGE
Other	52	9.3
Christian	433	77.3
Moslem	64	11.4
Traditionalist	11	2.0
Total	560	100.0

Source: Edulink Round II Survey, 2011

4.7 LIFESTYLE PATTERNS

4.7.1 SMOKING STATUS

It is observed in Table 4.7 that 5 individuals did not respond to the question have you ever smoked. Out of the 555 individuals who responded, 18 percent have ever smoked compared to 82 percent who said they have never smoked. This proportion is quite large compared to 6% of the proportion of Ghanaians who use tobacco (GSS, 2009).

In order to assess smoking status individuals who said they are currently smoking are considered smokers while individuals who said they are not currently smoking are considered non-smokers. Therefore from Table 4.7 only 77 percent of these individuals currently smoke compared to 23 percent who are not currently smoking.

It is also observed in Table 4.7 that out of the 77 percent who are classified as smokers 16 percent smoke on daily basis while 84 percent smoke but not on daily basis. This phenomenon could possibly be due to the fact that expenditure on tobacco contributes to household poverty (WHO, 2004). Therefore purchasing on daily basis could be a problem for most urban poor dwellers.

Table 4.7 further shows the history of smokers by investigating how long they have been smoking. It can be observed from Table 4.7 that only 7 percent of the respondents have smoked for less than a year. The possible reason for such a small proportion could be due to the fact that these respondents may just have started smoking. The proportion of respondents who have smoked for 1-5 years increases to 33 percent. The percentage distribution of respondents who have smoked for 6-10 years is 20 while the proportion of those who have smoked for more than 10 years is 40 percent. Clearly as indicated by Table 4.7, the proportion of individuals increases

as the duration of smoking increases with the exception of individuals who have smoked for 6-10 years.

Table 4.7 percentage distribution of respondents by their smoking status

Ever smoked	Total number	Percentage
Yes	96	17.7
No	459	82.3
Total	555	100
Smoking status		
Smokers	75	76.5
Non-smokers	23	23.5
Total	98	100
Currently smoking		
Yes, daily	12	16
Yes, not daily	63	84
Total	75	100
Duration of smoking (years)		
<1	1	6.7
1-5	5	33.3
6-10	3	20.0
10+	6	40.0
Total	15	100

* There are 5 non-responses for ever smoked
** There are 462 non-responses for smoking currently
*** There are 545 non-responses for duration of smoking
Source: Edulink Round II Survey, 2011

4.7.2 ALCOHOL CONSUMPTION

As shown by data from Edulink, round II survey in Table 4.8, 65 percent of the respondents have ever consumed alcohol compared to 35 percent who have never consumed alcohol. One individual did not respond to the above question. In addition, Table4.8 reveals that out of the total 65 percent who responded to ever consuming alcohol only 360 individuals responded to alcohol consumption in the past 30 days. Among the 360 respondents, 61 percent (representing 221 individuals) consumed alcohol in the past 30 days compared to 39 percent who said no to alcohol consumption in the past 30 days.

It is also observed from Table 4.8 that out of the 360 individuals who said yes to ever consuming alcohol in the past 30 days only 221 individuals responded to consuming alcohol in the past 24 hours preceding the survey. The results further indicate that 45 percent of the total 221 said yes to consuming alcohol in the past 24 hours preceding the survey compared to 55 percent who said no to alcohol consumption in the past 24 hours preceding the survey (Table 4.8). Therefore the number of individuals who said yes to alcohol consumption in the past 24 hours preceding the survey are classified as regular alcohol consumers while those who said no are classified as occasional alcohol consumers. This is because the 55 percent though did not consume alcohol in the past 24 hours; they have ever consumed alcohol and also consumed alcohol in the past 30 days. Those who never consumed alcohol are categorized as non-alcohol consumers. This variable is subsequently used as a measure for alcohol consumption and used in subsequent chapters as such. Alcohol consumption especially excessive alcohol intake has been found to be associated with blood pressure.

Table 4.8 percentage distribution of respondents by alcohol consumption

Ever consumed alcohol	Total number	Percentage
Yes	363	64.8
No	196	35.2
Total	559*	100
Alcohol consumed in the past 30 days		
Yes	221	61.4
No	139	38.6
Total	360**	100
Alcohol consumed in the past 24 hrs		
Regular	99	45
Occasional	122	55
Total	221***	100
Alcohol status		
Regular consumers	99	23.7
Occasional consumers	122	29.3
Non-alcohol consumers	196	47.0
Total	417	100

* There is 1 non-response for ever taken alcohol
** There are 200 non-responses for alcohol consumption in 30 days
*** There are 339 non-responses for alcohol consumption in the past 24 hours
Source: Edulink Round II Survey, 2011

4.7.3 PHYSICAL ACTIVITY

As shown by Table 4.9, 77 percent of respondents engage in physical activities at home compared to 23 percent of their counterparts who do not engage in physical activity at home. It is further observed from Table 4.9 that 65 percent of the respondents engage in physical activities at their workplace compared to 35 percent of the respondents whose work activities do not involve any physical activity. The total response to this question is 441, which partly could be attributed to non-responses and partly due to the fact that some respondents are unemployed. The high engagement of physical activity may possibly be as a result of the differences within–settings in urban areas based on occupation. In urban settings especially in urban poor areas street hawkers for example may walk long distances. A study in Accra done by Amoah (2003) documented that unskilled manual workers, farmers, fishermen have the lowest rates of obesity and he attributed that to the vigorous physical activity their various occupations entail on daily basis. Twenty five percent of the respondents engage in physical activities during their leisure time while 75 percent do not engage in physical activities during their leisure time (Table 4.9).

It was based on the physical activity engaged in these three locations namely workplace, leisure and home that the variable physical activity is computed. Therefore, as can be seen in Table 4.9, 90 percent of the respondents engage in active physical activity while 10 percent are physically inactive. The total number of respondents reduced from 560 to 546 and this could be attributed to the total size under physical activity at workplace.

The results imply that in the urban poor areas in Accra, more people engage in physical activity. This finding is in contrast with most studies which indicate that Accra is associated with more sedentary lifestyle (Amoah, 2003; GSS, 2009). The fact that physical inactivity is associated with

hypertension implies that the study expects that physically inactive respondents may be more prone to hypertension compared to respondents who are physically active.

Table 4.9 percentage distribution of respondents by their physical activity

Home	Total number	Percentage
No	128	22.9
Yes	432	77.1
Total	560	100
Workplace		
No	155	35.1
Yes	286	64.9
Total	441**	100
During Leisure		
No	419	74.8
Yes	141	25.2
Total	560	100
Physical activity		
Inactive	55	10.1
Active	491	89.9
Total (%)	546**	100

* There are 119 non-responses for physical activity at the workplace
** There are 14 non-responses for physical activity
Source: Edulink Round II Survey, 2011

4.7.4 DIETARY INTAKE

The univariate analysis from Table 4.10 indicates that 70 percent of respondents do not control their salt intake while 30 percent of the respondents control their salt intake. Furthermore, Table 4.10 indicates that only one percent of the sample consumes more than five servings of fruits in a day while the majority (99 percent) consumes less than five servings of fruits in a day.

It can also be seen from Table 4.10 that only one percent of the sample consume more than five servings of vegetables in a day while the majority representing 99 percent consume less than five servings of vegetables in a day.

The findings as indicated by Table 4.10 show that fruit and vegetable consumption is very low among the urban poor in Accra. This is consistent with a study done by Hall et al., (2009) which indicates that currently, self-reported fruit and vegetable consumption intake in Ghana is among the lowest in the world. This is also consistent with findings from the Ghana Demographic and Health Survey (2008). This may be as a result of the increase in price of vegetables and fruits in the domestic market due to low production and the desire to export raw vegetables and fruits for higher prices.

It was based on salt consumption, fruit and vegetable consumption that the variable dietary intake is computed. Therefore Table 4.10 indicates that 70 percent of respondents have poor dietary intake while 30 percent of the respondents have good dietary intake. The total number of respondents reduced to 549 and this could be attributed to the total size under respondents who consume salt.

Table 4.10 percentage distribution of respondents by their dietary intake

Salt consumption	Total number	Percentage
Yes	164	30.4
No	376	69.6
Total	549*	100
Fruit consumption		
Yes	7	1.3
No	553	98.7
Total (%)	560	100
Vegetable consumption		
Yes	6	1.1
No	554	98.9
Total	560	100
Dietary intake		
Good	164	30.4
Poor	376	69.6
Total	549*	100

* There are 11 non-responses for salt consumption
** There are 11 non-responses for dietary intake
Source: Edulink Round II Survey, 2011

4.8 PERCEPTION OF HEALTH

Perception of health is an important and valid measure of people's general wellbeing. As can be seen from Table 4.11, the proportion of individuals increases as one perceives his/her health to be better. For instance, 11 percent of respondents perceive their health to be poor, the proportion increases as respondents perceive their health to be good (34 percent) and eventually increases to 55 percent as individuals perceive their health to be excellent (Table 4.11).Thus, it follows that one's perception of health, is a critical step for an individual to enter the pathway to healthy behaviour change. Therefore, with the majority of respondents perceiving their health to be good it is expected that they are more likely to have their blood pressure measurement to be normal.

Table 4.11 Percentage distribution of respondent by their perceived health

Perception of health	Frequency	Percentage
Poor	59	10.5
Good	193	34.5
Excellent	308	55.0
Total	560	100

Source: Edulink Round II Survey, 2011

4.9 Blood pressure status

The proportion of respondents decreases as their blood pressure status become severe or worsens (Table 4.12). For instance, a large proportion of individuals (48 percent) have normal blood pressure. The percentage of respondents who are pre-hypertensive is 38, which indicates a reduction in proportion compared to those with normal blood pressure. The proportion of

respondents further decreases to 16 percent for respondents who are hypertensive. Findings from Table 4.12 indicate that the hypertension prevalence rate of the sample is 16%. In other words two out of every 14 individuals in the sample are hypertensive while nine out of every 25 respondent are pre-hypertensive.

Table 4.12 percentage distribution of respondents by Blood pressure status

Blood pressure status	Frequency	Percent
Normal	268	47.9
Pre-hypertensive	200	35.7
Hypertensive	92	16.4
Total	560	100

Source: Edulink Round II Survey, 2011

4.10 Summary

The analysis in this chapter indicates that the sample is a youthful sample with a mean age of 31 and a median age of 29 years. More than half of the sample (55 percent) is females. Seventy four percent of the sample is engaged in some form of economic activity while 80 percent which forms majority of the sample reside in Ga Mashie. Most of the respondents have attained at least JHS or SHS and 77 percent are Christians. Only eighteen percent of the respondents smoke and 45 percent are regular alcohol consumers. Furthermore, 10 percent are physically inactive and 70 percent have poor dietary intake. Almost 90 percent of the respondents perceive their health to be either good or excellent and 16 percent of the sample is hypertensive.

CHAPTER FIVE

LIFESTYLE AND SOCIO-DEMOGRAPHIC CHARACTERISTICS BY THEIR PERCEPTION OF HEALTH AND BLOOD PRESSURE STATUS

5.1 LIFESTYLE BEHAVIOURS BY THEIR PERCEPTION OF HEALTH

5.1.1 SMOKING AND PERCEPTION OF HEALTH

Among the 75 respondents who smoke, 11 percent perceive their health to be poor, 29 percent perceive their health to be good and 60 percent perceive their health to be excellent (Table 5.1). This is in contrast to non-smokers where the proportion of respondents who perceive their health to be poor is 4.3 percent and excellent is 52 percent; these proportions are lower compared to the proportion of smokers in Table 5.1. However non-smokers recorded a higher proportion (44 percent) of respondents who perceive their health to be good compared to 29 percent of smokers (Table 5.1). Therefore, from Table 5.1, a higher proportion of smokers perceive their health to be poorer compared to non-smokers, as well as having a higher proportion who perceive their health to be excellent compared to non-smokers.

Though the mechanism of the relationship between smoking and perceived health is not clear, it can be stated that the health consequences of smoking may take many years to manifest when one smokes. Therefore, individuals who witness early symptoms are more likely to perceive their health to be poor compared to their counterparts who witness late symptoms at a later age of their lives; this might explain why a larger proportion of smokers perceive their health to be excellent. Nevertheless smoking status is not statistically significant to how individuals perceive their health.

Table 5.1 percentage distribution of smoking status by their perception of health

Smoking status	Perception of health			
	Poor	Good	excellent	Total number
Smokers	10.7	29.3	60.0	75
Non-smokers	4.3	43.5	52.2	23
Total	10.5	34.5	55.0	98

Source: EDULINK round II survey, 2011 χ^2= 4.874and p=0.300

5.1.2 ALCOHOL CONSUMPTION AND PERCEPTION OF HEALTH

The proportion of respondents who perceive their health to be good increases as one's status of alcohol increases (Table 5.2). For example, among respondents who perceive their health to be good, 33 percent are non-alcohol consumers, 34 percent are occasional alcohol consumers and 41 percent are regular alcohol consumers. It is further illustrated by Table 5.2 that occasional and non alcohol consumers have the same proportion of respondents i.e. 57 percent who perceive their health to be excellent compared to regular alcohol consumers who recorded 44 percent of their respondents perceiving their health to be excellent.

Under the category of poor perception of health, regular consumers recorded the highest proportion of 14 percent. This is followed by non-alcohol consumers with 10 percent and 9 percent recorded by occasional alcohol consumers. Therefore from the results in Table 5.2, it can be concluded that occasional and non-alcohol consumers are more likely to perceive their health to be excellent compared to alcohol consumers whereas a larger proportion of regular consumers are more likely to perceive their health to be poor. However, alcohol consumption is not significantly related to perception of health.

Table 5.2 percentage distribution of alcohol consumption by their perception of health

Alcohol consumption	Perception of health			
	Poor	Good	Excellent	Total number
Non-alcohol consumers	10.0	32.7	57.2	196
Occasional consumers	9.0	33.6	57.4	122
Regular consumers	14.1	41.4	44.4	99
Total	10.5	34.5	55.0	417

Source: EDULINK round II survey, 2011 χ^2= 5.713 and p=0.222

5.1.3 PHYSICAL ACTIVITY AND PERCEPTION OF HEALTH

As indicated in Table 5.3, a larger proportion of respondents (58 percent) who are physically inactive perceive their health to be excellent compared to 54 percent of respondents who are physically active. It is observed that 11 percent of physically active respondents perceive their health to be poor compared to 9 percent of physically inactive respondents (Table 5.3). It is further shown in Table 5.3 that the proportion of physically active respondents who perceive their health to be good (35 percent) is higher than physically inactive respondents whose proportion is 32 percent. It can be concluded from the above results that a larger proportion of physically inactive respondents perceive their health to be excellent compared to physically active respondents whereas a larger proportion of physically active respondents perceive their health to be poor compared to physically inactive respondents.

It was further revealed that physical activity is not significant to how individuals assess their own health. This might be because people do not regard house chores, walking etc. as a form of

physical activity. They even believe excessive physical labour is detrimental to their health. Thus, this might influence how they perceive the effect of physical activity on their health. For example, in a study carried out by Kiawi et al. (2006) few people associated lack of physical activity to a chronic disease like diabetes. Instead, most people prefer sedentary lifestyle such as riding in vehicles and sitting long hours in air conditioned rooms as a sign of prestige and could explain why a large proportion of inactive individuals perceive their health to be excellent. Rather, walking which is a form of exercise is regarded as demeaning and attributed to poverty because of negative cultural beliefs associated to it (Kiawi et al., 2006).

Table 5.3 percentage distribution of physical activity by their perception of health

	Perception of health			
Physical activity	Poor	Good	Excellent	Total number
Inactive	9.1	32.7	58.2	55
Active	10.8	35.2	54.0	491
Total	10.5	34.5	55.0	546

Source: EDULINK round II survey, 2011 χ^2= 0.385 and p=0.825

5.1.4 DIETARY INTAKE AND PERCEPTION OF HEALTH

From Table 5.4, 14 percent of respondents who have good dietary intake perceive their health to be poor, 27 percent perceive their health to be good and 59 percent perceive their health to be excellent. Among respondents with poor dietary intake 9 percent perceive their health to be poor, 38 percent perceive their health to be good and 52 percent perceive their health to be excellent (Table 3.4). As can be observed from Table 5.4 a larger proportion of respondents with good dietary intake perceive their health to be excellent compared to respondents who have poor

dietary intake. It is also observed that a lower proportion of respondents with poor dietary intake perceive their health to be poor compared to others with good dietary intake.

This may be attributed to the fact that some people find consumption of vegetables and fruits to be hazardous to human health. This is evident in a study conducted by De-Graft Aikins et al. (2012), where some respondents believe that chemicals used in cultivating vegetables are dangerous and harmful for human consumption. In addition, the analysis shows that dietary intake is significantly associated to perception of health at a P-value of 0.022.

Table 5.4 percentage distribution of dietary intake by their perception of health

	Perception of health			
Dietary intake	Poor	Good	Excellent	Total number
Poor	9.3	38.3	52.4	376
Good	14.0	26.8	59.1	164
Total	10.5	34.5	55.0	540

Source: EDULINK round II survey, 2011 χ^2= 7.635 and p=0.022

5.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS BY THEIR PERCEPTION OF HEALTH

5.2.1 AGE AND PERCEPTION OF HEALTH

In Table 5.5, we find that for all ages below 35 years, the proportion of respondents who perceive their health to be excellent increases with age, with the exception of respondents aged 25-29 years and the proportion declines when the age of respondent is 35 years and above. For example, the proportions of respondents increases from 57 percent for 15-19 years to 60 percent among respondents aged 30-34 years. The proportion decreases from 35-39 years i.e. 56 percent

to 11 percent among respondents aged 50 years and above. It is further observed from Table 5.5 that among respondents who perceive their health to be poor, the highest proportion was recorded by individuals aged 50 years and above. This is followed by respondents 45-49 years and 35-39 years recording the same proportion of 14 percent. Respondents aged 15-19 years recorded 11 percent while the least proportion was amongst respondents aged 40-44 years and 30-34 years with 8 percent respectively. Therefore it can be concluded from the above analysis that with the exception of respondents aged 40-44 years, adults aged 35 years and above are more likely to perceive their health to be poor. In addition, respondents below 45 years are more likely to perceive their health to be excellent (Table 5.5).

From the analysis the younger age groups are more likely to perceive their health to be good. This may be because the younger age groups are more likely to be involved in physical activities, they might be full of energy bearing in mind that they are in their youthful age compared to older adults who might now be experiencing some form of poor health. However, age is not significantly related to how an individual perceives his/her health.

Table 5.5 percentage distribution of respondents' age by their perception of health

	Perception of health			
Age	Poor	Good	Excellent	Total number
15-19	11.3	31.0	57.7	12.7
20-24	3.7	32.2	59.1	20.5
25-29	9.8	34.3	55.9	18.2
30-34	8.0	32.0	60.0	13.4
35-39	14.1	29.7	56.0	11.4
40-44	7.7	34.6	57.7	9.3
45-49	14.0	50.0	36.0	8.9
50+	16.1	41.9	41.9	5.5
Total	10.5	34.5	55.0	100

Source: EDULINK round II survey, 2011 $\chi 2$= 13.685 and p=0.473

5.2.2 SEX AND PERCEPTION

As can be seen in Table 5.6, the proportion of males (60 percent) who perceive their health to be excellent is higher than females whose proportion is 51 percent. The proportion of females who perceive their health to be poor (12 percent) and good (37 percent) are relatively higher compared to males who recorded 8 percent and 32 percent of respondents who perceive their health to be poor and good respectively. It can be observed from the results that higher proportion of males perceive their health to be excellent compared to females and a larger proportion of females perceive their health to be poor compared to males. This could probably be explained by how our Ghanaian culture has shaped the nature of health experiences and responses in a gendered form of identity (masculine, feminine) as indicated by Allotey and Gyapong (2005). For example, in most traditional societies in Ghana, men are supposed to be strong and healthy, they are less likely to report their health problems and are likely to receive

pain, illness and disability differently from women. Whereas women are supposed to reproduce and nurture, therefore, they are more likely to talk about their problems and even prioritize their family problems over their own, thereby delaying treatment for themselves (Allotey and Gyapong, 2005). However, an individual's sex is not significantly related to assessing one's own perception of health.

Table 5.6 percentage distribution of respondents' sex by their perception of health

	Perception of health			
Sex	Poor	Good	Excellent	Total number
Female	12.1	36.9	51.0	306
Male	8.7	31.5	59.8	254
Total	10.5	34.5	55.0	560

Source: EDULINK round II survey, 2011 $\chi 2$= 4.7 and p=0.094

5.2.3 EMPLOYMENT AND PERCEPTION OF HEALTH

Though employment status is not significantly related to perception of health, the bivariate analysis in Table 5.7 shows that 10 percent of employed respondents perceive their health to be poor, 36 percent perceive their health to be good and 54 percent perceive their health to be excellent. For respondents who are unemployed, the analysis reveals that 13 percent perceive their health to be poor, 29 percent perceive their health to be good and 58 percent perceive their health to be excellent (Table 5.7). It can be seen from the analysis in Table 5.7 that a higher proportion of respondents who are unemployed perceive their health to be poor and excellent compared to respondents who are employed.

Table 5.7 percentage distribution of employment status by perception of health

	Perception of health			
Employment status	Poor	Good	Excellent	Total number
Employed	9.7	36.3	54.0	413
Unemployed	12.9	29.3	57.8	147
Total	10.5	34.5	55.0	560

Source: EDULINK round II survey, 2011 χ^2= 2.940 and p=0.412

5.2.4 EDUCATION AND PERCEPTION OF HEALTH

For respondents who perceive their health to be excellent, the analysis in Table 5.8 shows that the highest proportion (68 percent) is recorded by respondents with no formal education. This is followed by respondents with Senior High School (SHS) education having 62 percent and 56 percent by respondents with Junior High School (JHS) education. Higher and primary education recorded lower rates compared to the other educational levels with 52 percent and 43 percent respectively.

It is further observed in Table 5.8 that respondents with no primary education recorded the highest proportion of respondents (15 percent) who perceive their health to be poor. This is followed by respondent with JHS education with 13 percent and respondents with Higher education with 11 percent. Respondent with primary and SHS recorded lower rates of 9 percent and 7 percent respectively compared to the other educational levels. It is therefore evident from Table 5.8, that respondents with no formal education have the largest proportion of respondents who perceive their health to be poor as well as the largest proportion who perceive their health to be excellent compared to all other educational levels.

In addition, education is significantly related to how an individual views his own health. This might be because education is a platform for the knowledge and prevention of many diseases including non-communicable diseases such as hypertension. It allows an individual to be conscious of their lifestyle and pay particular attention to their health.

Table 5.8 percentage distribution of educational level by perception of health

	Perception of health			
Educational level	Poor	Good	Excellent	Total number
No education	14.7	17.6	67.6	34
Primary	8.9	48.4	42.7	124
JHS	12.7	31.0	56.3	245
SHS	6.9	31.5	61.5	130
Higher	11.1	37.0	51.9	27
Total	10.5	34.5	55.0	560

Source: EDULINK round II survey, 2011 χ^2= 10.045 and p=0.010

5.2.5 COMMUNITY AND PERCEPTION OF HEALTH

Results from Table 5.9, indicates that both communities, Agbogbloshie and Ga Mashie have the same proportion of respondents i.e. 10 percent who perceive their health to be poor. However, the proportion for the two communities among respondents who perceive their health to be good and excellent differs significantly. For instance, 30 percent of respondents in Agbogbloshie perceive their health to be good and 60 percent perceive their health to be excellent. For respondents residing in Ga Mashie, the analysis shows that 38 percent perceive their health to be good and 54 percent perceive their health to be excellent. Between the two communities a higher proportion of respondents in Agbogbloshie perceive their health to be excellent compared to Ga

Mashie. The result further indicates that place of residence is not significantly related to perception of health.

Table 5.9 percentage distribution of place of residence by their perception of health

	Perception of health			
Community	Poor	Good	Excellent	Total number
Agbogbloshie	10.4	29.6	60.0	115
Ga Mashie	10.6	37.7	53.7	445
Total	10.5	34.5	55.0	560

Source: EDULINK round II survey, 2011 χ^2= 1.667and p=0.435

5.2.6 RELIGION AND PERCEPTION OF HEALTH

Table 5.10 indicates that under the categorization of poor perception of health 18 percent of traditionalist perceive their health to be poor. The three other religious groups i.e. Christians, moslems and other religion recorded almost the same proportion of 10 percent respectively. In relation to good perception of health moslems recorded 45 percent of their respondents perceiving their health to be good and traditionalist having 22 percent representing the least proportion in that category.

A different scenario is observed among individuals who perceive their health to be excellent. With the exception of moslems the other three religious groups recorded more than half of their respondents perceiving their health to be excellent (Table 5.10).

Therefore, the results from Table 5.10 indicate that a higher proportion of respondents from the Traditional Religion perceive their health to be poor compared to the other religious groups and a

higher proportion of respondents from the Other Religion perceive their health to be excellent compared to all the other religious groups. It is also established by the results that religion is not significantly related to an individual's assessment of his personal health.

Table 5.10 percentage distribution of religious affiliation by their perception of health

	Perception of health			
Religion	Poor	Good	Excellent	Total number
Other	9.6	26.9	63.5	52
Christians	10.4	33.9	55.7	433
Moslems	10.9	45.3	43.8	64
Traditionalist	18.2	22.3	54.5	11
Total	10.5	34.5	55.0	560

Source: EDULINK round II survey, 2011 χ^2= 6.096 and p=0.412

5.3 SOCIO-DEMOGRAPHIC CHARACTERISTICS BY BLOOD PRESSURE STATUS

5.3.1 AGE AND BLOOD PRESSURE STATUS

For respondents with normal blood pressure, the bivariate analysis in Table 5.11 indicates that the proportion of respondents declines as the age of the individual increases. For instance, 66 percent of individuals aged 15-19 years have normal blood pressure. This proportion decreases for all age groups except age group 25-29 years with 60 percent. However, beyond age 29 years the proportion declines significantly with respondents aged 50 years and above having the lowest proportion of 13 percent.

In contrast to the pattern observed among respondents with normal blood pressure is that observed among respondents with hypertension (Table 5.11). Under the category of

hypertension, the proportion of hypertension increases as the age of the respondent increases. Clearly, from Table 5.11 the proportion having hypertension, among age group 15-19 years is 4 percent. The proportion increases as the age of the respondents increases and subsequently increases significantly among the oldest age group (i.e. 50 years and above) recording 48 percent.

This clearly informs that pre-hypertension and hypertension is greater or higher amongst adult population (30 years and above) compared to the younger ages of 15-29 years. This finding could possibly be due to the fact that old age exposes an individual to non-communicable diseases. Thus it has been found that blood pressure is associated with old age. At a late age, one becomes predisposed or vulnerable to high blood pressure. This is because high blood pressure in the aged has been associated to their sensitivity to salt in-take, increased body mass index and alcohol consumption. In addition, age of a respondent is significantly related to blood pressure status at a P-value of 0.000.

Table 5.11 Percentage distribution of respondents by age and blood pressure status

Age (years)	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
15-19	66.2	29.6	4.2	71
20-24	57.4	38.3	4.3	115
25-29	59.8	33.3	6.9	102
30-34	48.0	34.7	17.3	75
35-39	37.5	43.8	18.8	64
40-44	30.8	40.4	28.8	52
45-49	28.0	28.0	44.0	50
50+	12.9	38.7	48.4	31
Total	47.9	35.7	16.4	560

Source: EDULINK round II survey, 2011 χ^2= 93.372 and p= 0.000

5.3.2 SEX OF RESPONDENT AND BLOOD PRESSURE STATUS

As indicated by Table 5.12 a higher proportion of females (60 percent) have normal blood pressure compared to 34 percent of males with normal blood pressure. However, under the category of pre-hypertension and hypertension, males recorded higher rates of 45 percent and 21 percent respectively compared to 28 percent and 12 percent of females who have pre-hypertension and hypertension respectively.

The above results could be explained by the fact that most studies indicate that prior to attaining menopause; men are at a higher risk of getting high blood pressure than women. The situation

changes when a woman attains menopause then women are at a higher risk of experiencing high blood pressure than men. This is further confirmed by the fact that women in the study only included individuals in their reproductive years (that is those aged 15-49 years). This could probably explain the significance of sex on blood pressure and the reason why males tend to be more hypertensive than females in this particular study. In addition, sex of respondent is statistically significant with blood pressure at a chi-square of 36.577 and a P-value of 0.000.

Table 5.12 Percentage distribution of Sex of respondent and blood pressure

Sex of respondent	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Female	59.5	28.1	12.4	306
Male	33.9	44.9	21.3	254
Total	47.9	35.7	16.4	560

Source: EDULINK round II survey, 2011 χ^2= 36.577 and p= 0.000

5.3.3 EMPLOYMENT STATUS AND BLOOD PRESSURE

Table 5.13 indicates that the unemployed recorded a higher proportion of individuals (55 percent) who have normal blood pressure compared to 45 percent of individuals employed. However Table 5.13 further shows that individuals who are employed recorded a higher proportion of pre-hypertension, that is, 37 percent compared to 31 percent of others who are unemployed. In addition, 17 percent of individuals who are employed were recorded to be hypertensive compared to 14 percent of their counterparts who are unemployed.

This could possibly be due to the fact that employment generates income and income is very crucial when it comes to people's behavioural lifestyle. It allows an individual the opportunity to purchase goods or services that can affect diet, physical activity and time use which in the long run can affect the individual's health. This could have implications for the health of individuals and may explain why respondents who are employed recorded higher rates of pre-hypertension and hypertension compared to the unemployed. In addition, employment status is not statistically significant with blood pressure status at a P-value of 0.120.

Table 5.13 Percentage distribution of respondent by employment status and blood pressure

Employment Status	Blood Pressure Status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Employed	45.3	37.3	17.4	413
Unemployed	55.1	31.3	13.6	147
Total	47.9	35.7	16.4	560

Source: EDULINK round II survey, 2011 χ^2= 4.244 and p= 0.120

5.3.4 EDUCATION AND BLOOD PRESSURE STATUS

With the exception of respondents who have attained primary education, the proportion of respondents with normal blood pressure decreases as the educational level of the respondent increases (Table 5.14). That is, under the category of normal blood pressure, respondents with primary education recorded 56 percent; Junior High School (JHS) had a lower proportion of 47 percent compared to primary level. The proportion is further reduced to 45 percent by Senior

High School (SHS) level and the proportion declined significantly to 33 percent by respondents with higher education

A similar but contrasting pattern is observed among respondents with pre-hypertension (Table 5.14). For pre-hypertension, the proportion increases as the educational level also increases with the exception of respondents who have attained SHS. For example, respondents with no formal education recorded 29 percent being pre-hypertensive. The proportion increases among respondents with primary education (34 percent), JHS (36 percent) and increases further to 52 percent among respondents with Higher education.

It is further observed that respondents with no formal education had the highest proportion being hypertensive. This is followed by respondents who have attained SHS i.e., 21 percent while the least proportion (10 percent) is among respondents with primary education.

However, educational level is not statistically significant to blood pressure at a chi-square of 10.846 and a P-value of 0.211. The insignificant relationship between education and blood pressure status could be possibly because education in itself does not have direct bearing on blood pressure of an individual. Rather to a large extent education is highly correlated to one's occupation and socio-economic status.

Table 5.14 Percentage distribution of educational level and blood pressure

Educational level	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
No education	47.1	29.4	23.5	34
Primary	55.6	33.9	10.5	124
JHS	47.3	36.3	16.3	245
SHS	44.6	34.6	20.8	130
Higher	33.3	51.9	14.8	27
Total	47.1	29.4	23.5	560

Source: EDULINK round II survey, 2011 χ^2= 10.486 and p=0.211

5.3.5 COMMUNITY OF RESIDENCE AND BLOOD PRESSURE

The percentage distribution of respondents by community and blood pressure status in Table 5.15 suggests that 51 percent of respondents in Agbogbloshie have normal blood pressure compared to 47 percent of residents in Ga Mashie. For the category of pre-hypertensive, respondents in Ga Mashie have a higher proportion of 37 percent who are pre-hypertensive compared to 32 percent of residents in Agbogbolshie. Nevertheless both place of residence recorded almost the same percentage of individuals being hypertensive (i.e. 16 percent). However, community of residence is not statistically significant with blood pressure at a chi-square of 0.868 and a P-value of 0.648.

Even though residents in Agbogbloshie seem to have a larger proportion having normal blood pressure compared to residents in Ga Mashie, the difference is insignificant especially among

individuals with hypertension. This could possibly be due to the fact that both communities are similar in terms of limited infrastructures for physical activities, food eaten and similar lifestyles.

Table 5.15 Percentage distribution of community of residence and blood pressure

Community	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Agbogbloshie	51.3	32.2	16.5	115
Ga Mashie	47.0	36.6	16.4	445
Total	47.9	35.7	16.4	560

Source: EDULINK round II survey, 2011 χ^2= 0.868 and p=0.648

5.3.6 RELIGION AND BLOOD PRESSURE

Table 5.16 shows that the proportion of respondents with normal blood pressure is similar for the respondents from Other Religion and the Christian Religion, recording 48 percent each. The proportion declines to 42 percent for Moslems and increases significantly (64 percent) for Traditionalists. It can also be observed from Table 5.16 that the proportion of individuals who are hypertensive are low and the same for Other Religion and Christians, the proportion increases for Moslems (22 percent) and further increases to 27 percent for Traditionalist. This could be explained by the proportions recorded under pre-hypertension. While the rates are high and the same for Christians and Other Religion (i.e. 36 percent) the proportion decreases slightly for Moslems and reduces drastically (i.e. 9 percent) for Traditional Religion (Table 5.16). However, the chi-square test indicates that religion is not significantly related to blood pressure status.

Table 5.16 Percentage distribution of religious affiliation and blood pressure

Religion	Blood pressure status			Total
	Normal blood	Pre-hypertensive	Hypertensive	
Other	48.1	36.5	15.4	52
Christian	48.3	36.3	15.5	433
Moslem	42.2	35.9	21.9	64
Traditionalist	63.6	9.1	27.3	11
Total	48.1	36.5	15.4	560

Source: EDULINK round II survey, 2011 χ^2= 5.466 and α=0.486

5.4 LIFESTYLE AND BLOOD PRESSURE

5.4.1 SMOKING STATUS AND BLOOD PRESSURE

The proportion of respondents who are currently smoking reduces as their blood pressure status worsens compared to their counterparts who do not smoke (Table 5.17). For instance, 51 percent of current smokers have normal blood pressure, 31 percent are pre-hypertensive and 19 percent are hypertensive. In contrast to that are the proportions recorded by non-smokers. For example, 17 percent of non-smokers have normal blood pressure, 52 percent are pre-hypertensive and 30 percent are hypertensive. In addition, smoking status is statistically significant with blood pressure status at a P-value of 0.019. However, a larger proportion of non-smokers are pre-hypertensive and hypertensive compared to current smokers as observed in Table 5.17.

Even though most studies have found blood pressure for current smokers to be higher than that of former smokers or those who have never smoked (Fogari et al., 2006), others have found

contrary evidence (Okubo et al., 2004; Lee et al., 2001). Thus the effect of smoking on high blood pressure has not been conclusive (John et al., 2006; Narnkiewicz et al., 2005). The low prevalence of hypertension among current smokers may be due to the fact that in some instances smoking reduces weight and obesity is a well-known risk factor for hypertension. This is supported by a study done by Poulter (2002) who observed a higher body weight and increased blood pressure among former smokers and never-smokers. It is also suggested by Benowitz and Sharp (1989) that nicotine found in tobacco contributed to low blood pressure among current smokers. Therefore, they concluded in their study that nicotine in tobacco is inversely related to high blood pressure.

Table 5.17 Percentage distribution of respondents by smoking status and blood pressure

Smoking status	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Smoker	50.7	30.7	18.7	75
Non-smoker	17.4	52.2	30.4	23
Total	42.9	35.7	21.4	98

Source: EDULINK round II survey, 2011 χ^2= 7.965 and p=0.019

5.4.2 ALCOHOL CONSUMPTION AND BLOOD PRESSURE

Even though alcohol consumption is not significantly related to blood pressure status, the bivariate analysis in Table 5.18 reveals that the hypertension prevalence is high among regular (25 percent) and occasional alcohol consumers (16 percent) compared to 14 percent of non-

alcohol consumers. A similar pattern is observed among pre-hypertension where occasional and regular consumers recorded the same proportion (i.e. 36 percent), which is higher compared to 35 percent of non-alcohol consumers. However, for normal blood pressure, the highest proportion of 52 percent was recorded by non-alcohol consumers. This is followed by occasional consumers having 46 percent and 38 percent by regular consumers.

Nevertheless, alcohol consumption is not significantly related to blood pressure status. This could be due to the limitation encountered in the measurement of alcohol consumption. The data allows the study to identify regular, occasional and non-alcohol consumers but fails to identify the number of glasses consumed in a day. This is because most studies attribute excessive alcohol consumption to high blood pressure.

Table 5.18 percentage distribution of respondents by alcohol consumption and blood pressure

Alcohol consumption	Blood Pressure Status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Non-alcohol consumers	51.7	35.4	13.9	99
Occasional consumers	47.5	36.1	16.4	122
Regular consumers	38.4	36.4	25.3	196
Total	42.7	37.3	20.0	417

Source: EDULINK round II survey, 2011 χ^2= 8.50 and p=0.074

5.4.3 PHYSICAL ACTIVITY AND BLOOD PRESSURE

Table 5.19 reveals that individuals who are physically active have a higher proportion of respondents (48 percent) having normal blood pressure compared to others who are physically inactive who recorded 44 percent. In the case of pre-hypertensive, physically active respondents recorded higher proportion of its members (i.e. 36 percent) being pre-hypertensive compared to their counterparts who are not physically active (33 percent). Contrary to the above is the fact that individuals who are physically inactive recorded twenty four percent of their members being hypertensive compared to 16 percent of individuals who are physically active. The above results suggest that physically inactive respondents are more likely to be hypertensive compared with physically active people.

The findings from Table 5.19 could possibly be due to the fact that regular physical activity produces cardiovascular adaptations that increase work capacity, endurance and vascular function (Thompson et al., 2003). Regular physical activity may improve an individual's cardiovascular risk profile by lowering blood pressure, modulating lipids, reducing insulin resistance and enhancing psychosocial status/ mental wellbeing.

However, physical activity is not statistically significant to blood pressure status. This is probably because even though some form of physical activity can reduce ones probability of becoming hypertensive, a special form of exercise is required called the aerobics exercise. It helps to reduce hypertension and mostly recommended for hypertension patients and not just any activity that causes physical activity. This form of exercise (aerobics) was not investigated for in

the data used in the analysis. The data only collected information on whether respondents engaged in any physical exercise and was not particular on the type of exercise.

Table 5.19 Percentage distribution of physical activity and blood pressure

Physical activity	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Inactive	43.6	32.7	23.6	55
Active	48.3	36.3	15.5	491
Total	47.8	35.9	16.3	546

Source: EDULINK round II survey, 2011 χ^2= 2.413 and p=0.486

5.4.5 DIETARY INTAKE AND BLOOD PRESSURE

As observed in Table 5.20 respondents who have poor diet recorded the highest proportion of respondents (47 percent) in that category having normal blood pressure with more than 50 percent of the individuals having poor diet intake being either pre-hypertensive (38 percent) or hypertensive (15 percent). This is in contrast with individuals who have good dietary intake which recorded 55 percent of its members having normal blood pressure, and 29 percent being pre-hypertensive. However this category (i.e. good dietary intake) recorded a higher proportion of its respondents being hypertensive compared to individuals with poor dietary intake. In addition dietary intake was not found to be significant to blood pressure at a P-value of 0.299.

Table 5.20 percentage distribution of dietary intake and blood pressure

Dietary intake	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertensive	
Poor	46.8	38.0	15.2	376
Good	53.0	28.7	18.3	164
Total	48.7	35.2	16.1	540

Source: EDULINK round II survey, 2011 χ^2= 4.460 and p=0.299

5.5 PERCEPTION OF HEALTH AND BLOOD PRESSURE

The chi-square test between perception of health and blood pressure status indicates that there is no significant relationship between the two variables. However, Table 5.21 shows that the proportion of respondents with normal blood pressure increases for all the different categories of perceived health. For instance, 45 percent of individuals who perceive their health to be poor have normal blood pressure and the proportion increases to 46 percent for those who perceive their health to be good and further increases to 49 percent for respondents with excellent perception of health.

It can also be observed from the same Table 5.21, that the proportions of respondents for both individuals who perceive their health to be poor and good are the same for pre-hypertension (i.e. 34 percent) and hypertension (i.e. 20 percent). However, for respondents who perceive their health to be excellent, 37 percent are pre-hypertensive. This is higher compared to their

counterparts with poor and good perception of health. In addition, their proportion under hypertension is lower (13.3 percent) compared to those who perceive their health to be poor and good.

Perception of health as indicated earlier in the previous chapter has been used as an indicator of overall health status for individuals. In addition, the current study finds it critical for individuals to enter the path for healthy behavioural change. Nevertheless, more than half of the respondents who perceive their health to be either good or excellent are highly predisposed to hypertension (pre-hypertensive) or are hypertensive (Table 5.21). This finding is in contradiction with what most studies have found that is perceived health status is highly correlated to actual health status (Hunt et al., 1980; Unden and Elfosson, 2001).

Table 5.21 Percentage distribution of perception of health by blood pressure status

Perception of health	Blood pressure status			Total number
	Normal blood pressure	Pre-hypertensive	Hypertension	
Poor	45.8	33.9	20.3	59
Good	46.1	33.7	20.2	193
Excellent	49.4	37.3	13.3	308
Total	47.9	35.7	16.4	560

Source: EDULINK round II survey, 2011 χ^2= 4.874 and p=0.300

5.6 SUMMARY

In this chapter the analysis shows that the following categories of people who engage in the following lifestyle behaviours perceive their health to be excellent: smokers, both occasional and non-alcohol consumers, physically inactive respondents and individuals with good dietary intake. For respondents with these particular background characteristics (respondents below 45 years, males, unemployed, Agbogbloshie residents and individuals with no formal education) they also perceive their health to be excellent.

Interestingly, for majority of the respondents indentified above who perceive their health to be good or excellent, they rather form the higher proportion of individuals who are either pre-hypertensive or hypertensive. However, smokers and unemployed respondents recorded a very low proportion of respondents who are either pre-hypertensive or hypertensive compared to their counterparts.

CHAPTER SIX

DETERMINANTS OF BLOOD PRESSURE AMONG ACCRA'S URBAN POOR

6.1 INTRODUCTION

It has been variously argued that modifiable lifestyle behavior such as physical inactivity, poor dietary intake, excessive alcohol consumption and smoking are strongly associated with hypertension prevalence and incidence (Gibbs et al., 2000; Werko, 2006; Omvik et al., 1996; Thompson et al., 2003). Now, with the introduction of perception of health and some selected socio-demographic variables, it will be important to control for these variables in order to determine if there will be an impact on lifestyle behavior and hypertension prevalence.

A more sophisticated test of the strength of the relationship between lifestyle behaviour and blood pressure status is carried out within a multivariate framework. This was done to find out whether smoking status will still be a significant predictor or the other lifestyle behaviour will become a significant predictor of hypertension, when confounded by other variables that could possibly influence the prevalence of hypertension. The results are presented in Table 6.1.

6.2 LIFESTYLE, SOCIO-DEMOGRAPHIC CHARACTERISTICS AND PERCEPTION OF HEALTH BY BLOOD PRESSURE STATUS

The multivariate analysis shows that dietary intake, religion, age and sex of respondent are significant predictors of an individual's probability of developing hypertension (Table 6.1). For example, individuals with poor dietary intake are 1.6 times more likely to be pre-hypertensive compared to their counterparts who have good dietary intake. A different scenario is seen among the hypertension category where respondents with poor dietary intake are as likely to be

hypertensive as individuals with good dietary intake, even though the relationship is not statistically significant at a P-value of 0.999.

The odds ratios are less than one for all ages under both categories of pre-hypertension and hypertension. For pre-hypertension, with the exception of age groups 25-29 years and 45-49 years, the probability of an individual becoming less pre-hypertensive decreases as their age increases. For instance, respondents aged 15-19 years are 0.8 times less likely to be pre-hypertensive as compared to their counterparts aged 50 years and above. This probability decreases to 0.3 times less likely for those aged 40-44 years. The significant associations in this category are age groups 15-19 years and 25-29 years which are both 0.8 times less likely to be pre-hypertensive compared to respondents aged 50 years and above at a P-value of 0.029 and 0.037 respectively.

A similar pattern is observed among hypertension where the probability of being less likely to be hypertensive decreases as age increases with the exception of age groups 30-34 years and 40-44 years. The age group 15-19 years is 0.99 less likely to be hypertensive compared to age group 50 years and above. This is followed by individuals aged 20-24 years who are 0.98 times less likely to be hypertensive compared to age group 50 years and above. In addition, respondents aged 25-29 years and 30-34 years are 0.96 and 0.7 times respectively less likely to be hypertensive compared to others aged 50 years and above. This confirms the bivariate analysis where the proportion of respondents being either pre-hypertensive or hypertensive is high among the older age groups. This could possibly be due to the fact that hypertension is highly associated with old age. This does not mean one becomes hypertensive when he/she is old; rather old age predisposes one to hypertension. This most studies have attributed to their sensitivity to salt intake, alcohol consumption and body weight.

In females, the multivariate analysis shows that they are 0.7 times less likely to be pre-hypertensive compared to males. A similar result is found under the category of hypertension, only that the probability of being less likely decreases. That is, under hypertension females are 0.6 times less likely to be hypertensive compared to males. This could possibly be because women in their reproductive age are less likely to be hypertensive compared to males at that same age. The situation could possibly change if females are pregnant or have attained menopause. At this point in a female's life, she now becomes more prone to hypertension compared to males at the same age. To a large extent, the above results can be true because females interviewed in the study only consisted of females in their reproductive age (15-49 years). Therefore it is highly probable that females in this study have not attained menopause and in addition pregnant females were excluded from the analysis.

With Traditional Religion as the reference category the probability of becoming hypertensive and pre-hypertensive is high and increases from Other Religion through to the Moslems (Table 6.1). For example, members of Other Religion are 9.7 times more likely to be pre-hypertensive compared to the Traditional Religion. The probability increases for Christians who are 10.7 times more likely to be pre-hypertensive and further increases for Moslems who are 12.93 times more likely to be pre-hypertensive compared to the Traditional Religion.

For the hypertensive category, a similar but lower probability of becoming more likely to be hypertensive is observed in Table 6.1. Members of Other Religion are 2.3 times more likely to be hypertensive compared to the Traditional Religion. The probability increases for Christians who are 2.5 times more likely and increases further for Moslems, who are 4.95 times more likely to be hypertensive compared to the Traditional Religion. It is important to note that only odds ratio under pre-hypertension for variable religion is significant.

This could probably be due to the fact that religion is still to a large extent an integral part of the Ghanaian lifestyle, particularly in the traditional environment. Even though, some religious organizations have helped in the provision of education and health care facilities other religious groups have certain religious practices that have adverse effect on the welfare of their members. For example, it is the doctrinal practice of some churches not to accept medications for themselves and their dependants during ailment. Members of Jehovah witness for example are also known to be against blood transfusion (Graphic, 1964). In 2000, for example, some members of the Apostolic church refused a nationwide immunization exercise against poliomyelitis (Graphic, 2000).

Alcohol consumption, smoking and physical activity are not significant but are very important to the study. For alcohol consumption, the odds ratio increases as the individual's drinking status increases. Therefore, from Table 6.1, under hypertension, regular consumers are 1.6 times and occasional alcohol consumers are 1.1 times more likely to be hypertensive compared to non-alcohol consumers. Smokers are 0.7 times less likely to be pre-hypertensive and at the same time 0.6 times less likely to be hypertensive compared to non-smokers. This finding confirms the bivariate results that suggest that hypertension prevalence is low among smokers compared to non-smokers. Physically inactive respondents are 1.4 times more likely to be hypertensive compared to respondents who are physically active.

The final fitting of the model in Table 6.1 indicates that the model does not really explain the relationship between lifestyle behaviour and blood pressure status. This is because of the value of the Nagelkerke R Square, which explains the variation in blood pressure status which is explained by the variables selected in the study. The Nagelkerke R square indicates that 30.8 percent of the variation in blood pressure status of individuals who do not suffer from chronic

illness is explained by their lifestyle behaviours, perceived health and some selected socio-demographic variables. This informs us that 70 percent of the variation in blood pressure status is due to other variables not controlled for in the study.

Table 6.1 net odds of blood pressure status in urban poor communities in Accra by selected socio-economic variables, 2011 Edulink Round II Data

	Pre-hypertension			Hypertension		
	Nagelkerke R^2=0.308					
	Exp(B)	Std. error	P-value	Exp(B)	Std. Error	P-value
Smoking status						
Smokers	0.294	0.699	0.080	0.356	0.825	0.211
Non-smokers (ref)						
Alcohol status						
Regular	1.021	0.298	0.944	1.580	0.377	0.226
Occasional	0.910	0.262	0.724	1.065	0.380	0.868
Non-alcohol (ref)						
Physical activity						
Inactive	0.811	0.365	0.567	1.460	0.465	0.416
Active (ref)						
Dietary intake						
Poor	1.649	0.234	0.032	1.000	0.315	0.999
Good (ref)						
Age of respondent						
15-19	0.208	0.718	0.029	0.014	0.935	0.000
20-24	0.315	0.681	0.090	0.025	0.829	0.000
24-29	0.244	0.677	0.037	0.0.39	0.765	0.000
30-34	0.339	0.692	0.119	0.150	0.722	0.009
35-39	0.745	0.710	0.678	0.301	0.754	0.111
40-44	0.657	0.731	0.566	0.483	0.750	0.331
45-49	0.523	0.751	0.390	0.720	0.749	0.662
50+ (ref)						
Sex						
Female	0.367	0.233	0.000	0.411	0.328	0.001
Male (ref)						
Employment status						
Employed	1.187	0.280	0.542	0.485	0.406	0.075
Unemployed (ref)						
Community						
Agbogbloshie	0.806	0.261	0.583	1.181	0.366	0.649
Ga Mashie (ref)						

Table 6.1 continued net odds of blood pressure status in urban poor communities in Accra by selected socio-economic variables, 2011 Edulink Round II Data

	Pre-hypertension			Hypertension		
	Nagelkerke R^2=0.308					
	Exp(B)	Std. error	P-value	Exp(B)	Std. Error	P-value
Education						
No education	0.544	0.678	0.370	1.120	0.927	0.903
Primary	0.503	0.542	0.205	0.487	0.816	0.337
JHS	0.596	0.504	0.305	0.842	0.756	0.820
SHS	0.605	0.518	0.332	1.663	0.765	0.506
Higher (ref)						
Religion						
Other	9.677	1.170	0.052	2.268	0.961	0.394
Christian	10.723	1.130	0.036	2.460	0.853	0.291
Moslem	12.928	1.166	0.028	4.948	0.935	0.087
Traditional (ref)						
Perception of health						
Poor	1.179	0.349	0.637	1.475	0.464	0.402
Good	0.980	0.229	0.929	1.567	0.315	0.149
Excellent (ref)						

(ref) represents reference category

6.3 SUMMARY

After confounding for the other variables in the multivariate analysis, smoking status was not found to be an important predictor of blood pressure. Instead, dietary intake, religion age and sex of respondent were found to be significant predictors of blood pressure. Though, perception of health is not found to be significant, the analysis in this chapter indicates that the difference between blood pressure statuses in terms of hypertension is almost the same for individuals who perceive their health to be either poor or good. Finally, the multivariate analysis does not fully explain the relationship between lifestyle behaviours and blood pressure.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 SUMMARY

The main objective of the study was to examine the relationship between lifestyle patterns, perception of health and blood pressure among Accra's urban poor based on data from Edulink Round II survey, 2011. It sought to assess how an individual who engages in unhealthy lifestyle rates or perceives his/her own health and how that translates into his/her actual health status (measured blood pressure status). The study further investigated the extent to which the impact of lifestyle behaviour on blood pressure status is confounded by perception of health and some selected socio-demographic characteristics. The variables used included perception of health, age and sex of respondent; employment status; education; community; religion; tobacco use; alcohol consumption; physical activity and dietary intake.

Some behaviour change models from psychology and sociology were employed to explain how perception of health, lifestyle behaviour and the selected socio-demographic characteristics can influence an individual's blood pressure status. The hypotheses proposed include the following: Respondents who perceive their health to be poor are more likely to be hypertensive than individuals who perceive their health to be good; Respondents who are physically inactive are more likely to be hypertensive than people who are more physically active; Regular alcohol consumers are more likely to be hypertensive than non-alcohol consumers; Tobacco users are more likely to be hypertensive than non-smokers. The following statistical analyses were used to achieve the objectives of the study: simple percentages; bivariate analysis and multinomial

logistic regression. In addition, Chi-square test was used at a P-value of 0.05 to examine the relationship between perception of health and lifestyle behaviour on blood pressure status.

The analysis from the background characteristics and lifestyle patterns of the respondents shows that the age structure of the sample is a youthful sample with 33 percent of the respondents aged 15-24 years. More than half of the sample (55 percent) is females. Seventy four percent of the sample is engaged in some form of economic activity with the main occupation being sales, skilled manual and unskilled manual; while 80 percent which forms majority of the sample reside in Ga Mashie. Most of the respondents have attained at least JHS or SHS and 77 percent are Christians. A very small group of the sample currently smokes (i.e. 75 respondents) and 45 percent are regular alcohol consumers. Furthermore, 10 percent are physically inactive and 70 percent have poor dietary intake. Almost 90 percent of the respondents perceive their health to be either good or excellent and 16 percent of the sample is hypertensive.

The findings from the bivariate analysis indicate that more than 50 percent of the respondents who perceived their health to be good or excellent are either pre-hypertensive or hypertensive. Respondents aged 45 years and above recorded high rates of hypertension. A higher proportion of males (21 percent) are hypertensive compared to females. Employed respondents, individuals with no formal education and those in Traditional Religion recorded high rates of hypertension representing 17 percent, 24 percent and 27 percent respectively. There was no difference in the hypertension rates between Ga Mashie and Agbogbloshie since both communities recorded the same prevalence rate of 16 percent. Under the lifestyle category, regular alcohol consumers, physically inactive respondents, non-smokers and individuals with good dietary intake recorded high rates of hypertension. The result further indicates that age and sex of respondents and

smoking status are the variables that are most likely to influence an individual's blood pressure status.

However, after controlling for confounding variables, the multinomial logistic regression model indicates that age, sex, religion and dietary intake are the most important predictors of hypertension. The findings further indicate that females are 0.7 times less likely to be pre-hypertensive and 0.6 times less likely to be hypertensive than males. Individuals with poor dietary intake are 1.6 as more likely to be pre-hypertensive and individuals aged 15-19 years are 0.8 times less likely to be pre-hypertensive compared to individuals aged 50 years and above. Among the religious groups, Other Religion, Christians and Moslems are 9.7, 10.7 and 12.9 times more likely respectively to be pre-hypertensive compared to Traditional Religion. In addition, the following hypotheses are confirmed: physically inactive respondents are more likely to be hypertensive and regular alcohol consumers are more likely to be hypertensive compared to non-alcohol consumers.

7.2 RECOMMENDATIONS

The focus of the study was in line with the Regenerative Health and Nutrition (RHN) Programme initiated by the Ministry of Health, which aims at improving the lives and health of Ghanaians (MOH, 2005, 2007). This is crucial to the Ministry of Health's paradigm shift from curative care to a more preventive emphasis. The preventive health service focuses on healthy lifestyles which promote good health. This includes improving the quality of food we eat, regular exercise, and reduction in smoking and alcohol consumption, etc. The above is in line with international health perspective on preventing diseases (chronic conditions) through healthy lifestyles (WHO, 2005) and also community base empowerment (Sanders, Todd and Chopra,

2005). Therefore, findings from the study should be integrated fully into the county's health system. This can be achieved through the first key strategic objective of RHN intervention that is Behaviour Enhancing Communication. Behaviour Enhancing Communication seeks to initiate and facilitate a process of learning, sharing information and skills that encourage individuals and community to understand and adopt behaviours that lead to healthier longer lives. This is because for understanding the relationship between current diseases and lifestyle and the relationship between health and human development, there is a need for a "multi-institutional multifaceted" approach as advocated by WHO (2005).

Since the study indicates that a large proportion of individuals who perceive their health to be good and excellent are indeed predisposed to hypertension or are hypertensive. Then interventions such as the Regenerative Health and Nutrition (RHN) programme which is focused on improving health behaviour in Ghana especially in Accra's urban poor are not going to be successful until the perception of health of the individual residing in these communities are similar to their lifestyle and actual health. The disparity between perceived health and actual health (measured by blood pressure status) could be seen as a hindrance to the (RHN) programme and any other future programme or interventions that is meant to improve the lives of the people in Accra's urban poor. Therefore, the study recommends that Government, non-governmental agencies, international agencies and the media should have campaigns on the massive awareness and education about hypertension and more importantly this education should be targeted at promoting appropriate views of health and the need for improved health. Furthermore, public messages and programs for residents in Accra's urban poor should be focused on individuals who believe they are healthy when indeed they are unhealthy or have poor health. For example the study identified that a higher proportion of smokers, both

occasional and non-alcohol consumers, physically inactive respondents and individuals with good dietary intake perceive their health to be either good or excellent. In addition, respondents below 45 years, males, most unemployed respondents, majority of Agbogbloshie residents and a large proportion of individuals with no formal education also perceive their health to be good or excellent, although most of them are highly predisposed to hypertension or are hypertensive. Therefore, the challenge then becomes formulating or packaging messages and programs about health and health needs which take into account the disparity about perception of health and actual health among the residents of Accra's urban poor and the cultural context in which this disparity is formed.

Applying the behaviour change models to the above recommendation, then, implies that in the education programmes individuals are to be made to understand that hypertension is a health problem which could affect their health, therefore the need for behavioural change in respect to the Transtheoretical Model. In view of the Health Belief Model, individuals should be made aware of the magnitude of their susceptibility to contracting hypertension. There should be available information for positive behavioural change according to the Knowledge Attitude Behaviour Model, increasing benefits-to-cost ratios in the Behaviour Learning Theory and increase positive outcomes in the Social Cognitive Theory. Therefore, benefits of lifestyles should play a central role in the messages of the public education. This, the study suggests may be better received than messages about how not controlling these poor lifestyles can lead to diseases and mortality. For example, a study done by Dave et al. (2009) suggests that education regarding the unhealthiness of fast food may not influence fast food consumption, but that education targeting the issue of convenience and quick or efficient preparation of nutritious alternatives to fast food may be more promising. This could make programmes that are targeted

in promoting healthy lifestyle more successful in preventing diseases and avoiding complications in individuals already living with non-communicable diseases especially hypertension.

7.3 CONCLUSION

Overall, 90 percent of Accra's urban poor believed they were in good or excellent health. However, more than 50 percent of the sample population who perceived their health to be good or excellent is either pre-hypertensive or hypertensive. This informs us that one's perception or assessment of his/her health does not correlate with their actual health outcome. Further evidence of this disparity of perceived and actual health status is provided in the multinomial logistic regression analysis where both individuals who perceive their health to be poor or good have almost the same probability of becoming hypertensive compared to respondents who perceived their health to be excellent. This contradiction between perception of health and actual health status is not seen in other populations (Hunt et al., 1980; Unden and Elofsson, 2001). Most often there is a high correlation between perceptions of health with diagnosed health (Mossey and Shapiro, 1982). However, the study did not find perception of health to be a significant predictor of blood pressure status. This perhaps could be attributed to the fact that hypertension may not be considered a health issue in Accra's urban poor until the condition has caused sudden attack or failure to the individual especially since hypertension comes with no symptoms. It can be detected through regular checkups or when one receives an attack.

In respect of the lifestyle behaviour, 70 percent of the respondents have poor dietary intake. This can be attributed to the low consumption of fruit and vegetables. As many as 99 percent of the respondents do not consume the required amount of servings of fruit and vegetables per day, that is, at least five servings in a day as recommended by the Ministry of Health (MoH). The findings

further indicate that current smoking prevalence in Accra's urban poor is 18 percent. The alcohol consumption rate is high among Accra's urban poor with 45 percent of the respondents consumed alcohol 24 hours preceding the survey. Unlike smoking where the prevalence is generally low in Ghana, alcohol consumption is more prevalent (GSS, 2009). Even though there is limited data on alcohol consumption in Ghana, Acheampong, (1997) suggests that Ghanaian drinking pattern has changed from a high status drinking in the pre-colonial era to a more socialized drinking which cuts across all ages and economic status. Moreover, there is a general culture of social drinking that is encouraged by most alcohol industries with massive advertising campaigns (Ofori-Atta et al., 1998).

In addition, the finding reveals that physical activity is very high among Accra's urban poor. This can be attributed to the kind of occupation of respondents in the study. Most of the respondents are involved in sales, skilled manual and unskilled manual jobs which involve some form of physical activity.

References

Acheampong, E.K. 1997. Drink Power and Cultural Change: A social history of alcohol in Ghana. Oxford and Portsmouth, NH: James Currey and Heinemann.

Addo J., Amoah A.G.B., Koram K. A., 2006: The changing patterns of hypertension in Ghana: a study of four rural communities in the Ga district. Ethn Dis, 16:894-899.

Allotey P. and Gyapong M., 2005. The agenda in Tropical Diseases: a review of current evidence Social, Economic and Behavioural Research. Special Topics No.4.TDR/STR/SEB/ST/OS.I. Geneva: WHO

Alves L.C., Rodrigues R. N., 2005. Determinants of self-rated health among elderly persons in Sao Paulo, Brazil. Rev PanamSalud Publica;17(5-6):333–41. [In Portuguese] [PubMed]

Agyemang C., Bruijnzeels M. A. and Owusu-Dabo E., 2006: Factors associated with hypertension awareness, treatment, and control in Ghana, West Africa. J Hum Hypertens ; 20:67-71.

Agyei-Mensah S. and De-Graft Aikins A., 2010. Epidemiological Transition and the Double Burden of Disease in Accra, Ghana. Journal of Urban Health: *Bulletin of the New York Academy of Medicine*, Vol. 87, No. 5 doi: 10.1007/s 11524-010-9492-y

Amoah A. G., 2003. Hypertension in Ghana: a cross-sectional community prevalence study in greater Accra. Ethn Dis.;13:310–315.

Ajzen I., 1991. The theory of planned behavior. Organ Behav Human Decis Process, 50: 179-211.

Baronowski T., Cullen K.W., Nicklas T, Thompson D., Baronowski J., 2003: Are current health behavioral change models helpful in guiding prevention of weight gain efforts? Obesity Res, 11(Suppl): 23S-43S.

Bauman A., 2004.Commentary on the VERB™ Campaign—Perspectives on Social Marketing to Encourage Physical Activity Among Youth. Preventing chronic disease. Volume 1: No.3.

Beaglehole R. and Yach D., 2003. Globalisation and the prevention and control of non-communicable disease: the neglected chronic diseases of adults. *Lancet*;362:903-908

Benowitz N.L., Sharp D. S., 1989. Inverse relation between serum cotinine concentration and blood pressure in cigarette smokers. Circulation; 80:1309.

Bosu, W. K., Ghana's National NCD Programme: history, prospects and challenges. Paper presented at the 1st Annual Workshop, UK-Africa, Nouguchi Memorial institute for medical research. (12th April, 2007)

Bosu W. K., 2010. Epidemic of hypertension in Ghana: a systematic review. BMC Public Health, 10:418 http://www.biomedcentral.com/1471-2458/10/418

Brown J.S., Rawlinson M., 1975. Relinquishing the sick role following open-heart surgery. *J Health SocBehav*. Mar;16(1):12–27. [PubMed]

Castelli W. P., 1984. Epidemiology of coronary heart disease. The Framinghen Study. America Journal of Medicine; 76;4-12.

Cappuccio F., Micah F., Emmett L., Kerry S., Antwi S., Martin-Peprah R., Phillips R., Plange- Rhule J., Eastwood J., 2004. Prevalence, Detection, Management, and Control of Hypertension in Ashanti, West Africa. Hypertension;43: 1017–1022.

Cappuccio F.P., Plange-Rhule J., Phillips R.O., Eastwood J.B. (2000). Prevention of hypertension and stroke in Africa. *Lancet*, 356; 677–678

Chobanian A.V., Bakris G. L., Black H. R., et al., 2003. The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA; 289(19): 2560–2571.

Chukwuemeka A.C., Pobee J.O.M., Chuwa M., Kpodonu J., Larbi E., 1983. Cardiovascular abnormalities from a field survey for cardiovascular diseases in an urban area of Accra, Ghana. IntCongrCardiol Trop Kenya.

Cott C.A., Gignac M.A., Badley E.M., 1999. Determinants of self rated health for Canadians with chronic disease and disability. J Epidemiol Community Health. 53(11):731–6. [PMC free article] [PubMed]

Constitution of the World Health Organization. 2006. www.who.int/governance/eb/who_constitution_en.pdf.

Danaei G., Finucane M.M., Lin J.K., et al., 2011. National, regional, and global trends insystolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5.4 millionparticipants. Lancet 2011 Feb 12; 377 (9765): 568-77

De-Graft Aikins A., 2007. Ghana's neglected chronic disease epidemic: a developmental challenge. *Ghana Med J*. 41:154-9.

De-Graft Aikins A., Anum A., Agyemang C., Addo J. and Ogedegbe O., 2012. Lay representations of chronic diseases in Ghana: implications for primary prevention. *Ghana Medical Journal.*

De-Graft Aikins, A., 2007. *Eating, drinking and smoking habits in Ghana: a Public Health Psychology perspective.* Invited lecture presented at the West African college of physicians

(WACP)/Ghana College of Physicians and Surgeons, (GCPS) Cardiology Update Course, GCPS, Accra. 6th June 2007.

De-Graft Aikins A., Unwin N., Agyemang C., Allotey P., Campbell C. and Arhinful D., 2010. Tackling Africa's chronic disease burden: from the local to the global. *Globalization and Health;* **6**:5.

Drewnowski A., Popkin B. M., 1997. A dietary intervention trial for nutritional management of cardiovascular risk factors. Nutr. Rev; 55: 3–4.

Eberhardt M.S. and Pamuk E.R. (2004). The Importance of Place of Residence: Examining Health in Rural and Nonrural Areas. *Am J Public Health*. 94(10): 1682–1686.

Elliot P., Stamler J., Nicholas R., Dyer A. R., Stamler R., Marmot M., et al., 1996. For the Intersalt Cooperative Research Group, Intersalt revisited: firther analyses for 24hr sodium excretion and blood pressure within and across population. *British Medical Journal*; 312: 1249-55.

Elhadi I. E., Hasan Y, Rasid A., RachmanA.,Ismail O., 2007. identification of Factors Ffecting Blood pressure control in patients admitted with hypertension in Penang General Hospital. The Malaysian Journal Of Medial Sciences: 14(1).

European Community Health Indicators and Monitoring (ECHIM) Public Health. [cited 2010 May 23]. Available from: URL: http://www.healthindicators.eu/object_document/o5873n28314.html .

The European Commission. Development of public health performance indicators for the pharmaceutical sector. [cited 2011 Feb 23]. Available from: URL:http://ec.europa.eu/health/ph_information/dissemination/pharma/index_en.print.htm

Falkner B., Gidding S.S, Ramirez-Garnica G. Wiltrout S.A, West A and Rappaport E.B. (2006). The relationship of body mass index and blood pressure in primary care pediatric patients. *The Journal of Pediatrics* 2006, 148:195-200.

Fezeu L., Minkoulo E., Balkau B., Kengne A. P., Awah P., Unwin N., Alberti G. K., Mbanya J. C., 2006. Association between socioeconomic status and adiposity in urban Cameroon. *International Journal of epidemiology*; 35(1): 105-111.

Finkelstein M. M., 2000. Hypertension, self-perceived health status and use of primary care services. CMAJ; 162(1):45–6. [PMC free article] [PubMed]

Fogari R., Zoppi A., Lusardi P., Marasi G., Villa G., Vanasia A. (1996). Cigarette smoking and blood pressure in a worker population: a cross-sectional study. *J Cardiovasc Risk*.3:55–9.

Garrity T. F. Vocational adjustment after first myocardial infarction; comparative assessment of several variables suggested in the literature. *SocSci Med.* 1973 Sep;7(9):705–717. [PubMed]

Gibbs C. R., Lip G. Y. H., Beevers D. G., 2000. Salt and cardiovascular disease: clinical and epidemiological evidence. *Journal of cardiovascular risk*; 7: 9-13.

Ghana Statistical Service (GSS), Ghana Health Service (GHS), ICF Macro: Ghana Demographic and Health Survey 2008. Accra, Ghana: GSS, GHS and ICF Macro 2009.

Ghannem H, HadjFredj A., 1997. Epidemiology of hypertension and other cardiovascular disease factors in theurban poor community Soussa, Tunisia; 3(3): 472-79.

Gordon Neil F., Meg Gulanick, Fernando Costa, Gerald Fletcher, Barry A. Franklin, Elliot J. Roth and Tim Shephard, 2004. Physical Activity and Exercise Recommendations for Stroke Survivors: An American. Heart Association Scientific Statement From the Council

on Clinical Cardiology, Subcommittee on Exercise, Cardiac Rehabilitation, and Prevention; the Council on Cardiovascular Nursing; the Council on Nutrition, Physical Activity, and Metabolism; and the Stroke Council.American Heart Association;35:1230-1240

Greater Accra Regional Health Directorate: Annual Report 2007. Accra: Ghana Health Service 2008

Graphic, Saturday, January 1, 2000.

Graphic, Tuesday, February 18, 1964.

Griffith B. N, Gretchen D Lovett, Donald N Pyle and Wayne C Miller, 2011.Self-rated health in rural Appalachia:health perceptions are incongruent with health status and health behaviors. BMC Public Health; 11:229.

Hall J.N., Moore S., Harper S.B., Lynch J.W., 2009: Global variability in fruit and vegetable consumption. Am J Prev Med, 36:402- 409.

Hunt S.M., McKenna S.P., McEwen J., Backett E.M., Williams J., Papp E., 1980. A quantitative approach to perceived health status: a validation study. J Epidemiol Community Health.; 34(4):281–6. [PMC free article] [PubMed]

INTERSALT Cooperative Research group, 1988. INTERSALT an international study of electrolyte excretion and blood pressure. Results for 24hr urinary sodium and potassium excretion. *British Medical Journal*; 297: 319-28.

Isezuo S., Sabir A., Ohwovorile A., &Fasanmade O., 2011. Prevalence, associated factors and relationship between prehypertension and hypertension: a study of two ethnic African populations in northern Nigeria. *Journal of Human Hypertension:* 25, 224- 230.

Joffers M., Campbell N. R. C., Manns B., Tu K., 2007. Estimate of the benefits of a population-based reduction in dietary sodium additives on hypertension and its related care cost. in Canada. *Can J Cardiol*; 23: 437-43.

John U., Meyer C., Hanke M., Volzke H., Schumann A. (2006). Smoking status, obesity and hypertension in a general population sample: a cross-sectional study. *Q J Med*; 99:407–415. doi:10.1093.

Jha P., Peto R., Zatonski W., et al., 2006. Social inequalities in male mortality, and in male mortality from smoking: indirect estimation from national death rates in England and Wales, Poland, and North America. Lancet; 368: 367-70.

Joshipura K. J., Ascherio A., Manson J. F., et al ., 1999. Fruit and vegetable intake in relation to ischemic stroke. *Journal of the American Medical Association*; 282: 1233-9.

Kadiri S. And Salako B., 1997. Cardiovascular risk factors in middle aged Nigerians. *East African Medical Journal;* 74 (5): 303-306.

Kannel W.B. Prevalence and complication of uncontrolled sysyloic hypertension Drugs Ageing 2003; 20 (4): 277-86.

Kearney P.M., Whelton M., Reynolds K., Muntner P., Whelton P.K., He J., 2005. Global burden of hypertension: analysis of worldwide data. *Lancet*; 365:217–223.

Kim J.K. Attey D., Seeman T., Karlamangla A., Crimmins E., 2006. Recent change cardiovascular risk factors among women and men. Journal of Women's Health; 15(6).

Kiawi E., Richard Edwards, Joseph Shu, Nigel Unwin, Raoul Kamadjeu, Jean Claude Mbanya, 2006. Knowledge, Attitudes, and Behavior Relating to Diabetes and its main risk factors among Urban Residents in Cameroon: a qualitative survey. Ethnicity & Disease, Volume 16.

Kornitzer M., Dramani M. and Becker G. D., 1999 (May). Epidemiology of risks factors for hypertension, implication for preventive and therapy-drugs; 57(5): 695-712.

Kunutsor S., Powles J.: Descriptive epidemiology of blood pressure in a rural adult population in Northern Ghana. Rur Remote Health 2009, 9:1095.

Laabes E.P., Thacher T. D., Okeahialam B. N., 2008. Risk factors for heart failure in adult Nigerians. ActaCardiol; 63 (4): 437-443.

Lee D.H., Ha M.H., Kim J.R., Jacobs D.R, Jr. (2001). Effects of smoking cessation on changes in blood pressure and incidence of hypertension: a 4-year follow-up study. *Hypertension*; 37:194–8.

Leon D. A., Saburova L., Tomkins S., et al., 2007. Hazardous alcohol drinking and premature mortality in Russia: a population base-control study. Lancet; 369: 2001-09.

Lorriane F., 2000. Factors influencing blood pressure, development of a risk model. J CardiovascNurs ; 15(1); 62-69.

Ministry of Health, Ghana, 2007. Regenerative health and nutrition: Strategic plan, 2007-2011. Accra: MOH.

Ministry of Health (2005). The Ghana Health Sector 2006. Programme of Work.

Molarius A., Berglund K., Eriksson C., Lambe M., Nordstrom E., Eriksson H.G., et al. Socioeconomic conditions, lifestyle factors, and self-rated health among men and women in Sweden. Eur J Public Health. 2007;17(2):125–33. [PubMed]

Molarius A., and Janson S., 2002 Self-rated health, chronic diseases and symptoms among middle-aged and elderly men and women. J ClinEpidemiol; 55(4):364–70. [PubMed]

Narnkiewicz K., Kjeldsen S.E, Hedner T. (2005). Is smoking a causative factor of hypertension? *Blood Press*; 14:69 –71.

Natural Heart Lung and Blood Institute Diseases and Condition Index. High Blood Pressure, who is at risk. Bethesda, MD: NHLBID; 2008.

Nestle M., 1999. Animal vs. Plant foods in human diets and health: is the historical record unequivocal? *Proceedings of the nutrition society*; 58: 211-8.

Ness A. R. and Powless J. W., 1997. Fruit and vegetable intake and risk of cardiovascular disease: a review. *International journal of epidemiology*; 26:1-13.

Okubo Y., Suwazono Y., Kobayashi E., Nogawa K. (2004). An association between smoking habits and blood pressure in normotensive Japanese men: a 5-year follow-up study. *Drug Alcohol Depend*; 73:167–74. Omvik P. (1996). How smoking affects blood pressure. *Blood Press*; 5:71–7.

Opie, L., Seedat, Y., Hypertension in Sub-Saharan African populations (2005). *Circulation*, 2005; 112.3562:3568

Ormel J., VornKorrf M., Burger H., Scott K., Demyttenaere K., Huang Y., Posada-Villa J., Pierre Lepine J. Angermeyer M. C., Levinson d., et al., 2007. Mental disorders among patients with heart disease results from World Mental Health Surveys. Gen Hospital Psychiatry; 29 (4):325-334.

Owiredu W.K.B.A., Adamu M.S., Amidu N., Woode E., Bam V., Plange-Rhule J., Opoku-Okrah C.: Obesity and Cardiovascular Risk Factors in a Pentecostal Population in Kumasi-Ghana. J Med Sci 2008, 8:682-690.

Owusu I. K., 2007. Causes of heart failure as seen in Kumasi, Ghana. Internet J. Third World Med: 5.

Pampel F.C.(2002). Patterns Of Tobacco Use In The Early Epidemic Stages: Malawi and Zambia, 2000–2002. *Am J Pub Health;* 95:1009–1015.

Paradis A.M., Perusse L., Godin G., Vohl M-C, 2008: Validity of self-reported measure of familial history of obesity. Nutr J, 7: 27-33.

Pescatello L. S., and Kulikowich J.M., 2001. The aftereffects of dynamic exerciseon ambulatory blood pressure. *Med Sci Sports Exerc*, 33:1855–61.

Plange-Rhule J., Phillips R., Acheampong J. W., Saggar-Malik A.K., Cappuccio F. P., Eastwood J. B., 1999. Hypertension and renal failure in Kumasi, Ghana. J Hum Hypertens ; 13:37-40.

Pobee J. O., Larbi E. B., Dodu S.R., Pisa Z., Strasser T., 1979. Is systemic hypertension a problem in Ghana? Trop Doct; 9:89-92.

Pobee J.O., 1993. Community-based high blood pressure programs in sub-Saharan Africa. Ethn Dis;3: S38–S45.

Poulter N.R., 2002. Independent effects of smoking on risk of hypertension: small, if present. J Hypertens; 20:171.

Poulter N. K., Khaw K. T., Hopwood B. E. C., Mugambi M., Peart W. S., Rose G., et al., 1990. The KeyanLuo migration study: observation on the initiation of a rise in blood pressure. *British Medical Journal*; 300: 967-72.

Poulter N. R., *et al,* Determinants of blood pressure changes due to urbanization: a longitudinal study (1985). *J Hypertens Suppl.* 1985; 3 (suppl 3): S375-377.

Pole D., Ikeme A.C., Pobee J.O.M., Larbi E., Williams H., Blankson J. 1979. The Mamprobi Survey - a screening survey for cardiovascular disease and risk factors in Africa: methodology and validity. Bull WHO, 57:81-87.

Prochaska J.O., Velicer W.F., Rossi J.S, Goldstein M.G., Marcus B.H., Rakowski W., Fiore C., Harlow L.L., Redding C.A., Rosenbloom D., Rossi S.R.: Stages of change and decisional balance for 12 problem behaviors. Health Psychol 1994, 13: 39-46.

Rohrer J.E., Young R., Sicola V., Houston M., 2007. Overall self-rated health: a new quality indicator for primary care. J EvalClin Practice, 13: 150-153.

Salehi, L., Eflekhar, H., Mohammed K., Tauafian, S. S., Jazayery A. and Montazeri A., 2010. "Consumption of fruit and vegetables Among Ederly People: A cross sectional study from Iran" Nutritional Journal; 9(2): 1-9.

Sanders, D. M., Todd, C., & Chopra, M. Confronting Africa's health crises: more of the same will not be enough. *BMJ,* 2005, 331, 755-758

Shaper A. G., Wright G. H., Kyobe J., 1969. Blood pressure and body build in three nomadic Tribes of northern Kenya. East Afr Med J.; 46:273–281.

Stewart S., *et al.*,n.d.The epidemiologic and nutrition transition: prevalence and correlates of hypertension in rural East Africa

Steyn K., Silwa K., Hawken S., Commerford P., Onen C., Damasceno A., Ounpuu S., Yusuf S., 2005. INTERHEART Investigators in Africa: risk factors associated with myocardial infarction in Africa: the INTERHEART Africa study. Circulation, 122(23): 3536-3540.

Tagoe H. A. and Dake F. A. A., 2011. Healthy lifestyle behaviour among Ghanaian adults in the phase of a health policy change Globalization and Health , 7:7

Thompson P. D., Buchner D., Pina I. L,, et al., 2003. Exercise and physical activity in the prevention and treatment of atherosclerotic cardiovascular disease. Circulation;107:3109–16.

Tuomilehto J., Jousilahti P., Rastenyte D., Moltchanov V., Tanskanen A., Pietinen P., Nissinen A., 2001. A urinary sodium excretion and cardiovascular mortality in Finland: a prospective study. *Lancet*; 357: 848-51.

Unden AL, Elofsson S. Health from the patient's point of view. How does it relate to the physician's judgement? FamPract. 2001;18(2):174–80. [PubMed]

United Nations (1985). Socio-Economic Differentials in Child mortality in Developing Countries. *Department of Economic and Social Affairs*. New York.

Werko L., 2006. High Blood Pressure: Disease or risk factor? Scandinavian Cardiovascular Journal; 40: 131-33.

Whelton P. K., He J., Appel L. J., Cutler J. A., Havas S., Kotchen T.A., et al., 2002. Primary prevention of hypertension: Clinical and public health advisory from The National High Blood Pressure Education Program. *JAMA*; 288:1882-8.

World Health Organization, 2002. The World Health Report. Reducing Risks, Promoting Healthy Lifestyles. Geneva: WHO

World Health Organization, 2005. Preventing Chronic Disease. A vital investment. Geneva:*WHO;* 2005.

WHO, 2009. Mortality and burden of disease estimates for WHO Member States in 2004. Geneva: World health Organization.

World Health Organization, 1996. Hypertension control: report of WHO Expert committee Geneva

WHO Regional Office for Africa (WHO/AFRO), *The Health of the People: The* African Regional Health Report (2006). *WHO Geneva* 2006

World Health Organization: WHO STEPS Surveillance Manual. Geneva: WHO 2008.

WHO The tobacco Atlas, WHO, Geneva 2002

WHO, 2004. Tobacco and poverty: a vicious cycle. Geneva: World Health Organization

World Economic Forum. Global risks 2011.http:riskreport.weforum.org/(accessed Feb21 2011).

Yusuf S., Hawken S., Ounpuu S., et al., 2004. Effects of potentially modifiable risk associated with myocardial infarction in 52 countries (the INTERHEART Study); case control study. Lancet; 364: 935-52.

Yach D., Hawkes C., Hofman K: The global burden of chronic diseases: overcoming impediments to prevention and control, JAMA 2004, 291 (21): 2616-2622

Yu E.S., Kean Y.M., Slymen D.J., Liu W.T., Zhang M., Katzman R: Self-perceived health and 5-year mortality risks among the elderly in Shanghai, China.*Am J Epidemiol* 1998, **147**(9)**:**880-890. PubMed Abstract | Publisher Full Text